CTP-2005
August 7, 1996

FOREWORD

In accordance with PROMATEC Internal Audit Report No. Q1A-100-95, this foreword shall serve as notice of review by the Product Assurance Manager as stated in QAM20188, Issue C, dated March 28, 1993, Section XI, paragraph 4.5.

The PROMATEC Quality Assurance Department has approved the applicable procedures, monitored the construction of the test specimens, monitored the application of the fire proofing material, maintained complete documentation of the fire proofing material application and hereby verifies that approved procedures were utilized in the application of fire proofing material into various assemblies.

Copies of the applicable manufacturer's Certificates of Compliance are available from the PROMATEC Quality Assurance Department upon written request and may be excluded from the contents of this documentation package.

The Quality Assurance/Quality Control functions performed by PROMATEC personnel are governed within the applicable sections of the PROMATEC Quality Assurance Program and the applicable Quality Control Procedures.

L. Charles Spriggs
VP/Product Assurance

FIRE ENDURANCE TEST OF 3M INTERAM™ MAT FIRE PROTECTIVE ENVELOPES (6 in. wide and 24 in. by 4 in. Deep Steel Ladder-Back Cable Trays)

Project No. 14540-99417

FIRE ENDURANCE TEST TO QUALIFY PROTECTIVE ENVELOPES FOR CLASS 1E ELECTRICAL CIRCUITS

September 22, 1997

Prepared For:

Peak Seals, Inc.
P.O. Box 309
Cypress, Texas 774219

OMEGA POINT LABORATORIES

ABSTRACT

Two steel raceway assemblies clad with 3M Interam™ Mat materials as described herein, were evaluated in accordance with the Peak Seals, Inc. TEST PLAN No. CTP-2005 "Three (3) Hour Fire Endurance Test 3M Interam™ Fire Wrap," and Supplement 1 to the U.S. Nuclear Regulatory Commission Generic Letter 86-10.

The details, procedures and observations reported herein are correct and true within the limits of sound engineering practice. All specimens and test sample assemblies were produced, installed and tested under the surveillance of either Peak Seals, Inc.'s or the testing laboratory's in-house Quality Assurance Program. This report describes the analysis of a distinct assembly and includes descriptions of the test procedure followed, the assembly tested, and all results obtained. All test data are on file and remain available for review by authorized persons.

Herbert W. Stansberry II
Project Manager

9/22/97
Date

Constance A. Humphrey
Manager, QA Dept.

9/22/97
Date

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TABLE OF CONTENTS

ITEM	PAGE
INTRODUCTION	1
OBJECTIVE	1
TEST PROCEDURE	2
Fire Test Furnace	2
Thermocouples	3
Data Acquisition System	3
Hose Stream Test	4
TEST ASSEMBLY	4
Test Slab	4
Test Items (General)	5
Test Items (Cable Trays)	7
Thermocouple Placement	7
3M Interam™ Mat Installation Highlights	8
TEST RESULTS	8
CONCLUSIONS	11
APPENDICES	
Appendix A: CONSTRUCTION DRAWINGS	12
Appendix B: TEST PLAN	17
Appendix C: THERMOCOUPLE LOCATIONS	78
Appendix D: TEST DATA	91
Appendix E: QUALITY ASSURANCE	203
Appendix F: PHOTOGRAPHS	270
Last Page of Document	310

INTRODUCTION

The protection of vital electrical circuits from the effects of an external fire exposure is of primary concern in the design and construction of an electrical power generating plant. Typical "fire protective envelopes" are designed to protect the contents of an electrical raceway for fire exposure periods of one to three hours, during which time the electrical circuitry must remain functional, as defined in Generic Letter 86-10, Supp. 1.

The external fire exposure selected to evaluate protective envelope systems is that described in the ASTM E119-95a Fire Tests of Building Construction and Materials (E119 Time-Temperature Curve, described later in this document). The ASTM E119 test procedure is identical or very similar to the following standard test methods:

UL 263
UBC 7-1(43-1)
NFPA 251

Typical fire test programs involve the selection and construction of a specific electrical raceway system, instrumentation for thermal and circuit integrity measurements, followed by the application of the protective envelope system by qualified personnel.

This standard should be used to measure and describe the properties of materials, products, or assemblies in response to heat and flame under controlled laboratory conditions and should not be used to describe or appraise the fire hazard or risk of materials, products, or assemblies under actual fire conditions. However, results of this test may be used as elements of a fire risk assessment that takes into account all the factors that are pertinent to an assessment of the fire hazard of a particular end use.

OBJECTIVE

The objective of this project was to evaluate specific assemblies for use as 3-hour fire-protective envelopes for redundant electrical systems. The entire program was carried out in accordance with the Peak Seals, Inc., TEST PLAN No. CTP-2005, *Three (3) Hour Fire Endurance Test 3M Interam™ Fire Wrap*, which may be found in Appendix B of this document. For reasons of clarity and to reduce redundancy, many items discussed in the Test Plan have not been duplicated elsewhere in this document.

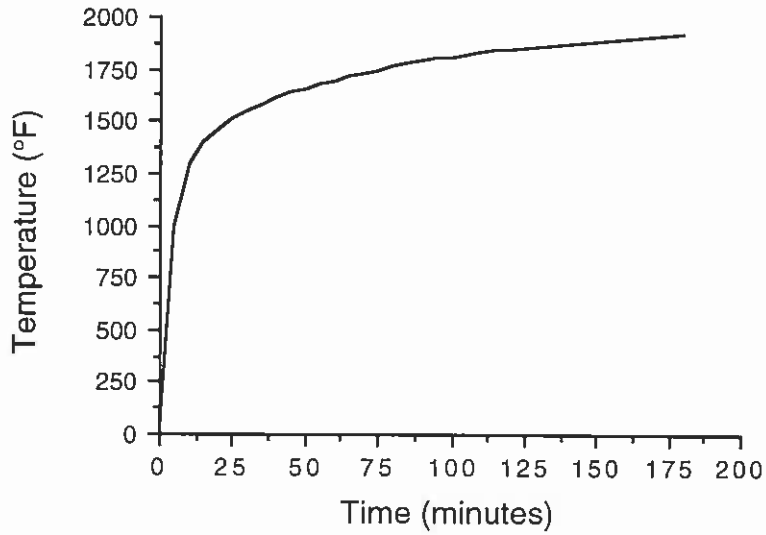
TEST PROCEDURE

FIRE TEST FURNACE

The test furnace is designed to allow the specimen to be uniformly exposed to the specified time-temperature conditions. It is fitted with symmetrically located propane gas burners designed to allow an even heat flux distribution across the surface of a test specimen.

The temperature within the furnace is determined to be the mathematical average of thermocouples located symmetrically within the furnace and positioned 12 in. away from representative parts and locations of the test specimen. The exact positioning of the thermocouples is such that the average fire exposure across the entire test specimen can be determined. The materials used in the construction of these thermocouples are those suggested in the E119 test standard. During the performance of a fire exposure test, the furnace temperatures are monitored at least every 15 seconds and displayed for the furnace operator to allow control along the specified temperature curve. All data is printed to paper every 30 seconds and saved to magnetic disk every minute.

The fire exposure is controlled to conform with the standard time-temperature curve shown in Figure 1, as determined by the table below:



Temperature (°F)	Time (min)
1000	5
1300	10
1462	20
1550	30
1700	60
1792	90
1850	120
1888	150
1925	180

Figure 1

The fire test is controlled according to the standard time-temperature curve, as indicated by the average temperature obtained from the readings of the furnace interior thermocouples symmetrically located across the specimen, 12 in. away. The thermocouples are enclosed in protection tubes of such material and dimensions that the time constant of the thermocouple assembly lies between 5.0 and 7.2 minutes, as required by the E 119 standard. The furnace temperature during a test is controlled such that the area under the time-temperature curve is within 5% of the corresponding area under the standard time-temperature curve for the three hour test period.

The furnace pressure is controlled to be as nearly neutral with respect to the surrounding laboratory atmosphere as possible, measured at the vertical mid-height of the test specimen. Adjusting the neutral plane at that position results in a nominal +0.015 in. WC pressure at the top of the specimen (under the surface of the slab) and –0.015 in. WC pressure at the bottom of the specimen.

THERMOCOUPLES

Temperatures on the interior of the fire protected systems were measured with Type K, 24 gauge, Chromel-Alumel electrically welded thermocouples formed from Chromel and Alumel wires of "special limits of error (±1.1°C)," and covered with Teflon® PFA insulation. The Teflon® insulation material begins to break down at temperatures above 500°F. Temperature readings above 500°F can not be guaranteed as accurate since the thermocouple conductors may no longer be adequately separated.

DATA ACQUISITION SYSTEM

The outputs of the test article thermocouples and furnace probes are monitored by a total of two data acquisition systems consisting of: 1) a John Fluke Mfg. Co., Model HELIOS 2289A Computer Front End, a John Fluke Mfg. Co., Model HELIOS 2281A Extender Chassis, and an Apple Computer Co., Macintosh IIcx microcomputer, yielding a channel capacity of 200 channels, and 2) a John Fluke Mfg. Co., Model HELIOS 2289A Computer Front End and an Apple Computer Co., Macintosh IIsi microcomputer, yielding a channel capacity of 100 channels. The HELIOS Computer Front Ends are connected to the RS422 Serial Interface Port of the Macintosh Classic Computers and the Extender Chassis is serially connected to one HELIOS Computer Front End. The computers are programmed in Microsoft BASIC to command the data acquisition units to sample the data input lines, receive and convert the data into a digital format, and to manipulate the raw data into usable units for display on screen and paper and for storage on hard disk.

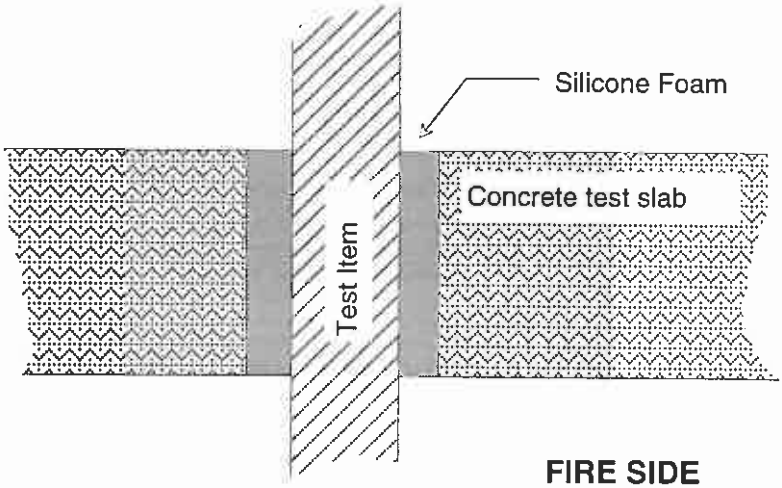
HOSE STREAM TEST

According to the Test Plan, following the fire exposure test, the test specimen is removed from the test furnace and exposed to the impact, erosion, and cooling effects of a hose stream directed perpendicular to the exposed surface of the test specimen as outlined in the standard. The stream is delivered, for a minimum period of 5 minutes, through a 1-1/2 in. fog nozzle with an adjustable stream, with a nozzle pressure of 75 psi, a spray angle of 30° and with the tip of the nozzle a distance of 5 ft. from the exposed face. The nozzle is to flow a minimum of 75 gpm during the hose stream test. It is recognized that, with a three-dimensional object, not all surfaces can be attacked by the hose stream test. For this reason, the hose is moved about to allow the stream to play against the sides, inside and outside vertical surfaces and the underside of the item, resulting in little, if any, direct force being applied to the inside top surface of the specimen. This exposure, however, meets the intent of hose stream applications specified in USNRC GL 86-10 Supplement 1.

TEST ASSEMBLY

TEST SLAB

The test deck consisted of a perimeter of 6 in. structural steel channel, welded together into an 8 ft by 13 ft rectangle, with the flanges inward. Steel rebar (#7) was welded to the interior web of the perimeter channel in a grid pattern spaced 12 in. o.c. The rebars were located 1-1/2 in. up from the bottom of the channel frame. A 10 in. steel I-beam was welded across the top of the steel framework along the long axis to act as additional support. Normal weight concrete was poured into the slab frame and vibrated to remove any air pockets. The assembly was allowed sufficient curing so as not to be severely damaged by the fire exposure. Holes were bored through the concrete slab to allow passage of thermocouple lead wires and the test article to the cold side of the test assembly. After installation of the penetrating items, all holes bored through the slab and all blockouts were completely filled with silicone foam.



CROSS-SECTIONAL VIEW OF POINT OF PENETRATION
OF THE SLAB BY A TEST ITEM

This method of sealing around the point where a test item penetrates the test deck has proven very effective at withstanding the 180 minute fire exposure. Since the penetration seal is considered a part of the support system, and is not in itself being evaluated by this test method, the important aspect of the seal is that it be "typical" of a field installation and withstand the fire exposure test. The silicone foam system used in this design does not unduly act as a heat sink, nor doest it offer significant physical support to the penetrating item. Its purpose is to seal the gap without affecting the evaluation of the protective envelope system.

TEST ITEMS (GENERAL)

Cable tray materials used in this test were purchased by Omega Point Laboratories, Inc., from B-Line Systems, Inc., and various other approved vendors. The table on the following page provides pertinent information about the raceway items used. The weight of the bare #8 copper conductor is considered negligible and is therefore not included.

Cable Trays

ATTRIBUTE	DIMENSION / WEIGHT
6 in. x 4 in. Cable Tray	
Side rail thickness	0.048
Rung thickness	18 GA
Rung spacing	9 in. o.c.
Rung dimensions	1-5/8 in. w x 13/16 in. h x 3/8 in. leg
Weight per linear foot	1.29 lbs
24 in. x 4 in. Cable Tray	
Side rail thickness	0.048
Rung thickness	18 GA
Rung spacing	9 in. o.c.
Rung dimensions	1-5/8 in. w x 13/16 in. h x 3/8 in. leg
Weight per linear foot	1.93 lbs

3M Interam™ Mat Materials/Installation/Inspection

3M Interam™ Mat materials were supplied by 3M, St. Paul, MN. Materials supplied by 3M were Interam™ E-54A Mat (rolls 24.5 in. wide x 20 ft long), Interam™ T-49 Tape (rolls 4 in. wide x 180 ft. long), Interam™ FireDam™ 150 Caulk (10-1/2 fl. oz cartridges) and Dow Corning 732 RTV Multipurpose Sealant. All materials were measured, cut and installed onto the respective test assembly by Peak Seals, Inc. craft personnel (insulators) using approved Peak Seals, Inc. drawings, procedures and specifications. The phases of inspection were accomplished by Peak Seals, Inc. Quality Control personnel.

Other Materials

Materials used in conjunction with the 3M components previously identified were 3M Scotch™ Brand Premium Grade Filament Tape P-898 (rolls 3/4 in. wide x 60 yd long). and 1/2 in. wide x 0.020 in. thick stainless steel banding straps and stainless steel banding clips (provided by Promatec, Houston, TX).

TEST ITEM (CABLE TRAYS)

The 6 in. cable tray assembly consisted of a B-Line Systems, Inc. 6 in. wide x 4 in. deep, ladder back vertical cable tray (Catalog No. 248P-09-06-144), assembled into a "U-shaped" configuration having a horizontal dimension of 104 in. and a vertical dimension of 76 in. at each leg. Both vertical legs transitioned through the upper steel deck into the horizontal section via a 6 in. wide x 4 in. deep ladder back 90° inside bend fitting having an inside radius of 12 in. (Catalog No. 248P-06-90VI12).

The 24 in. cable tray assembly consisted of a B-Line Systems, Inc. 24 in. wide x 4 in. deep, ladder back vertical cable tray (Catalog No. 248P-09-24-144), assembled into a "U-shaped" configuration having a horizontal dimension of 104 in. and a vertical dimension of 76 in. at each leg. Both vertical legs transitioned through the upper steel deck into the horizontal section via a 24 in. wide x 4 in. deep ladder back 90° inside bend fitting having an inside radius of 12 in. (Catalog No. 248P-24-90VI12).

Both cable tray assemblies were supported with a common trapeze type hanger formed from 3x4.1 steel channel. The distance exposed from the bottom of the trays to the top of the support angle measured 36 in.

A nominal 1-1/2 in. gap was provided around each penetrating raceway section. The fire barrier material abutted to the exposed side of the concrete test deck. Each blockout was sealed with Dow Corning 3-6548 RTV silicone foam material (after installation of the fire barrier material onto the raceways). Internal seals were similarly constructed at all locations where a raceway exited the concrete test slab.

Drawings of the test items and supports are located in Appendix A: Construction Drawings.

THERMOCOUPLE PLACEMENT

In order to monitor temperatures in the interior of the raceways, bare #8 AWG stranded copper wire was instrumented with 24 gauge, Type K, Chromel-Alumel electrically-welded thermocouples (Special Limits of Error: ±1.1°C, purchased with lot traceability and calibration certifications) placed nominally every 6 in. along the length of wire. The thermocouples were attached to the bare #8 AWG stranded copper wire by placing the thermojunction in direct contact with the top surface of the wire and crimping the junction to the copper wire with a copper Buchanan 2011S open-end splice cap fastened in place with a Buchanan C-24 "pres-SURE" tool. Wires instrumented as such were laid atop the rungs of each cable tray assembly.

In order to get a realistic measurement of the temperatures on the cable tray side rail surfaces, similar thermocouples were positioned nominally every 6 in. along the outside surface of the tray rails on each cable tray, (and immediately adjacent to the support and barrier penetrations, per Supp. 1) being held in position by clamping under the head of a #8 x 32 x 1/4 in. long stainless steel round-head machine screw in a drilled and threaded hole at each location. The thermocouple leads were routed in the interior of the cable tray.

3M INTERAM™ MAT INSTALLATION HIGHLIGHTS

3M Interam™ Mat materials were installed in accordance with Peak Seals, Inc. design drawings and procedures. Application methods are presented in the Test Plan, contained in Appendix B.

TEST RESULTS

The completed test specimen was placed atop the Laboratory's intermediate horizontal fire test furnace, on the Laboratory's facility at 16015 Shady Falls Rd., Elmendorf, Texas. The thermocouples were then connected to the data acquisition system and their outputs verified.

The test was conducted on August 21, 1997, by Herbert W. Stansberry II, Project Manager, with the following persons present:

Mike Murphy	-	Peak Seals, Inc.
Randy Brown	-	Peak Seals, Inc.
Cheryl Brown	-	Peak Seals, Inc.
L. Charles Spriggs	-	Promatec
Deggary N. Priest	-	Omega Point Laboratories, Inc.
Kerry Hitchcock	-	Omega Point Laboratories, Inc.
Cleda Patton	-	Omega Point Laboratories, Inc.
Laudencio Castanon	-	Omega Point Laboratories, Inc.
Oscar Estrada	-	Omega Point Laboratories, Inc.

The furnace was fired at 9:21 a.m. and the ASTM E119 standard time-temperature curve followed for a period over 180 minutes. The pressure differential between the laboratory surrounding the furnace and a point within the furnace level with the vertical midpoint of the exposed portion of the specimen was maintained at approximately 0.00 in. water column throughout the test. During the fire exposure, no visual openings into the raceway were observed. Other observations made during the test are as follows:

Time (min:sec)	Observation
0:00	Furnace fired at 9:21 a.m.
0:57	Ignition of the filament tape.
1:16	T-49 tape darkening.
2:21	T-49 foil tape melting and falling from raceway envelopes.
31:12	Edges of mat material exposed in outer layer.
180:00	Test officially terminated.

At the end of the fire exposure period, the thermocouples were disconnected, the furnace extinguished and the specimen removed from the furnace. When the test item was removed from the furnace it was still flaming, which slowly decreased as it was positioned for the hose stream test. Prior to the hose stream test, the exposed surfaces of the test items were observed to be covered with a layer of white ash with all layers applied to the test specimens virtually intact. No openings along joints or seams were evident in the test assemblies; support coverage was virtually intact.

The test specimen was suspended from an overhead crane and slowly spun (at approximately 6 to 8 revolutions per minute) while being exposed to a hose stream delivered through a 1-1/2 in. fog nozzle with a discharge angle of 30° with a minimum pressure at the nozzle of 75 psi at a distance of 5 feet, for a 5 minute duration. The minimum flow from the nozzle was 75 gpm. The hose stream was thus positioned to attack the sides, bottom and inside vertical surfaces of the test item, with only minimal exposure to the top surface. This exposure meets the intent of the hose stream application specified in USNRC GL 86-10, Supplement 1.

Following the hose stream test, the outermost layer of 3M material on the supports and the raceway assemblies had become dislodged by the water hose stream. An in-depth description of the condition of each protective envelope is presented later in this document.

The significant temperatures within the raceway systems at the end of the prescribed 180 minutes (3 hr) fire exposure are presented in the table below. An explanation of the allowable limits is given following the table.

LOCATION	INDIVIDUAL		AVERAGE	
	MAX. TEMP. (°F)	MAX. Allowed (°F)	MAX. TEMP. (°F)	MAX. Allowed (°F)
6" CABLE TRAY				
Front Tray Side Rail	319	417	256	342
Rear Tray Side Rail	333	418	264	343
Bare #8 Wire on Rungs	303	418	247	343
24" CABLE TRAY				
Front Tray Side Rail	325	417	271	342
Rear Tray Side Rail	315	418	269	343
Bare #8 Wire on Rungs	287	417	231	342

Both cable tray assemblies met the stated criteria for a fire endurance rating of three hours, as the average and maximum temperatures on the bare #8 wires within each tray and the average and maximum temperatures on the surface of each cable tray side rail were below allowable limits.

Post-Test Examination

Following the hose stream test and a cooling down period, the test items were systematically disassembled and examined for damage and general condition. A listing of those findings follows.

6 in. Cable Tray

The 6th (outermost) layer of 3M material was completely dislodged by the hose stream test. The 5th layer was also mostly eroded from the water stream. The 4th layer foil covering was intact and the mat material itself uncharred, however the material was completely discolored (green). The 3rd layer foil covering was intact, as well as the mat material, and this layer was only partially discolored. The 2nd layer, the standoff between the 2nd and 1st layer and the 1st layer were completely intact and uncharred. Much of the material covering the supports underneath the tray was washed away during the water hose stream. The material (in all layers and/or areas which survived the water stream) was completely discolored (green) in the vicinity of the support member.

24 in. Cable Tray

The 6th (outermost) layer of 3M material was completely dislodged by the hose stream test. The 5th layer was also mostly eroded from the water stream. The 4th layer foil covering was intact and the mat material itself uncharred, however the material was completely discolored (green). The 3rd layer foil covering was intact, as well as the mat material, and this layer was only partially discolored. The 2nd layer, the standoff between the 2nd and 1st layer and the 1st layer were completely intact and uncharred. Much of the material covering the supports underneath the tray was washed away during the water hose stream. The material (in all layers and/or areas which survived the water stream) was completely discolored (green) in the vicinity of the support member.

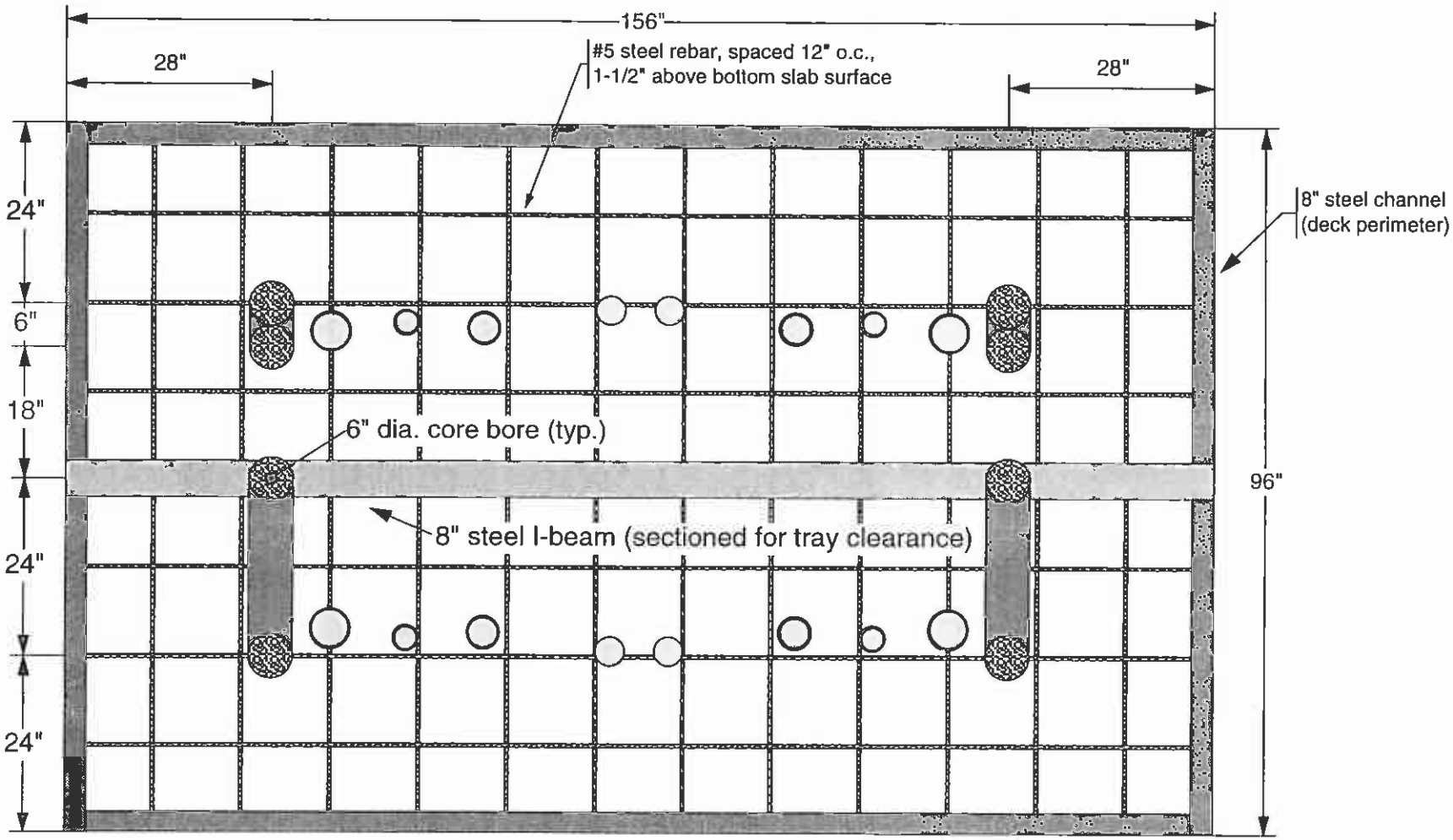
CONCLUSIONS

All of the raceway items evaluated in this fire exposure test, clad with 3M Interam™ Mat materials as presented herein, met the requirements of the TEST PLAN for a fire resistance rating of three hours.

Appendix A

CONSTRUCTION DRAWINGS

OMEGA POINT LABORATORIES



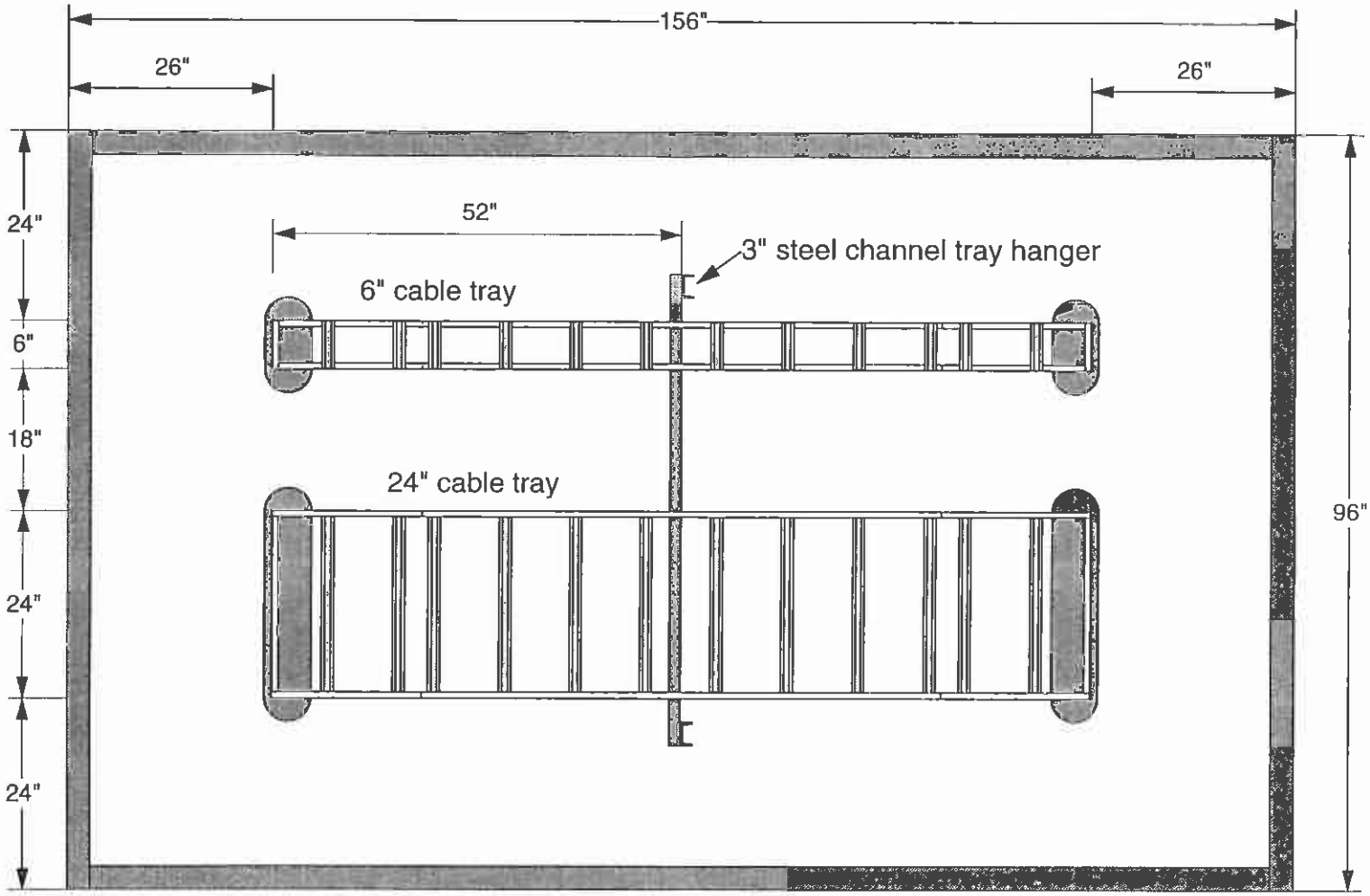
Note:
Slab constructed using normal weight concrete, poured to a depth of 8". All dimensions have a working tolerence of ±1/2".

- previous blockout holes

⊗ - current core-bore locations

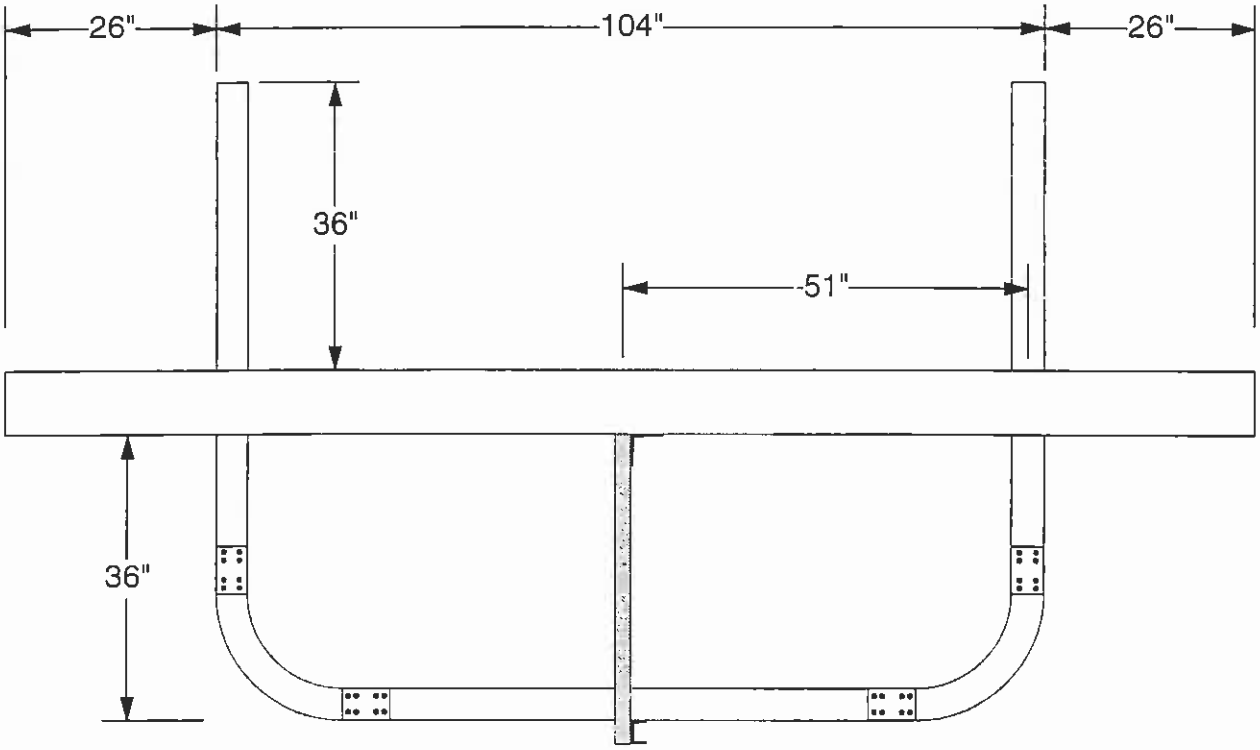
● - current Saw-cut locations

OMEGA POINT LABORATORIES, INC. Project No. 14540-99417
Peak Seals, Inc.
Fig. 1 Plan View-Slab Construction, Rev. 0
Drawn By: 1/23/96 Approved By:
Client Appr'l:



NOTE:
The cable tray assemblies consisted of galvanized steel ladder-back sections bolted together. The tray assemblies were supported with 3" steel channel in a trapeze-type hanger, bolted to the slab.

OMEGA POINT LABORATORIES, INC. Project No. 14540-99417
Peak Seals, Inc.
Fig. 2 Plan View-Below Deck, Rev. 0
Drawn By: 1/23/96 OPL Approval:
Client Approval:

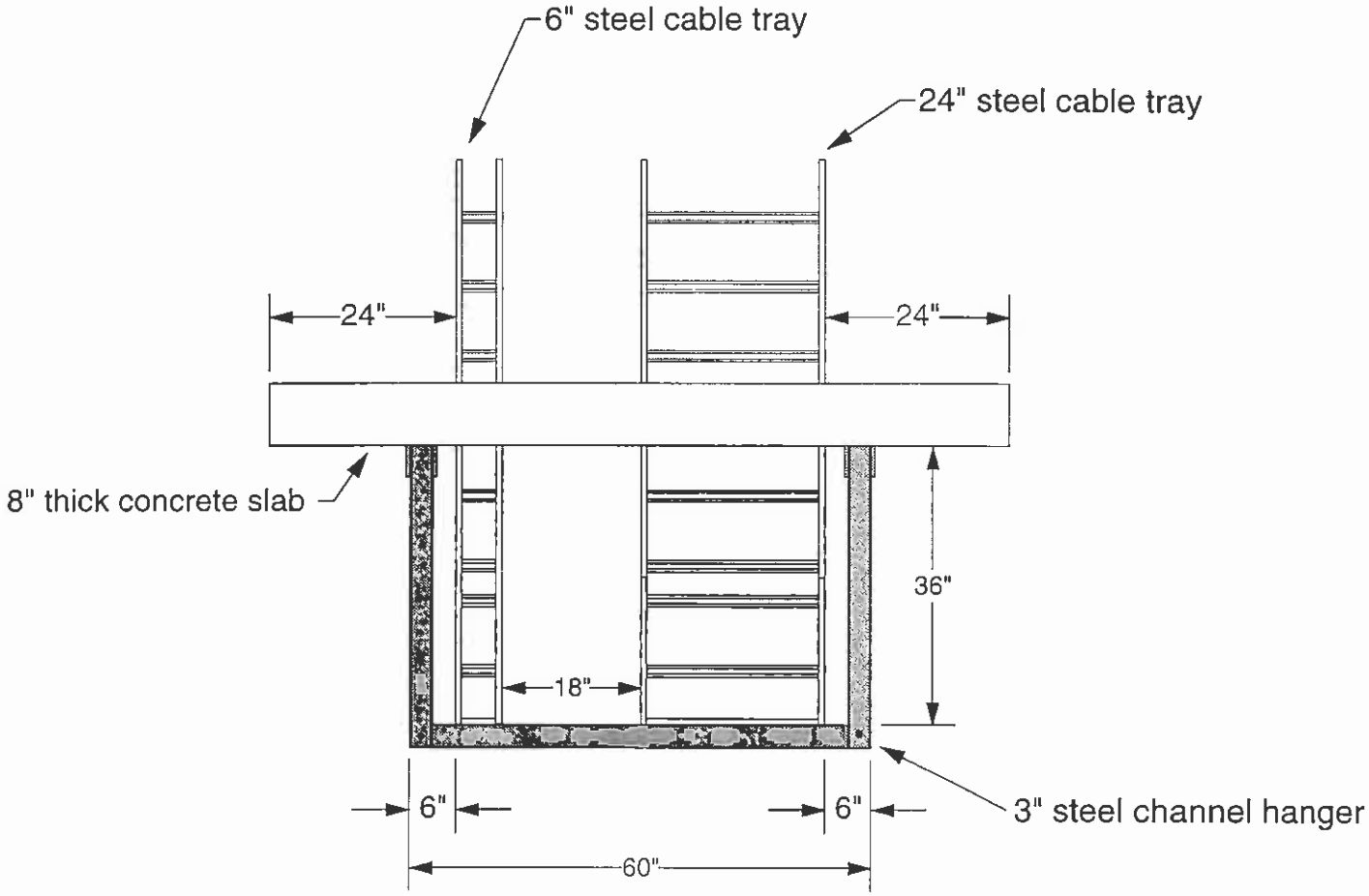


ELEVATION VIEW - VIEWED FROM FRONT

NOTE:
The cable tray assemblies consisted of galvanized steel ladder-back sections bolted together. The tray assemblies were supported with 3" steel channel in a trapeze-type hanger, bolted to the slab.

OMEGA POINT LABORATORIES, INC. Project No. 14840-99417
Peak Seals, Inc.
Fig. 3 Elevation View - Typical Cable Tray, Rev. 0
Drawn By: 1/23/96 Approved By:
Client Appr'l:

OMEGA POINT LABORATORIES



NOTE:
The cable tray assemblies consisted of galvanized steel ladder-back sections bolted together. The tray assemblies were supported with 3" steel channel in a trapeze-type hanger, bolted to the slab. The hanger was welded together at the corner joints.

OMEGA POINT LABORATORIES, INC. Project No. 14840-99417
Peak Seals, Inc.
Fig. 4 End View - Raceway Layout, Rev. 0
Drawn By: 1/23/96 Approved By:
Client Appr'l:

OMEGA POINT LABORATORIES

Appendix B

TEST PLAN

OMEGA POINT LABORATORIES

PEAK SEALS INC.

TEST PLAN NO. CTP-2005

THREE (3) HOUR FIRE ENDURANCE TEST

3M INTERAM™ FIRE WRAP

Rev	Date	By	Approved	Issue Date	Comments
3	08/21/97	M. Murphy	L.C. Spriggs	08/21/97	As Built

TEST PLAN NO. CTP-2005

THREE(3) HOUR FIRE ENDURANCE TEST

3M INTERAM™ FIRE WRAP

1.0 PURPOSE

1.1 The purpose of this test is to qualify various configurations of 3M Interam™ E50 series fire wrap systems for a three hour rating in accordance with criteria established by the USNRC in Generic Letter GL-86-10, Supplement 1. This test will be performed and the results reported by a third-party test laboratory. The configurations to be tested are intended to qualify the following raceways and size ranges:

- Steel cable trays ranging in size from 6" - 24".
- Steel conduits ranging in size from 1" - 5".
- Steel condulet fittings ranging in size from 1" - 5".
- Steel junction boxes.

2.0 SCOPE

2.1 Test outline, including individual raceway configurations, sizes, applicable test standards, acceptance criteria, barrier wrap designs and reporting requirements.

2.2 Procedures for installation of 3M Interam™ fire wrap systems.

2.3 Procedures for quality verification of wrap installation, including material receipt and traceability, in-process inspection and final inspection.

2.4 Reporting and final test report requirements.

3.0 APPLICABLE DOCUMENTS

3.1 USNRC Generic Letter GL-86-10, Supplement 1, "Fire Endurance Test Acceptance Criteria For Fire Barrier Systems Used To Separate Redundant Safe Shutdown Trains Within The Same Fire Area".

3.2 ASTM E119-88, Standard Methods of Fire tests of Building Construction and Materials.

3.3 Promatec Quality Assurance Program Manual, Revision D, Dated June 28, 1995.

4.0 DEFINITIONS

4.1 Interam™ E50 series mat: Flexible endothermic wrap system manufactured by 3M Company for the separation and protection of redundant cables and equipment in nuclear power facilities (individual component and composite system descriptions are detailed in the body of this test plan).

4.2 Third-Party Testing Laboratory: A nationally recognized and independent testing organization capable of performing fire endurance and other tests for the purpose of qualifying systems and designs in accordance with governing codes and applicable standards.

4.3 Qualification Fire Test: A fire endurance test conducted at a third party test laboratory intended to provide objective and documentary evidence that the system tested meets the performance requirements of governing codes and standards.

4.4 Preliminary Test Report: A synopsis of the test, issued by the third-party test laboratory. Information reported includes test deck and raceway descriptions, observances made during the course of the test, thermocouple temperature data, basic drawings and sketches of the test assembly, hose stream results and preliminary conclusions.

4.5 Final Test Report: A detailed report issued by the third-party test laboratory that includes all relevant information applicable to the test including, but not limited to:

4.5.1 Detailed discussion on test purpose and scope.

4.5.2 Written description and drawings of raceway components used, configurations of the raceways and orientation of the test deck.

4.5.3 Specification of thermocouples and drawings showing the number and actual location of each thermocouple.

4.5.4 Furnace and test deck description.

4.5.5 Systems and applications methods observed and verified by the third-party quality assurance organization during installation.

4.5.6 Observances made on system behavior during the course of the fire; after removal from the furnace, prior to the hose stream and after the hose stream test.

4.5.7 Complete thermocouple data in tabular and graph form.

4.5.8 Complete quality assurance documentation of the overall test process, including material certifications, inspection reports and photographs.

4.5.9 Detailed discussion on the results and conclusions drawn from the fire and hose stream test.

4.6 Longitudinal joint: A joint (or seam) which runs parallel to the item being protected.

4.7 Perimeter joint: A joint (or seam) which runs perpendicular to the item being protected.

4.8 Butt Joint: A joint (or seam) where the edges of two adjacent pieces of the same layer meet with no overlap.

4.9 Through Joint: A joint (or seam) where each layer terminates at the same location at a given butt joint.

4.10 Overlap Joint: A joint (or seam) where a piece of a given layer overlaps onto the same layer piece adjacent to it.

4.11 Offset Joint: A butt joint (or seam) that is staggered in its location from the butt joint occurring in the layer *above* or *below* it. (See also Through Joint).

4.12 Two Piece Wrap Method: An installation method whereby each layer is installed in two distinct pieces. (This method is normally employed for smaller diameter conduits at radial bends.)

4.13 Four piece Wrap Method: An installation method whereby each layer is installed in four distinct pieces. (This method is normally employed for larger diameter conduits and cable trays at radial bends.)

4.14 Circumference Wrap Method: An installation method whereby each layer of the mat is installed around the circumference or perimeter of the protected item in a continuous piece. At the longitudinal joint formed where the two edges of the mat meet an overlap is normally incorporated.

4.15 One Piece Corner Method: An installation method intended for a sharp transition (e.g. the horizontal to vertical transition at a condulet or corner of a support) whereby the transition is covered with a single piece of material. This type of pattern normally results in a longitudinal butt joint at the inside bend of the transition and a diagonal joint on each side of the item covered.

4.16 Modified One Piece Corner: An installation method intended for a sharp transition (e.g. the horizontal to vertical transition at a condulet or corner of a support) whereby the transition is covered with two or more pieces of material. This type of pattern normally results in a single heel piece, and one or more throat pieces. Longitudinal butt joints normally occur where the heel and throat pieces meet

4.17 Two Piece Corner Method: An installation method intended for a sharp transition (e.g. the horizontal to vertical transition at a condulet or corner of a support) whereby the transition is covered with two distinct pieces. One piece is used for the horizontal portion, and the other is used for the vertical portion of the transition. The point at which the two pieces meet is mitered, forming the corner of the transition. This pattern normally results in a longitudinal overlap joint at the inside bend of the transition.

4.18 Collar: A strip of material of a minimum width which is utilized to cover final layer perimeter butt joints.

4.19 Cover Strip: A strip of material of a minimum width which is utilized to cover final layer butt joints which do not receive a collar.

4.20 Caulk: 3M Fire Dam-150, Dow Corning 732 Multi Purpose Sealant; These caulks may be used interchangeably.

4.21 Tape: 3M T-49 Aluminum Tape

4.22 Strut: B-Line B72 galvanized steel channel 13/16" wide x 13/32" deep x 18 ga., .26 LB/ft.

4.23 Standoffs: (spacers) Thin strips of mat 2" (-1/2" + 0") applied to the article around the perimeter or longitudinally to provide a space between the article and the mat or between two adjacent layers of mat.

5.0 RESPONSIBILITIES

5.1 **Peak Seals** shall be responsible for the following:

5.1.1 Supply of wrap system components, craft labor for wrap installation, and quality inspection of wrap installation activities.

5.1.2 Developing and issuing test plans that provide detailed information on the test purpose, items to be tested, wrap system designs to be used, installation procedures and quality control requirements.

5.1.3 Installation of fire barrier wrap systems in accordance with procedures and drawings provided in this test plan.

5.1.4 Inspection and documentation of material receipt, in-process installation and final verification in accordance with procedures provided with this test plan.

5.2 **The third-party test laboratory** shall be responsible for the following:

5.2.1 Supply of facilities, test decks, raceway components, thermocouples, wire, furnace, instrumentation, measuring equipment and technicians for construction and test activities.

5.2.2 Construction of the test decks and installation of raceways, penetration seals, cables and supports.

5.2.3 Installation and instrumenting of thermocouples in accordance with the requirements of Generic Letter GL-86-10, Supplement 1.

5.2.4 Quality Assurance monitoring and documentation during test deck assembly, thermocouple placement, wrap system installation, fire test performance, hose stream test and post test examination.

5.2.5 Actual performance of fire endurance and hose stream test.

5.2.6 Post-fire dissection and observances.

5.2.7 Preparation and issuance of preliminary and final test reports.

6.0 WRAP MATERIALS

Component	*Application*
Interam™ E54A Mat	Primary wrap system.
Dow Corning 732 adhesive/sealant	Filling gaps and seams and at barrier terminations
FireDam™ FD-150 Caulk	Filling gaps at seams and at support terminations.
T-49 Aluminum Foil Tape	Securing overlap joints, covering exposed mat and caulk at edges and seams.
1/2" Stainless Banding and Clips	Securement of final mat layer.

7.0 TEST ASSEMBLY

7.1 Test Deck

Two test decks shall be used for this test. The test decks shall be constructed of concrete and shall have the approximate dimensions of 12' x 7' x 8". Individual blockouts shall be coredrilled or otherwise formed for each raceway penetration.

7.2 Raceway Configurations:

7.2.1 Test Deck # 2 Cable Trays

- ***Article 1***: 24" wide x 4" deep steel ladder-back cable tray.
- ***Article 2***: 6" wide x 4" deep steel ladder-back cable tray.

Each tray is to be constructed in a standard U-shaped configuration with dimensions of 104" horizontal by 72" vertical (min. 36" exposed to the fire). Supports to be standard trapeze type constructed of 3" steel channel

A single AWG #8 stranded wire is to be routed along the centerline of the top of the tray rungs for the entire length. The trays shall not contain cable.

7.2.2 Test Deck #1 Junction Box and Conduits

- ***Article 3***: 1" std rigid steel conduit.
- ***Article 4***: 3" std rigid steel conduit.
- ***Article 5***: 5" std rigid steel conduit

Each conduit is to be in a U-Shaped configuration with nominal dimensions of 102" horizontal by 72" vertical (min. 36" exposed to the fire). 90° short radius elbows are to be used for the radius sweep on one end and LB condulets are to be used at the horizontal-to-vertical transition on

the opposite end. Supports to be standard trapeze type constructed of P1001 Unistrut.

A single AWG #8 stranded wire is to be inserted the full length through each conduit for internal thermocouple placement.

7.2.3 Junction Box

- ***Article 6***: 12" x 12" x 8" steel junction box

The junction box is to be installed approximately 12" above the 3" LB along the vertical run.

7.3 **Wrap System Attributes**

7.3.1 Article 1 - 4" x 24" Cable tray

- Six layers of E-54A (0.4" Nominal Thickness) shall be used. For additional detail of construction see section 9.0.

7.3.2 Article 2 - 4" x 6" Cable Tray

- Six layers of E-54A (0.4" Nominal Thickness) shall be used. For additional detail of construction see section 9.0.

7.3.3 Article 3 - 1" Conduit

- Five layers of E-54A (0.4" Nominal Thickness) shall be used. For additional detail of construction see section 9.0.

7.3.4 Article 4 - 3" Conduit

- Five layers of E-54A (0.4" Nominal Thickness) shall be used. For additional detail of construction see section 9.0.

7.3.5 Article 5 - 5" Conduit

- Five layers of E-54A (0.4" Nominal Thickness) shall be used. For additional detail of construction see section 9.0.

7.3.6 Article 6 - 12" x 12" x 8" Junction Box

- Six layers of E-54A (0.4" Nominal Thickness) shall be used. for additional detail of construction see section 9.0.

8.0 THERMOCOUPLE REQUIREMENTS

8.1 **Thermocouple Placement**

8.1.1 Cable trays

- Every 6" along the centerline of both side rails.
- Directly to the #8 wire installed along the centerline of the top of the rungs, at 6" intervals.
- Immediately adjacent to supports.

8.1.2 Conduits

- Every 6" along the bottom external surface of the conduit.
- Every 6" along the bare #8 wire inside the conduit.
- Immediately adjacent to supports.

8.1.3 Junction Box

- One thermocouple for every square foot of surface area with a minimum of one thermocouple geometrically centered on each inside surface .
- On the JB surface within 1" distance of the 3" conduit at both the point of entry and the point of exit.

8.2 **Thermocouple Groups**

Temperature conditions on the unexposed surface of the fire barrier shall be determined by averaging all thermocouples measured in a specific group. Thermocouple groups are defined as follows:

8.2.1 Cable Trays

- Left side rail.
- Right side rail.
- #8 wire along the top of the rungs.

8.2.2 Conduit

- External conduit surface.
- #8 bare wire inside conduit.

8.2.3 Junction Box

- Average of all thermocouples

9.0 INTERAM™ INSTALLATION PARAMETERS

9.1 Craft, as required, shall be indoctrinated and trained in accordance with the Peak Seals training program for Interam™. Training shall be documented in accordance with the Promatec Quality Assurance Program.

9.2 Install the wrap systems in accordance with guidelines established below .

Note:

- The wrap shall abut to the test deck and shall be sealed at the interface of the wrap and the concrete at each layer where necessary, with 3M FD-150 or D.C. 732 Multi Purpose Sealant, for gaps between 1/8" to 1/4". Gaps greater that 1/4" are not permitted. Where the concrete is chipped or spalled, the damaged area can be filled in with caulk.

- Butt joints are reasonably tight with gaps not exceeding 1/4".

- Gaps greater than 1/8" and up to 1/4" shall be caulked with 3M FD-150 or D.C. 732 Multi Purpose Sealant. Gaps greater that 1/4" are not permitted.

- Each layer upon installation shall be numbered for layer identification.

- Except on supports, exposed mat such as longitudinal joints, and perimeter joints shall be covered with tape for each layer installed. On the final layer, terminations, edges of collars, cover strips and joints of support wrap shall also be taped.

- For primary items, (conduits ,cable trays, etc.) 1/2" x 0.020 stainless steel banding shall be installed 12" on center (+1" -0") (minimum one band per piece) and within 1" of the edge of all collars. (Min. two bands required per collar.) and within 2" of all final layer butt joints and overlap joints where collars have not been applied. (Example: the transition from the 3" conduit to the junction box; overlap of the one piece corners on to the adjacent wrap.)

  - At one location on the vertical section of the 6" cable tray, the band spacing shall be 16" on center.

  - At one location on the vertical section of the 24" cable tray, the band spacing shall be 14" on center.

- Supports shall be banded 12" on center (+1/2" -0") (minimum one band per piece) and within 2" of offset or butt joints and terminations. At the intersection of the support and the primary item criss-cross banding shall be applied.

9.3 **24" x 4" CABLE TRAY**

9.3.1 See notes at the beginning of this section.

9.3.2 Prior to installing the first layer of wrap material, install strut spanning the width across the lip of the tray, on 15" centers (max.)

9.3.2.1 The strut shall be notched and beveled.

9.3.2.2 P-898 filament tape may be used to secure the strut when necessary.

9.3.2.3 Six layers of E-54A (0.4" Nominal Thickness) shall be used.

9.3.2.4 Standoffs shall be used after application of the first layer of mat.

9.3.2.5 Standoffs shall be applied to the article at intervals not to exceed 15" and as necessary to maintain the required airspace. Standoffs shall be required under subsequent layer butt joints, and adjacent to supports.

VERTICAL & HORIZONTAL SECTIONS:

9.3.3 For the vertical and horizontal sections of this tray the material shall be applied using the circumference wrap method.

9.3.4 Each layer of the circumference wrap method shall have an overlap joint of 4" (-1/2" + 0") These joints may occur at any point around the item.

9.3.5 Adjacent sections of the same layer shall be abutted (see butt joint definition) to one another resulting in 2" (-1/2" + 0") offset joints for subsequent layers applied, except at the transition to the radial bend from the vertical and horizontal portion of the tray run.

TRAY RADIUS:

9.3.5.1 The joint between the adjacent pieces at the transition from the horizontal tray run to the radial bend shall be an offset joint: (6" -1/2" + 0).

9.3.5.2 The joint between the adjacent pieces at the transition from the vertical tray run to the radial bend shall be perimeter through joints, and shall be caulked where necessary with a nominal 1/4" bead for gaps between 1/8" to 1/4". Gaps greater that 1/4" are not permitted. This joint shall be taped at each layer.

9.3.6 For the two radial bends, the material shall be applied using the four piece wrap method, using full width pieces where possible to avoid unnecessary joints.

9.3.6.1 The third and fourth pieces applied for each layer shall overlap the first and second pieces applied by the thickness of the mat, and shall be caulked with a nominal 1/4" bead and taped along this joint. *Except* for the last layer.

9.3.6.2 On the last layer, the first and second pieces applied shall be cut to a width necessary to cover the item ***plus an additional 3-1/2" to 4-1/2".***

9.3.6.3 The pieces above shall be centered over the item providing a 1-3/4" to 2-1/4" overlap onto the third and fourth sides.

9.3.6.4 The 1-3/4" to 2-1/4" overlap on each side may be "V" notched as necessary to permit the overlap portion to lay flat against the third and fourth sides, and shall be caulked with a nominal 1/4" bead at the "V" notches and taped after installation.

9.3.6.5 The final layer third and fourth sides shall be installed covering the overlap described above, and shall be taped after installation.

9.3.6.6 Where joints occur on the *outside* radial bend, they shall also be an offset joint, the same as the horizontal tray run to radial bend transition.

9.3.6.7 Where joints occur on the inside radial bend, they may abut and may be perimeter through joints. This joint shall be caulked where necessary for gaps between 1/8" to 1/4". Gaps greater that 1/4" are not permitted.

9.3.7 4" (-0" + 1/2") wide collars shall be installed over all final layer butt joints.

9.3.7.1 Nominal 2" wide shim pieces shall be used under the collar at the transition from the four piece method to the circumference wrap method occurring at the radial bends of the tray where necessary to fill in gaps.

9.3.8 See notes at the beginning of this section.

9.4 6" x 4" CABLE TRAY

9.4.1 See notes at the beginning of this section.

9.4.2 Six layers of E-54A (0.4" Nominal Thickness) shall be used.

9.4.2.1 Standoffs shall be used after application of the first layer of mat.

9.4.2.2 Standoffs shall be applied to the article at intervals not to exceed 15" and as necessary to maintain the required airspace. Standoffs shall be required under subsequent layer butt joints, and adjacent to supports.

VERTICAL & HORIZONTAL SECTIONS:

9.4.3 For the vertical and horizontal section of this tray the material shall be applied using the circumference wrap method.

9.4.4 Each layer of the circumference wrap method shall have an overlap joint of 4" (-1/2" + 0") These joints may occur at any point around the item.

9.4.5 Adjacent sections of the same layer shall be abutted (see butt joint definition) to one another resulting in 2" (-1/2" + 0") offset joints for subsequent layers applied, except at the transition to the radial bend from the vertical and horizontal portion of the tray run.

TRAY RADIUS:

9.4.5.1 The joint between the adjacent pieces at the transition from the horizontal tray run to the radial bend shall be an offset joint: (6" -1/2" + 0).

9.4.5.2 Transitions to the radial bend from the vertical portions of the tray run shall be perimeter through joints, and shall be caulked where necessary with a nominal 1/4" bead for gaps between 1/8" to 1/4". Gaps greater that 1/4" are not permitted. This joint shall be taped at each layer,

9.4.6 For the two radial bends, the material shall be applied using the four piece wrap method.

9.4.6.1 The third and fourth pieces applied for each layer shall overlap the first and second pieces applied by the thickness of the mat, and shall be caulked where necessary with a nominal 1/4" bead for gaps between 1/8" to 1/4". Gaps greater that 1/4" are not permitted This joint shall be taped at each

layer. This application method will be used for *all* layers on one of the two radial bends, and on the other radial bend all layers *except* for the last layer.

9.4.6.2 On the last layer, the first and second pieces applied to the one radial bend shall be cut to a width necessary to cover the item ***plus an additional 3-1/2" to 4-1/2".***

9.4.6.3 The pieces above shall be centered over the item providing a 1-3/4" to 2-1/4" overlap onto the third and fourth sides.

9.4.6.4 The 1-3/4" to 2-1/4" overlap on each side may be "V" notched as necessary to permit the overlap portion to lay flat against the third and fourth sides, and shall be caulked with a nominal 1/4" bead at the "V" notches.

9.4.6.5 The final layer third and fourth sides shall be installed covering the overlap described above, and shall be taped after installation.

9.4.6.6 Where joints occur on the *outside* radial bend, they shall also be an offset joint, the same as the horizontal tray run to radial bend transition.

9.4.6.7 Where joints occur on the inside radial bend, they may abut and may be perimeter through joints. This joint shall be caulked where necessary for gaps between 1/8" to 1/4". Gaps greater that 1/4" are not permitted.

9.4.7 4" (-0" + 1/2") wide collars shall be installed over all final layer butt joints.

9.4.7.1 Nominal 2" wide shim pieces shall be used under the collar at the transition from the four piece method to the circumference wrap method occurring at the radial bends of the tray only as necessary to fill in gaps.

9.4.7.2 At one location along the horizontal run of the cable tray, the collar will be omitted over two outer layer butt joints, adjacent to one another. For this area banding will be applied within 2" of the end of the mat section; minimum one band per piece.

9.4.8 See notes at the beginning of this section.

9.5 1" CONDUIT

9.5.1 See notes at the beginning of this section.

9.5.2 Five layers of E-54A (0.4" Nominal Thickness) shall be used.

9.5.3 Standoffs shall be used before application of the first layer of mat and after the application of the second layer.

9.5.3.1 Standoffs shall be applied to the article at intervals not to exceed 15" and as necessary to maintain the required airspace. Standoffs shall be required under subsequent layer butt joints, and adjacent to conduit straps and couplings.

9.5.3.2 Standoffs under butt joints of subsequent layer applied, shall be caulked with D.C. 732 Multi Purpose Sealant to maintain integrity of air space.

VERTICAL & HORIZONTAL SECTIONS:

9.5.4 For the vertical and horizontal sections of this conduit the material shall be applied using the circumference wrap method.

9.5.4.1 Each layer of the circumference wrap method shall have an overlap joint of 4" (-1/2" + 0") These joints may occur at any point around the item.

9.5.5 Adjacent sections of the same layer shall be abutted (see butt joint definition) to one another resulting in 2" (-1/2" + 0") offset joints for subsequent layers applied, except at the transition to the radial bend and condulet from the vertical and horizontal portion of the conduit run.

CONDUIT RADIUS:

9.5.6 Transitions to the radial bend and condulet from the horizontal and vertical portions of the conduit run shall be perimeter through joints, and shall be caulked with a nominal 1/4" bead and taped at each layer.

9.5.7 The first, second and third layers applied on the radial bend of the conduit run, shall be applied using the two piece wrap method .

9.5.7.1 The edges of the two pieces shall meet forming a longitudinal through joint and shall be caulked with a nominal 1/4" bead and taped at each layer.

9.5.8 The fourth and fifth layers applied on the radial bend of the conduit run, shall be applied using the four piece wrap method

9.5.8.1 The edges of the third and fourth pieces applied shall over lap the edges of the first and second pieces applied by 2" (-1/2" + 0").

CONDULET:

9.5.9 For the condulet end of the conduit run shall be treated as follows:

9.5.9.1 All layers shall be installed using the two piece corner method, and shall be caulked at the miter joint.

9.5.9.2 The joint at both the vertical and horizontal transition to the conduit shall be a butt joint.

9.5.10 4" (-0" + 1/2") wide collars shall be installed over all final layer perimeter butt joints.

9.5.11 2" (-0" + 1/2") wide cover strips shall be applied centrally over all final layer butt joints which do not receive a collar.

9.5.12 4" (-0" + 1/2") two layer collars shall be applied at the concrete/mat interface.

9.5.12.1 The collars shall have a longitudinal overlap of 2" (-1/2" + 0")

9.5.12.2 The collars shall abut tightly to the concrete, and shall be caulked at the concrete/mat interface with D.C. 732 Multi Purpose Sealant.

9.5.13 See notes at the beginning of this section.

9.6 3" CONDUIT

9.6.1 See notes at the beginning of this section.

9.6.2 Five layers of E-54A (0.4" Nominal Thickness) shall be used.

9.6.3 Standoffs shall be used before application of the first layer of mat and after the application of the second layer.

9.6.3.1 Standoffs shall be applied to the article at intervals not to exceed 15" and as necessary to maintain the required airspace. Standoffs shall be required under subsequent layer butt joints, and adjacent to conduit straps and couplings.

9.6.3.2 Standoffs under butt joints of subsequent layer applied, shall be caulked with D.C. 732 Multi Purpose Sealant to maintain integrity of air space.

VERTICAL & HORIZONTAL SECTIONS:

9.6.4 For the vertical and horizontal sections of this tray the material shall be applied using the circumference wrap method.

9.6.4.1 Each layer of the circumference wrap method shall have an overlap joint of 4" (-1/2" + 0") These joints may occur at any point around the item.

9.6.5 Adjacent sections of the same layer shall be abutted (see butt joint definition) to one another resulting in 2" (-1/2" + 0") offset joints for subsequent layers applied, *except* at the transition to the radial bend and the condulet from the vertical and horizontal portion of the conduit run.

CONDUIT RADIUS:

9.6.6 Transitions to the radial bend and condulet from the horizontal and vertical portions of the conduit run shall be perimeter through joints, and shall be caulked with a nominal 1/4" bead and taped at each layer.

9.6.7 For the radial bend of the conduit run, the material shall be applied using the four piece wrap method.

9.6.7.1 The edges of the four pieces shall overlap forming a 2" (-1/2" +0") longitudinal butt joint and shall be taped at each layer.

9.6.7.2 Transitions to the radial bend from the horizontal and vertical portions of the conduit run shall be through joints, and shall be caulked with a nominal 1/4" bead and taped at each layer.

CONDULET:

9.6.8 For the condulet portion of the conduit run the material shall be applied using the one piece corner or modified one piece corner method.

9.6.8.1 The resulting diagonal and longitudinal joint shall be caulked with a nominal 1/4" bead and taped each layer.

9.6.8.2 Transition to the condulet from the horizontal and vertical portion of the conduit run shall be a through joint. and shall be caulked with a nominal 1/4" bead and taped at each layer.

9.6.9 4" (-0" + 1/2") wide collars shall be installed over all final layer perimeter butt joints.

9.6.10 2" (-0" + 1/2") wide cover strips shall be installed over all final layer butt joints which do not receive a collar.

9.6.11 4" (-0" + 1/2") two layer collars shall be applied at the concrete/mat interface.

9.6.11.1 The collars shall have a longitudinal overlap of 2" (-1/2" + 0")

9.6.11.2 The collars shall abut tightly to the concrete, and shall be caulked at the concrete/mat interface with D.C. 732 Multi Purpose Sealant.

9.6.12 See notes at the beginning of this section.

9.7 5" CONDUIT

9.7.1 See notes at the beginning of this section.

9.7.2 Five layers of E-54A (0.4" Nominal Thickness) shall be used.

9.7.3 Standoffs shall be used before application of the first layer of mat and after the application of the second layer.

9.7.3.1 Standoffs shall be applied to the article at intervals not to exceed 15" and as necessary to maintain the required airspace. Standoffs shall be required under subsequent layer butt joints, and adjacent to conduit straps and couplings.

9.7.3.2 Standoffs under butt joints of subsequent layer applied, shall be caulked with D.C. 732 Multi Purpose Sealant to maintain integrity of air space.

VERTICAL & HORIZONTAL SECTIONS:

9.7.4 For the vertical and horizontal sections of this conduit the material shall be applied using the circumference wrap method

9.7.5 Each layer of the circumference wrap method shall have an overlap joint of 4" (-1/2" + 0") These joints may occur at any point around the item.

9.7.6 Adjacent sections of the same layer shall be abutted (see butt joint definition) to one another resulting in 2" (-1/2" + 0") offset joints for subsequent layers applied, *except* at the transition to the radial bend and condulet from the vertical and horizontal portion of the conduit run..

CONDULET:

9.7.7 The joint between the adjacent pieces at the transition from the horizontal conduit run to the condulet for the first four layers shall be perimeter through joints, and

shall be caulked with a nominal 1/4" bead and taped at each layer. The final layer shall be an overlap joint.

9.7.8 For the condulet, the material shall be cut to fit as necessary, employing a modified one piece corner using pieces as large as possible to minimize the number of joints.

9.7.8.1 Pieces of E-54A may be used under standoffs between fastening lugs on each side of the condulet to bring the surface of the standoff above the height of the fastening lugs.

9.7.8.2 The horizontal to vertical transition of the condulet shall be covered with the one piece corner method.

CONDUIT RADIUS:

9.7.9 The joint between the adjacent pieces at the transition from the horizontal conduit run to the radial bend shall be perimeter through joints, and shall be caulked with a nominal 1/4" bead and taped at each layer.

9.7.10 For the radial bend, the material shall be applied using the four piece wrap method,

9.7.10.1 The third and fourth pieces applied for each layer shall overlap the first and second pieces applied by 2" (-1/2" + 0").

9.7.11 4" (-0" + 1/2") wide collars shall be installed over all final layer perimeter butt joints.

9.7.12 2" (-0" + 1/2") wide cover strips shall be applied centrally over all final layer butt joints which do not receive a collar.

9.7.13 4" (-0" + 1/2") two layer collars shall be applied at the concrete/mat interface.

9.7.13.1 The collars shall have a longitudinal overlap of 2" (-1/2" + 0")

9.7.13.2 The collars shall abut tightly to the concrete, and shall be caulked at the concrete/mat interface with D.C. 732 Multi Purpose Sealant.

9.7.14 See notes at the beginning of this section.

9.8 JUNCTION BOX

9.8.1 See notes at the beginning of this section.

9.8.2 Six layers of E-54A (0.4" Nominal Thickness) shall be used.

9.8.3 Standoffs shall be used before application of the first layer of mat and after the application of the second layer.

9.8.3.1 Standoffs shall be applied to the article at intervals not to exceed 15" and as necessary to maintain the required airspace. Standoffs shall be required under subsequent layer butt joints

9.8.3.2 Standoffs under butt joints of subsequent layer applied, shall be caulked with D.C. 732 Multi Purpose Sealant to maintain integrity of air space.

9.8.4 The first five layers of the mat shall be applied using the four piece wrap method.

9.8.4.1 The third and fourth pieces, for each layer applied to the sides of the box, shall overlap the first and second pieces applied by the thickness of the mat.

9.8.4.2 Top and bottom pieces shall overlap the side pieces applied by the thickness of the mat.

9.8.4.2.1 A cut may be made in each top and bottom piece to permit its installation around the conduit, and shall be caulked with a nominal 1/4" bead along the seam and around the conduit for each layer.

9.8.4.2.2 This joint may abut however, shall not be a through joint; (The joint shall alternate for each layer a minimum of 90^0.)

9.8.4.3 Each joint shall be taped. *Except* for the final layer.

9.8.5 The final layer (sixth), for the sides of the box, the material shall be applied using the circumference wrap method, with an longitudinal overlap joint of 4" (-1/2" + 0")

9.8.6 The top and bottom pieces shall be cut a width and length necessary to cover the item, ***plus an additional 8"***

9.8.6.1 The pieces above shall be centered over the top and bottom of the item providing a 4" (-1/2" + 0") overlap onto the sides.

9.8.6.2 The overlap shall be banded with 1/2" x 0.020 stainless steel banding within 1" of the edge.

9.8.7 Two 1/2" x 0.020 stainless steel bands shall be installed on each side of the box on either side of the conduit.

9.8.8 See notes at the beginning of this section.

9.9 CONDUIT & CABLE TRAY SUPPORT

9.9.1 See notes at the beginning of this section.

9.9.2 The application of the mat to the protected items (conduit or cable tray) shall be completed prior to the application of mat to the support.

9.9.3 The interior of the Unistrut shall be loosely filled with refractory ceramic fiber prior to the application of the mat..

9.9.4 For supports constructed of channel, the channel may be filled with pieces of mat prior to application of the wrap to facilitate installation.

9.9.5 Where the wrap terminates, the support (Unistrut or channel) shall be filled with a nominal 4" depth of refractory ceramic fiber and sealed with FD-150 to a nominal depth of 1/2"; or as an alternative, pieces of mat may be cut to fit the contour of

the open end of the support, shall be 2" thick (5-layers) and shall be caulked in place where necessary.

9.9.6 5 layers of E-54A shall be used.

9.9.7 The material shall be applied to both the conduit and the cable tray support using the four piece wrap method.

9.9.8 For the conduit support, the third and fourth *pieces* applied shall overlap the first and second *pieces* applied by the thickness of the mat (stair-step joints) for each *layer* installed *except* the final layer.

9.9.8.1 On the final layer, the bottom pieces applied shall be cut to a width necessary to cover the item ***plus an additional 5-1/2" to 6-1/2".***

9.9.8.2 The pieces above shall be centered over the item providing a 2-3/4" to 3-1/4" overlap onto the third and fourth sides.

9.9.9 For the cable tray support, A combination of through-joints and stair-step joints, or combinations thereof shall be used, with no overlap on the final layer as described above.

9.9.10 The joint for adjacent pieces of the same layer shall abut and may be through joints for subsequent layers applied, and shall be caulked where necessary with a nominal 1/4" bead for gaps between 1/8" to 1/4". Gaps greater that 1/4" are not permitted. This joint shall be taped at the outer layer only.

9.9.11 Where pieces are perpendicular to one another, forming through joints, the interface shall be caulked for all layers applied.

9.9.12 The material shall cover the support to a distance 12" away from the protected item in each direction from the item as measured from the point of contact of the critical item with the support.

9.9.13 See notes at the beginning of this section.

10.0 INTERAM™ SYSTEM INSPECTION CRITERIA

10.1 Prior to use, receipt inspect all materials in accordance with procedure no. QCP-0050, "Receiving, Handling, and Storage Inspection".

10.2 On 24" trays, verify that strut (maximum of 15" intervals) has been installed.

10.3 During wrap installation, verify the following attributes:

10.3.1 Each section installed with the circumference wrap method has a longitudinal overlap joint. as specified in the above sections.

10.3.2 Each section installed with the four piece method has the necessary overlaps. (The thickness of the mat, 2" (-1/2" + 0") offset joints, or 4" (-1/2" + 0") overlap joints , whichever is applicable.)

10.3.3 Butt joints are reasonably tight with gaps not exceeding 1/4".

10.3.4 Gaps greater than 1/8" and up to 1/4" are filled with caulk prior to installing the next layer.

10.3.5 Correct mat type, layer count and configuration for each item.

10.3.6 Support wrap has been applied in accordance with the installation instructions in the above sections.

10.3.7 Except on supports, exposed mat such as longitudinal joints, and perimeter joints has been covered with tape for each layer installed. On the final layer, terminations, edges of collars, cover strips and joints of support wrap also have been taped.

10.3.8 4" collars are installed around all final layer perimeter butt joints, at concrete/mat interfaces and cover strips have been installed over all other final layer butt joints, (except as noted above).

10.3.9 For primary items (conduits ,cable trays, etc.) 1/2" x 0.020 stainless steel banding has been installed 12" on center (except as noted above) (+1/2" - 0")(minimum one band per piece) and within 1" of the edge of all collars and terminations to concrete (min. two bands required per collar or concrete termination.

10.3.10 For supports 1/2" x 0.020 stainless steel banding has been installed 12" on center (+1/2" -0")(minimum one band per piece)and within 2" of butt joints and terminations, also criss-cross straps at support/primary item intersections and as necessary to secure mat .

10.4 Upon completion of all wrap installation and prior to the pouring of penetration seals, perform a final visual inspection of the system. Verify that wrap is securely installed and all bands are tight. Verify that there is no exposed mat. Where mat is exposed it shall be covered with T-49 tape.

11.0 TEST PERFORMANCE

11.1 Fire Endurance Test

11.1.1 Each prepared test assembly shall be exposed to a three hour fire endurance test in a horizontal furnace based upon the standard ASTM E 119 time-temperature curve. Temperatures shall be measured and recorded at one minute intervals.

11.1.2 Upon completion of the three hour duration, the test assembly shall be immediately exposed to a hose stream test by randomly spraying all exposed surfaces utilizing a 1½" fog nozzle set at a discharge angle of 30° with a nozzle pressure of 75 psi and a minimum discharge of 75 gpm. The distance between the nozzle and specimen shall be a maximum of five feet and the total duration five minutes.

11.2 Acceptance Criteria

The testing organization shall assess the performance of the test assembly based upon the following pass criteria:

11.2.1 The average temperature rise recorded for each thermocouple group shall not exceed 250°F above the initial temperature.

11.2.2 The temperature rise recorded for any individual thermocouple shall not exceed the 250°F limit by more than 30%.

11.2.3 The wrap system remained intact during the fire exposure and hose stream tests without developing any openings through which the protected component, or raceway, is visible.

11.3 In the event that any of the above criteria are exceeded, further evaluation may be required to determine the acceptability of the wrap designs.(e.g., air oven tests) If necessary, such additional evaluations will be determined and specified at the conclusion of the fire/hose stream test.

11.4 Final Report

11.4.1 Results shall be documented in a Final Test Report. This Final Report shall contain:

a) Applicable Corporate Test Procedure

b) Quality Control documentation, as applicable

c) Summation of Test Results

d) Test report as supplied by Third Party Testing organization.

12.0 ATTACHMENTS

12.1 Peak Seals drawing: PSI-2005.

12.2 Peak Seals drawing: PSI-2005.1

12.3 Peak Seals drawing: PSI-2005.2

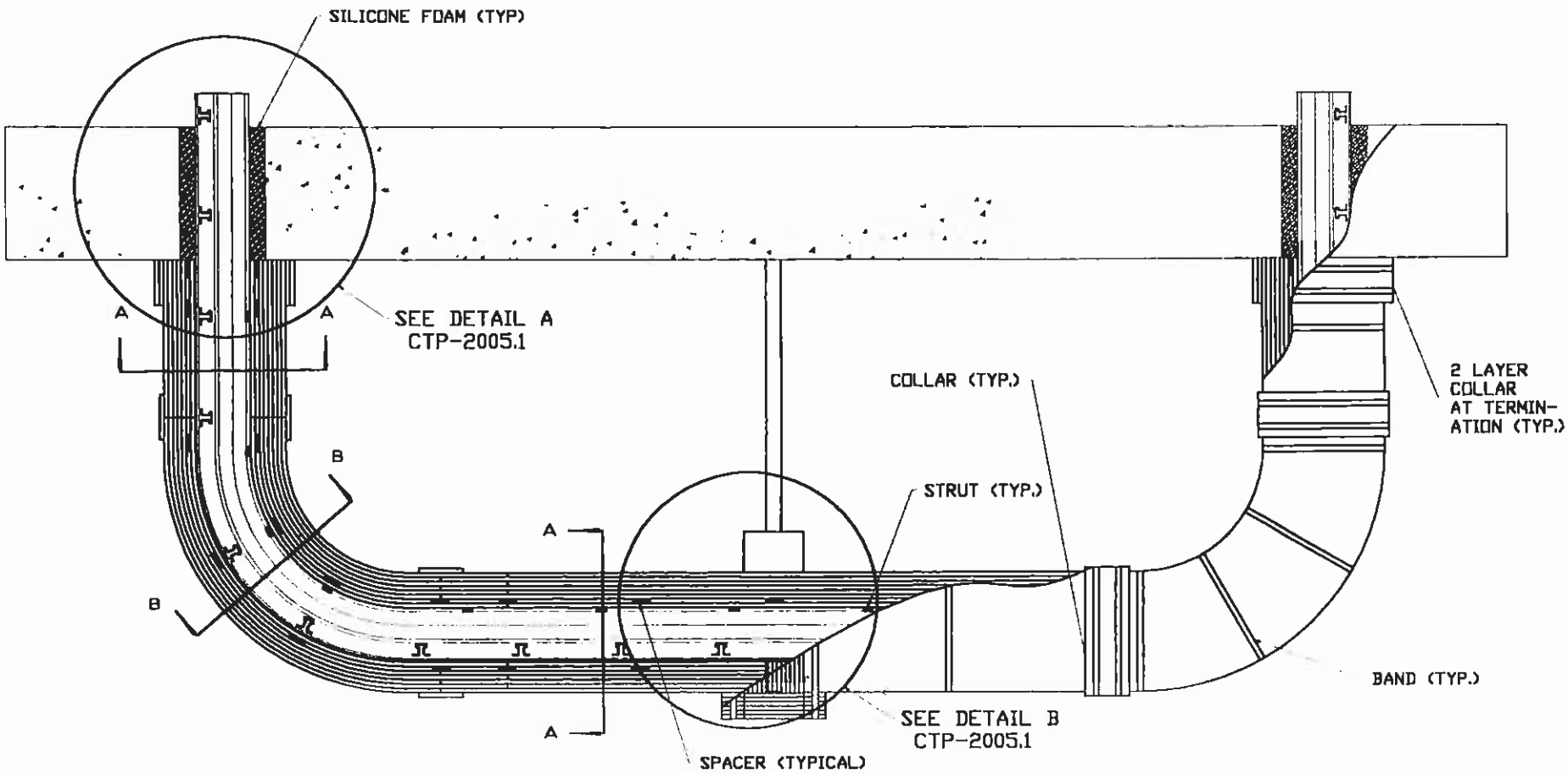
12.4 Peak Seals drawing: PSI-2005.3

12.5 Peak Seals drawing: PSI-2005.4

12.6 Peak Seals drawing: PSI-2005.5

12.7 Peak Seals drawing: PSI-2005.6

12.8 Peak Seals drawing: PSI-2005.7



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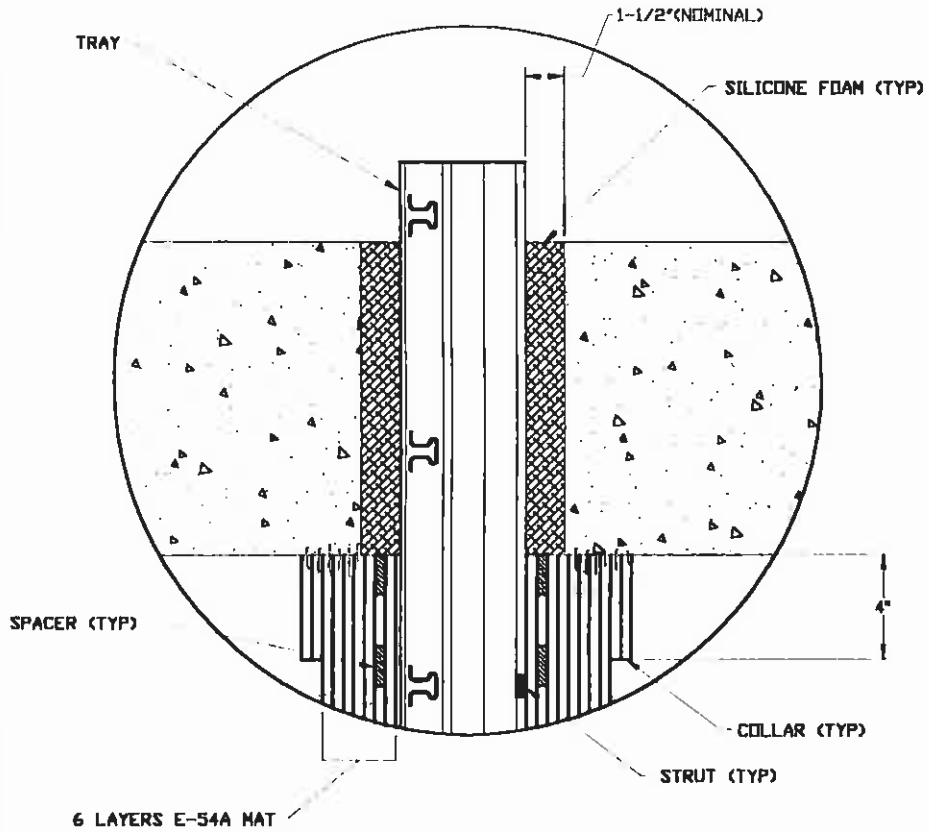
PEAK SEALS INCORPORATED

Dwg No.: PSI-2005

TITLE: CABLE TRAY FIRE TEST DETAIL
3M INTERAM 3 HOUR FIRE WRAP

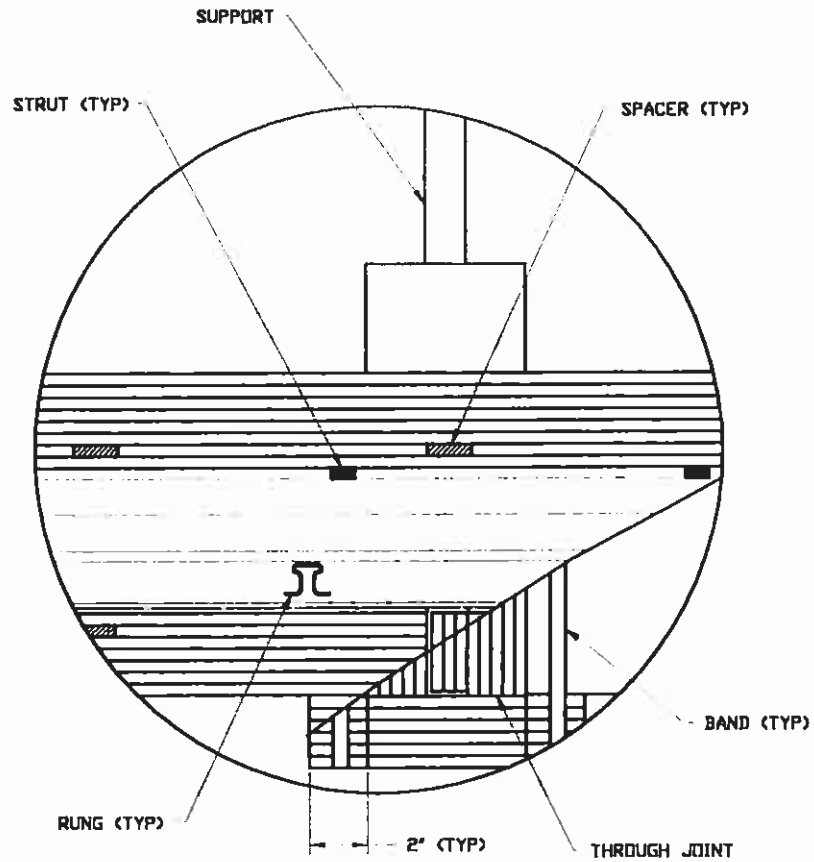
Drawn By	Date	Sheet	1 OF 1
MDM	08.06.97	File Name: OPL2005	Disk No. 2005

Rev. No.	Date	App. By
0	08.06.97	



DETAIL A

TYPICAL VIEW OF TERMINATION AND PENETRATION SEAL



DETAIL B

TYPICAL VIEW OF SUPPORT

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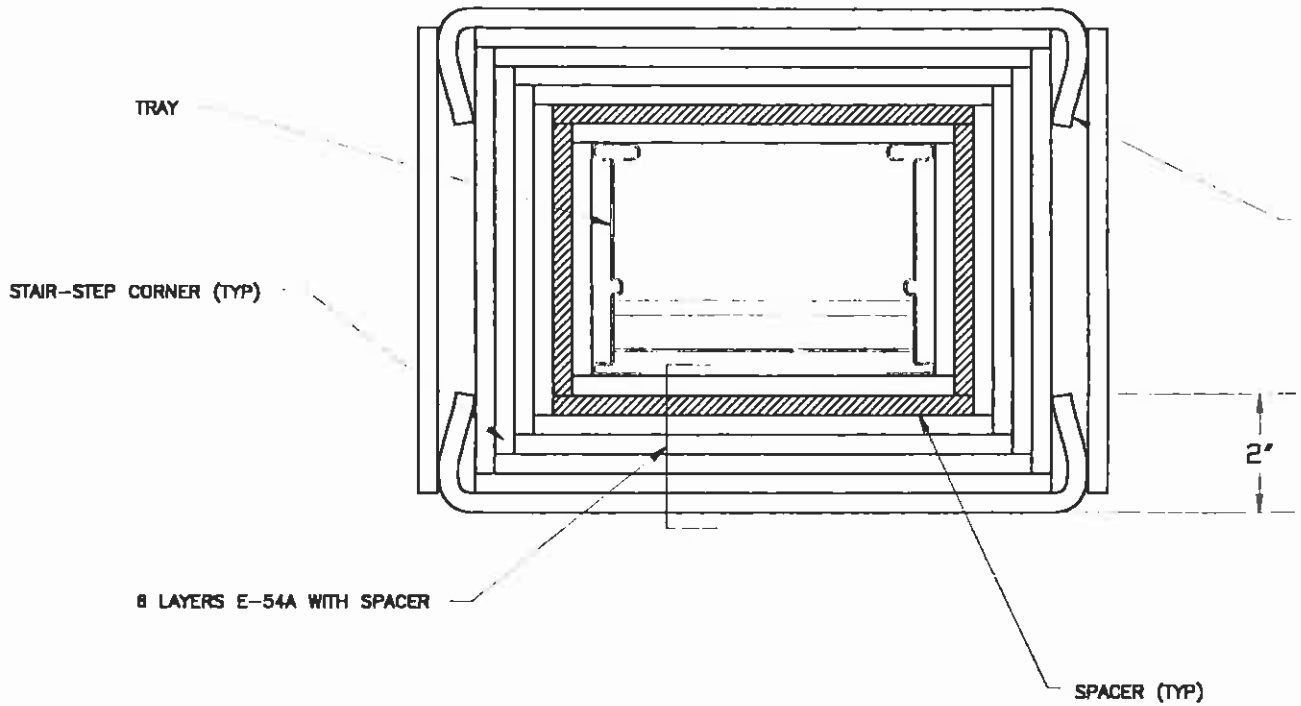
PEAK SEALS INCORPORATED

Dwg No.: PSI-2005.1

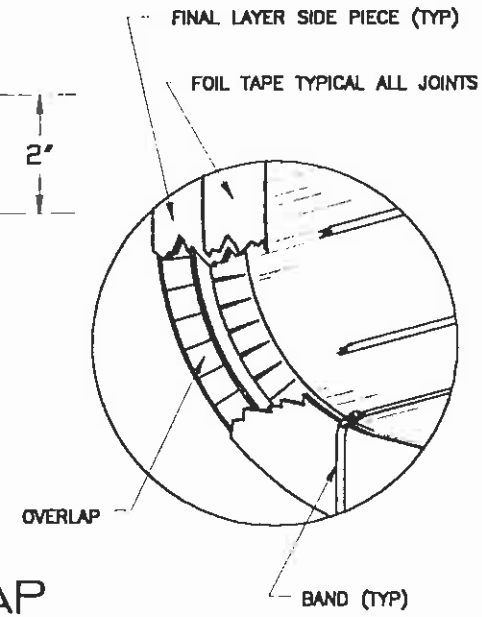
TITLE: CABLE TRAY FIRE TEST DETAIL
3M INTERAM 3 HOUR FIRE WRAP

Drawn By	Date	Sheet	1 OF 1
MDM	08.21.97	File Name: OPL2005	Disk No. 2005

Rev. No.	Date	App. By
0	08.06.97	KB



SECTION B - B
TYPICAL VIEW OF 6" TRAY
RADIUS WITH FINAL LAYER OVERLAP



DETAIL OF FINAL
LAYER OVERLAP

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Cypress, Texas 77429
(713) 256-2901

Dwg No.: PSI-2005.2

TITLE: CABLE TRAY FIRE TEST DETAIL
3M INTERAM 3 HOUR FIRE WRAP

Drawn By	Date	Sheet	1 OF 1
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Rev. No.	Date	App. By
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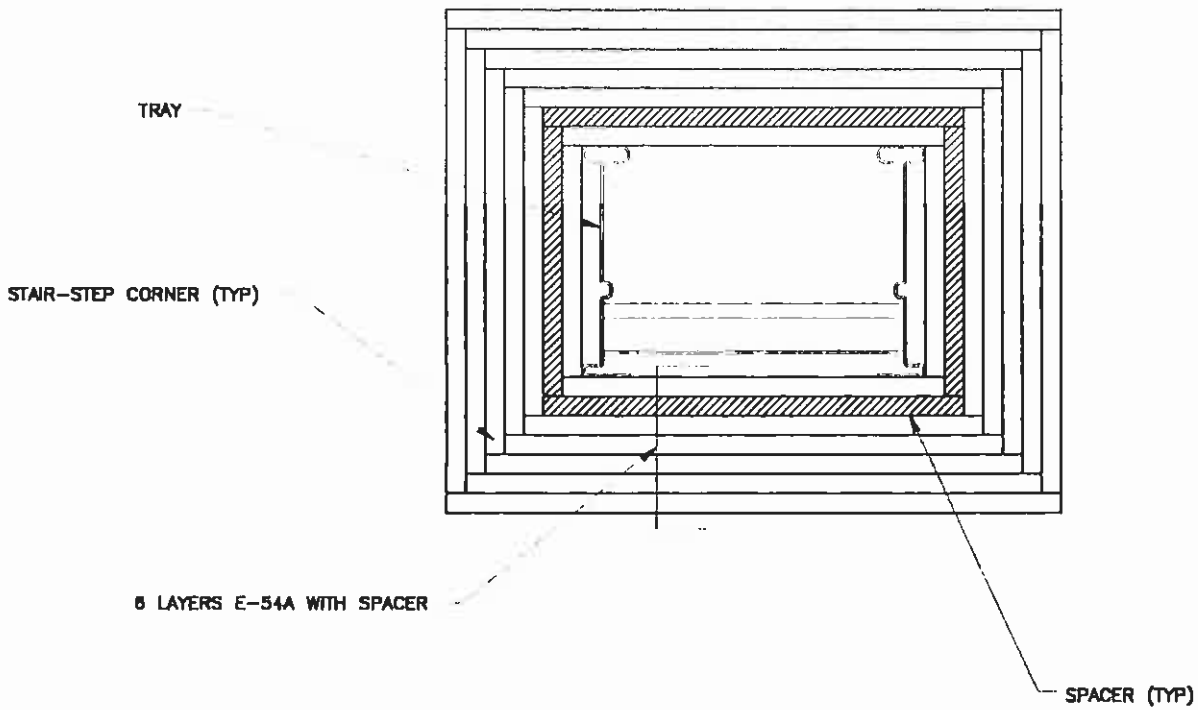

SECTION B - B (ALT.)
TYPICAL VIEW OF 6" TRAY
RADIUS WITHOUT FINAL LAYER OVERLAP

PEAK SEALS, INC.
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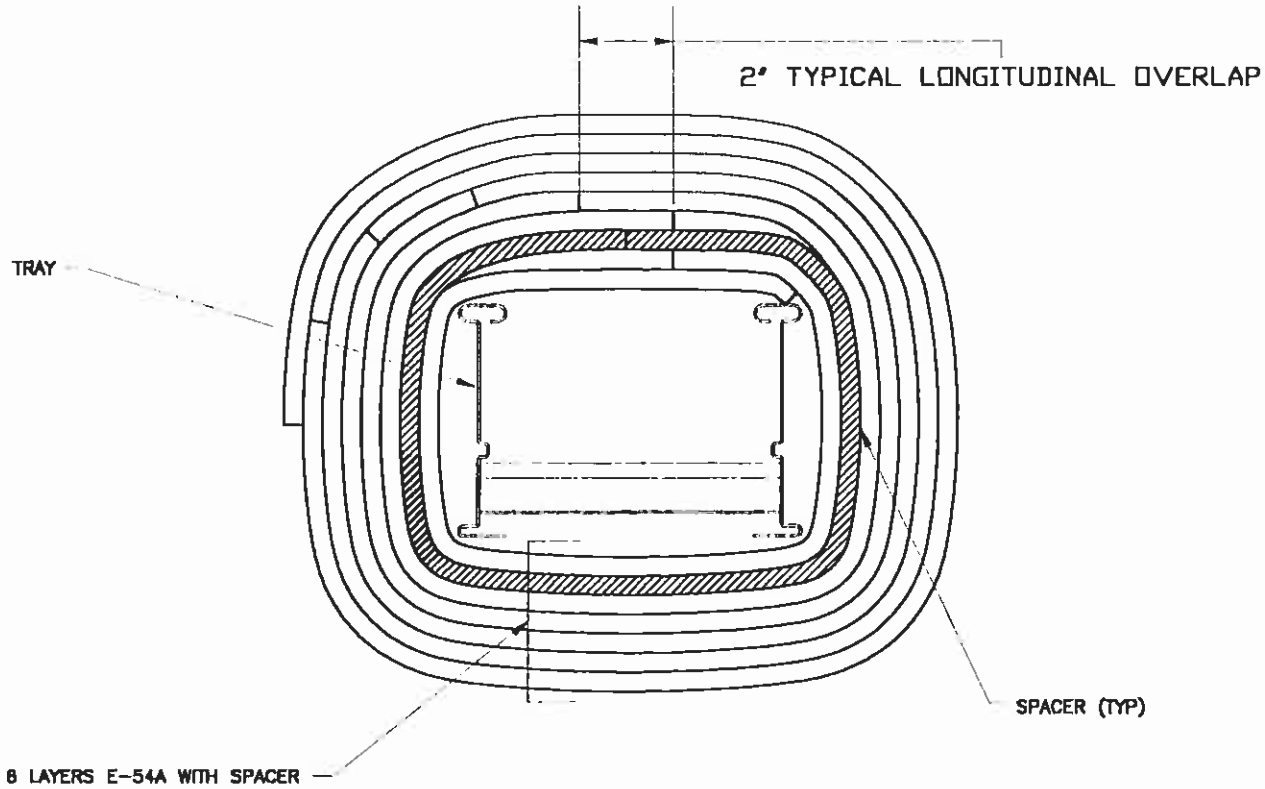
PEAK SEALS INCORPORATED

Dwg No.: PSI-2005.3

TITLE: CABLE TRAY FIRE TEST DETAIL 3M INTERAM 3 HOUR FIRE WRAP				Rev. No.	Date	App. By
				0	08.06.97	
Drawn By	Date	Sheet	1 OF 1			
MDM	08.21.97	File Name: OPL2005	Disk No. 2005			



SECTION A - A
TYPICAL VIEW OF 6" TRAY
HORIZONTAL OR VERTICAL SECTION

PEAK SEALS, INC.
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Dwg No.: PSI-2005.4

TITLE: CABLE TRAY FIRE TEST DETAIL 3M INTERAM 3 HOUR FIRE WRAP				Rev. No.	Date	App. By
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Drawn By	Date	Sheet 1 OF 1				
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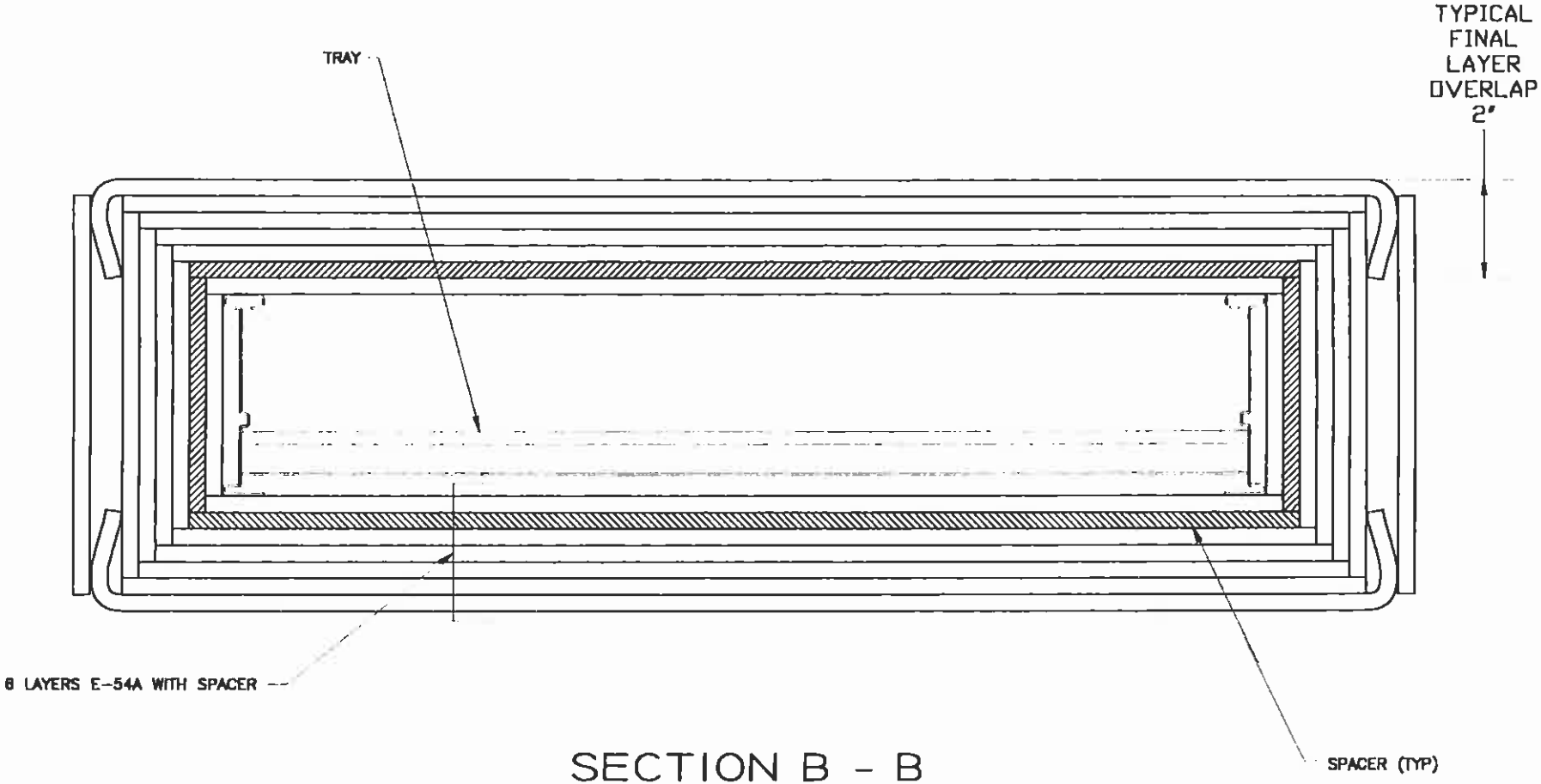

SECTION B - B
TYPICAL VIEW OF 24" TRAY
RADIUS WITH FINAL LAYER OVERLAP

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PEAK SEALS INCORPORATED

Dwg No.: PSI-2005.5

TITLE: CABLE TRAY FIRE TEST DETAIL
3M INTERAM 3 HOUR FIRE WRAP

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Rev. No.	Date	App. By
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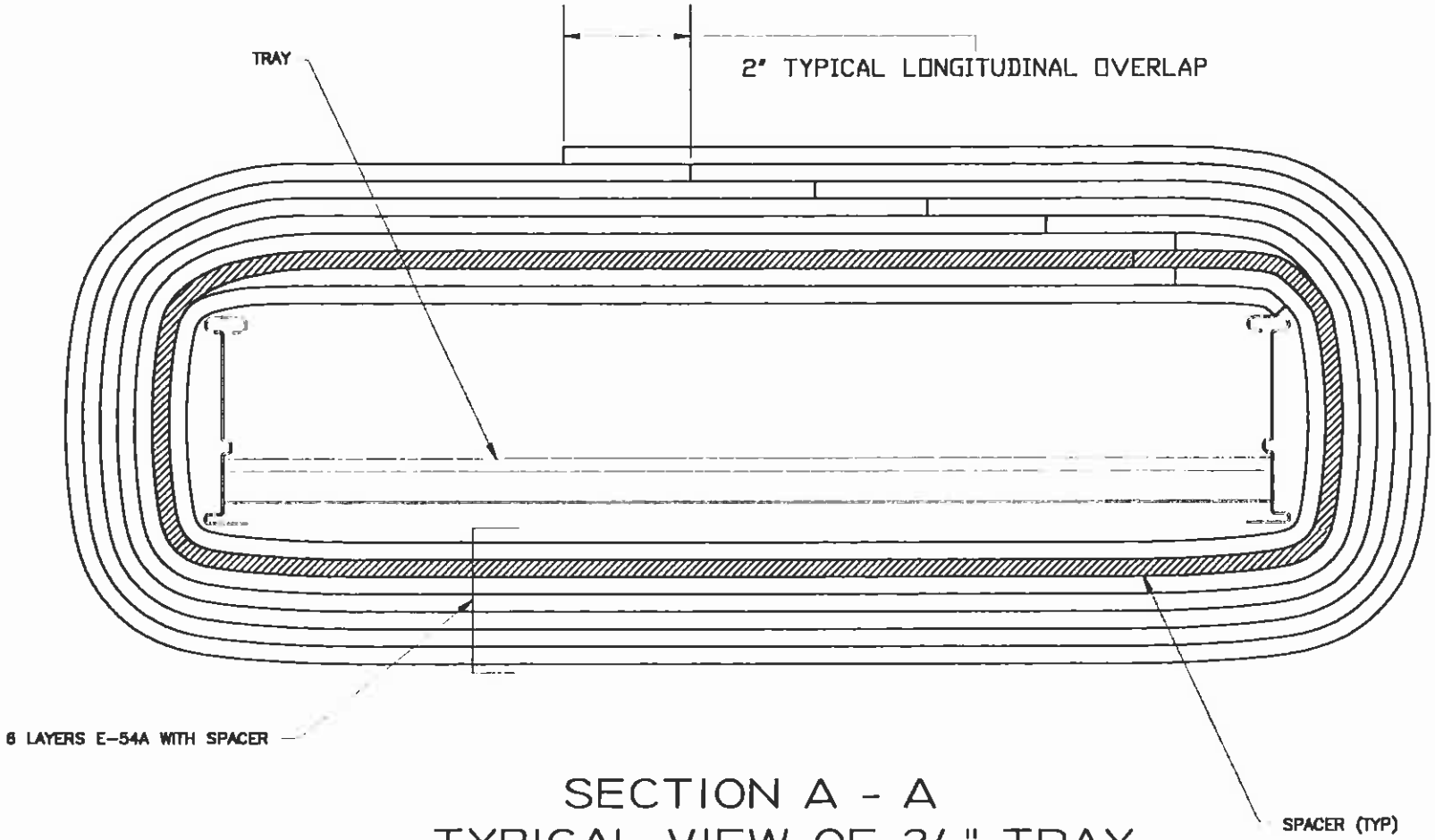

SECTION A - A
TYPICAL VIEW OF 24" TRAY
HORIZONTAL OR VERTICAL SECTION

PEAK SEALS, INC.
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PEAK SEALS INCORPORATED

Dwg No.: PSI-2005.6

TITLE: CABLE TRAY FIRE TEST DETAIL 3M INTERAM 3 HOUR FIRE WRAP				Rev. No.	Date	App. By
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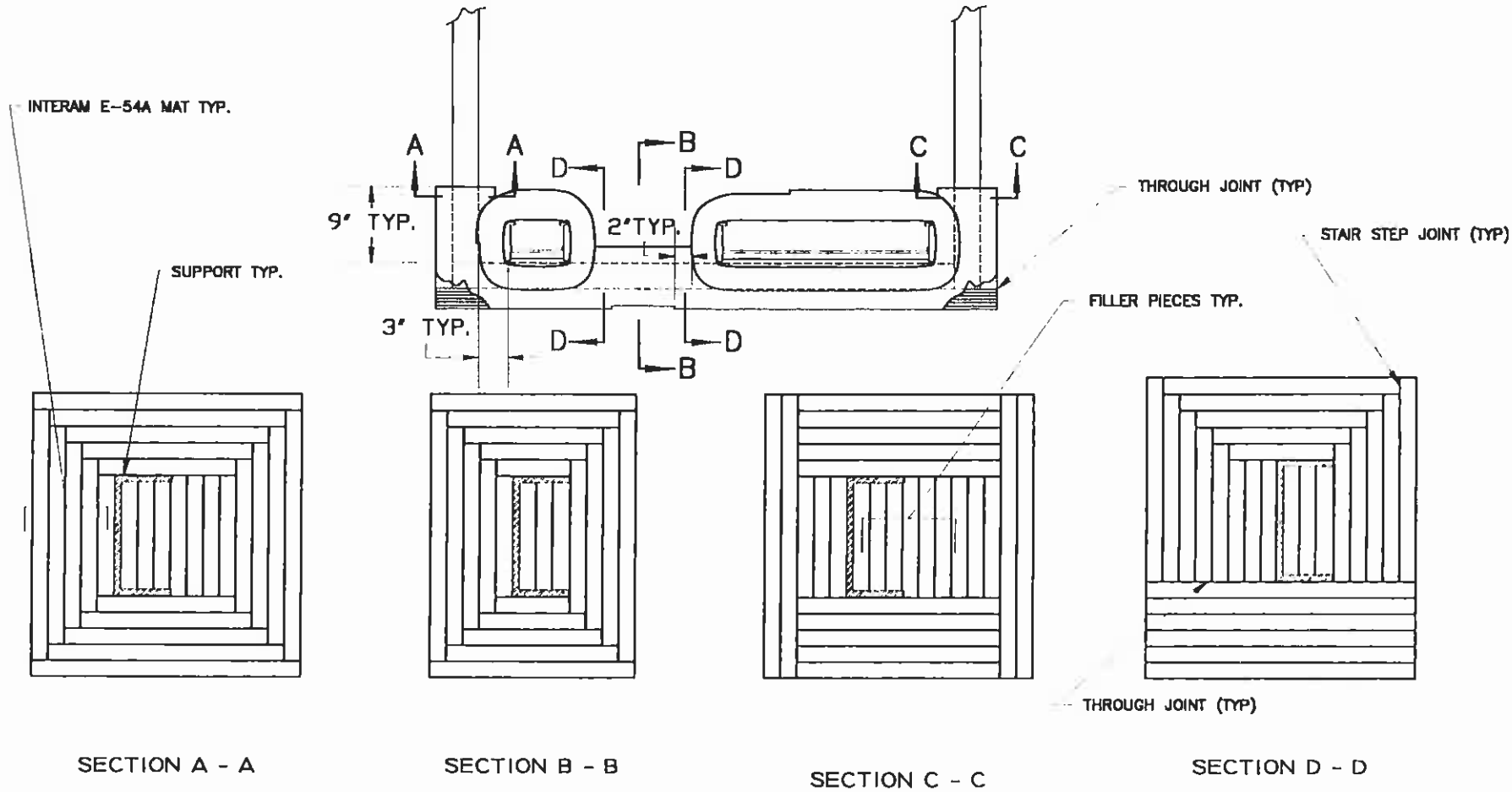
Drawn By	Date	Sheet 1 OF 1				
MDM	08.21.97	File Name: OPI2005	Disk No. 2005			



TYPICAL VIEW OF HORIZONTAL AND VERTICAL SUPPORT SECTIONS

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Suite 100
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(713) 256-2901

Dwg No.: PSI-2005.7

TITLE: CABLE TRAY FIRE TEST DETAIL 3M INTERAM 3 HOUR FIRE WRAP				Rev. No.	Date	App. By
Drawn By	Date	Sheet 1 OF 1		0	08.06.97	
MDM	08.21.97	File Name: OPI2005	Disk No. 2005			

U.S.NRC Supplement 1 to Letter 86-10

OMEGA POINT LABORATORIES

Serial# -94-209 47

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555

Rec'd MAR 31 1994

March 25, 1994

Nuclear Licensing

TO: ALL HOLDERS OF OPERATING LICENSES OR CONSTRUCTION PERMITS FOR NUCLEAR POWER REACTORS

SUBJECT: FIRE ENDURANCE TEST ACCEPTANCE CRITERIA FOR FIRE BARRIER SYSTEMS USED TO SEPARATE REDUNDANT SAFE SHUTDOWN TRAINS WITHIN THE SAME FIRE AREA (SUPPLEMENT 1 TO GENERIC LETTER 86-10, "IMPLEMENTATION OF FIRE PROTECTION REQUIREMENTS")

PURPOSE

The U.S. Nuclear Regulatory Commission (NRC) is issuing Supplement 1 to Generic Letter (GL) 86-10, "Implementation of Fire Protection Requirements," April 24, 1986, to disseminate the review guidance contained in Enclosure 1, "Fire Endurance Test Acceptance Criteria for Fire Barriers Used to Separate Redundant Safe Shutdown Trains Within the Same Fire Area." This guidance will be used by the staff to review and evaluate the adequacy of fire endurance tests and fire barrier systems proposed by licensees or applicants in the future to satisfy existing NRC fire protection rules and regulations. This guidance refines and clarifies the fire barrier testing acceptance criteria specified by GL 86-10, for application in that specific (future review) context.

BACKGROUND

On April 24, 1986, the NRC issued GL 86-10 in order to give the industry additional guidance on implementing NRC fire protection requirements. The guidance in GL 86-10 did not change the requirement to separate one safe shutdown train from its redundant train with either a 1-hour or a 3-hour fire rated barrier. In Enclosure 2 to GL 86-10, the NRC staff responded to industry questions. Question 3.2.1 of the enclosure provided the staff position on fire endurance test acceptance criteria for fire barrier cable tray wraps. In its response, the staff stated that Chapter 7, "Tests of Nonbearing Walls and Partitions," of National Fire Protection Association (NFPA) Standard 251, "Standard Methods of Fire Tests of Building Construction," was applicable to cable-tray fire wraps.

On July 30, 1991, the NRC established a special review team to identify and evaluate technical issues related to the Thermo-Lag 330-1 fire barrier system. On August 6, 1991, the NRC issued Information Notice (IN) 91-47, "Failure of Thermo-Lag Fire Barrier Material to Pass Fire Endurance Test." This IN gave licensees information on the fire endurance test performed by Gulf States Utilities Company on a Thermo-Lag 330-1 fire barrier installed on a wide aluminum cable tray and the associated fire test failure. On December 6, 1991, the NRC issued IN 91-79, "Deficiencies in the Procedures for Installing Thermo-Lag Fire Barrier Material," which gave information on deficiencies in procedures that the Thermo-Lag vendor (Thermal Science, Incorporated) provided for constructing Thermo-Lag 330-1 fire barriers. In

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response to concerns about the indeterminate qualifications of Thermo-Lag 330-1 fire barriers, on June 23, 1992, the NRC issued IN 92-46, "Thermo-Lag Fire Barrier Material Special Review Team Findings, Current Fire Endurance Tests, and Ampacity Calculation Errors." The staff found the following problems with Thermo-Lag 330-1 fire barriers: incomplete or indeterminate fire test results, questionable ampacity derating test results and a wide range of documented ampacity derating factors, some barrier installations that were not constructed in accordance with vendor-recommended installation procedures, incomplete installation procedures, and as-built fire barrier configurations that may not have been qualified by valid fire endurance tests or evaluated in accordance with the guidance of GL 86-10.

After reviewing INs 91-47 and 91-79, Texas Utilities (TU) Electric Company initiated a fire endurance test program to qualify the Thermo-Lag raceway fire barrier systems for Comanche Peak Steam Electric Station. Under this program, TU Electric performed an initial fire barrier test series during the weeks of June 15 and 22, and August 19, 1992. Notwithstanding the fire test acceptance criteria guidance specified in GL 86-10, TU Electric followed the guidance of American Nuclear Insurers (ANI) as specified in ANI Information Bulletin 5(79), "ANI/MAERP Standard Fire Endurance Test Method to Qualify a Protective Envelope for Class 1E Electrical Circuits," July 1979.

As a result of NRC interaction with TU Electric regarding its test program, the NRC concluded that there was uncertainty on the part of licensees as to whether or not the ANI test method established a level of fire barrier performance equivalent to that established by the GL 86-10 acceptance criteria. In addition, the NRC staff recognized that the 1-hour and 3-hour raceway fire barrier systems are unique and that additional guidance on the proper implementation of the GL 86-10 acceptance criteria would be useful.

AREAS OF CONCERN

The experiences with Thermo-Lag fire barrier systems at TU Electric recounted above raised the following general concerns:

(1) The fire endurance test acceptance criteria used by other fire barrier vendors, applicants, and licensees may not meet the acceptance criteria of GL 86-10, and may not fully demonstrate the fire barrier performance intended.

(2) Certain past cable functionality testing (i.e., circuit integrity monitoring) may not fully demonstrate the capability of protected circuits to function during and after a postulated fire.

FIRE ENDURANCE CAPABILITY

NRC Qualification Requirements and Guidance for Fire Barriers

Section 50.48 of 10 CFR requires that each operating nuclear power plant have a fire protection plan that satisfies General Design Criterion (GDC) 3. GDC 3 requires that structures, systems, and components important to safety be

designed and located to minimize, in a manner consistent with other safety requirements, the probability and effects of fires. Fire protection features required to satisfy GDC 3 include features to ensure that one train of those systems necessary to achieve and maintain shutdown conditions be maintained free of fire damage. One means of complying with this requirement is to separate one safe shutdown train from its redundant train with a fire-rated barrier. The level of fire resistance required of the barrier, 1-hour or 3-hours, depends on the other fire protection features in the fire area.

The NRC issued guidance on acceptable methods of satisfying the regulatory requirements of GDC 3 in Branch Technical Position (BTP) Auxiliary and Power Conversion Systems Branch (APCSB) 9.5-1, "Guidelines for Fire Protection for Nuclear Power Plants;" Appendix A to BTP APCSB 9.5-1; BTP Chemical Engineering Branch (CMEB) 9.5-1, "Fire Protection for Nuclear Power Plants;" and GL 86-10. In the BTPs and in GL 86-10, the staff stated that the fire resistance ratings of fire barriers should be established in accordance with NFPA Standard 251, "Standard Methods of Fire Tests of Building Construction and Materials," by subjecting a test specimen that represents the materials, workmanship, method of assembly, dimensions, and configuration for which a fire rating is desired to a "standard fire exposure.[1]"

Some licensees have used the acceptance criteria of ANI Bulletin No. 5(79), to evaluate the performance of their fire barrier systems. The ANI test methodology, which ANI issued for insurance purposes only, requires that cables within the fire barrier test specimen be monitored for circuit integrity while the test specimen is subjected to a test fire that follows the standard time-temperature curve specified in American Society of Testing and Materials (ASTM) Standard E-119, "Standard Methods of Fire Tests of Building Construction and Materials," and to a hose stream test. Under this criterion, the fire barrier system is evaluated by monitoring the capability of the cables inside the fire barrier to pass a low voltage circuit integrity test. During the fire and hose stream tests, if cable circuit integrity is maintained, the tests are considered successful. The ANI test methodology does not specify the following GL 86-10 (ASTM E119) acceptance criteria:

(1) The fire barrier design has withstood the fire endurance test without the passage of flame or the ignition of cotton waste on the unexposed side for a period of time equivalent to the fire-resistance rating required of the barrier.

(2) Analysis of temperature levels recorded on the unexposed side of the fire barrier demonstrates that the maximum temperature rise does not exceed 139 °C [250 °F] above ambient temperature.[2]

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[1] American Society for Testing and Materials Standard E-119 was adopted by NFPA as NFPA Standard 251.

[2] The 163 °C [325 °F] temperature condition was established by allowing the temperature of the unexposed side of the fire barrier to rise 139 °C [250 °F] above the assumed 24°C [75°F] ambient air temperature, as measured by the

(3) The fire barrier remains intact and does not allow water to be projected beyond the unexposed surface during the hose stream test.

Enclosure 1, "Interpretations of Appendix R," to GL 86-10, provided additional guidance with respect to the term "free of fire damage" as used in Appendix R. Interpretation 3, "Fire Damage," stated: "In promulgating Appendix R, the Commission has provided methods acceptable for assuring that necessary structures, systems, and components are free from fire damage (see Section III.G.2a, b, and c), that is, the structure, system or component under consideration is capable of performing its intended function during and after the postulated fire, as needed."

The review guidance provided in Enclosure 1 (1) clarifies the applicability of the test acceptance criteria stated in GL 86-10 to raceway fire barrier systems, (2) specifies a set of fire endurance test acceptance criteria which are acceptable for demonstrating that fire barrier systems can perform the required fire-resistive function and maintain the protected safe shutdown train free of fire damage, (3) specifies acceptable options for hose stream testing, and (4) specifies acceptable criteria for functionality testing of cables when a deviation is necessary, such as when the fire barrier temperature rise criteria are exceeded or the test specimen cables sustain visible damage.

The test methods and acceptance criteria specified in Enclosure 1 are acceptable for determining the adequacy of fire barrier systems proposed by licensees or applicants in the future to satisfy NRC fire protection rules and regulations. Applicants or licensees may propose alternative test methods and acceptance criteria to demonstrate an equivalent level of protection; the staff will review such proposals on a case-by-case basis. Enclosure 2 is a summary comparison of this review guidance against the GL 86-10 acceptance criteria.

Evaluation and Application of Fire Endurance and Functionality Test Results

The fire endurance qualification test is successful for a raceway fire barrier if the following conditions are satisfied (see Enclosure 3, "Fire Barrier Testing Acceptance Criteria/Logic Diagram"):

NO CABLE

(1) The average internal temperature of the fire barrier system, as measured on the exterior surface of the raceway or component, did not rise more than 139 °C [250 °F] above its initial temperature; and

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thermocouples within the test specimen at the onset of the fire exposure, during the fire test.

(2) When cables or components are included in the test specimen, a visual inspection of the protected cables or components revealed no signs of degraded conditions[3] from the thermal effects[4] of the fire exposure; and - cables

(3) The fire barrier system remained intact during the fire exposure and hose stream tests without developing any openings through which the protected component, raceway, or cables are visible.

For raceway fire barrier systems, the staff adopted the hose stream testing methodology specified in NUREG-0800, "Standard Review Plan (SRP) for the Review of Safety Analysis Reports for Nuclear Power Plants," Section 9.5.1, "Guidelines for Fire Protection for Nuclear Power Plants," Revision 2, July 1981, Position 5.a. This SRP position established the acceptability of using the fog nozzle method for hose stream testing of fire barrier penetration seals. The fog nozzle hose stream test method is an acceptable option for tests of the entire raceway fire barrier system under the new staff position.

Licensees that propose to use fire endurance test results that deviate from the acceptance criteria as the bases for qualifying and installing fire barrier configurations, should request a deviation from the acceptance criteria based on a engineering evaluation acceptable to the staff, such as demonstrating cable functionality. For those licensees required to comply with Section III.G to Appendix R, the engineering evaluation justifying the deviating conditions should be submitted with the exemption request. The review guidance provided in Enclosure 1 provides specific guidance for demonstrating cable functionality, including subjecting the cables to Megger and high-potential tests. The results of these tests can be used to determine the insulation-resistance characteristics of the thermally damaged cable and to determine if the cable insulation would have been sufficient to maintain circuit functionality during and after the fire exposure.

IMPLEMENTATION

This section describes how the NRC plans to use the review guidance contained in Enclosure 1. After this supplement to GL 86-10 is issued, except in those cases in which an applicant or licensee has proposed an acceptable alternative fire endurance test method and acceptance criteria that demonstrates an equivalent level of fire protection, the NRC will use the methods and the

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[3] Examples of thermal degradation of cable jacket and insulation materials are: swollen, split, cracked, blistered, melted, or discolored jacket; exposed shield; exposed, degraded, or discolored conductor insulation; and exposed copper conductor.

[4] When the temperature criterion is exceeded or damage occurs, operability at the temperature conditions experienced during the fire test must be assessed. That is, fire endurance tests that are judged acceptable on the basis of a visual inspection of certain components or cables may not be applied to other components or cables without a specific evaluation.

criteria specified in the enclosed review guidance to (1) evaluate fire endurance testing programs proposed by licensees or applicants in the future for demonstrating compliance with pertinent NRC fire protection rules and regulations and (2) review the adequacy of the fire barrier systems proposed in the future by applicants or licensees.

ACTIONS REQUESTED

None.

REPORTING REQUIREMENTS

None.

BACKFIT DISCUSSION

The guidance transmitted by this generic letter supplement will be used by the staff for review and evaluation of the adequacy of fire barrier systems and fire endurance tests that may be proposed in the future to satisfy NRC fire protection rules and regulations. This guidance refines and clarifies the guidance specified in Generic Letter 86-10 for application in that future review context; specifically it (1) clarifies the applicability of the test acceptance criteria stated in GL 86-10 to raceway fire barrier systems, (2) specifies a set of fire endurance test acceptance criteria which are acceptable for demonstrating that fire barrier systems can serve the required fire-resistive function and maintain the protected safe shutdown train free of fire damage, (3) contains acceptable options for hose stream testing, and (4) specifies acceptable criteria for functionality testing of cables when a deviation would be necessary, such as if the fire barrier temperature rise criteria are exceeded or the cable sustains visible damage.

No generic or plant-specific backfitting is intended or approved at this time in connection with issuance of this review guidance. The staff may consider the need for further generic action in that regard, if the industry guidance currently under development for addressing the pertinent fire protection issues is substantively inconsistent with this staff review guidance; but such action would be separately justified in accordance with the criteria of 10 CFR 50.109 and existing NRC backfit procedures. Similarly, if plant-specific backfits are proposed by the NRC staff consistent with this review guidance, the proposed backfits would be justified on a case-by-case basis in accordance with the criteria of 10 CFR 50.109 and existing NRC backfit procedures.

If you have any questions about this matter, please contact one of the contacts listed below or the appropriate Office of Nuclear Reactor Regulation project manager.

Sincerely,

Luis A. Reyes
Acting Associate Director for Projects
Office of Nuclear Reactor Regulation

Enclosures:
1. NRC Staff Review Guidance and Fire Endurance Test Acceptance Criteria for Fire Barrier Systems Used To Separate Redundant Safe Shutdown Trains Within the Same Fire Area.
2. Comparison of Staff Position on Fire Endurance Test Acceptance Criteria for Fire Barrier Systems Used To Separate Redundant Safe Shutdown Trains Within the Same Fire Area to the Acceptance Criteria of GL 86-10.
3. NRC Fire Testing Acceptance Criteria Logic Diagram.
4. List of Recently Issued Generic Letters

Technical contact: Patrick M. Madden, NRR
(301) 504-2854

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(301) 504-3024

FIRE ENDURANCE TEST ACCEPTANCE CRITERIA FOR FIRE BARRIER SYSTEMS USED TO SEPARATE REDUNDANT SAFE SHUTDOWN TRAINS WITHIN THE SAME FIRE AREA

I. BACKGROUND

In 1975, the Browns Ferry Nuclear power plant experienced a serious electrical cable tray fire. This fire had a significant impact on operator response to the event from a safety perspective. The fire caused spurious instrumentation indications and affected the control of several safety systems. As a result of this fire, the NRC issued the following fire protection guidelines and regulations concerning fire protection programs at nuclear power plants:

May 1, 1976	Branch Technical Position (APCSB) 9.5-1, "Fire Protection Program."
February 24, 1977	Appendix A to Branch Technical Position APCSB 9.5-1, "Guidelines for Fire Protection for Nuclear Power Plants Docketed Prior to July 1, 1976."
February 19, 1981	10 CFR 50.48, "Fire Protection."
February 19, 1981	Appendix R to 10 CFR Part 50, "Fire Protection Program for Nuclear Power Facilities Operating Prior to January 1979."
July 1981	NUREG-0800, Standard Review Plan (SRP), 9.5.1, "Fire Protection for Nuclear Power Plants."

In addition to the above fire protection guidance and regulations, the NRC, in an effort to clarify its fire protection requirements to the industry, issued Generic Letter (GL) 81-12, "Fire Protection Rule (45 FR 76602, November 19, 1980)," February 20, 1981; GL 83-33, "NRC Position on Certain Requirements of Appendix R to 10 CFR 50," October 19, 1983; and GL 86-10, "Implementation of Fire Protection Requirements," April 24, 1986. GL 86-10, which took precedence over previous staff guidance, provided staff interpretations to Appendix R and answers to industry questions regarding the implementation of Appendix R. The NRC, in an effort to give the licensees flexibility to make changes to its plant specific fire protection program, issued GL 88-12, "Removal of Fire Protection Requirements From Technical Specifications," August 2, 1988. Through the implementation and the adoption of a standard license condition, a licensee can make changes which do not adversely affect the ability to achieve and maintain post-fire safe shutdown to its fire protection program in accordance with 10 CFR 50.59.

The aforementioned NRC documents provided NRC staff guidance concerning fire barriers separating plant fire areas, including the fire resistance (endurance) ratings for the barriers and the qualification tests that establish their fire resistance ratings. In addition, the documents provided

guidance on combustibility of structural materials and tests for demonstrating low flame spread properties.

The following sections of this document provide the objective for providing safe shutdown related fire barriers in nuclear power plants, definition of fire protection terms related to fire barriers, and the NRC fire endurance test acceptance criteria for fire barriers used to separate safe shutdown functions within the same fire area.

II. OBJECTIVE OF FIRE BARRIERS USED TO SEPARATE SAFE SHUTDOWN FUNCTIONS WITHIN THE SAME FIRE AREA

Fire rated barriers are used in nuclear power plants to provide fire area separation between redundant safety-related components and safe shutdown functions. They provide fire resistance protection, as required by Appendix R[5], to one safe shutdown train in those fire areas which contain both trains. The objective of the safe shutdown related Appendix R fire barrier is to ensure that a safe shutdown train is conservatively protected from fire-related thermal damage. The necessity for these fire barriers has been verified by multiple probabilistic risk assessments (PRAs). These PRAs indicated that, even with fire barriers installed, fires are a major contributor to core melt probabilities.

It is the position of the NRC that fire endurance ratings of building construction and materials are demonstrated by testing fire barrier assemblies in accordance with the provisions of the applicable sections of NFPA 251, "Standard Methods of Fire Tests of Building Construction and Materials," and ASTM E-119, "Fire Test of Building Construction and Materials." Assemblies that pass specified acceptance criteria (e.g., standard time-temperature fire endurance exposure, unexposed side temperature rise, and hose stream impingement) are considered to have a specific fire resistance rating.

Enclosure 1 to GL 86-10, "Interpretations of Appendix R," provided additional guidance with respect to the term "free from fire damage." Interpretation 3, "Fire Damage," states, "In promulgating Appendix R, the Commission has provided methods acceptable for assuring that necessary structures, systems, and components are free from fire damage (see Section III.G.2a, b, and c), that is, the structure, system or component under consideration is capable of performing its intended function during and after the postulated fire, as needed."

GL 86-10, Response 3.2.1, also stated that, "The resulting 325 °F cold side temperature criterion is used for cable tray wraps because they perform a fire barrier function to preserve the cables free from fire damage. It is clear that cable that <u>begins to degrade</u> at 450 °F is free from fire damage at 325 °F." (Emphasis added.) In addition, the staff response stated that, "for newly identified conduit and cable trays requiring such wrapping new materials

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[5] For advanced reactor designs, redundant safe shutdown functions are required to be located in separate 3-hour fire areas.

which meet the 325 °F criterion should be used, or justification should be provided for the use of material which does not meet the 325 °F criterion. This may be based on an analysis demonstrating that the maximum recorded temperature is sufficiently below the cable insulation ignition temperature." (Emphasis added.)

The basic premise of the NRC fire resistance criteria is that fire barriers which do not exceed 163 °C [325 °F] cold side temperature[6] and pass the hose stream test provide adequate assurance that the shutdown capability is protected without further analyses. If the temperature criteria is exceeded, sufficient additional information is needed to perform an engineering evaluation to demonstrate that the shutdown capability is protected.

III. DEFINITIONS

In order to support the understanding of the technical terms used throughout this document, the following definitions are provided.

Combustible Material - Material that does not meet the definition of non-combustible.

Fire Barrier - Those components of construction (walls, floors and their supports), including beams, joists, columns, penetration seals or closures, fire doors, and fire dampers that are rated by approving laboratories in hours of resistance to fire and are used to prevent the spread of fire.

Fire Resistance Rating - The time that materials of a test assembly have withstood a standard ASTM E-119 fire exposure and have successfully met the established test acceptance criteria (fire barrier test acceptance criteria refer to Sections IV, V, and VI).

Noncombustible Material - (a) Material which, in the form in which it is used and under the conditions anticipated, will not ignite, burn, support combustion, or release flammable vapors when subjected to fire or heat; (b) Material having a structural base of noncombustible material, with a surfacing not over 1/8-inch thick that has a flame spread rating of not higher than 50 when measured in accordance with ASTM E-84, "Surface Burning Characteristics of Building Materials." (There is an exception to this definition as defined by BTP Appendix A, Position D.1.d. This position allows the use of combustible interior finishes when listed by a nationally recognized test laboratory, such as Factory Mutual or Underwriters Laboratories, Incorporated, for a flame spread, smoke and fuel contribution of 25 or less in its use configuration.)

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[6] The 163 °C [325 °F] temperature condition was established by allowing the temperature of the unexposed side of the fire barrier to rise 139 °C [250 °F] above the assumed 24 °C [75 °F] ambient air temperature, as measured by the thermocouples within the test specimen at the onset of the fire exposure during the fire test.

Raceway - Cable trays, conduits, junction boxes, and other components used to support and route cables from circuit termination to circuit termination.

Raceway Fire Barrier - Nonload bearing partition type envelope system installed around electrical components and cabling that are rated by test laboratories in hours of fire resistance and are used to maintain safe shutdown functions free of fire damage.

IV. FIRE ENDURANCE TEST ACCEPTANCE CRITERIA FOR FIRE BARRIER WALLS, FLOORS, CEILINGS, AND FREE STANDING EQUIPMENT ENCLOSURES USED TO SEPARATE SAFE SHUTDOWN FUNCTIONS WITHIN THE SAME FIRE AREA

To demonstrate the adequacy of fire barrier walls, floors, ceilings, and enclosures, barrier designs should be verified by fire endurance testing. NRC fire protection guidance refers to the guidance of NFPA 251 and ASTM E-119 as acceptable test methods for demonstrating fire endurance performance.

The fire endurance test acceptance criteria for the subject fire barriers are:

The fire barrier design has withstood the fire endurance test without the passage of flame or the ignition of cotton waste on the unexposed side for a period of time equivalent to the fire resistance rating required of the barrier;

The temperature levels recorded on the unexposed side of the fire barrier are analyzed and demonstrable that the maximum temperature does not exceed 139 °C [250 °F] above ambient; and

The fire barrier remains intact and does not allow projection of water beyond the unexposed surface during the hose stream test. (For acceptable hose stream test methods and time of application - See Section VII.)

If the above criteria are met for fire barrier walls, floors, ceilings, and free standing equipment enclosures separating safe shutdown functions within the same fire area, the barrier is acceptable.

NRC fire protection guidance also ensures that door and ventilation openings and penetrations are properly protected. The guidance requires that these openings be protected with fire doors and fire dampers which have been fire tested and listed by a nationally recognized test laboratory (e.g., Factory Mutual or Underwriters Laboratories, Incorporated). In addition, the construction and installation techniques for door and ventilation openings and other penetrations through these fire barriers should be qualified by fire endurance tests.

The guidance of NFPA 251 and ASTM E-119 should be consulted with regard to construction, materials, workmanship, and details such as dimensions of parts, and the size of the specimen(s) to be tested. In addition, NFPA 251 and ASTM E-119 should be consulted with regard to the placement of thermocouples on the specimen.

V. FIRE ENDURANCE TEST ACCEPTANCE CRITERIA FOR ELECTRICAL RACEWAY AND COMPONENT FIRE BARRIER SYSTEMS FOR SEPARATING SAFE SHUTDOWN FUNCTIONS WITHIN THE SAME FIRE AREA

The NRC provided guidance in Appendix A to Branch Technical Position 9.5-1, Position D.3.(d), for cable tray fire barriers. This fire protection guidance states that the design of fire barriers for horizontal and vertical cable trays should, as a minimum, meet the requirements of ASTM E-119, "Fire Test of Building Construction and Materials," including hose stream test. On November 19, 1980, the NRC issued Appendix R to 10 CFR Part 50. The technical basis for Section III.M, "Fire Barrier Penetration Seal Qualification," states that "Fire barriers are 'rated' for fire resistance by being exposed to a 'standard test fire.' This standard test fire is defined by the American Society of Testing and Materials in ASTM E-119." In addition, this technical basis stated that "[i]f specific plant conditions preclude the installation of a 3-hour fire barrier to separate the redundant trains, a 1-hour fire barrier and automatic fire suppression and detection system for each redundant train will be considered the equivalent of a 3-hour barrier." Appendix R to 10 CFR Part 50, Section III.G, "Fire protection of safe shutdown capability," provides what the NRC views as equivalent means for ensuring that one safe shutdown train remains free of fire damage.

In 1984 Appendix R workshops held with industry, and later in GL 86-10, the staff provided guidance related to fire barrier designs for raceways. In Enclosure 2, "Question and Answers," to this GL, Question 3.2.1., "Acceptance Criteria," the staff provided guidance on the cold side temperature for fire barrier cable tray wraps. In response to this question the staff stated that the acceptance criteria contained in Chapter 7 of NFPA 251, "Standard Methods of Fire Tests of Building Construction and Materials," pertaining to non-bearing fire barriers was applicable to cable tray fire barrier wraps. Chapter 5 of NFPA 251 explains the conduct of the fire test.

The following is the NFPA 251 acceptance criteria:

- The wall or partition withstood the fire endurance test without the passage of flame or gases hot enough to ignite cotton waste, for a period equal to that for which classification is desired;

- The wall or partition withstood the fire and hose stream tests specified in Chapter 5, without the passage of flame, gases hot enough to ignite cotton waste, or the hose stream. The assembly failed the hose stream test if an opening develops that permits the projection of water from the stream beyond the unexposed surface during the hose stream test; and

- Transmission of heat through the wall or partition during the fire endurance test did not raise the temperature on the unexposed surfaces more than 139 °C [250 °F] above their initial temperatures.

The staff considers the fire endurance qualification test for fire barrier materials applied directly to a raceway or component to be successful if the following conditions are met:

- The average unexposed side temperature of the fire barrier system, as measured on the exterior surface of the raceway or component, did not exceed 139 °C [250 °F] above its initial temperature; and

  (Staff Guidance: NFPA 251 and ASTM E-119 allow this temperature to be determined by averaging thermocouple temperature readings. For the purposes of this criterion, thermocouple averaging can be used provided similar series of thermocouples (e.g., cable tray side rail) are averaged together to determine temperature performance of the raceway fire barrier system. In addition, conditions of acceptance are placed on the temperatures measured by a single thermocouple. If any single thermocouple exceeds 30 percent of the maximum allowable temperature rise (i.e., 139 °C + 42 °C = 181 °F [250 °F + 75 °F = 325 °F]), the test exceeded the temperature criteria limit.)

- Irrespective of the unexposed side temperature rise during the fire test, if cables or components are included in the fire barrier test specimen, a visual inspection should be performed.[7] Cables should not show signs of degraded conditions[8] resulting from the thermal affects of the fire exposure; and

  (Staff Guidance: For those cases where signs of thermal degradation are present, the fire barrier did not perform its intended fire-resistive function. For those barriers which are not capable of performing their intended function, a deviation based on demonstrating that the functionality of thermally degraded cables or component was maintained and that the cables or component would have adequately performed their intended function during and after a postulated fire exposure may be granted. The attachment to this position provides a methodology for demonstrating the functionality of cables during and after a fire test exposure. The purpose of the functionality tests is to justify observed deviations in fire barrier performance. For those fire barrier test specimens that are tested without cables,

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[7] When the temperature criteria are exceeded or damage occurs, component operability at the temperatures experienced during the fire test should be assessed. Fire endurance tests that are judged acceptable on the basis of a visual inspection of specific components or cables included in the test specimen may not be applied to other components or cables without a specific evaluation.

[8] Examples of thermal cable degradation are: jacket swelling, splitting, cracking, blistered, melted, or discoloration; shield exposed; conductor insulation exposed, degraded, or discolored; bare copper conductor exposed.

an engineering analysis justifying internal fire barrier temperature conditions greater than allowed can be based on a comparison of the fire barrier internal temperature profile measured during the fire endurance test to existing cable specific performance data, such as environmental qualification (EQ) tests.)

- The cable tray, raceway, or component fire barrier system remained intact during the fire exposure and water hose stream test without developing any openings through which the cable tray, raceway, or component (e.g., cables) is visible. Section VII identifies acceptable hose stream test methods.

The test specimen should be representative of the construction for which the fire rating is desired as to materials, workmanship, and details such as dimensions of parts, and should be built under representative conditions. Raceway fire barrier systems being subjected to qualification fire endurance tests should be representative of the end use. For example, if it is intended to install a cable tray fire barrier system in the plant without protecting the cable tray supports, then the test program should duplicate these field conditions. In addition, the fire test program should encompass or bound raceway sizes and the various configurations for those fire barrier systems installed in the plant. It should be noted that several test specimens will be required in order to qualify various sizes of horizontal and vertical runs of cable trays and conduits, junction boxes and pull boxes, etc. The cable tray or raceway design used for the tests should be constructed with materials and configurations representative of in plant conditions (e.g., the mass associated with typical steel conduits and cable trays, representative internal and external penetration seals). If cables are included in the raceway fire barrier test specimen, these cables should be representative of the installed plant-specific cables.

Measuring cable temperatures is not a reliable means for determining excessive temperature conditions which may occur at any point along the length of the cable during the fire test. In lieu of measuring the unexposed surface temperature of the fire barrier test specimen, methods which will measure the surface temperature of the raceway (e.g., exterior of the conduit, side rails of cable trays, bottom and top of cable tray surfaces, junction box external surfaces) can be considered as equivalent if the raceway components used to construct the fire test specimen represent plant specific components and configurations. The metal surfaces of the raceway, under fire test conditions, exhibit good thermal conductivity properties. Temperatures measured on these surfaces provide a indication of the actual temperature rise within the fire barrier system.

In 1979, American Nuclear Insurers (ANI) issued a fire endurance test method for raceway fire barrier systems for insurance purposes. This method, "Fire Endurance Protective Envelope Systems for Class 1E Electrical Circuits," specified that cable temperatures be monitored by thermocouples. Industry considers this the proper location for determining the temperature rise within the raceway fire barrier system. Since cable jackets have a low thermal

conductivity, the actual local temperatures of the cable jackets indications of barrier failure and internal fire barrier temperature rise conditions during the fire exposure are masked. Monitoring cable temperatures can give indications of low internal fire barrier temperature conditions during the fire endurance test. Using this temperature monitoring approach, cable damage can occur without indication of excessive temperatures on the cables. This, linked with no loss of circuit integrity, would give indications of a successful test. The staff considers monitoring the cable temperature as the primary means of determining cable tray or raceway fire barrier performance to be nonconservative. Therefore, the staff has incorporated the provision for a post-fire visual inspection of cables that are installed in fire barrier test specimens. As discussed above, temperatures monitored on the exterior surface of the raceway provide a more representative indication of fire barrier performance.

Fire endurance tests of raceway fire barrier systems should be without cables. This method is preferred because by excluding cables from the test specimen it eliminates bias in the test results created by the thermal mass of the cables. Without this thermal mass, the internal temperature conditions measured by the test specimen thermocouples during the fire exposure will provide a more accurate determination of fire barrier thermal performance.

Thermocouple Placement - Test Specimens Containing Cables

The following are acceptable placements of thermocouples for determining the thermal performance of raceway or cable tray fire barrier systems that contain cables during the fire exposure:

Conduits - The temperature rise on the unexposed surface of a fire barrier system installed on a conduit should be measured by placing the thermocouples every 152 mm [6 inches][9] on the exterior conduit surface underneath the fire barrier material. The thermocouples should be attached to the exterior conduit surface located opposite the test deck and closest to the furnace fire source. Thermocouples should also be placed immediately adjacent to all structural members, supports, and barrier penetrations.

Cable Trays - The temperature rise on the unexposed surface of a fire barrier system installed on a cable tray should be measured by placing the thermocouples on the exterior surface of the tray side rails between the cable tray side rail and the fire barrier material. In addition to placing thermocouples on the side rails, thermocouples should be attached to two AWG 8 stranded bare copper conductors. The first copper conductor should be installed on the bottom of the cable tray rungs along the entire length and down the longitudinal center of the cable tray run. The second conductor should be installed along the outer top

[9] For the thermocouples installed on conduits, cable tray side rails, and bare copper conductors, a ±13 mm [±½ inch] installation tolerance is acceptable.

surface of the cables closest to the top and towards the center of the fire barrier. The bare copper wire is more responsive than cable jackets to temperature rise within the fire barrier enclosure. The temperature changes measured along the bare copper conductors provide indication of joint failure or material burn through conditions. Thermocouples should be placed every 152 mm [6 inches] down the longitudinal center along the outside surface of the cable tray side rails and along the bare copper conductors. Thermocouples should also be placed immediately adjacent to all structural members, supports, and barrier penetrations.

Junction Boxes (JB) - The temperature rise on the unexposed surface of a fire barrier system installed on junction boxes should be measured by placing thermocouples on either the inside or the outside of each JB surface. Each JB surface or face should have a minimum of one thermocouple, located at its geometric center. In addition, one thermocouple should be installed for every one square foot of JB surface area. These thermocouples should be located at the geometric centers of the one square foot areas. At least one thermocouple should also be placed within 25 mm [1 inch] of each penetration connector/interface.

Airdrops - The internal airdrop temperatures should be measured by thermocouples placed every 305 mm [12 inches] on the cables routed within the air drop and by a stranded AWG 8 bare copper conductor routed inside and along the entire length of the airdrop system with thermocouples installed every 152 mm [6 inches] along the length of the copper conductor. The copper conductor should be in close proximity with the unexposed surface of the fire barrier material. Thermocouples should also be placed immediately adjacent to all supports and barrier penetrations.

With the exception of airdrops, the installation of thermocouples on cables is optional and is left to the discretion of the licensee, test sponsor, or test laboratory. Cable thermocouples are to be used for engineering purposes only. Cable thermocouples alone are not acceptable for the demonstration of fire barrier performance. However, cable thermocouples may support fire barrier deviation conditions.

Temperature conditions on the unexposed surface of the fire barrier material during the fire test will be determined by averaging the temperatures measured by the thermocouples. In determining these cable tray or raceway temperature conditions, the thermocouples measuring similar fire barrier areas of performance should be averaged together and the basis of acceptance will be based on the individual averages. The following method of averaging should be followed:

Conduits - The thermocouples applied to the outside metal surface of the conduit should be averaged together.

Cable Trays - The thermocouples on each cable tray side rail should be averaged separately. For example, thermocouples placed on one side rail

will be averaged separately from the other side rail. In addition, the temperature conditions measured by thermocouples on the two bare copper conductors should be averaged separately.

Junction Boxes - For small JBs which have only one thermocouple placed on each JB surface, the individual JB surface thermocouples should be averaged together. For larger JBs which have more that one thermocouple placed on each JB surface, the thermocouples on the individual JB surfaces should be averaged together.

Airdrops - The thermocouples placed on the outer cable(s) routed in the airdrop fire barrier should be averaged together.

The averages of any thermocouple group during the fire test should not exceed 139 °C [250 °F] above the unexposed side temperature within the fire barrier test specimen at the onset of the fire endurance test. In addition, the temperature of each individual thermocouple will be evaluated. Individual thermocouple conditions should not exceed the 139 °C [250 °F] temperature rise by more than 30 percent.

Thermocouple Placement - Test Specimens Without Cables

The following are acceptable thermocouple placements for determining the thermal performance of raceway or cable tray fire barrier systems that do not contain cables:

Conduits - The temperature rise of the unexposed surface of a fire barrier system installed on a conduit should be measured by placing thermocouples every 152 mm [6 inches] on the exterior conduit surface between the conduit and the unexposed surface of the fire barrier material. These thermocouples should be attached to the exterior conduit surface opposite of the test deck and closest to the furnace fire source. The internal raceway temperatures should be measured by a stranded AWG 8 bare copper conductor routed through the entire length of the conduit system with thermocouples installed every 152 mm [6 inches] along the length of the copper conductor. Thermocouples should also be placed immediately adjacent to all structural members, supports, and barrier penetrations.

Cable Trays - The temperature rise on the unexposed surface of a fire barrier system installed on a cable tray should be measured by placing thermocouples every 152 mm [6 inches] on the exterior surface of each tray side rails between the side rail and the fire barrier material. Internal raceway temperatures should be measured by a stranded AWG 8 bare copper conductor routed on the top of the cable tray rungs along the entire length and down the longitudinal center of the cable tray run with thermocouples installed every 152 mm [6 inches] along the length of the copper conductor. Thermocouples should be placed immediately adjacent to all structural members, supports, and barrier penetrations.

Junction Boxes - The temperature rise on the unexposed surface of a fire barrier system installed on junction boxes should be measured by placing thermocouples on either the inside or the outside of each JB surface. Each JB surface or face should have a minimum of one thermocouple, located at its geometric center. In addition, one thermocouple should be installed for every one square foot of JB surface area. These thermocouples should be located at the geometric centers of the one square foot areas. At least one thermocouple should also be placed within 25 mm [1 inch] of each penetration connector/interface.

Airdrops - The internal airdrop temperatures should be measured by a stranded AWG 8 bare copper conductor routed inside and along the entire length of the airdrop system with thermocouples installed every 152 mm [6 inches] along the length of the copper conductor. The copper conductor should be in close proximity with the unexposed surface of the fire barrier material. Thermocouples should also be placed immediately adjacent to all supports and penetrations.

Temperature conditions on the unexposed surfaces of the fire barrier material during the fire test will be determined by averaging the temperatures measured by the thermocouples installed in or on the raceway. In determining these temperature conditions, the thermocouples measuring similar areas of the fire barrier should be averaged together. Acceptance will be based on the individual averages. The following method of averaging should be followed:

Conduits - The thermocouples applied to the outside metal surface of the conduit should averaged together.

Cable Trays - The thermocouples on each cable tray side rail should be averaged separately. For example, thermocouple placed on one side rail will be averaged separately from the other side rail. In addition, the temperature conditions measured by thermocouples on the bare copper conductor should be averaged separately from the side rails.

Junction Boxes - For JBs that have only one thermocouple on each JB surface, the individual JB surface thermocouples should be averaged together. For JBs that have more that one thermocouple on each JB surface, the thermocouples on the individual JB surfaces should be averaged together.

Airdrops - The thermocouples placed on the copper conductor within the airdrop fire barrier should be averaged together.

The average of any thermocouple group should not exceed 139 °C [250 °F] above the unexposed side temperature within the fire barrier test specimen at the onset of the fire endurance test. In addition, the temperature of each individual thermocouple will be evaluated. Individual thermocouple conditions should not exceed the 139 °C [250 °F] temperature rise by more than 30 percent.

If a fire barrier test specimen without cables does not meet the average or maximum single point temperature criteria, then the internal raceway temperature profile as measured by the instrumented bare copper conductors during the fire exposure can be used to assess cable functionality through air oven tests of plant specific cable types and construction.

VI. HOSE STREAM TESTS

NFPA 251 and ASTM E-119 allow flexibility in hose stream testing. The standards allow the hose stream test to be performed on a duplicate test specimen subjected to a fire endurance test for a period equal to one-half of that indicated as the fire resistance rating, but not for more than 1 hour (e.g., 30 minute fire exposure to qualify a 1-hour fire rated barrier).

For safe shutdown related fire barrier systems referenced in Section IV and duplicate electrical cable tray or raceway and component fire barrier test specimens that have been exposed to the ½-duration test fire exposure, the staff finds the hose stream application specified by the NFPA 251 acceptable. NFPA 251 requires the stream of water to be delivered through a 6.4 cm [2½-inch] hose discharging through a standard 2.9 cm [1½-inch] playpipe nozzle onto the test specimen after the fire exposure test. The stream is applied with the nozzle orifice positioned 6.1 meters [20 feet] away from the center of the test specimen at a pressure of 207 kPa [30 psi]. The application of the stream is to all exposed parts of the specimen for a minimum duration of 1 minute for a 1-hour barrier and 2½ minutes for a 3-hour barrier.

As an alternate for electrical raceway fire barrier test specimens, the application of the hose stream test can be performed immediately after the completion of the full fire endurance test period. If this method is used to satisfy the hose stream test criteria, the following hose stream applications are acceptable:

- The stream applied at random to all exposed surfaces of the test specimen through a 6.4 cm [2½-inch] national standard playpipe with a 2.9 cm [1½-inch] orifice at a pressure of 207 kPa [30 psi] at a distance of 6.1 meters [20 feet] from the specimen. (Duration of the hose stream application - 1 minute for a 1-hour barrier and 2½ minutes for a 3-hour barrier); or

- The stream applied at random to all exposed surfaces of the test specimen through a 3.8 cm [1½-inch] fog nozzle set at a discharge angle of 30 degrees with a nozzle pressure of 517 kPa [75 psi] and a minimum discharge of 284 lpm [75 gpm] with the tip of the nozzle at a maximum of 1.5 meters [5 feet] from the test specimen. (Duration of the hose stream application - 5 minutes for both 1-hour and 3-hour barriers); or

- The stream applied at random to all exposed surfaces of the test specimen through 3.8 cm [1½-inch] fog nozzle set at a discharge angle of 15 degrees with a nozzle pressure of 517 kPa [75 psi] and

a minimum discharge of 284 lpm [75 gpm] with the tip of the nozzle at a maximum of 3 meters [10 feet] from the test specimen. (Duration of the hose stream application - 5 minutes for both 1-hour and 3-hour barriers.)

VII. FIRE BARRIER COMBUSTIBILITY

The NRC's fire protection guidelines and requirements establish the need for each nuclear power plant to perform a plant-specific fire hazard analysis. The fire hazard analysis should consider the potential for in-situ and transient fire hazards and combustibles. With respect to building materials (e.g., cable insulation and jackets, plastics, thermal insulation, fire barrier materials), the combustibility, ease of ignition, and flame spread over the surface of a material should be considered by the fire hazards analysis. One method of determining combustibility is by subjecting a sample of the fire barrier material to a small scale vertical tube furnace as described by ASTM E-136. The flashover ignition temperature of the material (as determined by ASTM D-1929) and the flame spread characteristics of the material (as determined by ASTM E-84) should also be evaluated. The potential heat release of the material (as determined by ASTM D-3286 or NFPA 259), should also be factored into the fire hazards analysis.

Fire barrier materials used as radiant energy heat shields inside containment and used to achieve a combustible free zone are required to be noncombustible as defined in Section III.

VIII. REFERENCES

U.S. Nuclear Regulatory Commission

May 1, 1976	Branch Technical Position (APCSB) 9.5-1, "Fire Protection Program."
February 24, 1977	Appendix A to the Branch Technical Position APCSB 9.5-1, "Guidelines for Fire Protection for Nuclear Power Plants Docketed Prior to July 1, 1976."
February 19, 1981	10 CFR 50.48, "Fire protection."
February 19, 1981	Appendix R to 10 CFR Part 50, "Fire Protection for Nuclear Power Plants."
February 20, 1981	Generic Letter 81-12, "Staff Position - Safe Shutdown Capability."
July 1981	NUREG - 0800, Standard Review Plan, 9.5.1, "Fire Protection for Nuclear Power Plants."
October 19, 1983	Generic Letter 83-33, "NRC Positions on Certain Requirements of Appendix R to 10 CFR 50."

April 24, 1986 Generic Letter 86-10, "Implementation of Fire Protection Requirements."

American Society for Testing and Materials

ASTM E-84, "Surface Burning Characteristics of Building Materials."

ASTM E-119, "Fire Test of Building Construction and Materials."

ASTM E-136, "Behavior of Materials in a Vertical Tube Furnace at 750°C."

ASTM D-1929, "Test Method for Ignition Properties of Plastics."

ASTM D-3286, "Test Method for Gross Calorific Value of Solid Fuel by the Isothermal-Jacket Bomb Calorimeter."

American Nuclear Insurers (ANI)

July 1979, ANI Information Bulletin No. 5 (79) test criteria for "Fire Endurance Protective Envelope Systems for Class 1E Electrical Circuits."

National Fire Protection Association (NFPA)

NFPA 251, "Standard Methods of Fire Tests of Building Construction and Materials."

NFPA 259, "Standard Test Method for Potential Heat of Building Materials."

ACCEPTABLE METHODS FOR DEMONSTRATING FUNCTIONALITY OF CABLES PROTECTED BY RACEWAY FIRE BARRIER SYSTEMS DURING AND AFTER FIRE ENDURANCE TEST EXPOSURE

I. INTRODUCTION

The NRC considers fire barrier systems that meet the acceptance criteria adequate under NRC fire protection regulations. The licensee, where the criteria are not met, should submit an engineering analysis to the staff that clearly demonstrates the functionality of the protected cables. This engineering analysis should consider the cable insulation type, actual voltage and current conditions, cable function, and thermal affects on the cable and its ability to function. This evaluation should also consider cable operating temperatures within the fire barrier at the onset of the fire exposure.

II. CABLE CIRCUIT INTEGRITY TESTS

In 1979, American Nuclear Insurers (ANI) issued a fire endurance test method for raceway fire barrier systems for insurance purposes. This method, "Fire Endurance Protective Envelope Systems for Class 1E Electrical Circuits," specified a circuit integrity test. The intent of this test was to identify the onset of fire damage to the cables within the raceway fire barrier test specimen during the fire endurance test period. The circuit integrity test voltage is 8 to 10 volts DC; therefore the loss of circuit integrity under these voltage conditions may occur only as a result of a dead short or open circuit.

During fire tests of raceway fire barrier systems, thermal damage to the cables has been observed. This thermal damage has led to cable jacket and insulation degradation without the loss of circuit integrity as monitored using ANI criteria. Since cable voltages used for ANI circuit integrity tests do not replicate cable operating voltages, loss of cable insulation conditions can exist during the fire test without a dead short occurring. It is expected that if the cables were at rated power and current, a fault would propagate. The use of circuit integrity monitoring during the fire endurance test is not a valid method for demonstrating that the protected shutdown circuits are capable of performing their required function during and after the test fire exposure. Therefore, circuit integrity monitoring is not required to satisfy NRC acceptance criteria for fire barrier qualification.

III. EQUIPMENT QUALIFICATION

Comparison of the fire barrier internal time-temperature profile measured during the fire endurance test to existing cable performance data, such as data from environmental qualification (EQ) tests, could be proposed to the staff as a method for demonstrating cable functionality. EQ testing is typically performed to rigorous conditions, including rated voltage and current. By correlating the EQ test time-temperature profile to the fire test time-temperature profile, the EQ test data would provide a viable mechanism to ensure cable functionality. A large body of EQ test data for many cable types

exists today. The use of EQ data represents a cost-effective approach for addressing cable functionality for fire tests for those cases where the 163 °C [325 °F] limit is exceeded.

90-08

The staff agrees that a comparison of fire test temperature profiles to existing EQ and Loss of Cooling Accident (LOCA) test results or air oven test results is an acceptable approach to demonstrate cable functionality provided the subject analysis incorporates the anticipated temperature rise due to self heating effects of installed power cables with the fire test results.

IV. CABLE INSULATION TESTS

The two principal materials used as cable insulation and cable jackets by the nuclear industry are thermoplastics and thermosetting polymeric materials. A thermoplastic material can be softened and resoftened by heating and reheating. Conversely, thermosetting cable insulation materials cure by chemical reaction and do not soften when heated. Under excessive heating thermosetting insulation becomes stiff and brittle. Electrical faults may be caused by softening and flowing of thermoplastic insulating materials at temperatures as low as 149 °C [300 °F]. Thermosetting electrical conductor insulation materials usually retain their electrical properties under short-term exposures to temperatures as high as 260 °C [500 °F]. Insulation resistance (Megger) tests provide indications of the condition of the cable insulation resistance, whereas the high potential (Hi-Pot) test provides assurance that the cable has sufficient dielectric strength to withstand the applied rated voltage. A cable insulation failure usually results from two breakdown modes: one failure mode is excessive dielectric loss which is due to low insulation resistance, and the other failure mode is overpotential stress which is due to loss of dielectric strength of the insulation material.

If Megger tests are not performed at frequent intervals during the fire exposure, indications of insulation damage in insulation may go undetected. When removed from elevated temperatures, insulation will reset. Megger tests of insulated cables after the fire endurance test and after the cable has sufficiently cooled may not detect degradation in the insulation resistance. Therefore, wet or dry Megger of cables after a fire exposure does not provide reasonable assurance that the cables would have functioned as intended during the fire exposure.

To provide reasonable assurance that the cables would have functioned during and after the fire exposure, Megger tests need to be performed before the fire test, at multiple time intervals during the fire exposure (i.e, every 20 minutes during the 1-hour fire test and every hour during the 3-hour fire test) for instrumentation cables only, and immediately after the fire endurance test to assess the cable insulation resistance levels. This testing will assure that the cables will maintain the insulation resistance levels necessary for proper operation of instruments.

The Megger tests (pre-fire, during the fire [if performed], and immediately after the fire test conditions) should be done conductor-to-conductor for multi-conductor and conductor-to-ground for all cables. The minimum

acceptable insulation resistance (IR) value, using the test voltage values as shown in the table below, is determined by using the following expression:

$$\text{IR (Mega-ohms)} \geq \frac{\{[K+1 \text{ Mega-ohm }] * 1000 \text{ (ft) }\}}{\text{Length (ft)}}$$

Where K = 1 Mega-ohm/KV * Operating Voltage (expressed in KV)

In addition, to determine the insulation resistance levels required for nuclear instrumentation cables, an assessment of the minimum insulation resistance value (e.g., one mega-ohm) and its potential impact on the functionality of these cables should be evaluated. An ac or dc high potential (Hi-Pot) test for power cables greater than 1000 volts (V) should also be performed after the post-fire Megger tests to assess the dielectric strength. This test provides assurance that the cable will withstand the applied voltage during and after a fire. The high potential test should be performed for a 5 minute duration at 60 percent of either 80 V/mil ac or 240 V/mil dc (e.g., 125 mil conductor insulation thickness x 240 V/mil dc x 0.6 = 18,000 V dc).

The table below summarizes the Megger and Hi-Pot test voltages[10] which, when applied to power, control and instrumentation cables, would constitute an acceptable cable functionality test.

TYPE	OPERATING VOLTAGE	MEGGER TEST VOLTAGE	HIGH POTENTIAL TEST VOLTAGE
Power	≥ 1000 V ac	2500 V dc	60% x 80 V/mil (ac) 60% x 240 V/mil (dc)
Power	< 1000 V ac	1500 V dc*	None
Instrument and Control	≤ 250 V dc ≤ 120 V ac	500 V dc	None

* A Megger test voltage of 1000 V dc is acceptable provided a Hi-Pot test is performed after the Megger test for power cables rated at less than 1000 V ac.

The electrical cable functionality tests recommended above are one acceptable method. Alternate methods to assess degradation of cable functionality will be evaluated by the staff for acceptability on a case-by-case basis. The above table summarizing the Megger and Hi-Pot test voltages are "typical" and the applicant can follow the applicable industry standards and manufacturer's recommendations for the specific cable application in the performance of the insulation resistance and Hi-Pot tests.

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[10] The review guidance for Megger and Hi-Pot test voltages was derived from IEEE 383-1974, IEEE 422-1986 and IEEE 690-1984.

V. AIR OVEN TESTS

Air oven tests can be used to evaluate the functionality of cables for those cable tray or raceway fire barrier test specimens tested without cables. This testing method consists of exposing insulated wires and cables at rated voltage to elevated temperatures in a circulating air oven. The temperature profile for regulating the temperature in the air oven during this test is the temperature measured by the AWG 8 bare copper conductor during the fire exposure of those cable tray or raceway test specimen which were tested without cables.

The staff finds the test method described by UL Subject 1724, "Outline of Investigation for Fire Tests for Electrical Circuit Protective Systems", Issue Number 2, August 1991, Appendix B, "Qualification Test for Circuit Integrity of Insulated Electrical Wires and Cables in Electrical Circuit Protection Systems", with the following modifications, acceptable:

1. During the air oven test the cables are to be energized at rated voltage. The cables are to be monitored for conductor-to-conductor faults in multi-conductor cables and conductor-to-ground faults in all conductors.

2. The cables being evaluated should be subjected to the Megger and high potential tests, recommended above in Section IV, "Cable Insulation Tests."

3. The impact force test, which simulates the force of impact imposed on the raceway by the solid stream test, described in UL 1724, Appendix B, paragraph B3.16, is not required to be performed.

VI. CABLE THERMAL EXPOSURE THRESHOLD

The following analysis, which is based on determining whether a specific insulation material will maintain electrical integrity and operability within a raceway fire barrier system during and after an external fire exposure, is an acceptable method for evaluating cable functionality. In order to determine cable functionality, it is necessary to consider the operating cable temperatures within the fire barrier system at the onset of the fire exposure and the thermal exposure threshold (TET) temperature of the cable. For example, if the TET of a specific thermoplastic cable insulation (Brand X) is 149 °C [300 °F] and the normal operating temperature within the fire barrier system is 66 °C [150 °F], then the maximum temperature rise within the fire barrier system should not exceed 83 °C [150 °F] during exposure to an external fire of a duration equal to the required fire resistance rating of the barrier. For this example the TET limit for Brand X cable is 83 °C [150 °F] above the cable operating temperatures within the fire barrier system at the onset of the external fire exposure. The cable TET limits in conjunction with a post test visual cable inspection and the Hi-Pot test described above should readily demonstrate the functionality of the cable circuit during and after a fire.

The normal cable operating temperature can be determined by loading cable specimens installed within a thermal barrier system in the test configuration with rated voltage and current. The TET temperature limits for most cable insulation may be obtained from the manufacturer's published data which is given as the short-circuit rating limit. With the known TET and normal operating temperature for each thermal barrier system configuration, the maximum temperature rise limit within a fire barrier system may then be determined.

COMPARISON OF FIRE ENDURANCE TEST CRITERIA
FOR FIRE BARRIER SYSTEMS USED TO SEPARATE
SAFE SHUTDOWN FUNCTIONS WITHIN THE SAME FIRE AREA

GL 86-10, SUPP. 1	GL 86-10	RATIONALE FOR CLARIFICATION
Temperature, as measured on the external surface of the Raceway, should not exceed 163 °C [325 °F] (Note 1). This temperature is determined by averaging temperature readings of similar series of thermocouple (e.g., cable tray side rail) (Note 2).	**Temperature**, as measured on the unexposed side of the fire barrier material, should not exceed 163 °C [325 °F].	**Temperature** - Difficult to measure a uniform temperature on the fire barrier material surface. Raceway temps provide good indication of internal temp-rise and potential barrier failure locations during the test.
Barrier Condition - Fire barrier should remain intact. No visible signs of component, raceway or cables after fire and hose stream test.	**Barrier Condition** - The barrier should have withstood the fire and hose stream test without the passage of flame or hot gasses hot enough to ignite cotton waste.	**Barrier Condition** - Cotton waste has not been used in raceway fire barrier testing as an indicator of barrier failure. Visual inspection process provides a better indication of barrier condition after the fire and hose stream test.
Hose Stream Test - solid stream test as specified in NFPA 251 on second test specimen after being subjected to a fire exposure of 1/2 duration (Note 4) or a fog stream after the full fire exposure.	**Hose Stream Test** - solid stream test as specified in NFPA 251.	**Hose Stream Test** - To reflect alternative methods found acceptable (Note 3). The use of a fog nozzle for the hose stream at the end of a full duration of the fire test provides a good method for testing erosion and cooling effects.

GL 86-10, SUPP. 1	GL 86-10	RATIONALE FOR CLARIFICATION
Cable condition - When cables are included in the test specimen, post-fire condition must be visually inspected. Cables should show no signs of degraded conditions resulting from the thermal affects of the fire exposure.	**Cable condition** - No consideration given to determining the material condition of the cable.	**Cable condition** - The objective of these fire barriers is to assure that thermal damage to protected safe shutdown cables or components does not occur.

GUIDANCE FOR ENGINEERING EVALUATIONS JUSTIFYING DEVIATIONS FROM THE FIRE BARRIER ACCEPTANCE CRITERIA

Functionality should be demonstrated if any of the preceding criteria are exceeded (Note 5). Methods when cables are excluded from test specimen: Comparison of internal temp. profiles to EQ and LOCA test data. Air oven test of cables at rated voltage with Megger and Hi-Pot tests (Note 6) Method when cables are in test specimen include megger and Hi-Pot testing (Note 7) Demonstration of functionality should also consider operating temperature of the cables inside the fire barrier at the onset of the fire exposure.	**Functionality** - No guidance provided. Up to licensees to demonstrate by engineering analysis. Analysis kept on file for NRC review. Engineering analysis generally based on internal temperature below the ignition temperature. No consideration given cable operating temperatures within the barrier at the onset of the fire exposure.	**Functionality** is considered to be a deviation from the acceptance criteria and must be justified on a case-by-case basis which includes an assessment of cable jacket material.

Note 1: The 163 °C [325 °F] temperature condition was established by allowing the internal temperature on the raceway surface to rise a maximum of 139 °C [250 °F] above the initial temperature of the test specimen (assumed to be 24 °C [75 °F]).

Note 2: NFPA 251/ASTM-E119 allows the temperature condition to be determined by averaging the thermocouple readings. The conditions of acceptance are also placed on the temperature conditions measured by a single thermocouple. Under these conditions of acceptance, if any single thermocouple exceeds 30 percent above the maximum allowable temperature rise (i.e., max. allowable 139 °C + 42 °C = 181 °C [250 °F + 75 °F = 325 °F]) the test is considered to have exceeded the criteria temperature limit.

Note 3: SRP 9.5.1 recognizes the use of a fog stream as an alternative hose stream testing method for qualifying fire barrier penetration seals.

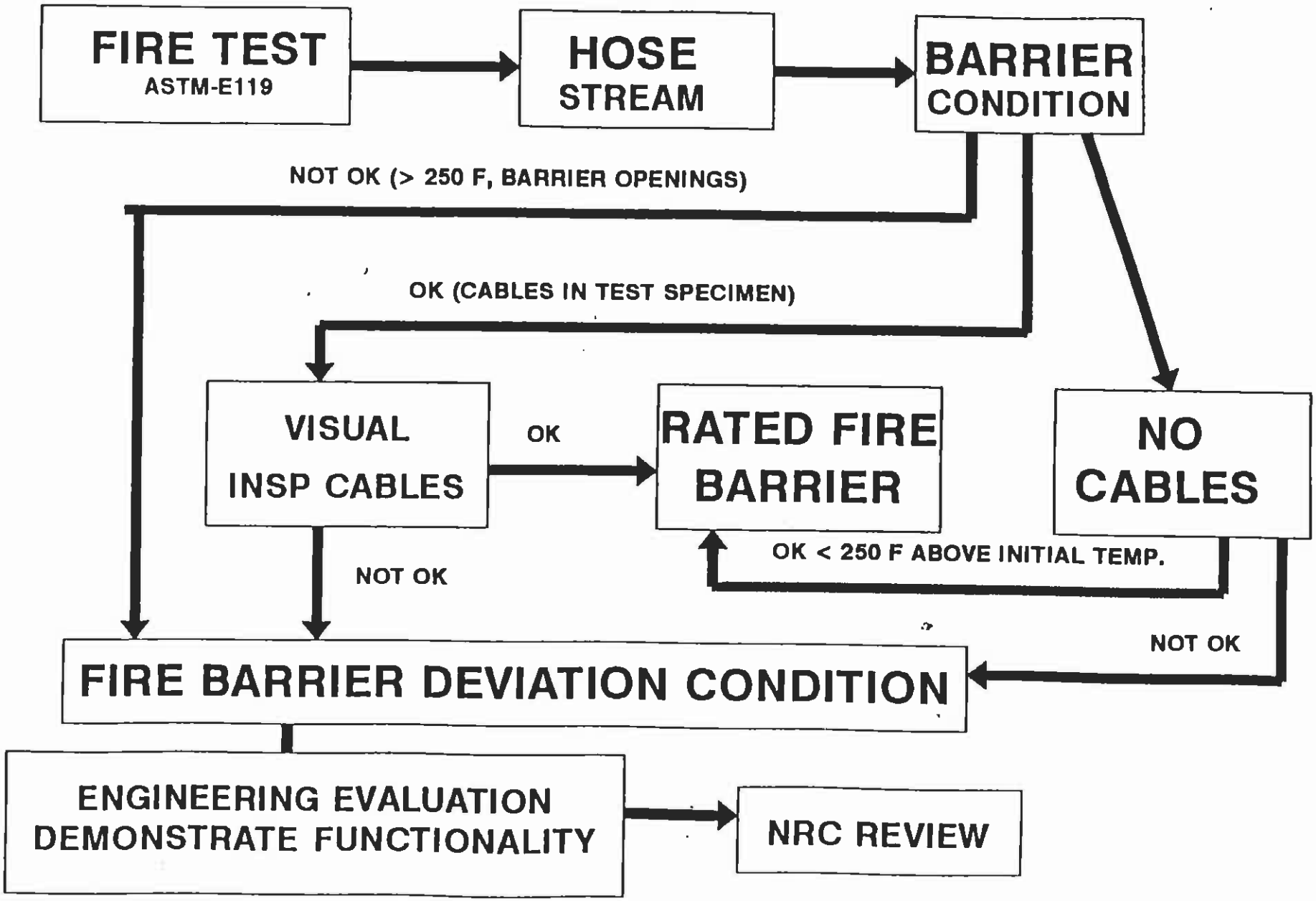
Note 4: This hose stream test method provides assurance that the cable tray or raceway fire barrier system has sufficient structural integrity to resist minor fire related barrier breaches caused by falling objects.

Note 5: A fire barrier system that does not meet the acceptance criteria is not considered a rated fire barrier. For those conditions (e.g., high raceway temperature, barrier openings, water projection, cable damage) which deviate from the acceptance criteria, an engineering analysis which clearly demonstrates the functionality of the protected components or cables should be submitted to the staff for review. The purpose of the recommended functionality tests is to justify observed deviations in fire barrier performance. Engineering analyses justifying these deviations should not rely substantially upon the equipment (e.g., cable) qualification as the basis for acceptance. Deviations will be evaluated by the staff on a case-by-case basis.

Note 6: For fire barrier systems tested without cables, plant-specific cable types should be subjected to air oven tests when the fire barrier temperature rise criteria are exceeded. These cables will be exposed to a temperature profile as determined by the internal raceway thermocouples during the fire test. Cables will be tested at rated voltage. Megger and Hi-Pot testing should be performed in a consistent manner to those tests performed for cables included in a fire barrier test specimen and subjected to the fire endurance test.

Note 7: Megger tests of cables included in the fire test specimen should be performed before, during (instrumentation cables only) and immediately after the fire exposure and subjecting power cables which have voltage ratings $\geq$ 1000 volts ac to a Hi-Pot test (60 percent) immediately after the fire exposure.

FIRE TESTING ACCEPTANCE CRITERIA
LOGIC DIAGRAM



77

LIST OF RECENTLY ISSUED GENERIC LETTERS

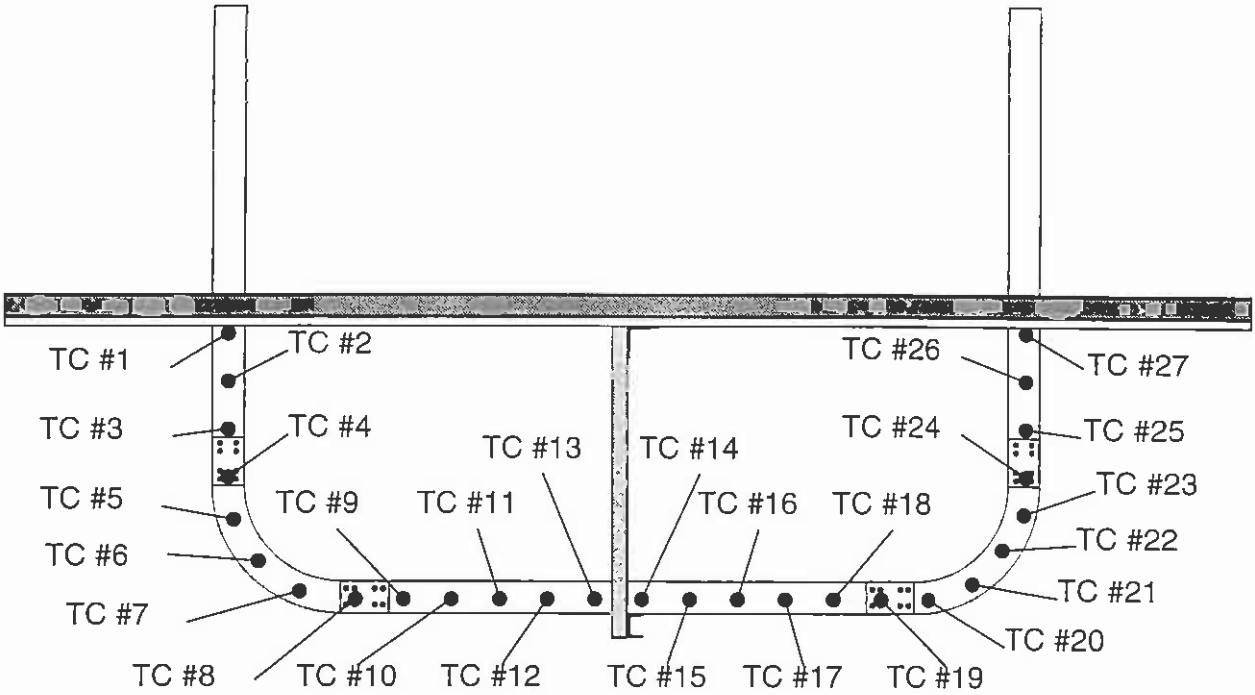
Generic Letter	Subject	Date of Issuance	Issued To
86-10, SUPP. 1	INFORMATION ON SCHEDULE AND GROUPING, AND STAFF RESPONSES TO ADDITIONAL PUBLIC QUESTIONS	03/08/94	ALL LICENSEES OF OPERATING NUCLEAR POWER PLANTS AND HOLDERS OF CONSTRUCTION PERMITS FOR NUCLEAR POWER PLANTS
93-08	RELOCATION OF TECHNICAL SPECIFICATION TABLES OF OF INSTRUMENT RESPONSE TIME LIMITS	12/29/93	ALL HOLDERS OF OLs FOR NPRs
93-07	MODIFICATION OF THE TECHNICAL SPECIFICATION ADMINISTRATIVE CONTROL REQUIREMENTS FOR EMERGENCY AND SECURITY PLANS	12/28/93	ALL HOLDERS OF OLs OR CPs FOR NPRs
93-06	RESEARCH RESULTS ON ON GENERIC SAFETY ISSUE 106, "PIPING AND THE USE OF HIGHLY COMBUSTIBLE GASES IN VITAL AREAS"	10/25/93	ALL HOLDERS OF OLs OR CPs FOR NPRs
93-05	LINE-ITEM TECHNICAL SPECIFICATIONS IMPROVEMENTS TO REDUCE SURVEILLANCE REQUIREMENTS FOR TESTING DURING POWER OPERATION	09/27/93	ALL HOLDERS OF OLs OR CPs FOR NPRs
89-10, SUPP. 5	INACCURACY OF MOTOR-OPERATED VALVE DIAGNOSTIC EQUIPMENT	06/28/93	ALL LICENSEES OF OPERATING NUCLEAR POWER PLANTS AND HOLDERS OF CONSTRUCTION PERMITS FOR NUCLEAR POWER PLANTS
93-04	ROD CONTROL SYSTEM FAILURE AND WITHDRAWAL OF ROD CONTROL CLUSTER ASSEMBLIES, 10 CFR 50.54(f)	06/21/93	ALL HOLDERS OF OLs OR CPs FOR (W)-DESIGNED NPRs EXCEPT HADDAM NECK

OL = OPERATING LICENSE
CP = CONSTRUCTION PERMIT
NPR = NUCLEAR POWER REACTORS

Appendix C

THERMOCOUPLE LOCATIONS

OMEGA POINT LABORATORIES

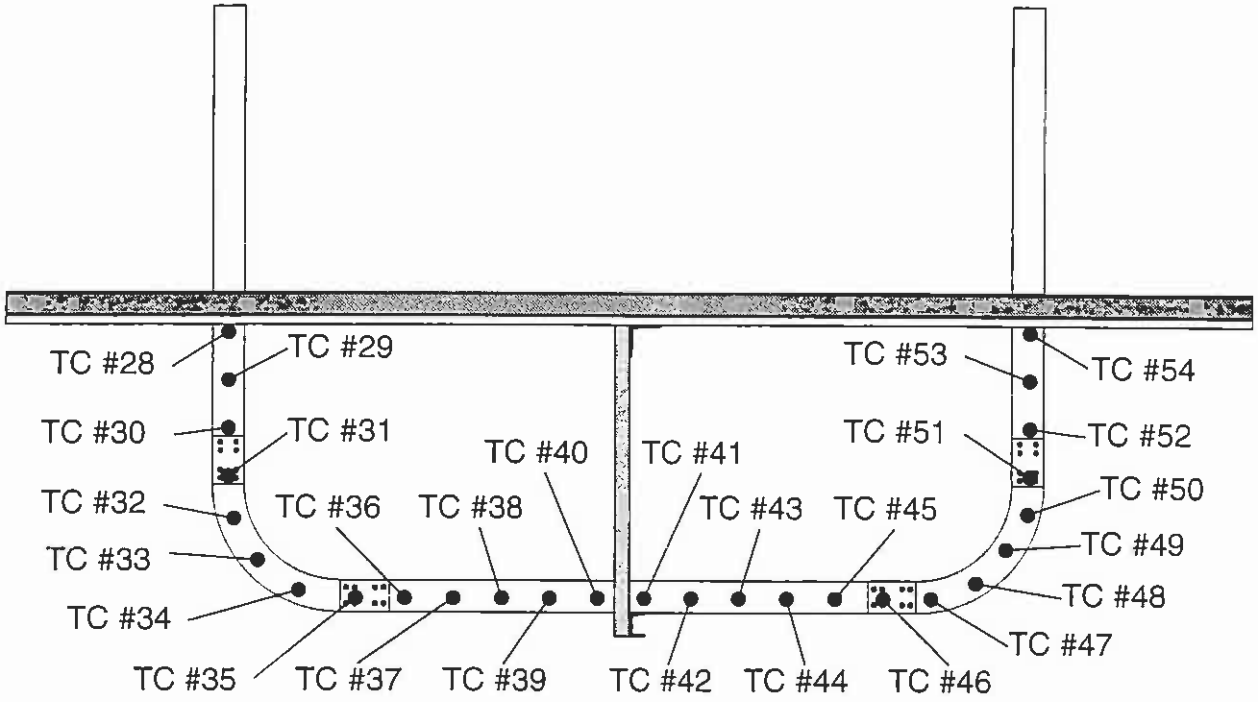


ELEVATION VIEW - VIEWED FROM FRONT

Note:
Type K, chromel-alumel, 24 GA, electrically welded thermocouples were attached to the cable tray side rails on 6" intervals. The thermojunctions were fastened under the heads of screws threaded into the metal side rail, at the vertical mid-height of the tray rails.

OMEGA POINT LABORATORIES, INC. Project No. 14840-99417
Peak Seals, Inc.
Fig. 5 Thermocouple Locations - 6" Cable Tray, Front Tray Rail, Rev. 0
Drawn By: 9/11/97 Approved By:
Client Appr'l: N/A

OMEGA POINT LABORATORIES

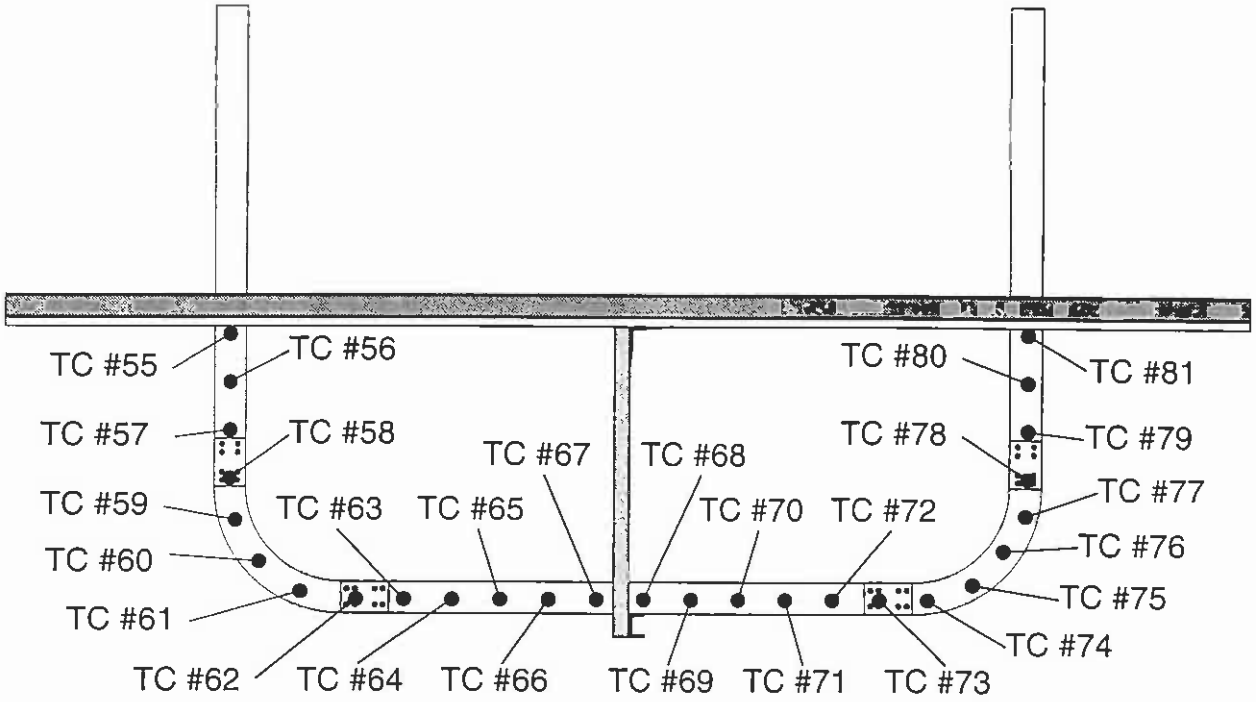


ELEVATION VIEW - VIEWED FROM FRONT

Note:
Type K, chromel-alumel, 24 GA, electrically welded thermocouples were attached to the cable tray side rails on 6" intervals. The thermojunctions were fastened under the heads of screws threaded into the metal side rail, at the vertical mid-height of the tray rails.

OMEGA POINT LABORATORIES, INC. Project No. 14840-99417
Peak Seals, Inc.
Fig. 6 Thermocouple Locations - 6" Cable Tray, Rear Tray Rail, Rev. 0
Drawn By: H. Stuart II 8/11/97 Approved By:
Client Appr'l: N/A

OMEGA POINT LABORATORIES

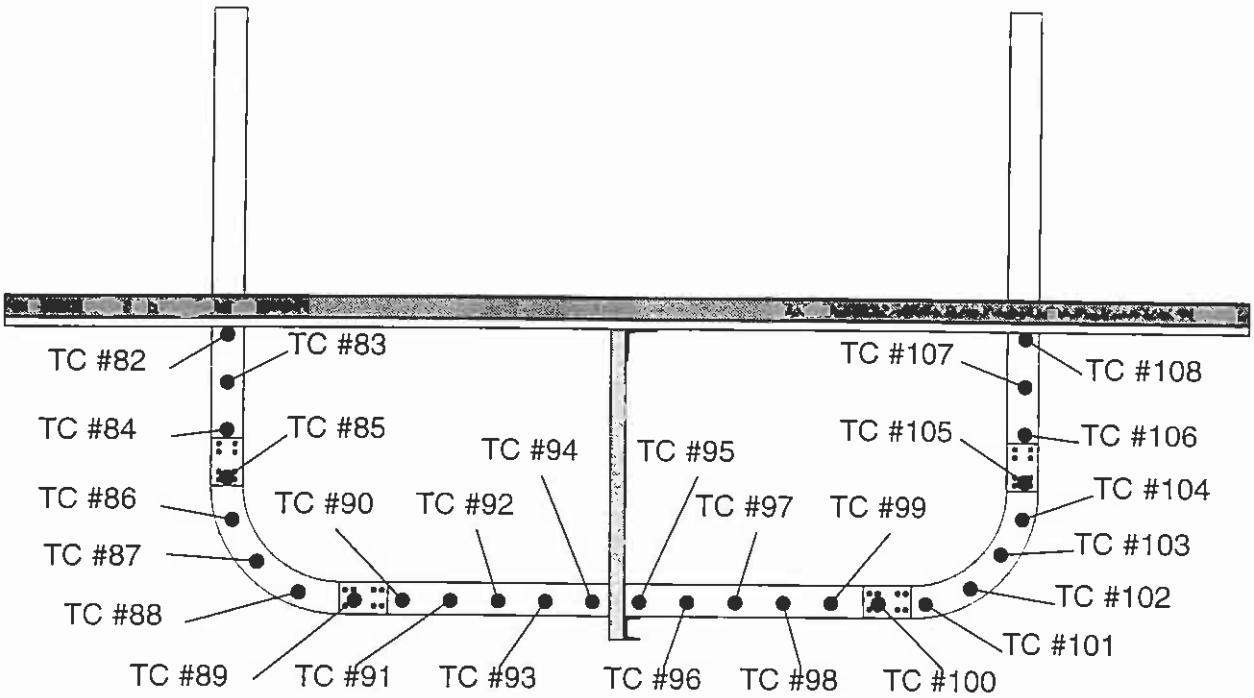


ELEVATION VIEW - VIEWED FROM FRONT

Note:
Type K, chromel-alumel, 24 GA, electrically welded thermocouples were attached to the cable tray side rails on 6" intervals. The thermojunctions were fastened under the heads of screws threaded into the metal side rail, at the vertical mid-height of the tray rails.

OMEGA POINT LABORATORIES, INC. Project No. 14840-99417
Peak Seals, Inc.
Fig. 7 Thermocouple Locations - 24" Cable Tray, Front Tray Rail, Rev. 0
Drawn By: H Shuff II 8/11/97 Approved By:
Client Appr'l: N/A

OMEGA POINT LABORATORIES

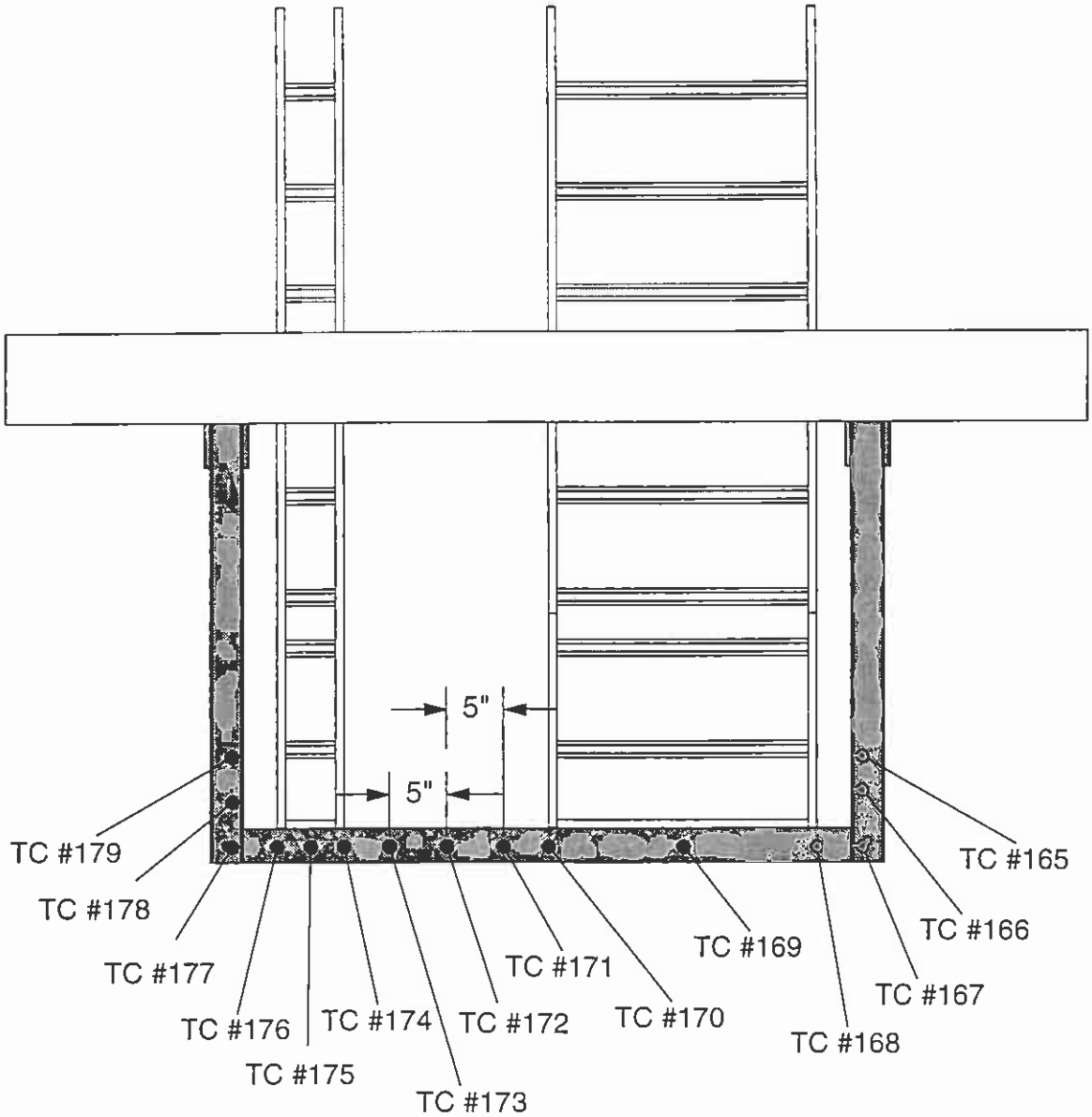


ELEVATION VIEW - VIEWED FROM FRONT

Note:
Type K, chromel-alumel, 24 GA, electrically welded thermocouples were attached to the cable tray side rails on 6" intervals. The thermojunctions were fastened under the heads of screws threaded into the metal side rail, at the vertical mid-height of the tray rails.

OMEGA POINT LABORATORIES, INC. Project No. 14840-99417
Peak Seals, Inc.
Fig. 8 Thermocouple Locations - 24" Cable Tray, Rear Tray Rail, Rev. 0
Drawn By: 8/11/96 Approved By:
Client Appr'l: N/A

OMEGA POINT LABORATORIES



Note:
Type K, chromel-alumel, 24 GA, electrically welded thermocouples were attached to the cable tray hanger as shown. The thermocouples were located at the center of each tray, at the side rail, and nominally every 4" from the rail (up to 12"). The thermojunctions were fastened under the heads of screws threaded into the metal support, at the vertical mid-height of the channel. The cladding applied to the vertical portions of the support terminated approximately 2-3/4" above TC # 165 and TC #179.

OMEGA POINT LABORATORIES, INC. Project No. 14840-99417
Peak Seals, Inc.
Fig. 9 Thermocouple Locations - Support Hanger, Rev. 1
Drawn By: 9/22/97 Approved By: 9/22/97
Client Appr'l: N/A

OMEGA POINT LABORATORIES

THERMOCOUPLE PLACEMENT LOG - PROJECT NO. 99417

NOTE:
This Log is to be used to document the precise location of the thermocouples located on each test item. The back of this sheet may be used for any necessary drawings or schematics.

Project #: 99417

Test Deck #: 1

Item: 6" Wide Cable Tray Assembly

Front Tray Rail

TC Number	Description of exact physical location
E1	On centerline of tray rail, 2" below deck insulation.
E2	On centerline of tray rail, 6" below previous thermocouple.
E3	On centerline of tray rail, 6" below previous thermocouple.
E4	On centerline of tray rail splice plate, 6" below previous thermocouple.
E5	On centerline of tray rail, 6" below previous thermocouple.
E6	On centerline of tray rail, 6" below previous thermocouple.
E7	On centerline of tray rail, 6" from previous thermocouple.
E8	On centerline of tray rail splice plate, 6" right of previous thermocouple.
E9	On centerline of tray rail, 6" right of previous thermocouple.
E10	On centerline of tray rail, 6" right of previous thermocouple.
E11	On centerline of tray rail, 6" right of previous thermocouple.
E12	On centerline of tray rail, 6" right of previous thermocouple.
E13	On centerline of tray rail, 6" right of previous thermocouple.
E14	On centerline of tray rail, 6" right of previous thermocouple.
E15	On centerline of tray rail, 6" right of previous thermocouple.
E16	On centerline of tray rail, 6" right of previous thermocouple.
E17	On centerline of tray rail, 6" right of previous thermocouple.
E18	On centerline of tray rail, 6" right of previous thermocouple.
E19	On centerline of tray rail splice plate, 6" right of previous thermocouple.
E20	On centerline of tray rail, 6" right of previous thermocouple.
E21	On centerline of tray rail, 6" right of previous thermocouple.
E22	On centerline of tray rail, 6" above previous thermocouple.
E23	On centerline of tray rail, 6" above previous thermocouple.
E24	On centerline of tray rail splice plate, 6" above previous thermocouple.
E25	On centerline of tray rail, 6" above previous thermocouple.
E26	On centerline of tray rail, 6" above previous thermocouple.
E27	On centerline of tray rail, 6" above previous thermocouple.

NOTE: TCs shall be numbered sequentially from 1 upwards for each deck assembly. Prefixes shall be added as follows: C (copper wire), and E (engineering TC), for instance c1, E35, etc.

PLEASE USE THE BACK OF THIS SHEET FOR DRAWINGS, IF NECESSARY

THERMOCOUPLE PLACEMENT LOG - PROJECT NO. 99417

NOTE:
This Log is to be used to document the precise location of the thermocouples located on each test item. The back of this sheet may be used for any necessary drawings or schematics.

Project #: 99417

Test Deck #: 1

Item: 6" Wide Cable Tray Assembly

Rear Tray Rail

TC Number	Description of exact physical location
E28	On centerline of tray rail, 2" below deck insulation.
E29	On centerline of tray rail, 6" below previous thermocouple.
E30	On centerline of tray rail, 6" below previous thermocouple.
E31	On centerline of tray rail splice plate, 6" below previous thermocouple.
E32	On centerline of tray rail, 6" below previous thermocouple.
E33	On centerline of tray rail, 6" below previous thermocouple.
E34	On centerline of tray rail, 6" from previous thermocouple.
E35	On centerline of tray rail splice plate, 6" right of previous thermocouple.
E36	On centerline of tray rail, 6" right of previous thermocouple.
E37	On centerline of tray rail, 6" right of previous thermocouple.
E38	On centerline of tray rail, 6" right of previous thermocouple.
E39	On centerline of tray rail, 6" right of previous thermocouple.
E40	On centerline of tray rail, 6" right of previous thermocouple.
E41	On centerline of tray rail, 6" right of previous thermocouple.
E42	On centerline of tray rail, 6" right of previous thermocouple.
E43	On centerline of tray rail, 6" right of previous thermocouple.
E44	On centerline of tray rail, 6" right of previous thermocouple.
E45	On centerline of tray rail, 6" right of previous thermocouple.
E46	On centerline of tray rail splice plate, 6" right of previous thermocouple.
E47	On centerline of tray rail, 6" right of previous thermocouple.
E48	On centerline of tray rail, 6" right of previous thermocouple.
E49	On centerline of tray rail, 6" above previous thermocouple.
E50	On centerline of tray rail, 6" above previous thermocouple.
E51	On centerline of tray rail splice plate, 6" above previous thermocouple.
E52	On centerline of tray rail, 6" above previous thermocouple.
E53	On centerline of tray rail, 6" above previous thermocouple.
E54	On centerline of tray rail, 6" above previous thermocouple.

NOTE: TCs shall be numbered sequentially from 1 upwards for each deck assembly. Prefixes shall be added as follows: C (copper wire), and E (engineering TC), for instance c1, E35, etc.

PLEASE USE THE BACK OF THIS SHEET FOR DRAWINGS, IF NECESSARY

THERMOCOUPLE PLACEMENT LOG - PROJECT NO. 99417

NOTE:
This Log is to be used to document the precise location of the thermocouples located on each test item. The back of this sheet may be used for any necessary drawings or schematics.

Project #: 99417

Test Deck #: 1

Item: 24" Wide Cable Tray Assembly

Front Tray Rail

TC Number	Description of exact physical location
E55	On centerline of tray rail, 2" below deck insulation.
E56	On centerline of tray rail, 6" below previous thermocouple.
E57	On centerline of tray rail, 6" below previous thermocouple.
E58	On centerline of tray rail splice plate, 6" below previous thermocouple.
E59	On centerline of tray rail, 6" below previous thermocouple.
E60	On centerline of tray rail, 6" below previous thermocouple.
E61	On centerline of tray rail, 6" from previous thermocouple.
E62	On centerline of tray rail splice plate, 6" right of previous thermocouple.
E63	On centerline of tray rail, 6" right of previous thermocouple.
E64	On centerline of tray rail, 6" right of previous thermocouple.
E65	On centerline of tray rail, 6" right of previous thermocouple.
E66	On centerline of tray rail, 6" right of previous thermocouple.
E67	On centerline of tray rail, 6" right of previous thermocouple.
E68	On centerline of tray rail, 6" right of previous thermocouple.
E69	On centerline of tray rail, 6" right of previous thermocouple.
E70	On centerline of tray rail, 6" right of previous thermocouple.
E71	On centerline of tray rail, 6" right of previous thermocouple.
E72	On centerline of tray rail, 6" right of previous thermocouple.
E73	On centerline of tray rail splice plate, 6" right of previous thermocouple.
E74	On centerline of tray rail, 6" right of previous thermocouple.
E75	On centerline of tray rail, 6" right of previous thermocouple.
E76	On centerline of tray rail, 6" above previous thermocouple.
E77	On centerline of tray rail, 6" above previous thermocouple.
E78	On centerline of tray rail splice plate, 6" above previous thermocouple.
E79	On centerline of tray rail, 6" above previous thermocouple.
E80	On centerline of tray rail, 6" above previous thermocouple.
E81	On centerline of tray rail, 6" above previous thermocouple.

NOTE: TCs shall be numbered sequentially from 1 upwards for each deck assembly. Prefixes shall be added as follows: C (copper wire), and E (engineering TC), for instance c1, E35, etc.

PLEASE USE THE BACK OF THIS SHEET FOR DRAWINGS, IF NECESSARY

THERMOCOUPLE PLACEMENT LOG - PROJECT NO. 99417

NOTE:
This Log is to be used to document the precise location of the thermocouples located on each test item. The back of this sheet may be used for any necessary drawings or schematics.

Project #: 99417

Test Deck #: 1

Item: 24" Wide Cable Tray Assembly

Rear Tray Rail

TC Number	Description of exact physical location
E82	On centerline of tray rail, 2" below deck insulation.
E83	On centerline of tray rail, 6" below previous thermocouple.
E84	On centerline of tray rail, 6" below previous thermocouple.
E85	On centerline of tray rail splice plate, 6" below previous thermocouple.
E86	On centerline of tray rail, 6" below previous thermocouple.
E87	On centerline of tray rail, 6" below previous thermocouple.
E88	On centerline of tray rail, 6" from previous thermocouple.
E89	On centerline of tray rail splice plate, 6" right of previous thermocouple.
E90	On centerline of tray rail, 6" right of previous thermocouple.
E91	On centerline of tray rail, 6" right of previous thermocouple.
E92	On centerline of tray rail, 6" right of previous thermocouple.
E93	On centerline of tray rail, 6" right of previous thermocouple.
E94	On centerline of tray rail, 6" right of previous thermocouple.
E95	On centerline of tray rail, 6" right of previous thermocouple.
E96	On centerline of tray rail, 6" right of previous thermocouple.
E97	On centerline of tray rail, 6" right of previous thermocouple.
E98	On centerline of tray rail, 6" right of previous thermocouple.
E99	On centerline of tray rail, 6" right of previous thermocouple.
E100	On centerline of tray rail splice plate, 6" right of previous thermocouple.
E101	On centerline of tray rail, 6" right of previous thermocouple.
E102	On centerline of tray rail, 6" right of previous thermocouple.
E103	On centerline of tray rail, 6" above previous thermocouple.
E104	On centerline of tray rail, 6" above previous thermocouple.
E105	On centerline of tray rail splice plate, 6" above previous thermocouple.
E106	On centerline of tray rail, 6" above previous thermocouple.
E107	On centerline of tray rail, 6" above previous thermocouple.
E108	On centerline of tray rail, 6" above previous thermocouple.

NOTE: TCs shall be numbered sequentially from 1 upwards for each deck assembly. Prefixes shall be added as follows: C (copper wire), and E (engineering TC), for instance c1, E35, etc.

PLEASE USE THE BACK OF THIS SHEET FOR DRAWINGS, IF NECESSARY

THERMOCOUPLE PLACEMENT LOG - PROJECT NO. 99417

NOTE:
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Project #: 99417

Test Deck #: 1

Item: Bare #8 AWG Copper Wire Under Rungs in 6" Wide Cable Tray

TC Number	Description of exact physical location
C109	On bare #8 wire under rungs, 2" below deck insulation.
C110	On bare #8 wire under rungs, 6" below previous thermocouple.
C111	On bare #8 wire under rungs, 6" below previous thermocouple.
C112	On bare #8 wire under rungs, 6" below previous thermocouple.
C113	On bare #8 wire under rungs, 6" below previous thermocouple.
C114	On bare #8 wire under rungs, 6" below previous thermocouple.
C115	On bare #8 wire under rungs, 6" below previous thermocouple.
C116	On bare #8 wire under rungs, 6" from previous thermocouple.
C117	On bare #8 wire under rungs, 6" from previous thermocouple.
C118	On bare #8 wire under rungs, 6" from previous thermocouple.
C119	On bare #8 wire under rungs, 6" from previous thermocouple.
C120	On bare #8 wire under rungs, 6" from previous thermocouple.
C121	On bare #8 wire under rungs, 6" from previous thermocouple.
C122	On bare #8 wire under rungs, 6" from previous thermocouple.
C123	On bare #8 wire under rungs, 6" from previous thermocouple.
C124	On bare #8 wire under rungs, 6" from previous thermocouple.
C125	On bare #8 wire under rungs, 6" from previous thermocouple.
C126	On bare #8 wire under rungs, 6" from previous thermocouple.
C127	On bare #8 wire under rungs, 6" from previous thermocouple.
C128	On bare #8 wire under rungs, 6" from previous thermocouple.
C129	On bare #8 wire under rungs, 6" from previous thermocouple.
C130	On bare #8 wire under rungs, 6" from previous thermocouple.
C131	On bare #8 wire under rungs, 6" from previous thermocouple.
C132	On bare #8 wire under rungs, 6" from previous thermocouple.
C133	On bare #8 wire under rungs, 6" from previous thermocouple.
C134	On bare #8 wire under rungs, 6" from previous thermocouple.
C135	On bare #8 wire under rungs, 6" from previous thermocouple.
C136	On bare #8 wire under rungs, 6" from previous thermocouple.

NOTE: TCs shall be numbered sequentially from 1 upwards for each deck assembly. Prefixes shall be added as follows: C (copper wire), and E (engineering TC), for instance C1, E35, etc.

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THERMOCOUPLE PLACEMENT LOG - PROJECT NO. 99417

NOTE:
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Project #: 99417

Test Deck #: 1

Item: Bare #8 AWG Copper Wire Under Rungs in 24" Wide Cable Tray

TC Number	Description of exact physical location
C137	On bare #8 wire under rungs, 2" below deck insulation.
C138	On bare #8 wire under rungs, 6" below previous thermocouple.
C139	On bare #8 wire under rungs, 6" below previous thermocouple.
C140	On bare #8 wire under rungs, 6" below previous thermocouple.
C141	On bare #8 wire under rungs, 6" below previous thermocouple.
C142	On bare #8 wire under rungs, 6" below previous thermocouple.
C143	On bare #8 wire under rungs, 6" below previous thermocouple.
C144	On bare #8 wire under rungs, 6" from previous thermocouple.
C145	On bare #8 wire under rungs, 6" from previous thermocouple.
C146	On bare #8 wire under rungs, 6" from previous thermocouple.
C147	On bare #8 wire under rungs, 6" from previous thermocouple.
C148	On bare #8 wire under rungs, 6" from previous thermocouple.
C149	On bare #8 wire under rungs, 6" from previous thermocouple.
C150	On bare #8 wire under rungs, 6" from previous thermocouple.
C151	On bare #8 wire under rungs, 6" from previous thermocouple.
C152	On bare #8 wire under rungs, 6" from previous thermocouple.
C153	On bare #8 wire under rungs, 6" from previous thermocouple.
C154	On bare #8 wire under rungs, 6" from previous thermocouple.
C155	On bare #8 wire under rungs, 6" from previous thermocouple.
C156	On bare #8 wire under rungs, 6" from previous thermocouple.
C157	On bare #8 wire under rungs, 6" from previous thermocouple.
C158	On bare #8 wire under rungs, 6" from previous thermocouple.
C159	On bare #8 wire under rungs, 6" from previous thermocouple.
C160	On bare #8 wire under rungs, 6" from previous thermocouple.
C161	On bare #8 wire under rungs, 6" from previous thermocouple.
C162	On bare #8 wire under rungs, 6" from previous thermocouple.
C163	On bare #8 wire under rungs, 6" from previous thermocouple.
C164	On bare #8 wire under rungs, 6" from previous thermocouple.

NOTE: TCs shall be numbered sequentially from 1 upwards for each deck assembly. Prefixes shall be added as follows: C (copper wire), and E (engineering TC), for instance C1, E35, etc.

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THERMOCOUPLE PLACEMENT LOG - PROJECT NO. 99417

NOTE:
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Project #: 99417

Test Deck #: 1

Item: Cable Tray Support Structure in Center of 3" Wide Channel

TC Number	Description of exact physical location
C165	12" from the front rail of the 24" wide cable tray.
C166	8" from the front rail of the 24" wide cable tray.
C167	4" from the front rail of the 24" wide cable tray.
C168	Centered under the front rail of the 24" wide cable tray.
C169	Centered under the 24" wide cable tray.
C170	Centered under the rear rail of the 24" wide cable tray.
C171	4" from the rear rail of the 24" wide cable tray.
C172	Centered between the two cable trays.
C173	4" from the front rail of the 6" wide cable tray.
C174	Centered under the front rail of the 6" wide cable tray.
C175	Centered under the 6" wide cable tray.
C176	Centered under the rear rail of the 6" wide cable tray.
C177	4" from the rear rail of the 6" wide cable tray.
C178	8" from the rear rail of the 6" wide cable tray.
C179	12" from the rear rail of the 6" wide cable tray.

NOTE: TCs shall be numbered sequentially from 1 upwards for each deck assembly. Prefixes shall be added as follows: C (copper wire), and E (engineering TC), for instance C1, E35, etc.

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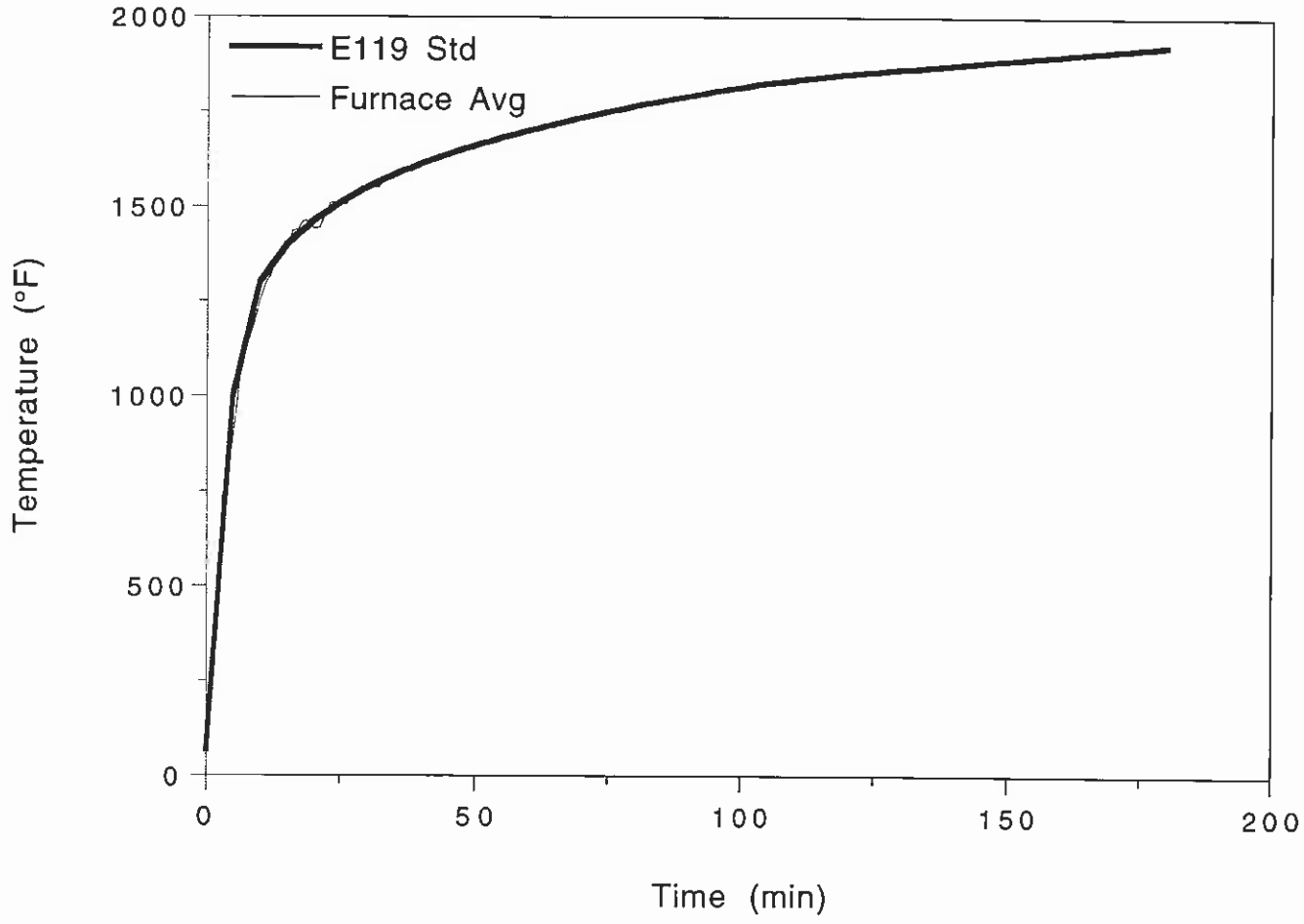
Appendix D

TEST DATA

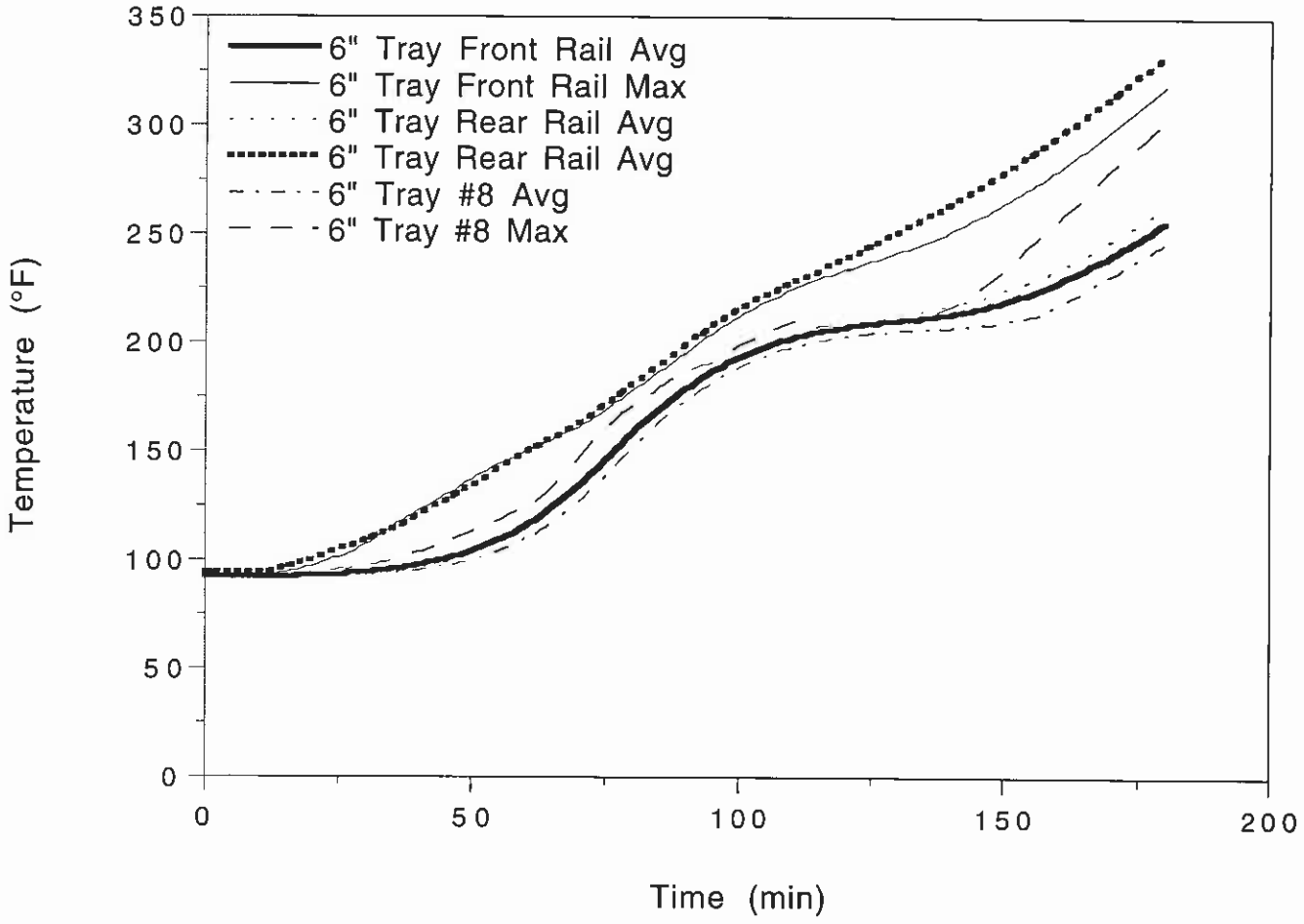
OMEGA POINT LABORATORIES

Peak Seals, Inc.
Project No. 14540-99417
Furnace Temperatures



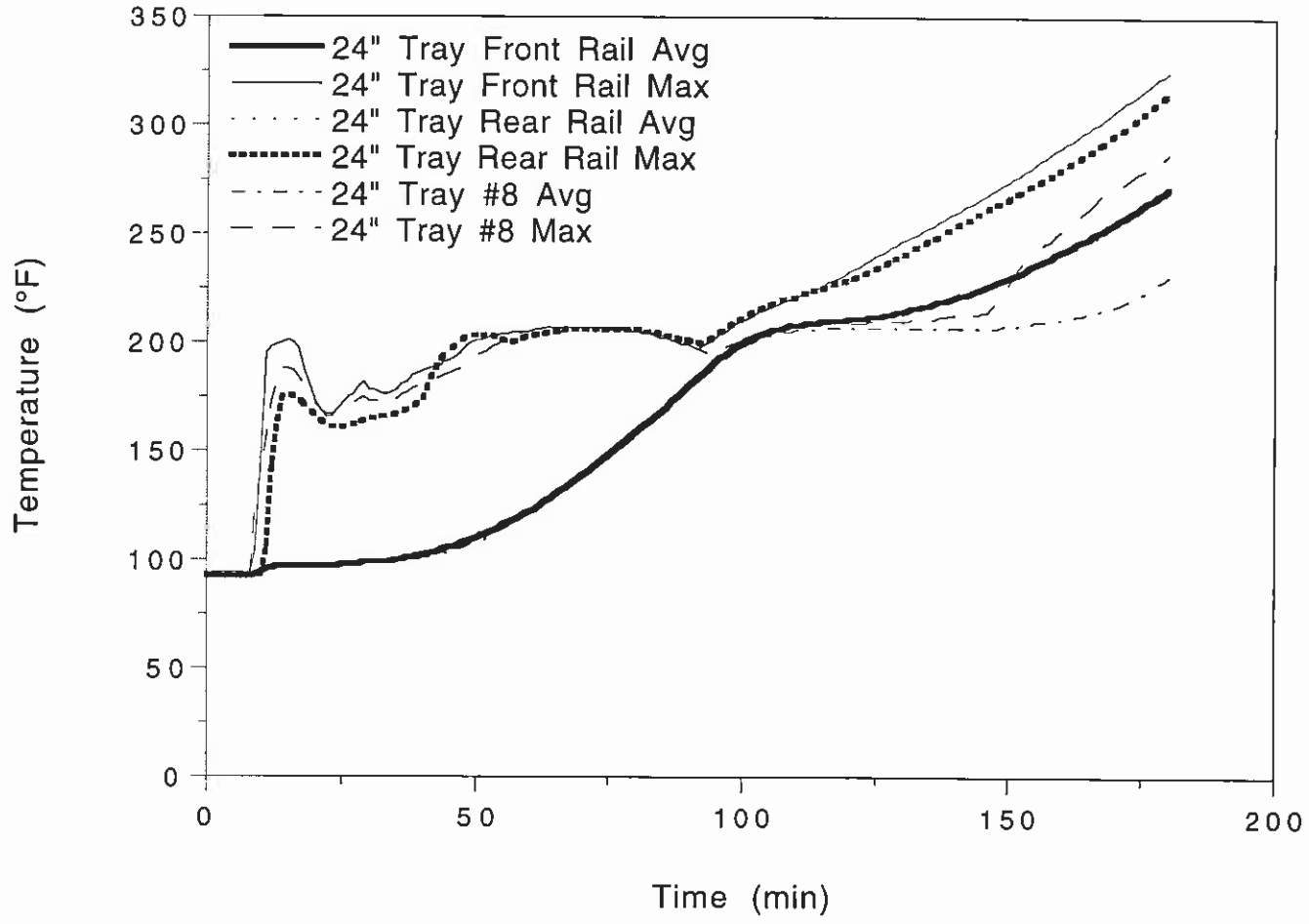
OMEGA POINT LABORATORIES

Peak Seals, Inc.
Project No. 14540-99417
6" Cable Tray Temperatures



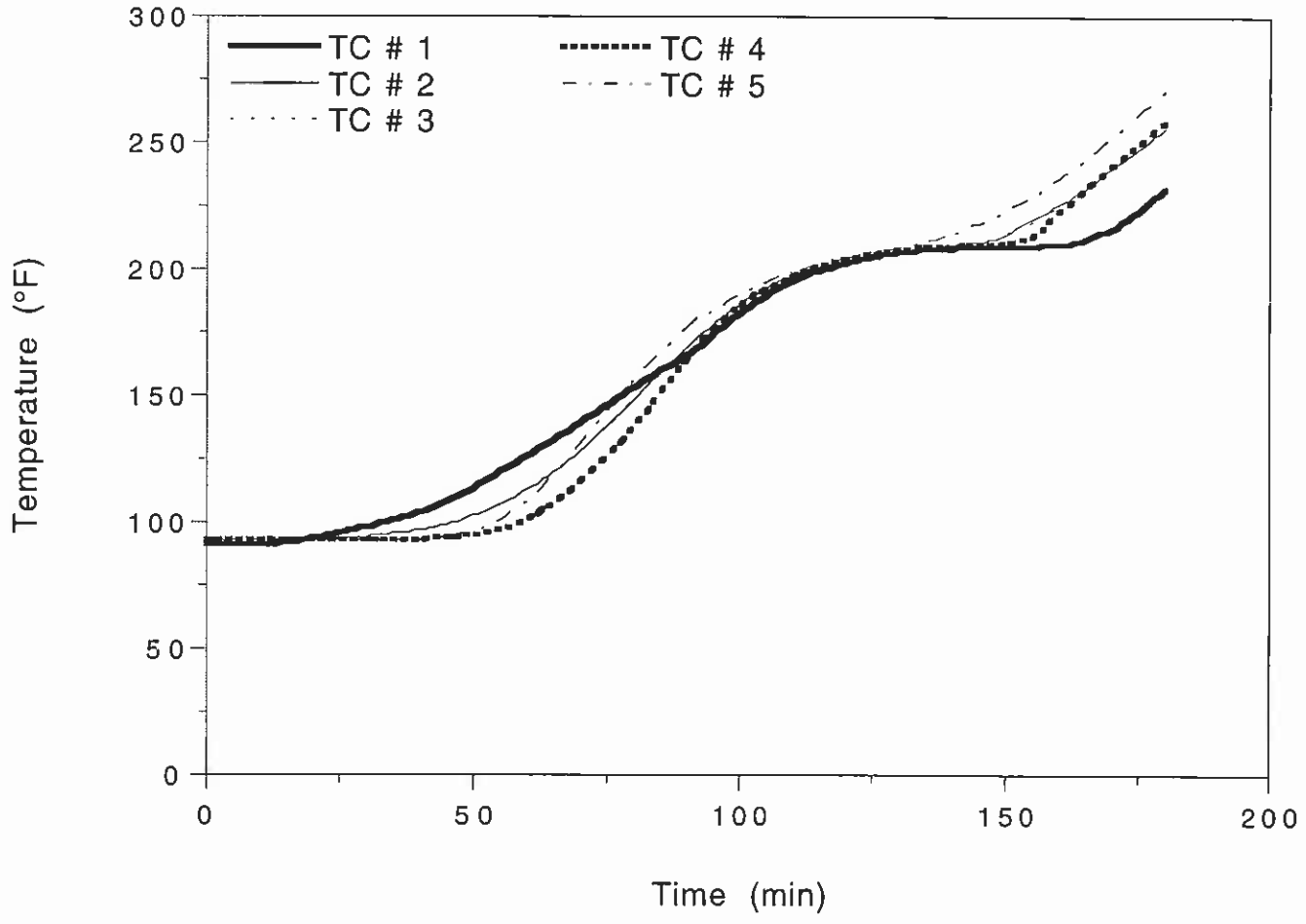
OMEGA POINT LABORATORIES

Peak Seals, Inc.
Project No. 14540-99417
24" Cable Tray Temperatures



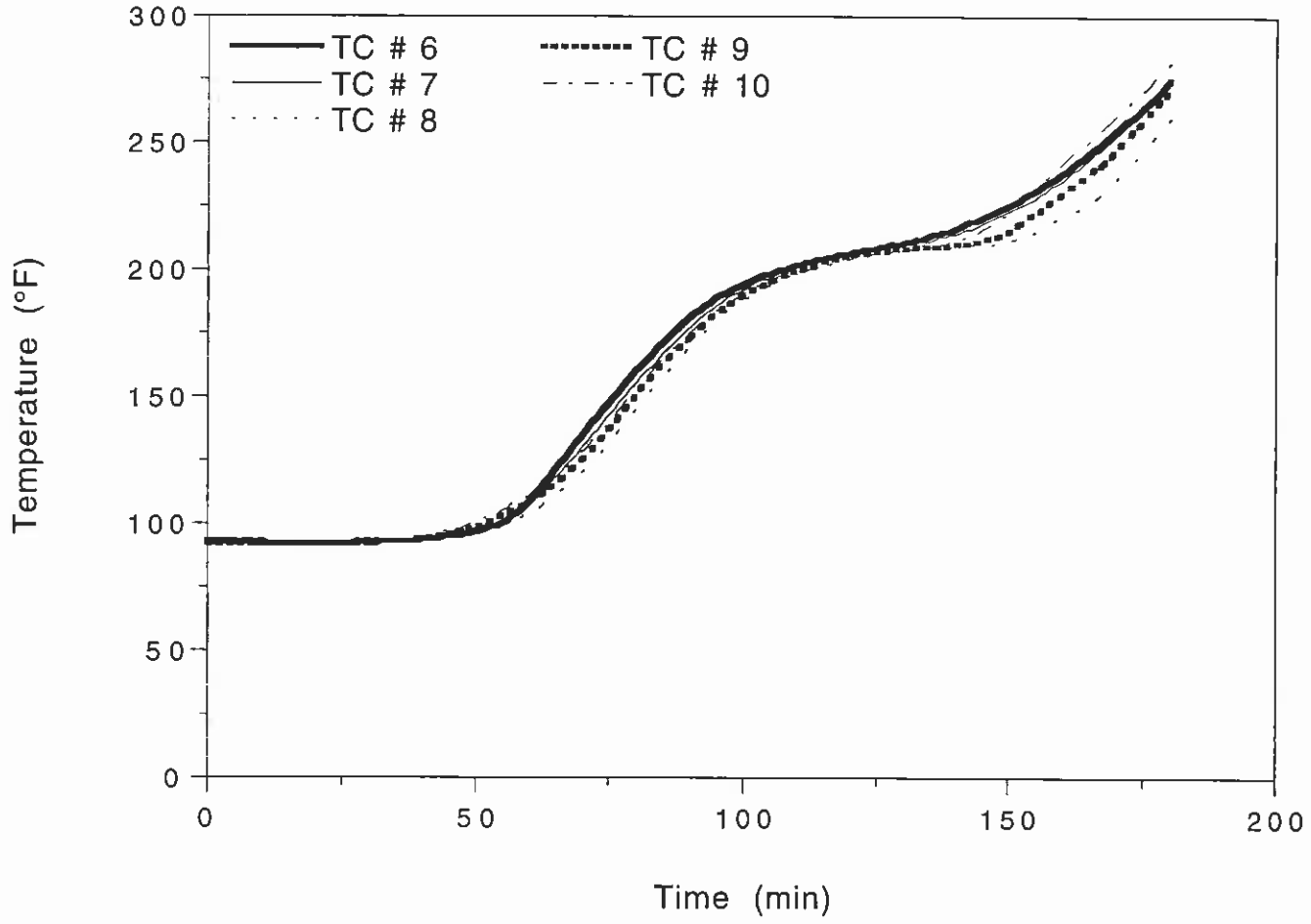
OMEGA POINT LABORATORIES

Peak Seals, Inc.
Project No. 14540-99417
6" Tray Front Rail Temperatures



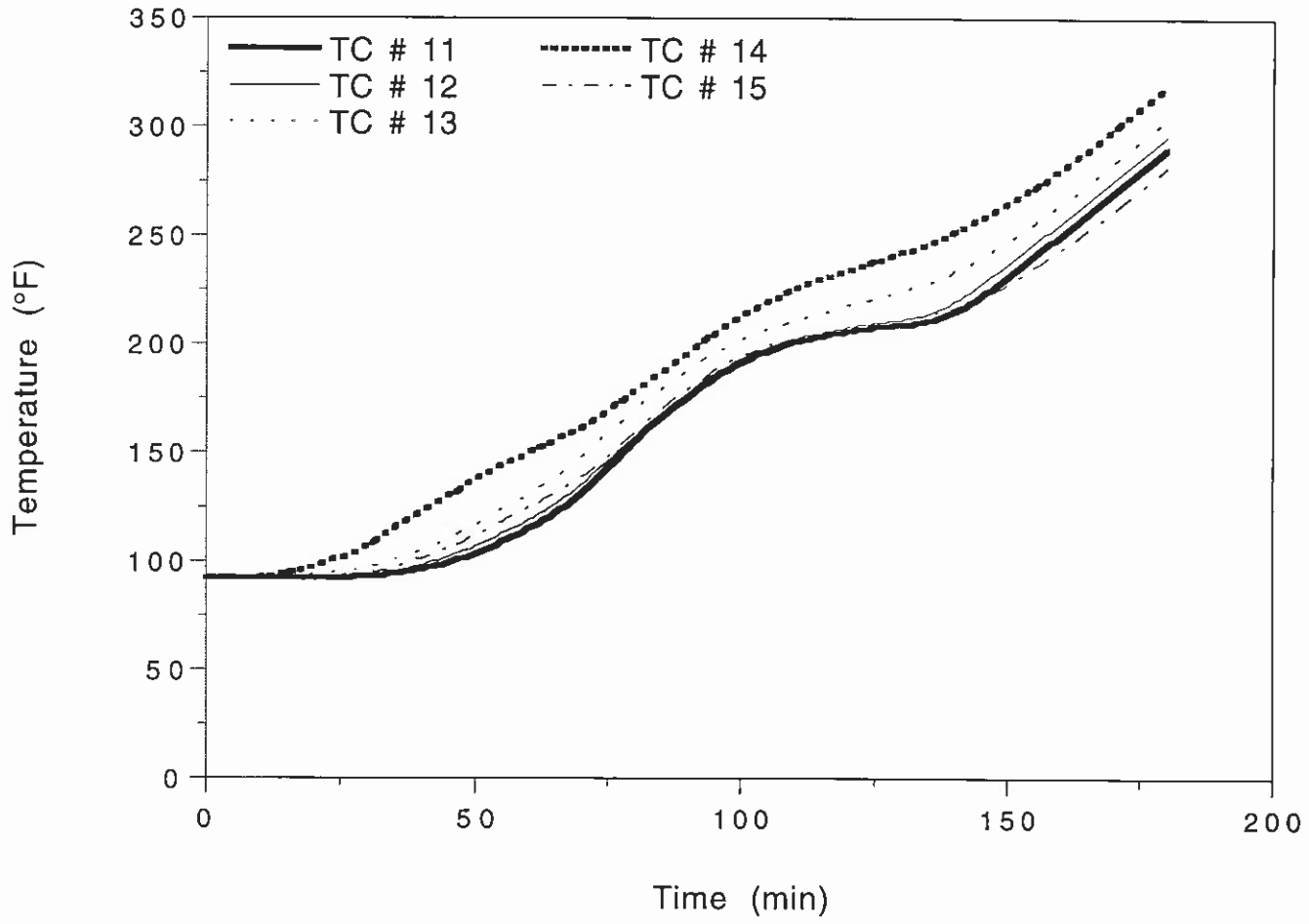
OMEGA POINT LABORATORIES

Peak Seals, Inc.
Project No. 14540-99417
6" Tray Front Rail Temperatures



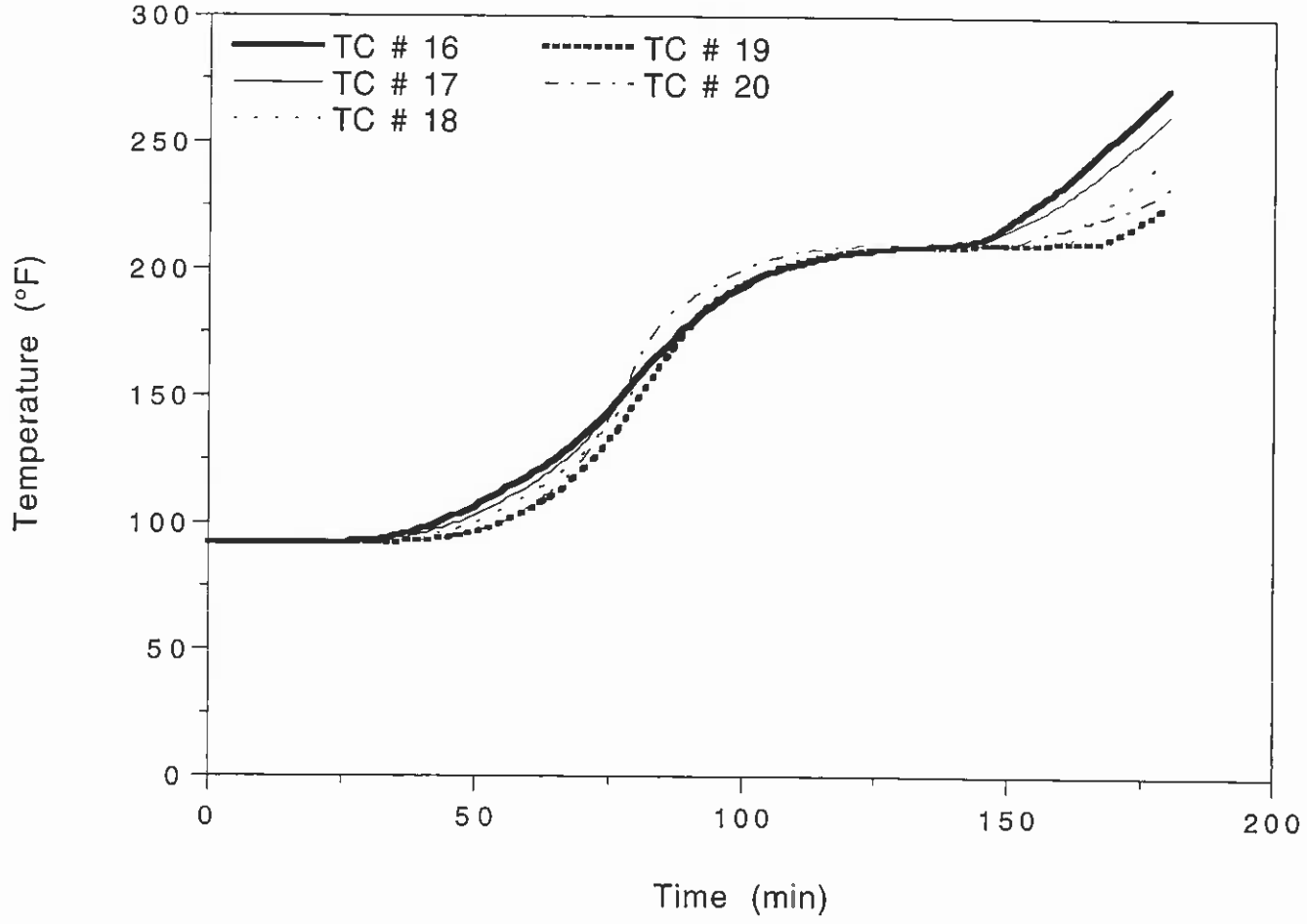
OMEGA POINT LABORATORIES

Peak Seals, Inc.
Project No. 14540-99417
6" Tray Front Rail Temperatures



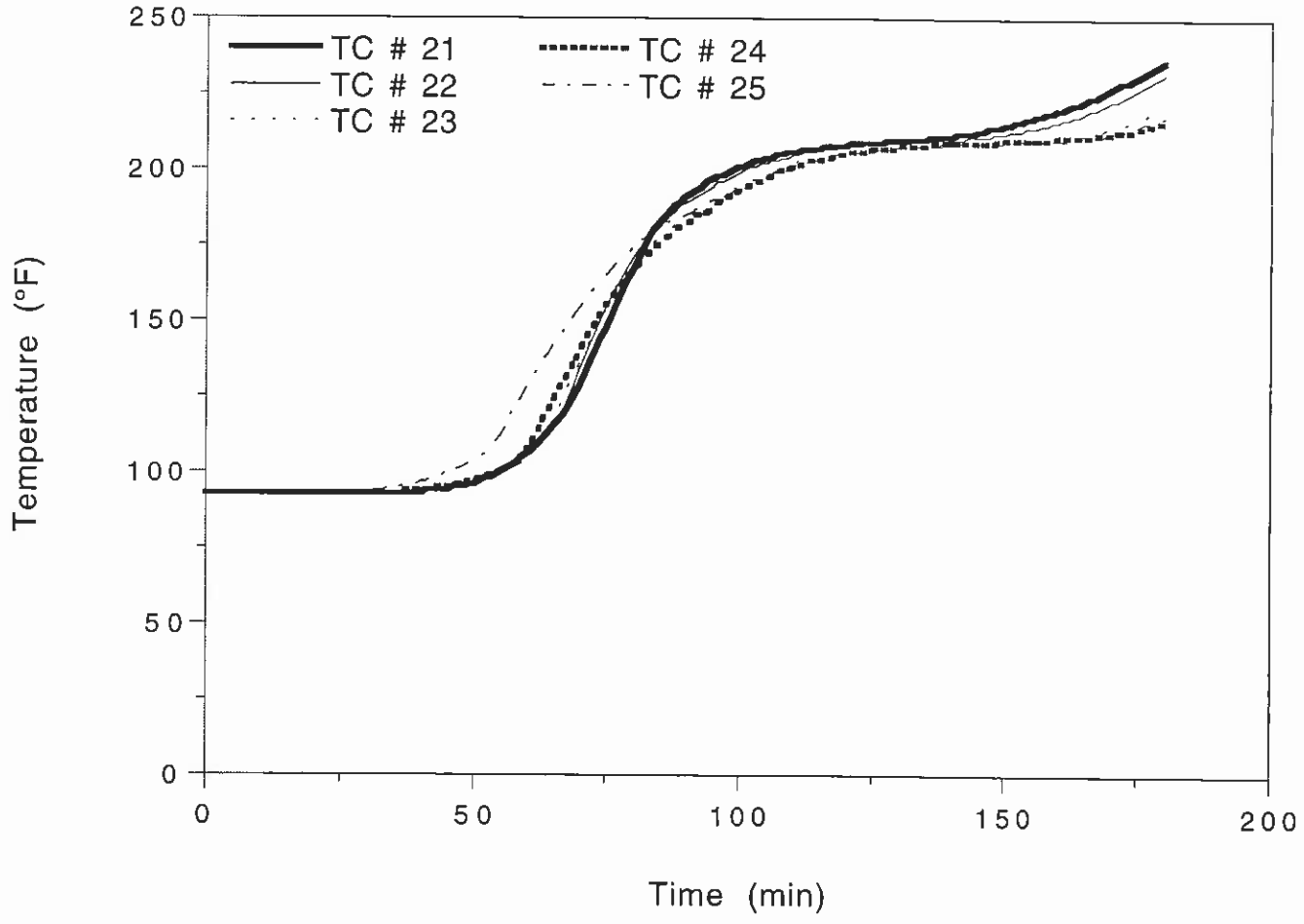
OMEGA POINT LABORATORIES

Peak Seals, Inc.
Project No. 14540-99417
6" Tray Front Rail Temperatures



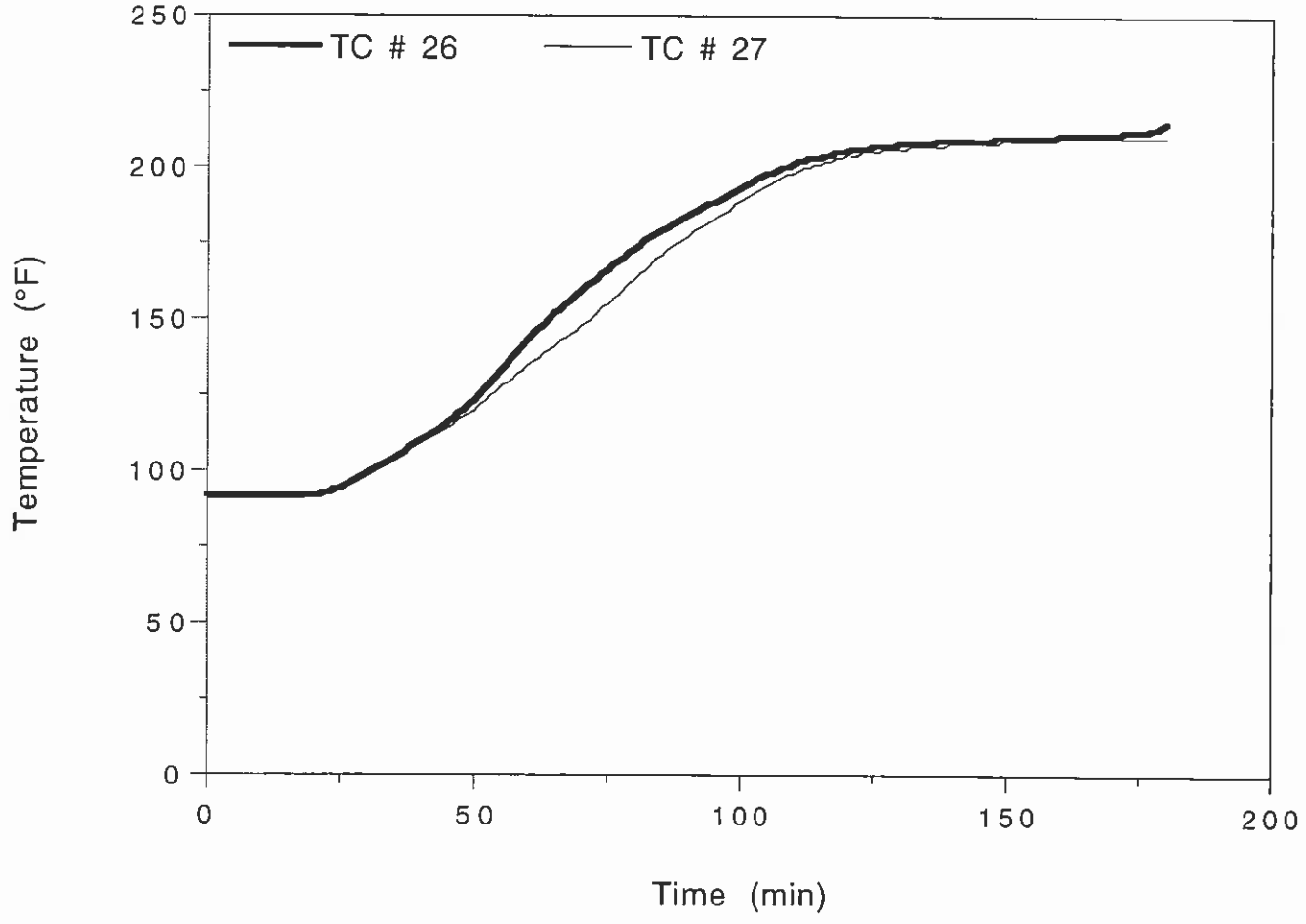
OMEGA POINT LABORATORIES

Peak Seals, Inc.
Project No. 14540-99417
6" Tray Front Rail Temperatures



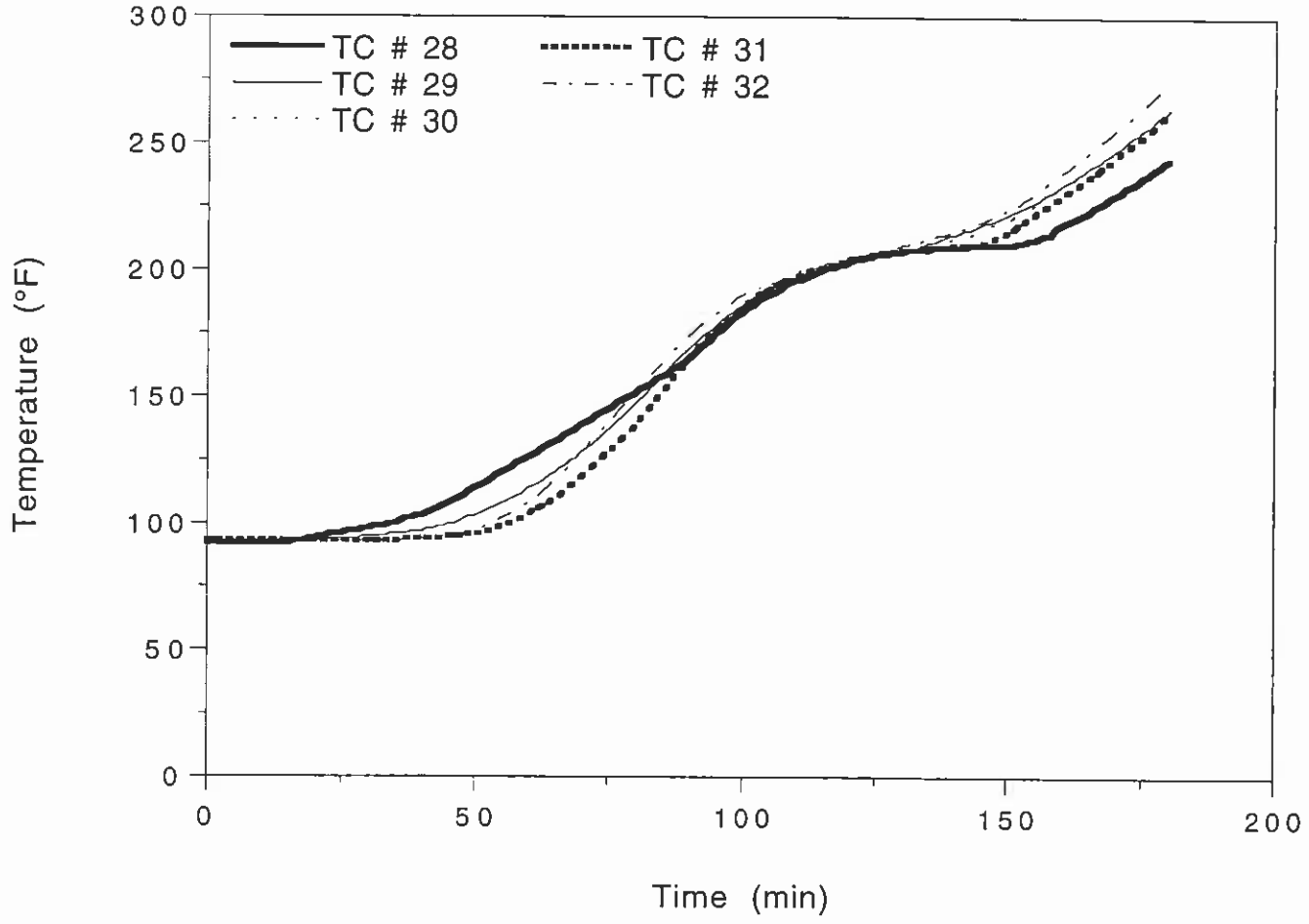
OMEGA POINT LABORATORIES

Peak Seals, Inc.
Project No. 14540-99417
6" Tray Front Rail Temperatures



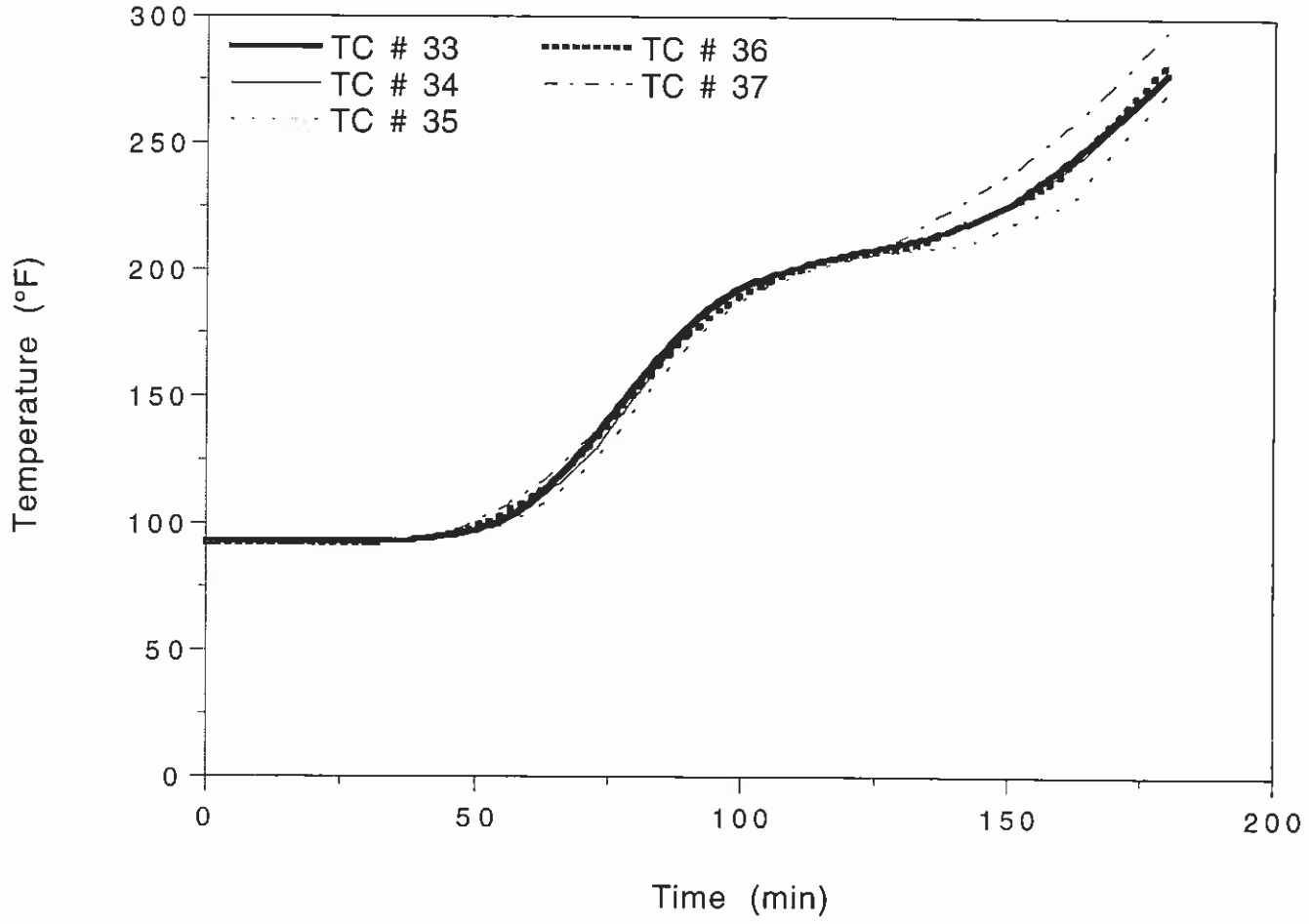
OMEGA POINT LABORATORIES

Peak Seals, Inc.
Project No. 14540-99417
6" Tray Rear Rail Temperatures



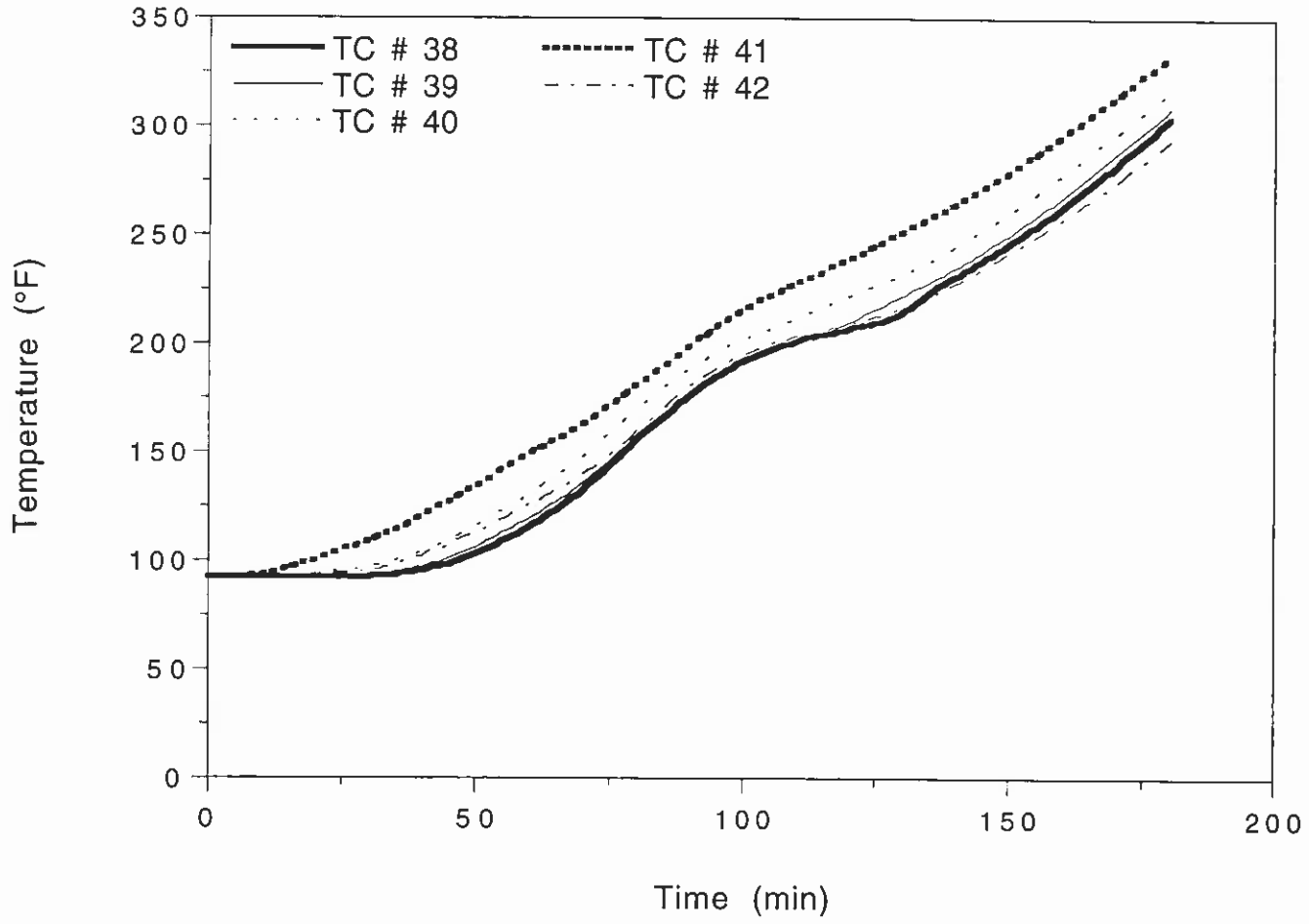
OMEGA POINT LABORATORIES

Peak Seals, Inc.
Project No. 14540-99417
6" Tray Rear Rail Temperatures



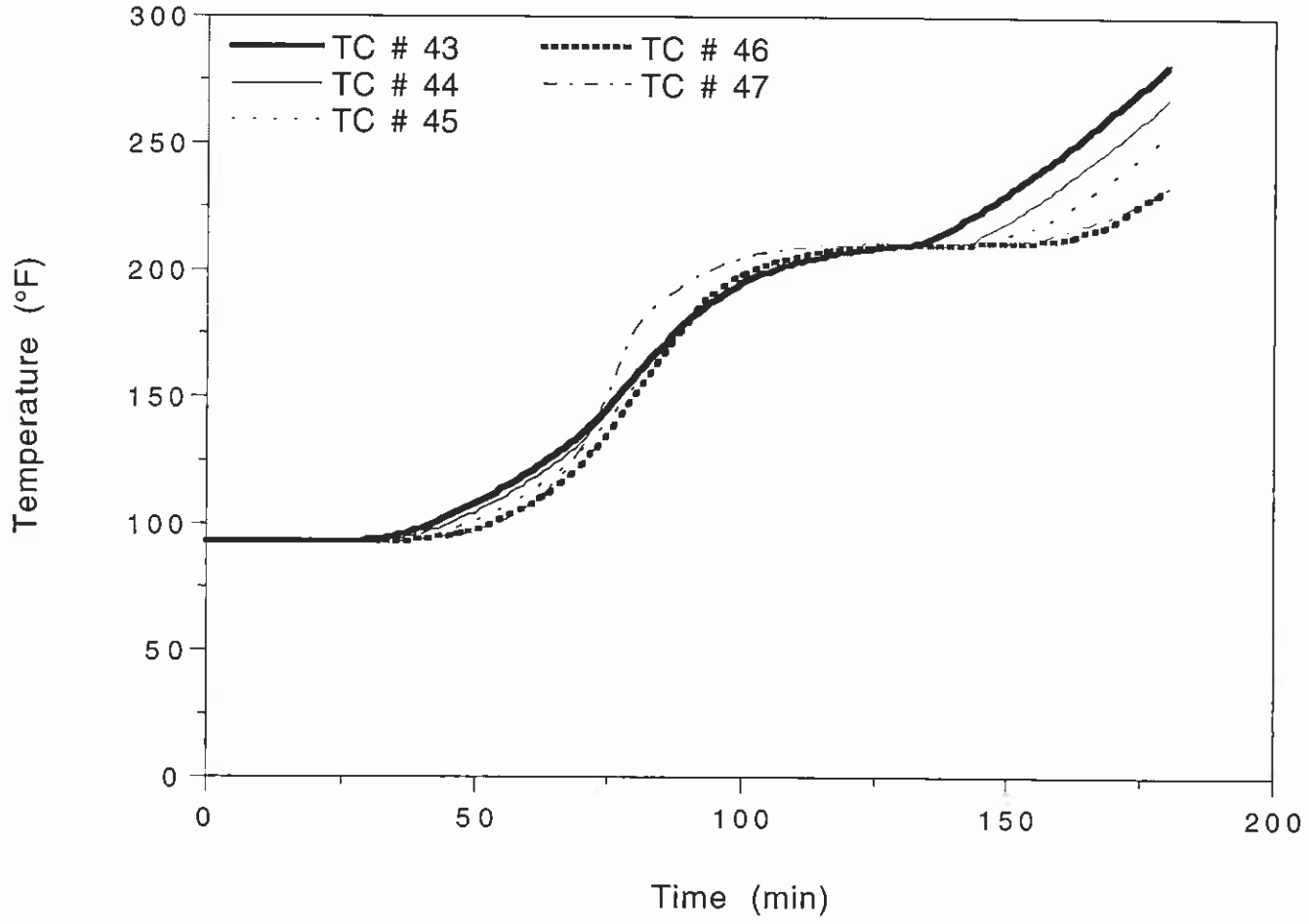
OMEGA POINT LABORATORIES

Peak Seals, Inc.
Project No. 14540-99417
6" Tray Rear Rail Temperatures



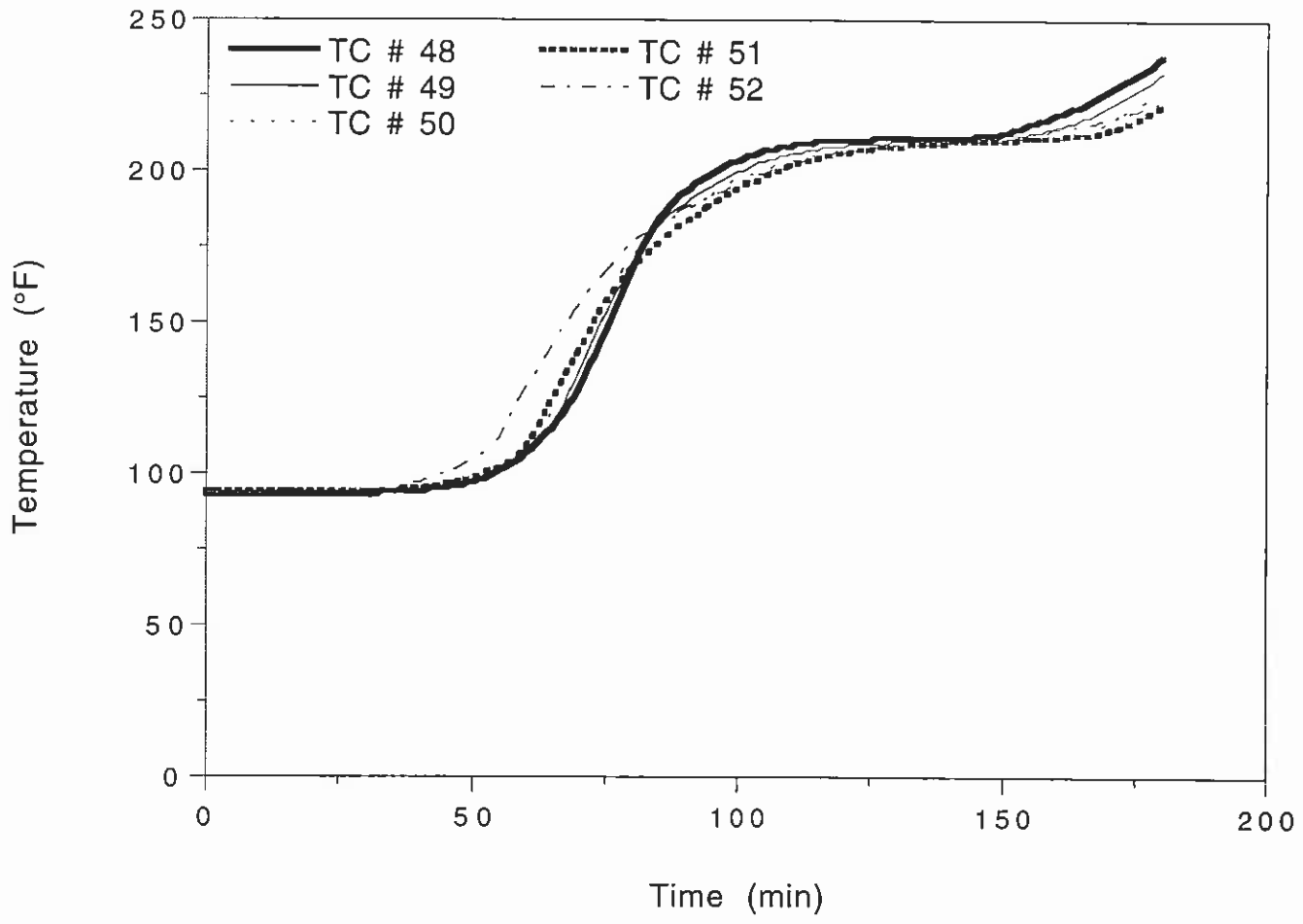
OMEGA POINT LABORATORIES

Peak Seals, Inc.
Project No. 14540-99417
6" Tray Rear Rail Temperatures



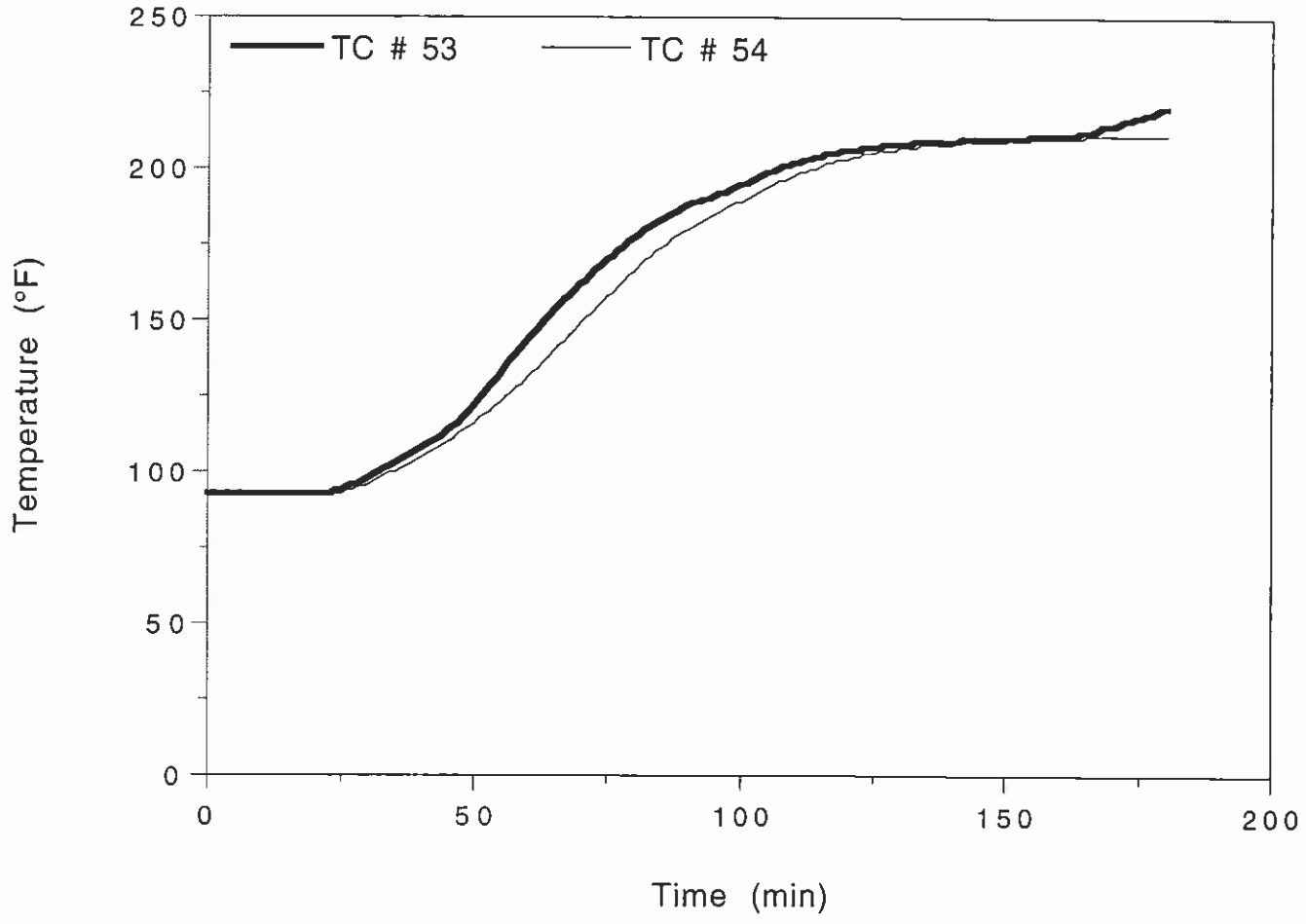
OMEGA POINT LABORATORIES

Peak Seals, Inc.
Project No. 14540-99417
6" Tray Rear Rail Temperatures



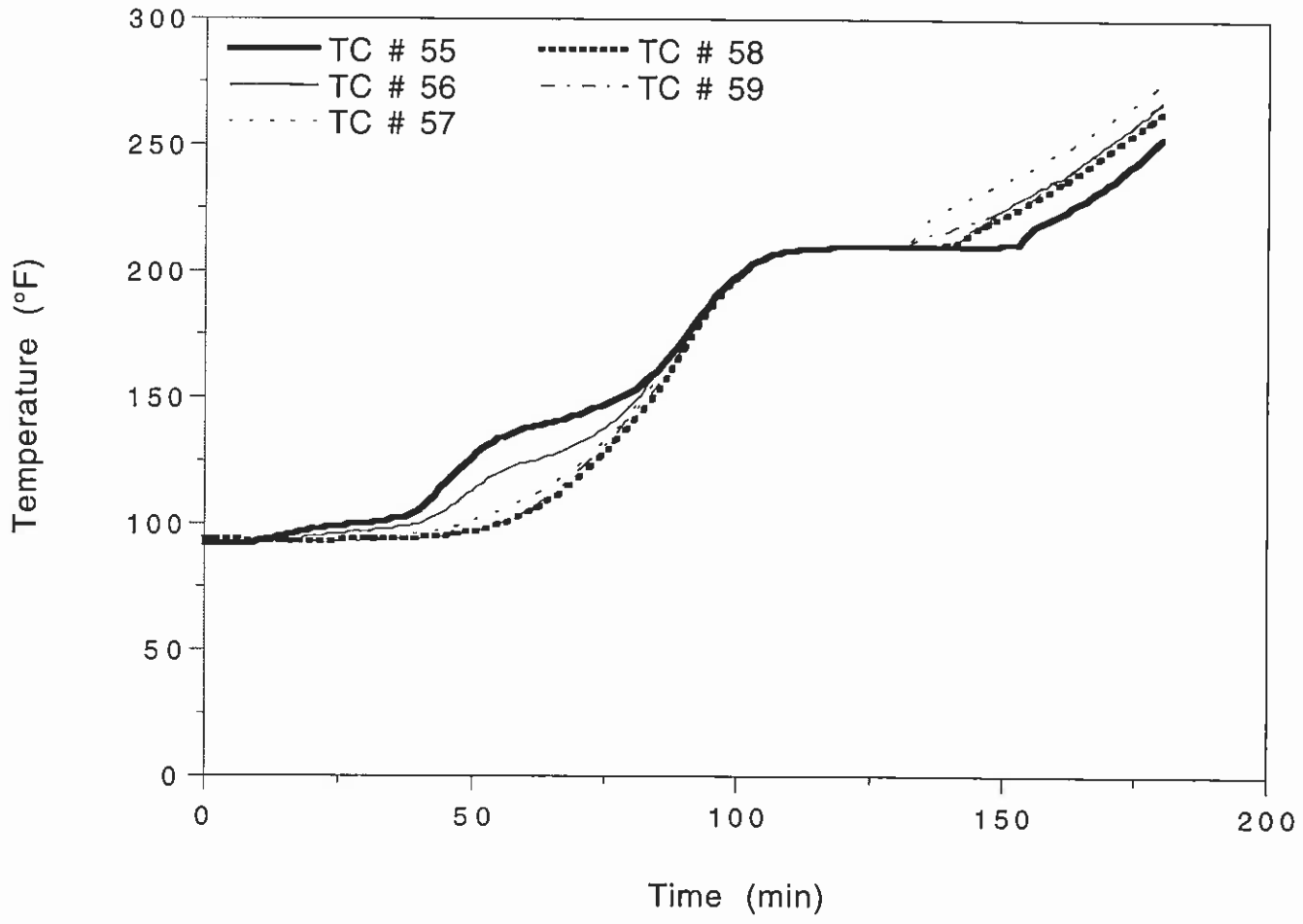
OMEGA POINT LABORATORIES

Peak Seals, Inc.
Project No. 14540-99417
6" Tray Rear Rail Temperatures



OMEGA POINT LABORATORIES

Peak Seals, Inc.
Project No. 14540-99417
24" Tray Front Rail Temperatures



OMEGA POINT LABORATORIES

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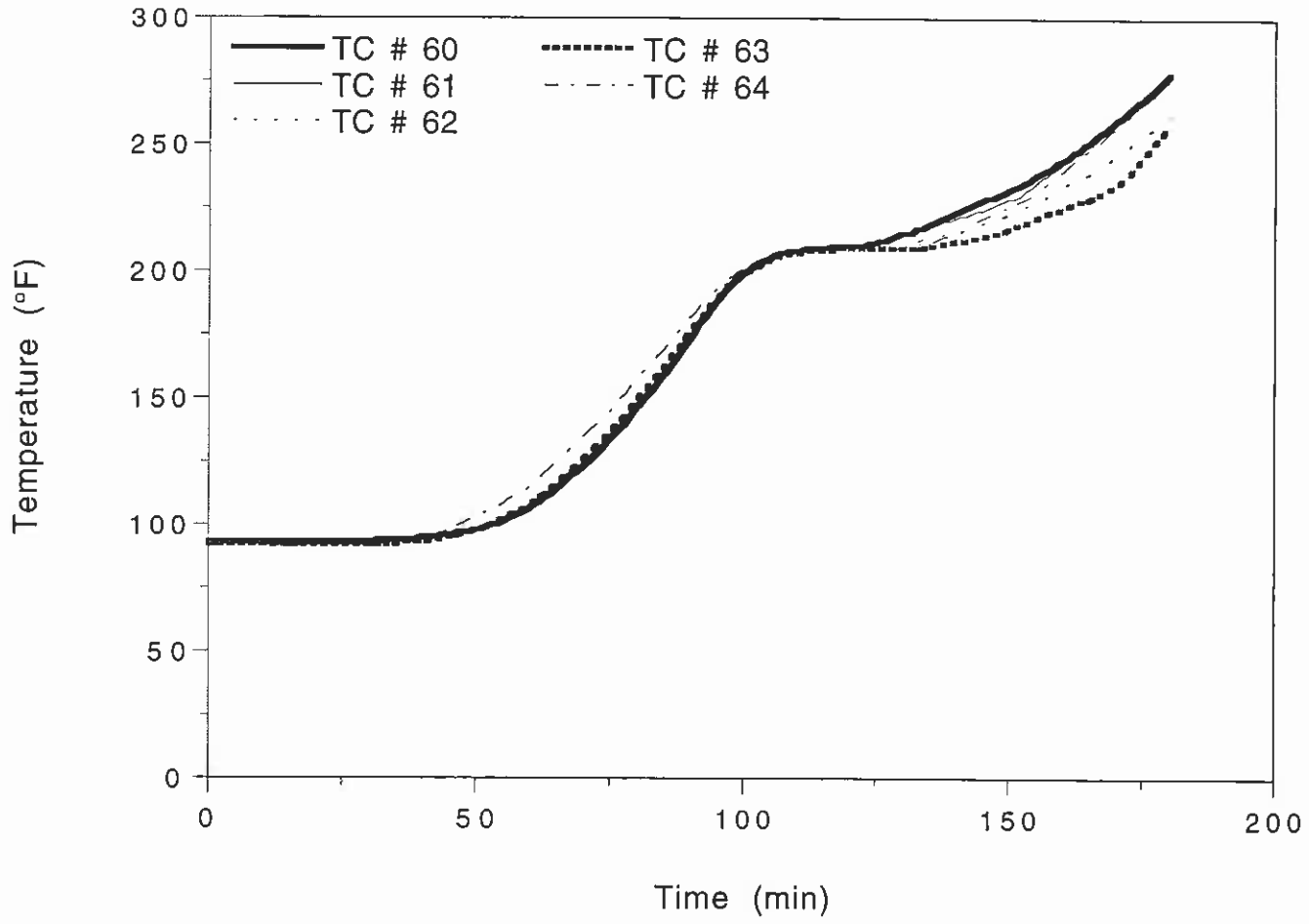
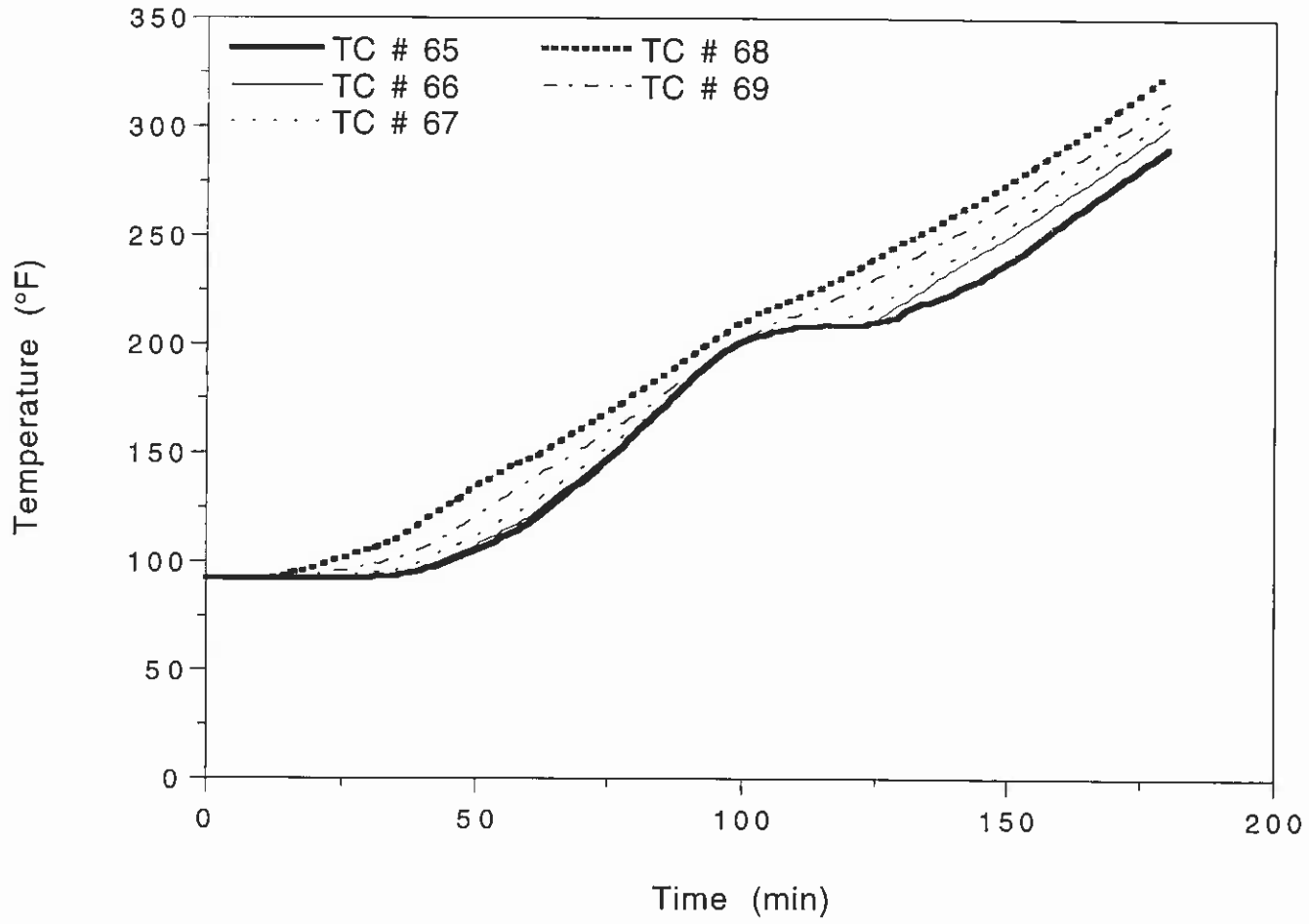
Project No. 14540-99417
24" Tray Front Rail Temperatures



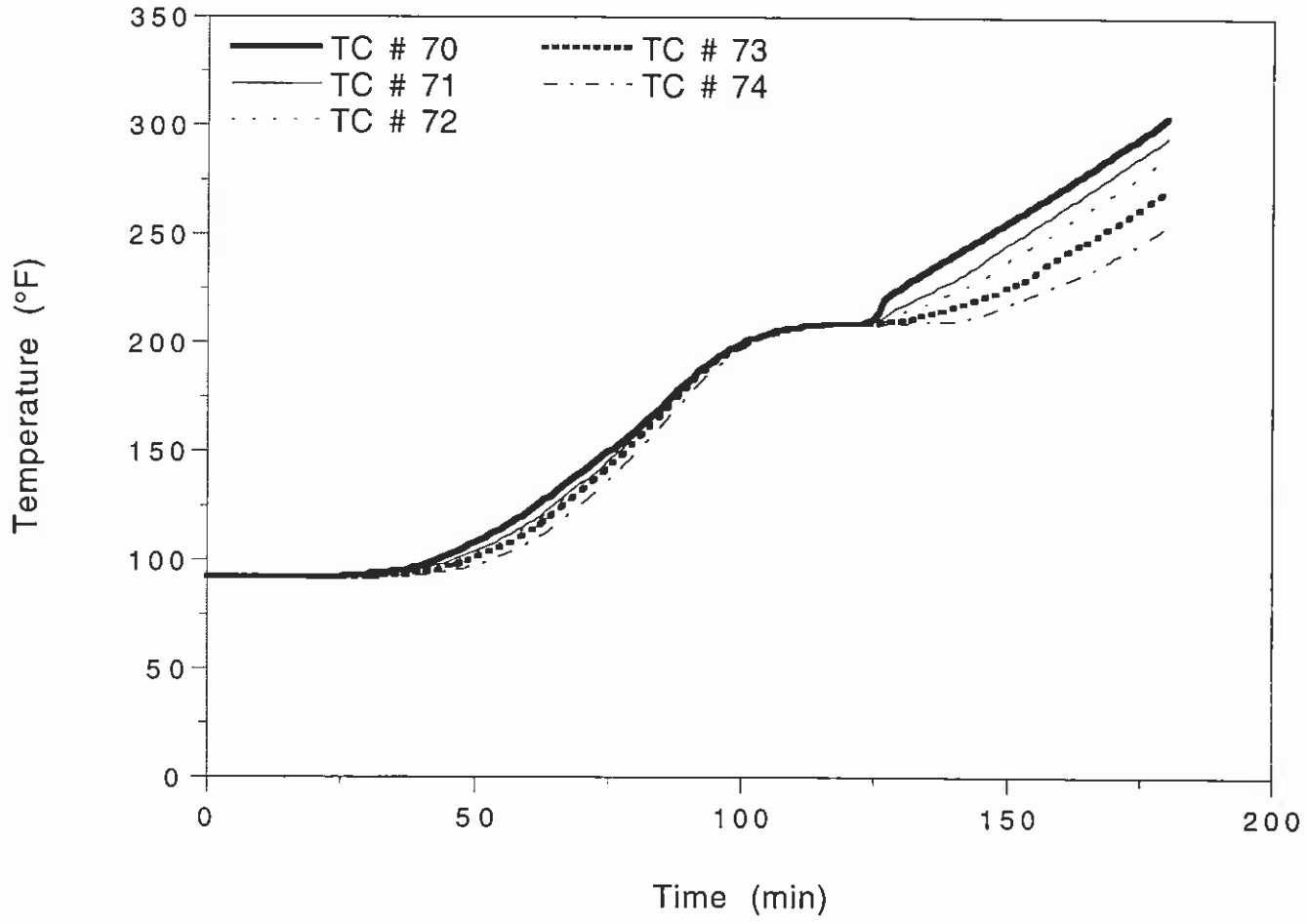
OMEGA POINT LABORATORIES

Peak Seals, Inc.
Project No. 14540-99417
24" Tray Front Rail Temperatures



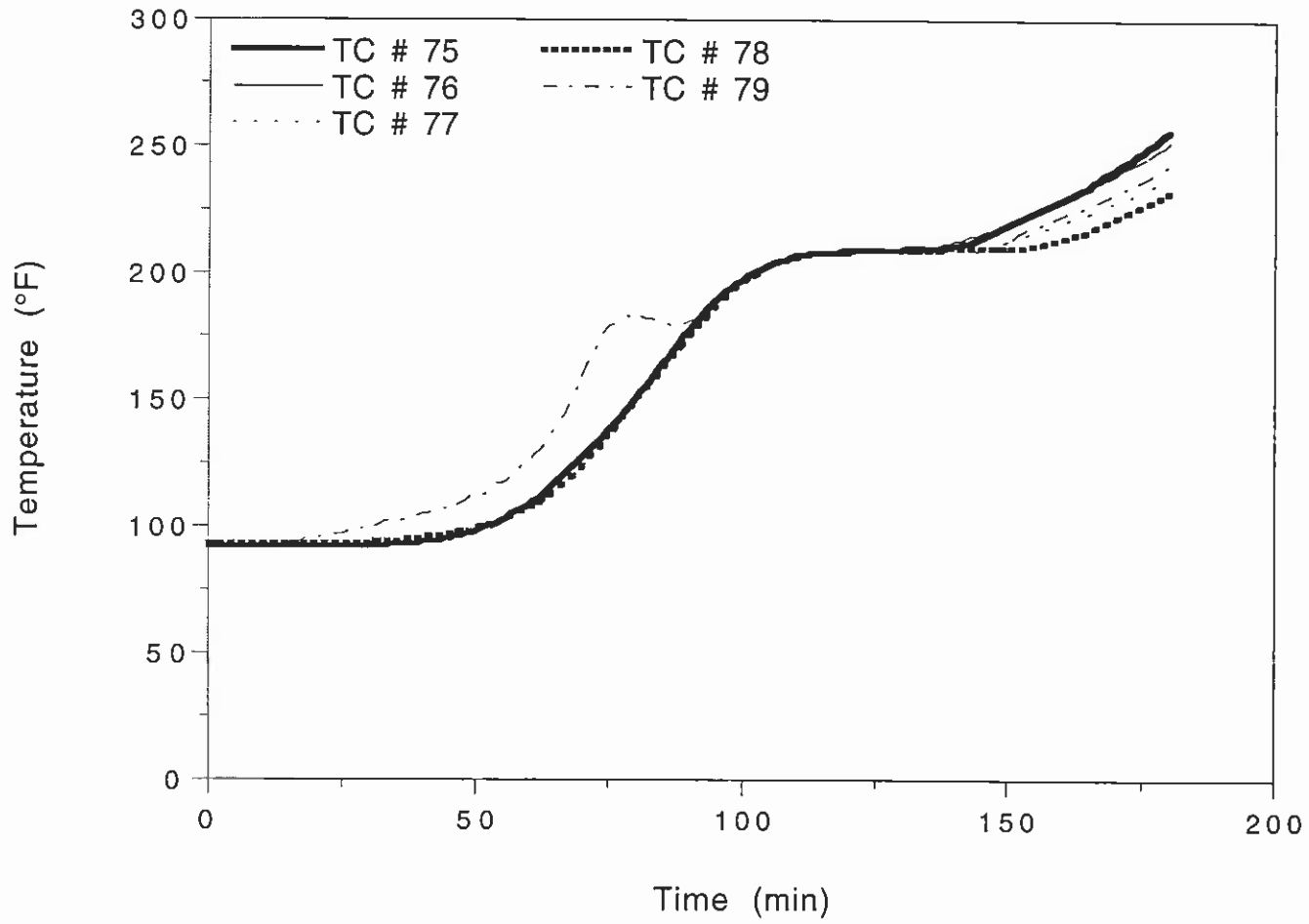
OMEGA POINT LABORATORIES

Peak Seals, Inc.
Project No. 14540-99417
24" Tray Front Rail Temperatures



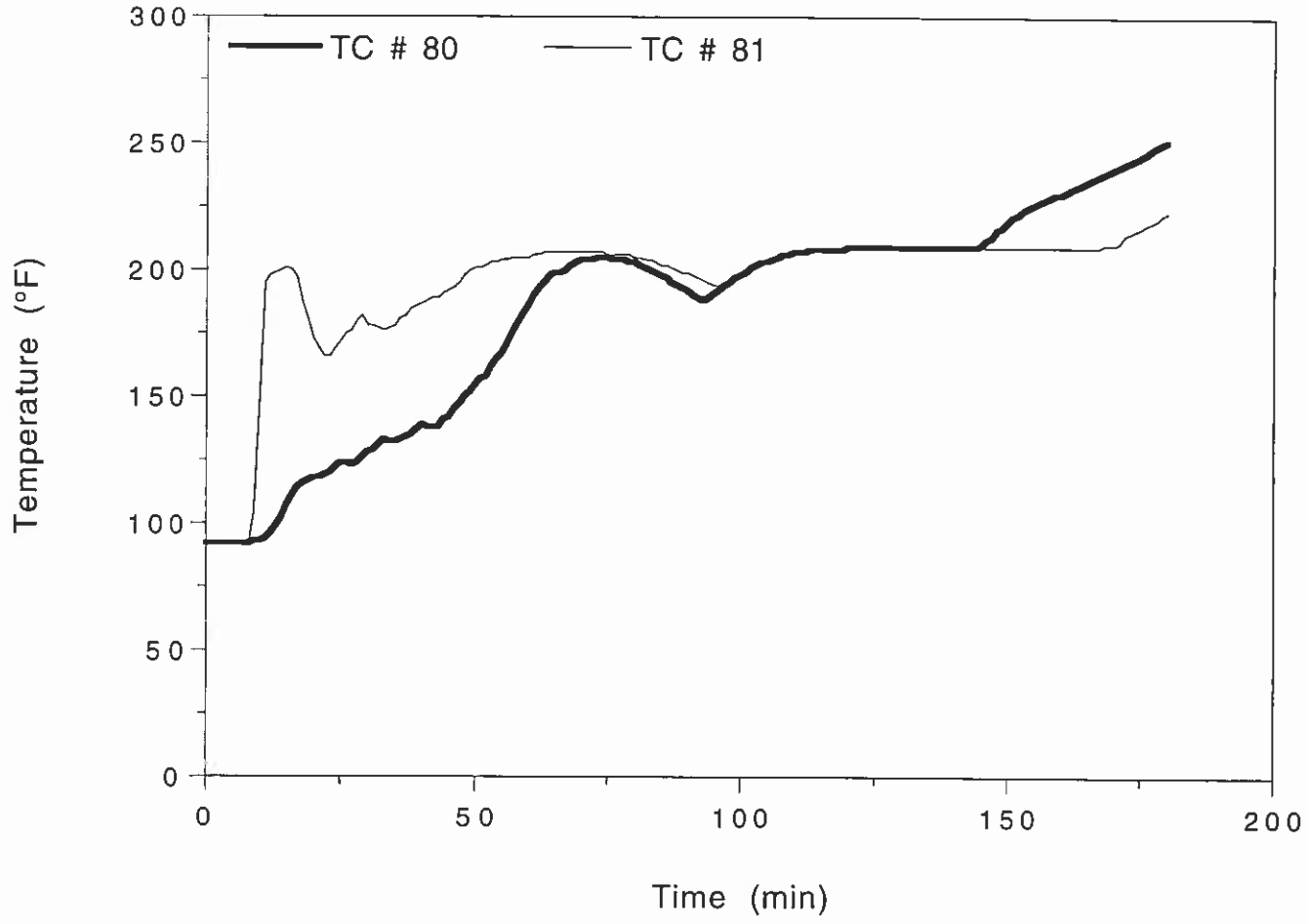
OMEGA POINT LABORATORIES

Peak Seals, Inc.
Project No. 14540-99417
24" Tray Front Rail Temperatures



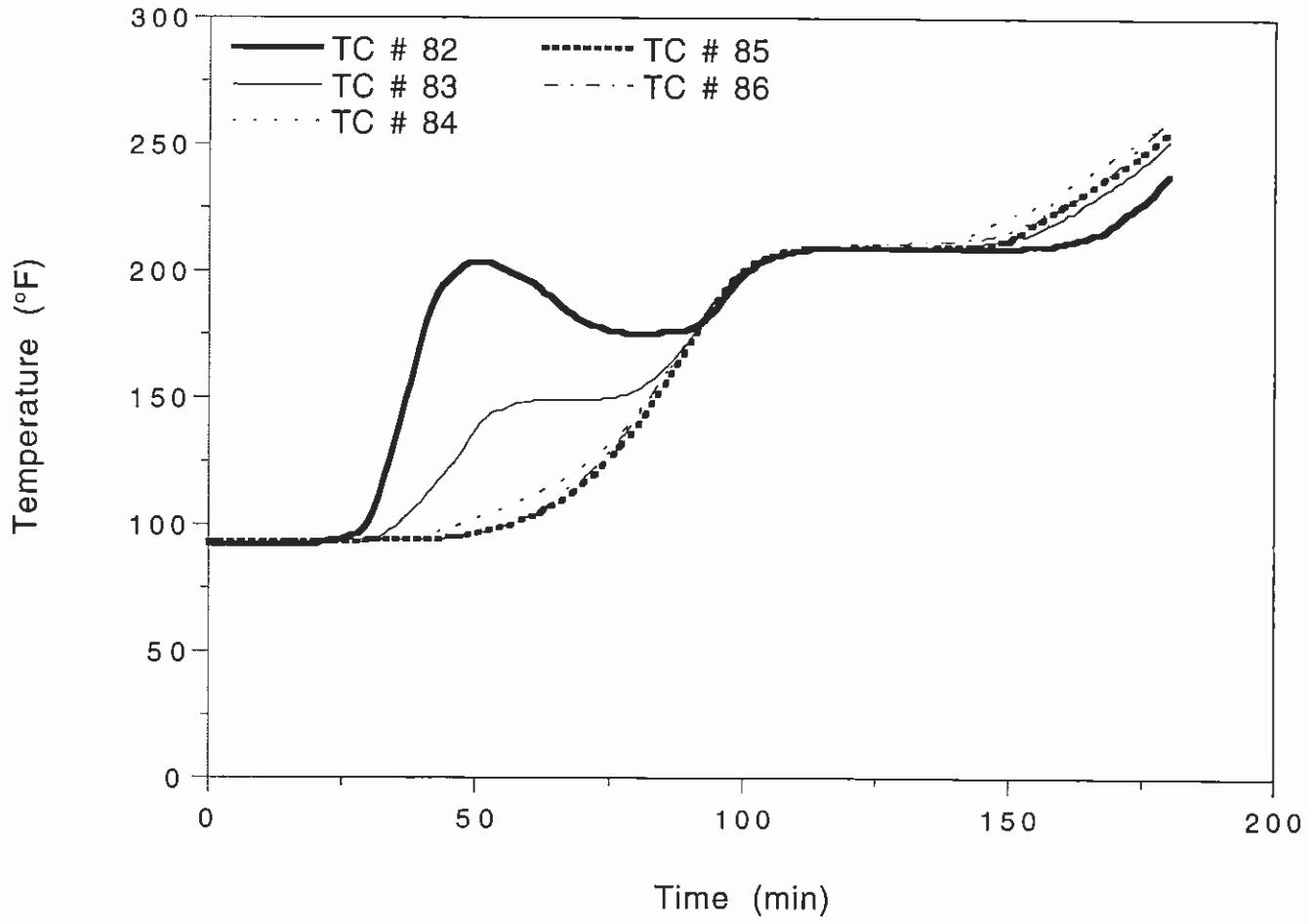
OMEGA POINT LABORATORIES

Peak Seals, Inc.
Project No. 14540-99417
24" Tray Front Rail Temperatures



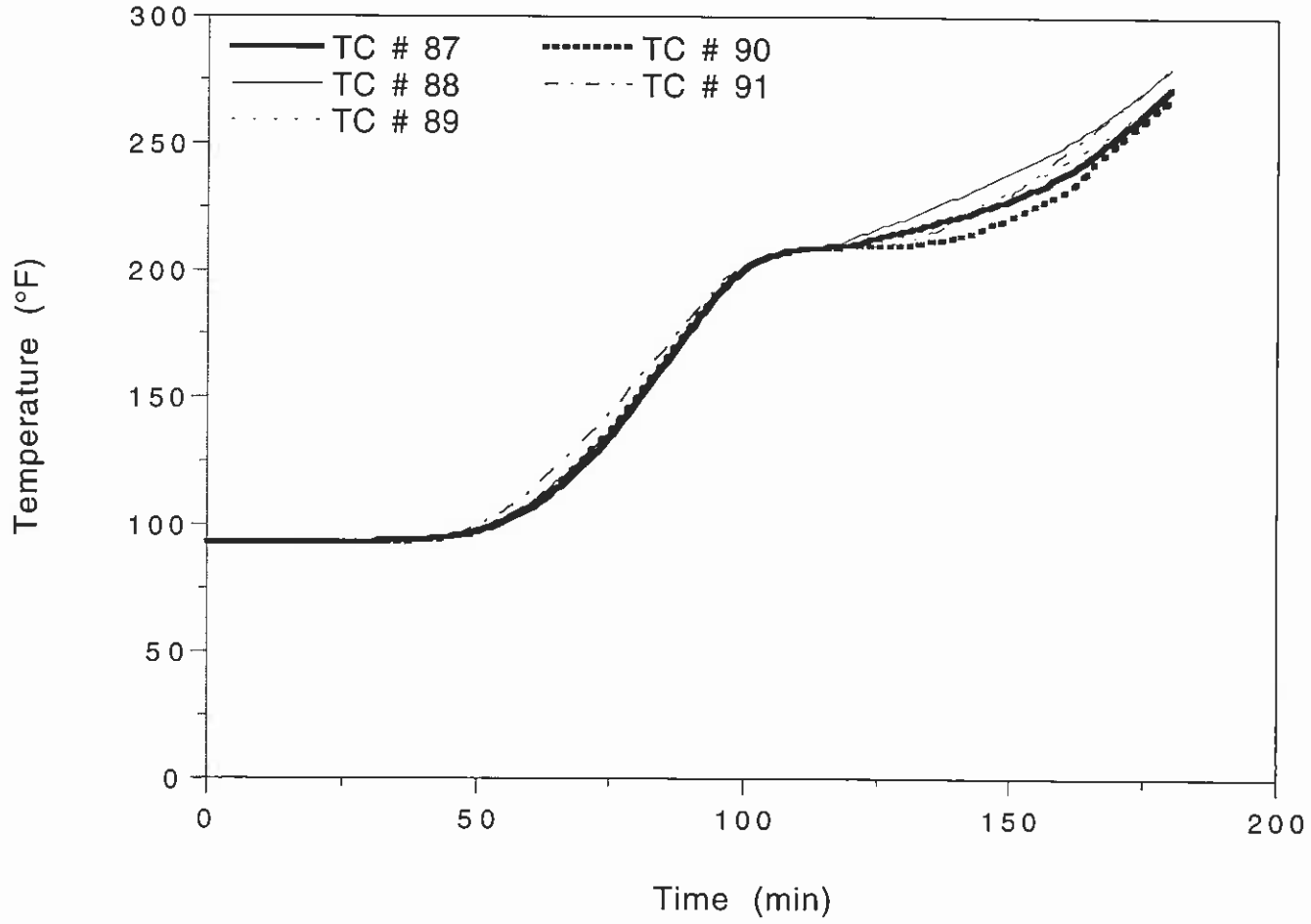
OMEGA POINT LABORATORIES

Peak Seals, Inc.
Project No. 14540-99417
24" Tray Rear Rail Temperatures



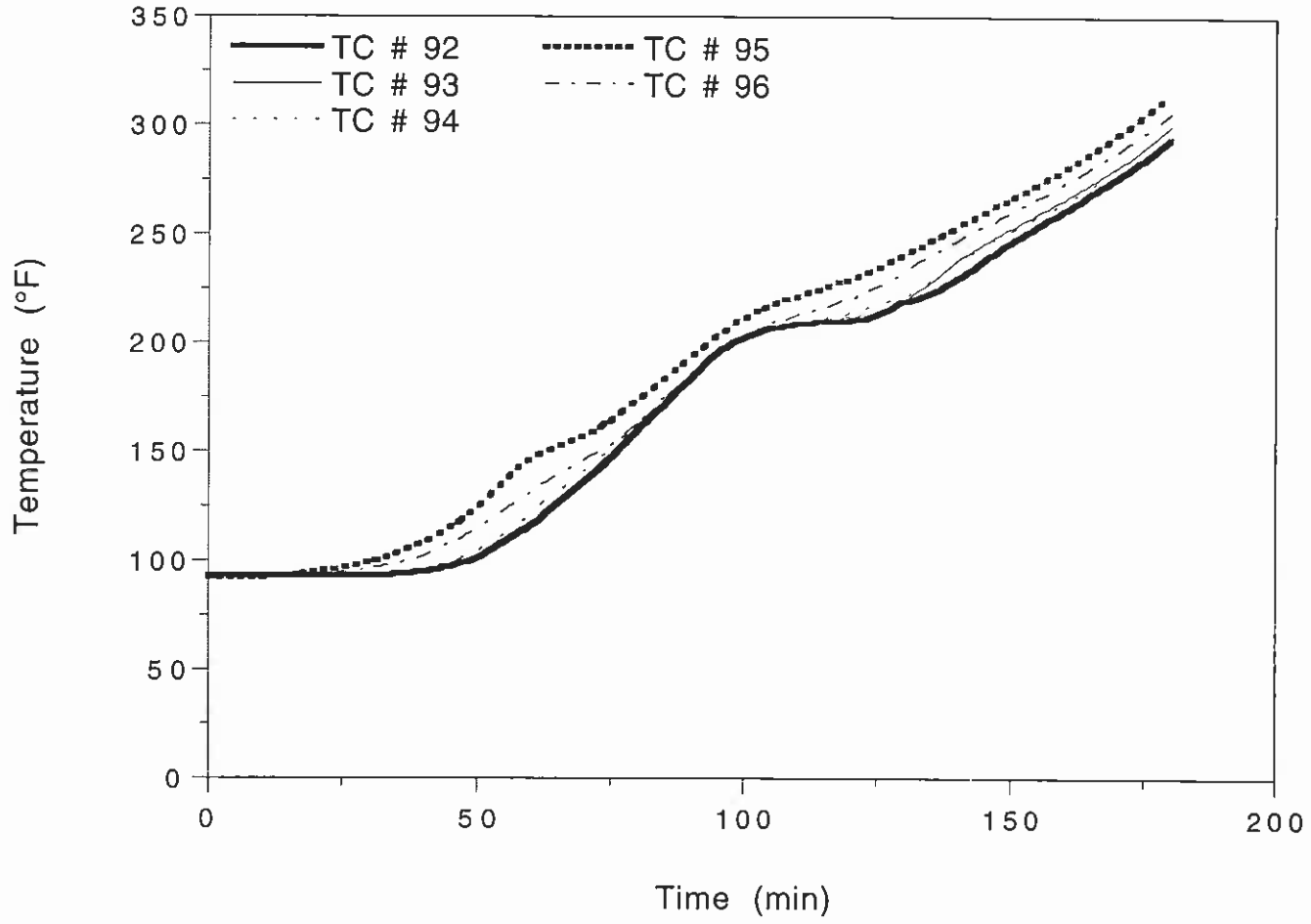
OMEGA POINT LABORATORIES

Peak Seals, Inc.
Project No. 14540-99417
24" Tray Rear Rail Temperatures



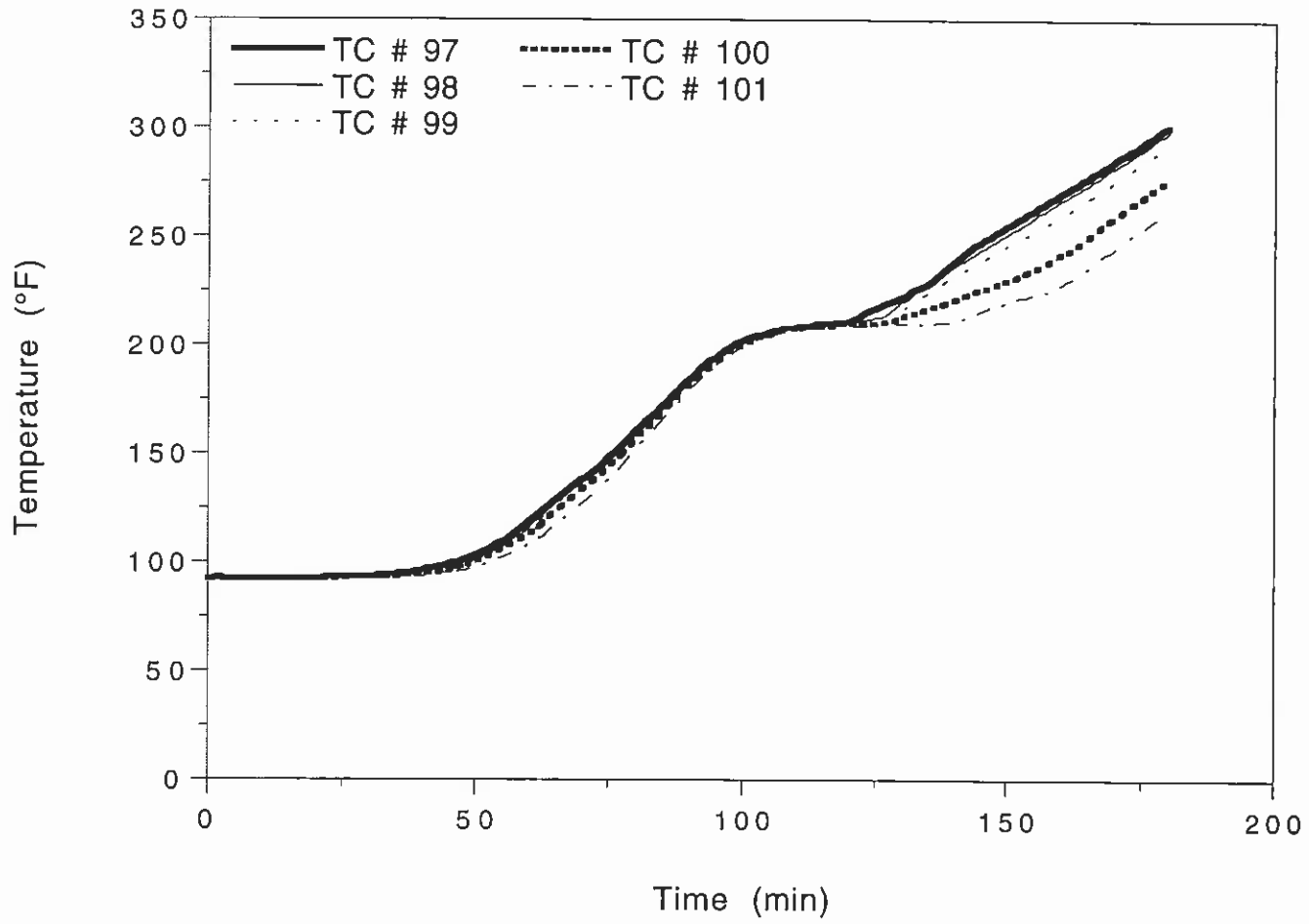
OMEGA POINT LABORATORIES

Peak Seals, Inc.
Project No. 14540-99417
24" Tray Rear Rail Temperatures



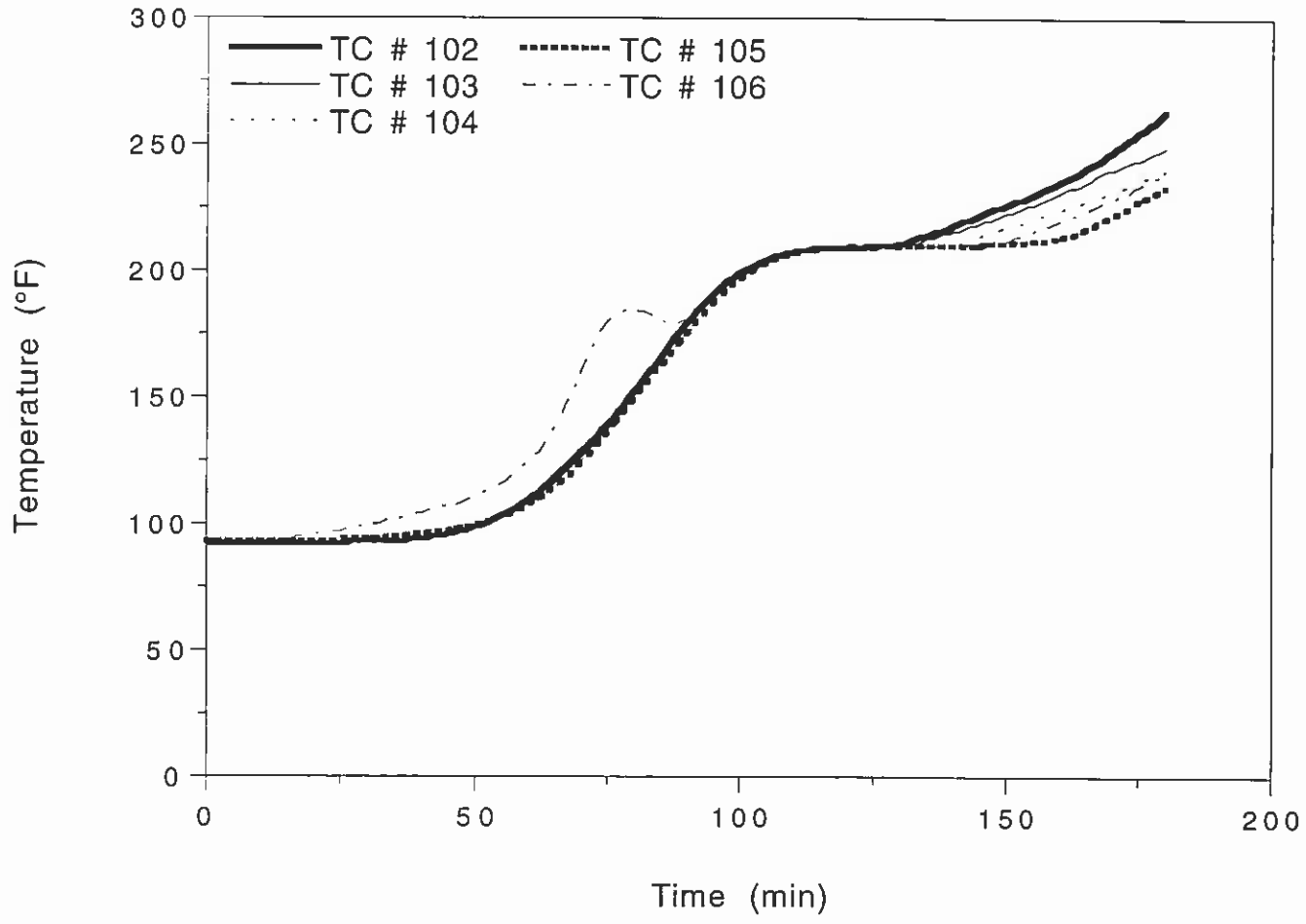
OMEGA POINT LABORATORIES

Peak Seals, Inc.
Project No. 14540-99417
24" Tray Rear Rail Temperatures



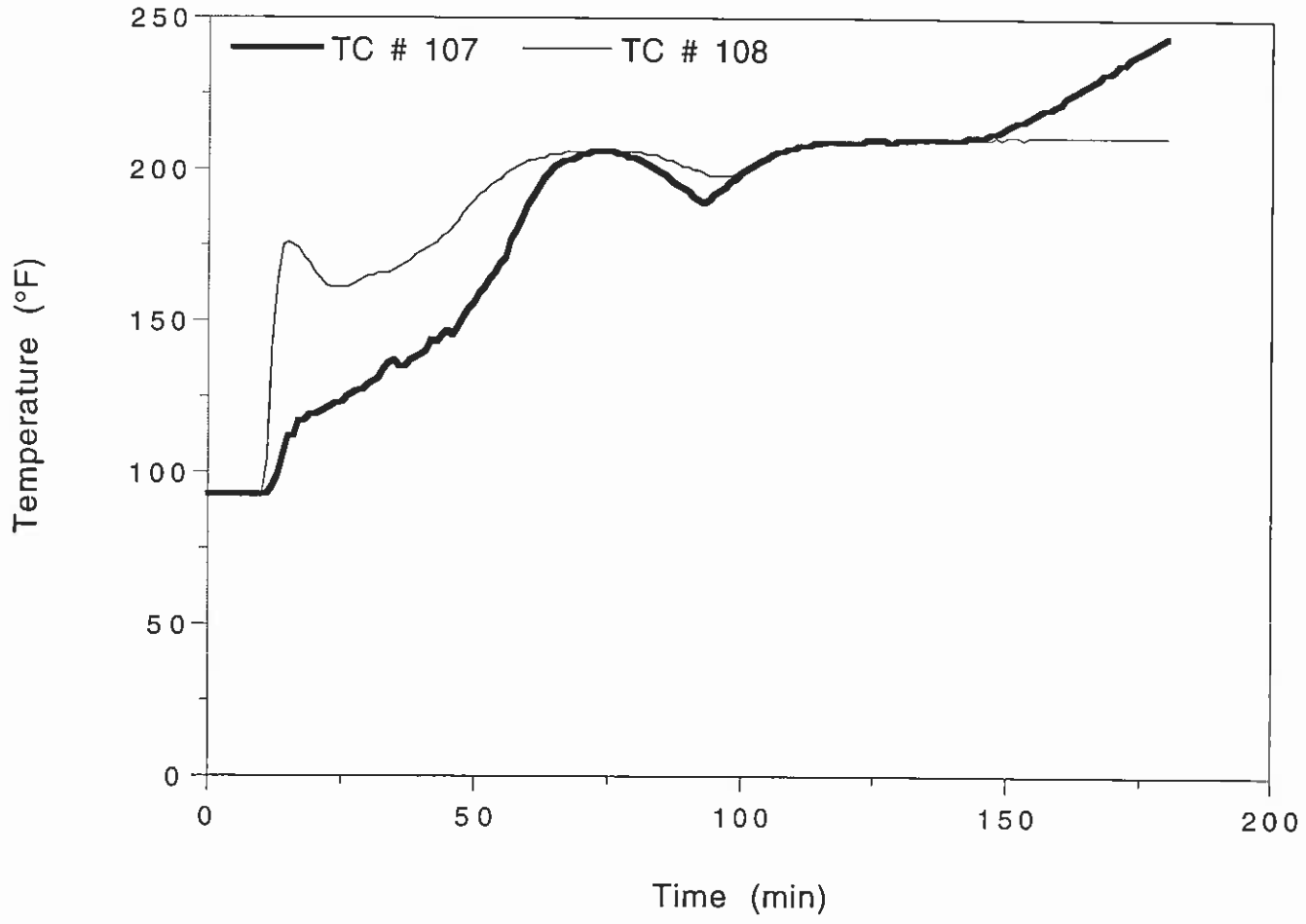
OMEGA POINT LABORATORIES

Peak Seals, Inc.
Project No. 14540-99417
24" Tray Rear Rail Temperatures



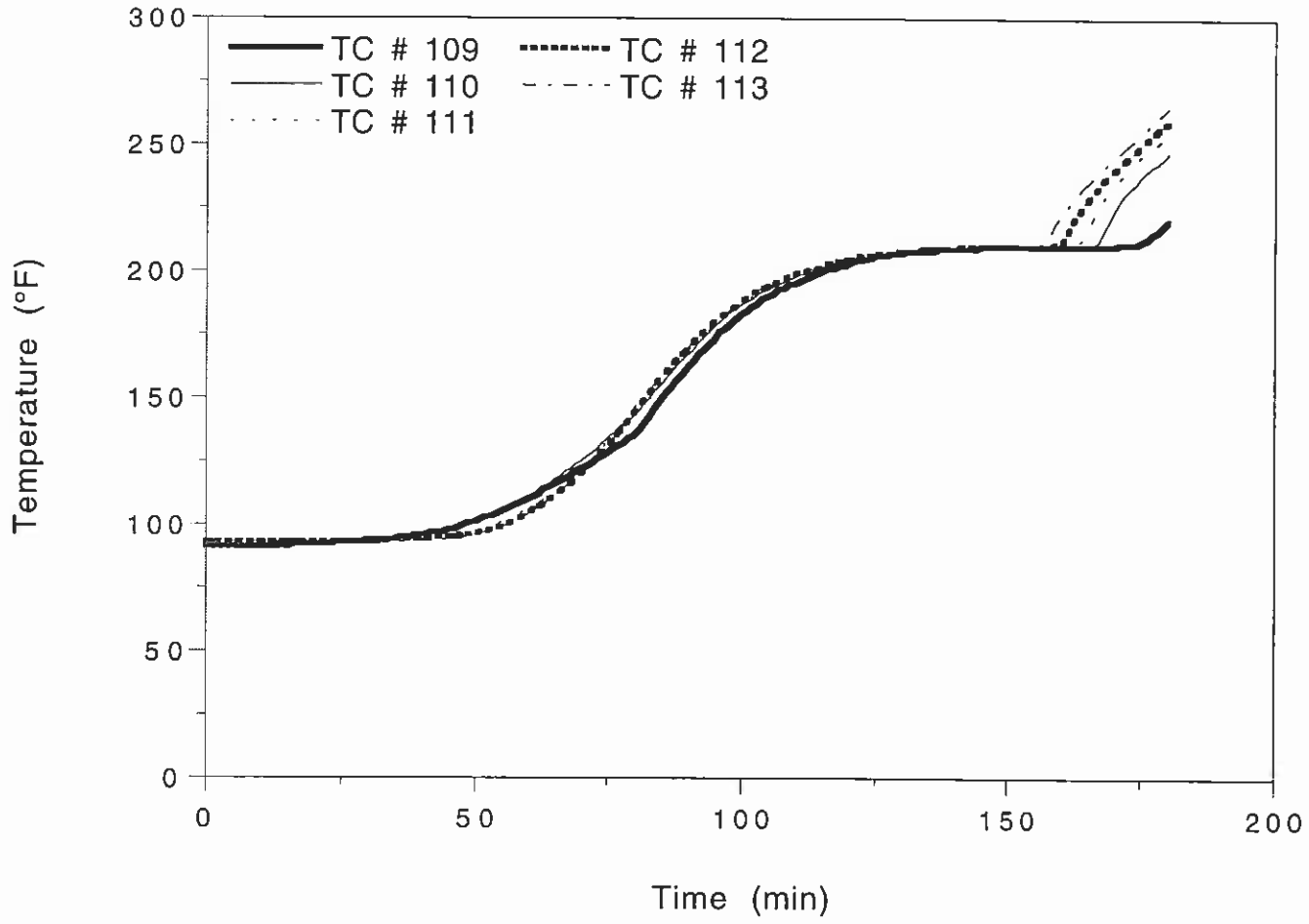
OMEGA POINT LABORATORIES

Peak Seals, Inc.
Project No. 14540-99417
24" Tray Rear Rail Temperatures



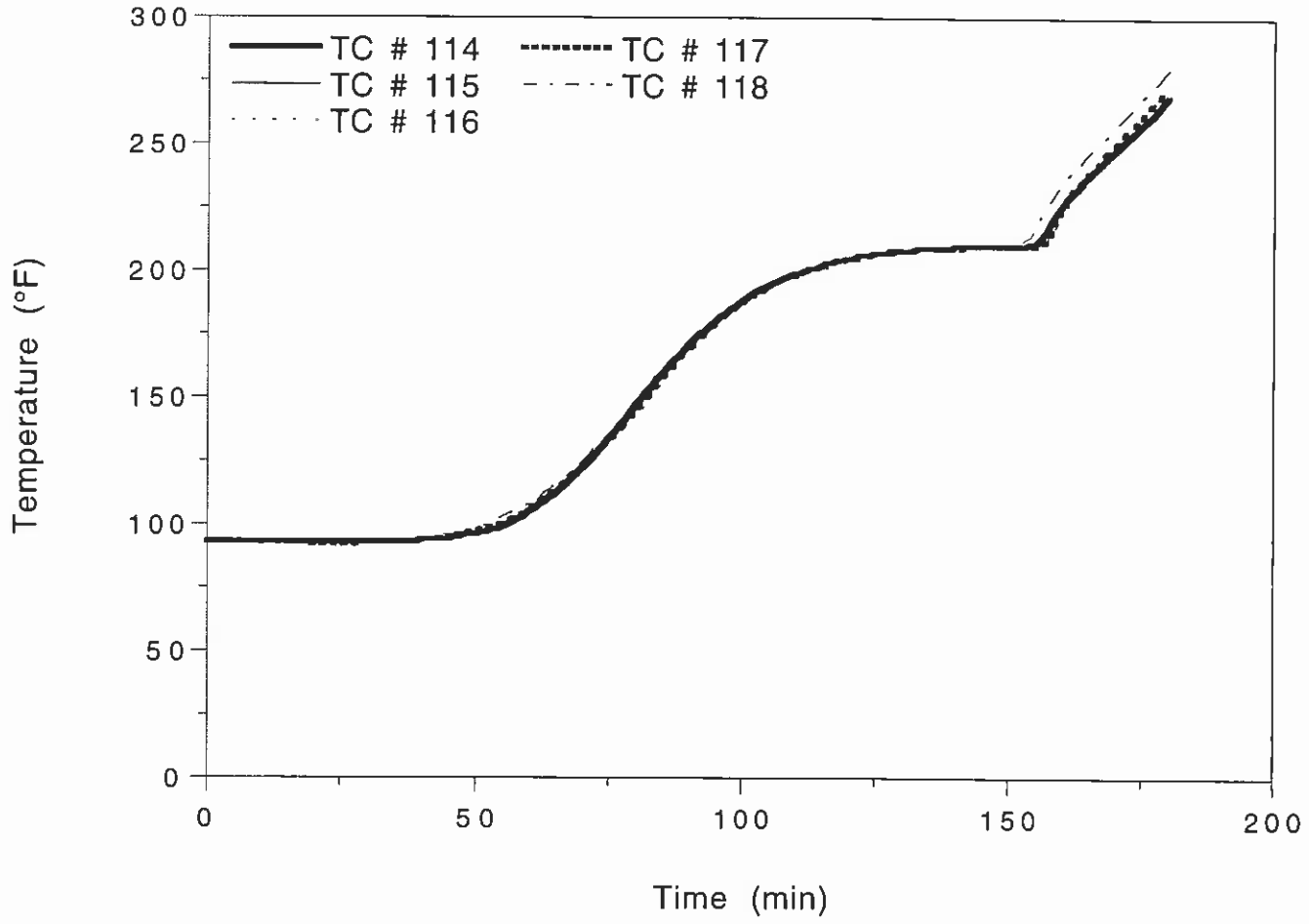
OMEGA POINT LABORATORIES

Peak Seals, Inc.
Project No. 14540-99417
6" Tray Bare #8 Temperatures



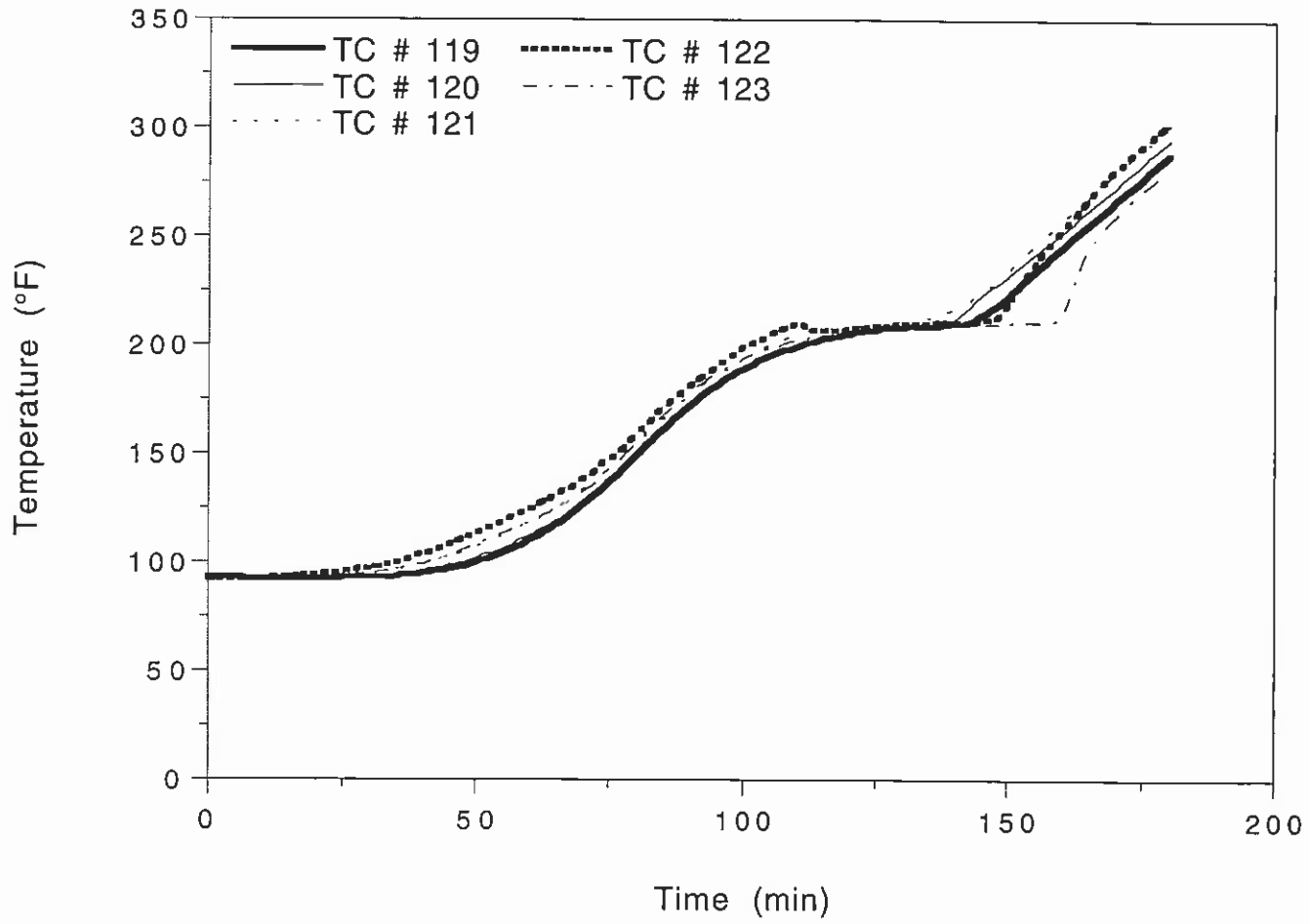
OMEGA POINT LABORATORIES

Peak Seals, Inc.
Project No. 14540-99417
6" Tray Bare #8 Temperatures



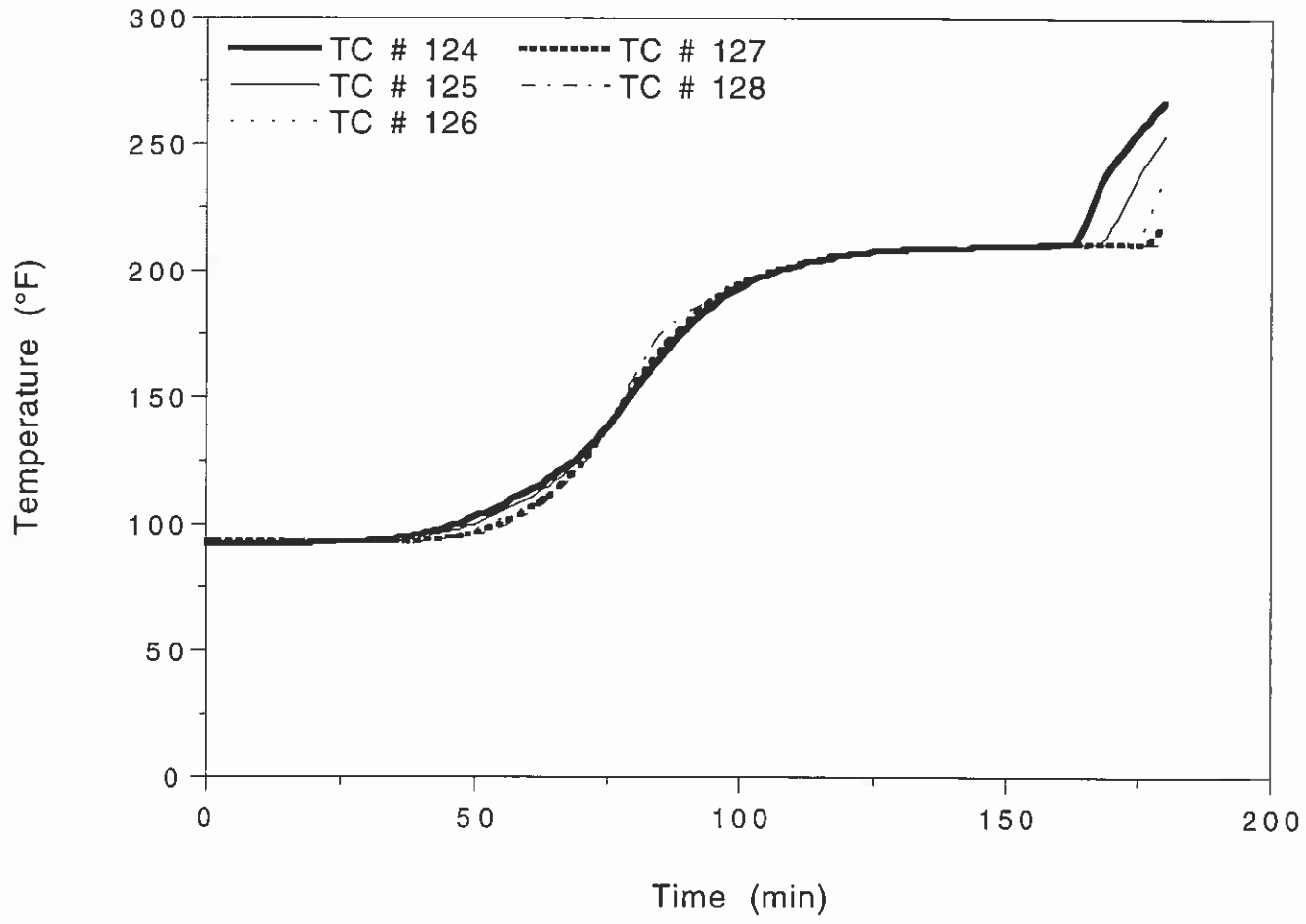
OMEGA POINT LABORATORIES

Peak Seals, Inc.
Project No. 14540-99417
6" Tray Bare #8 Temperatures



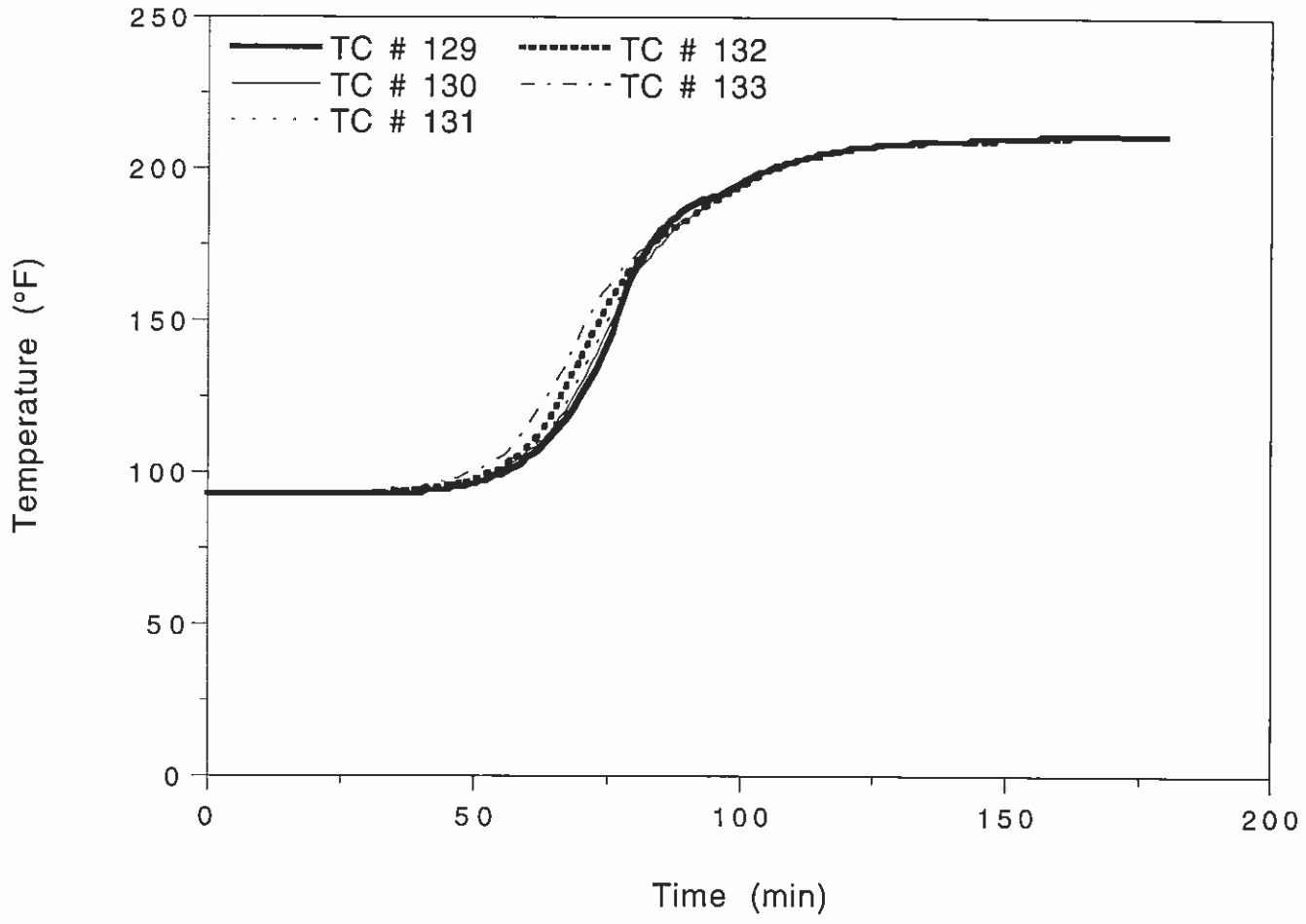
OMEGA POINT LABORATORIES

Peak Seals, Inc.
Project No. 14540-99417
6" Tray Bare #8 Temperatures



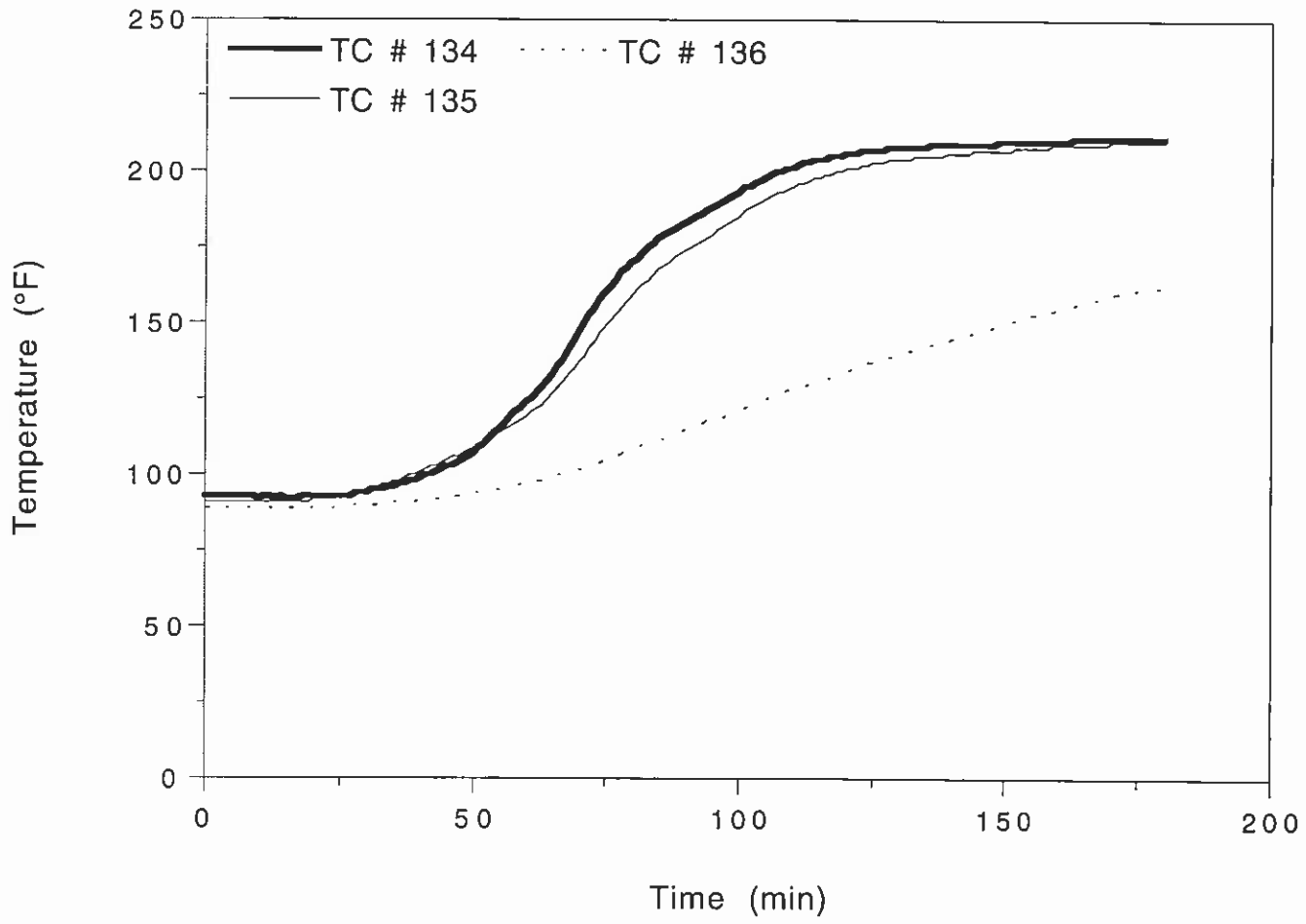
OMEGA POINT LABORATORIES

Peak Seals, Inc.
Project No. 14540-99417
6" Tray Bare #8 Temperatures



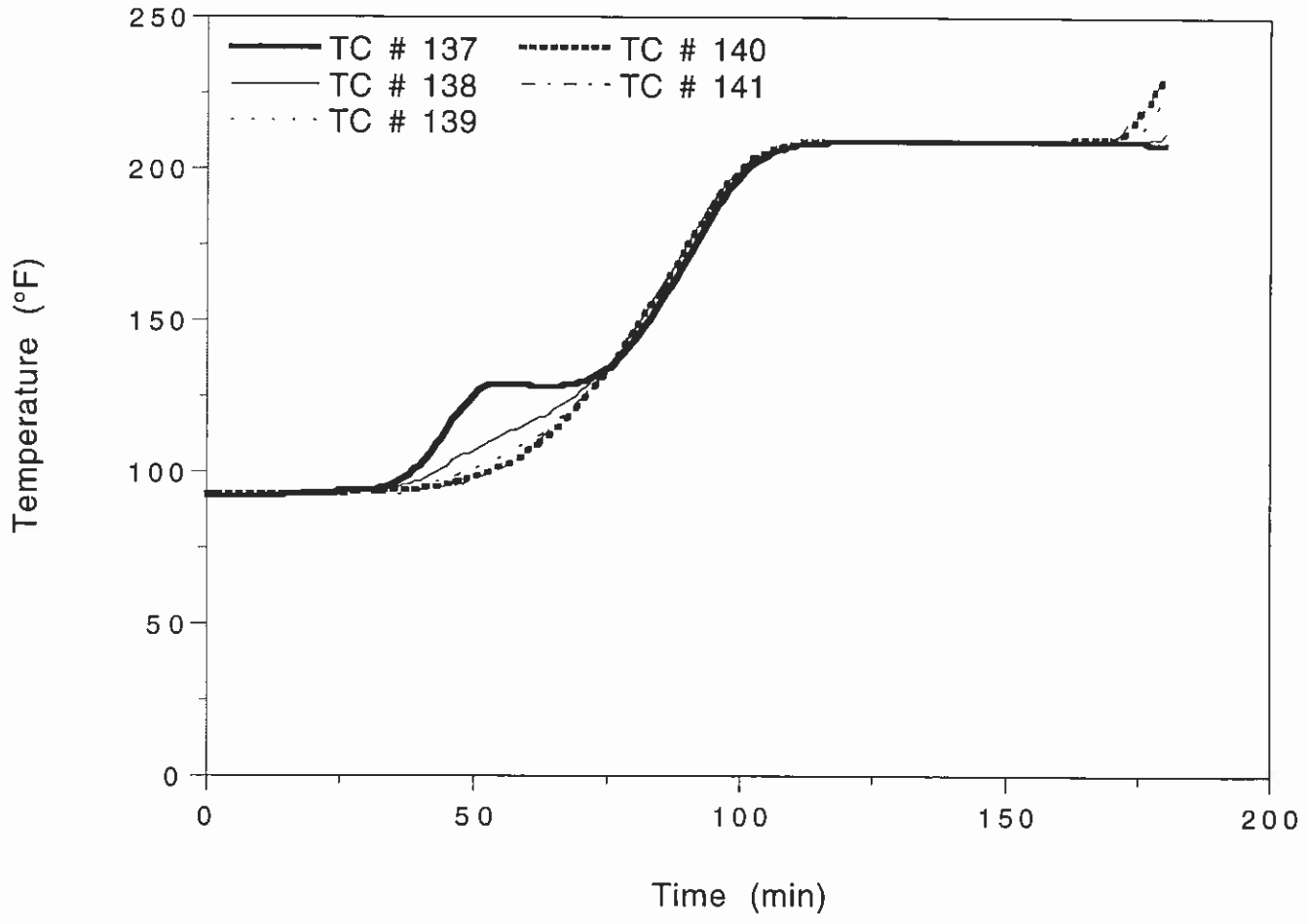
OMEGA POINT LABORATORIES

Peak Seals, Inc.
Project No. 14540-99417
6" Tray Bare #8 Temperatures



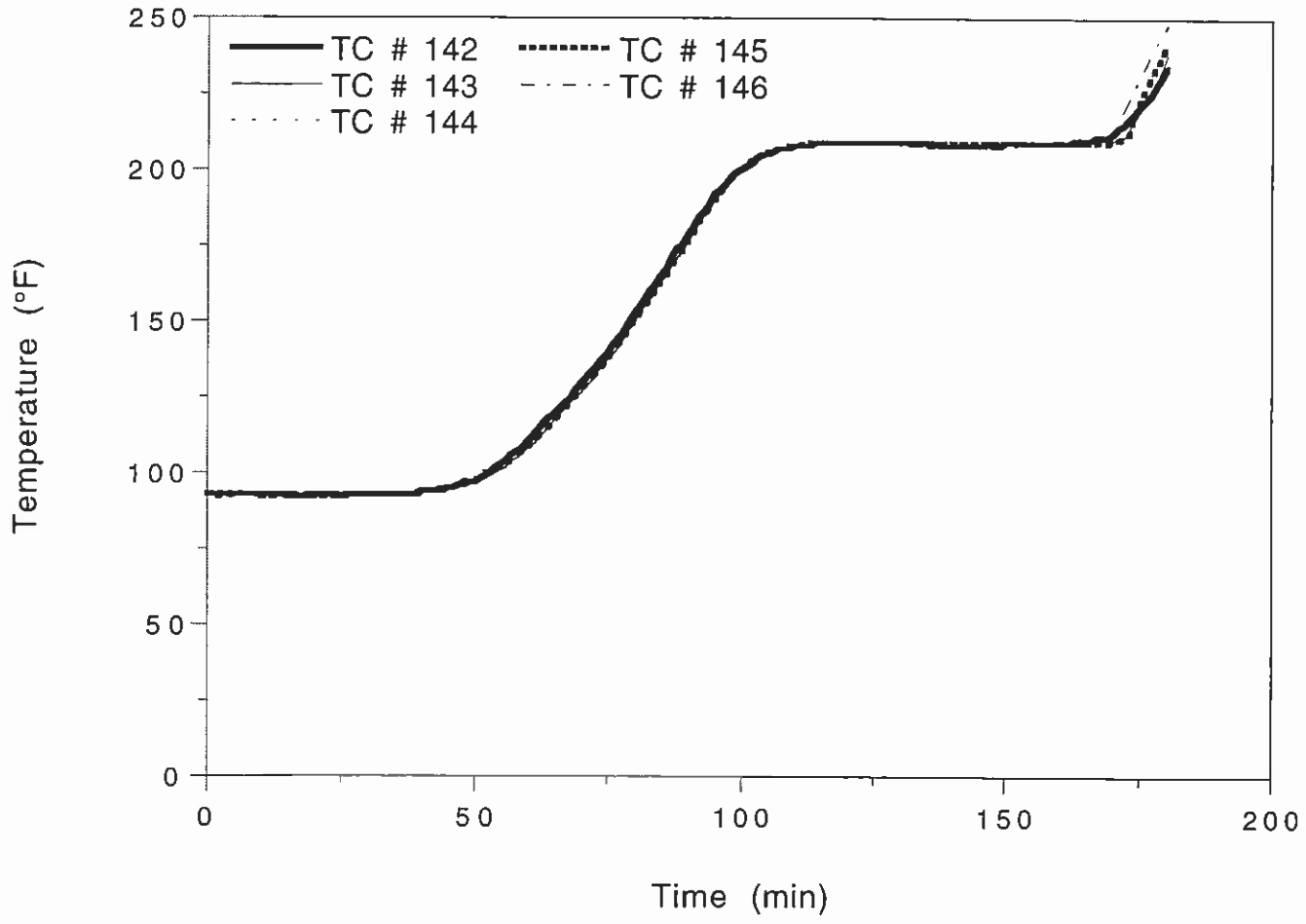
OMEGA POINT LABORATORIES

Peak Seals, Inc.
Project No. 14540-99417
24" Tray Bare #8 Temperatures



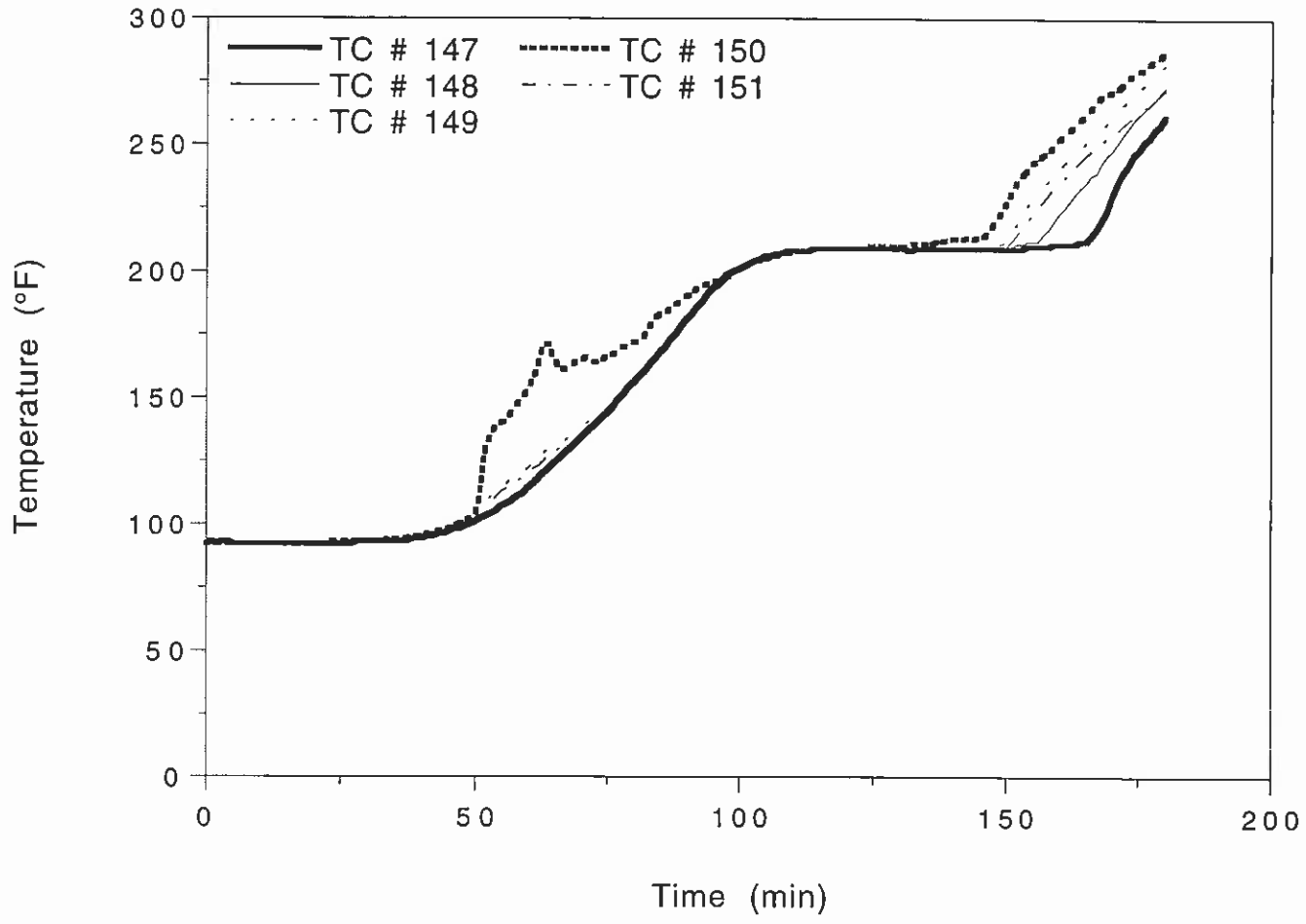
OMEGA POINT LABORATORIES

Peak Seals, Inc.
Project No. 14540-99417
24" Tray Bare #8 Temperatures



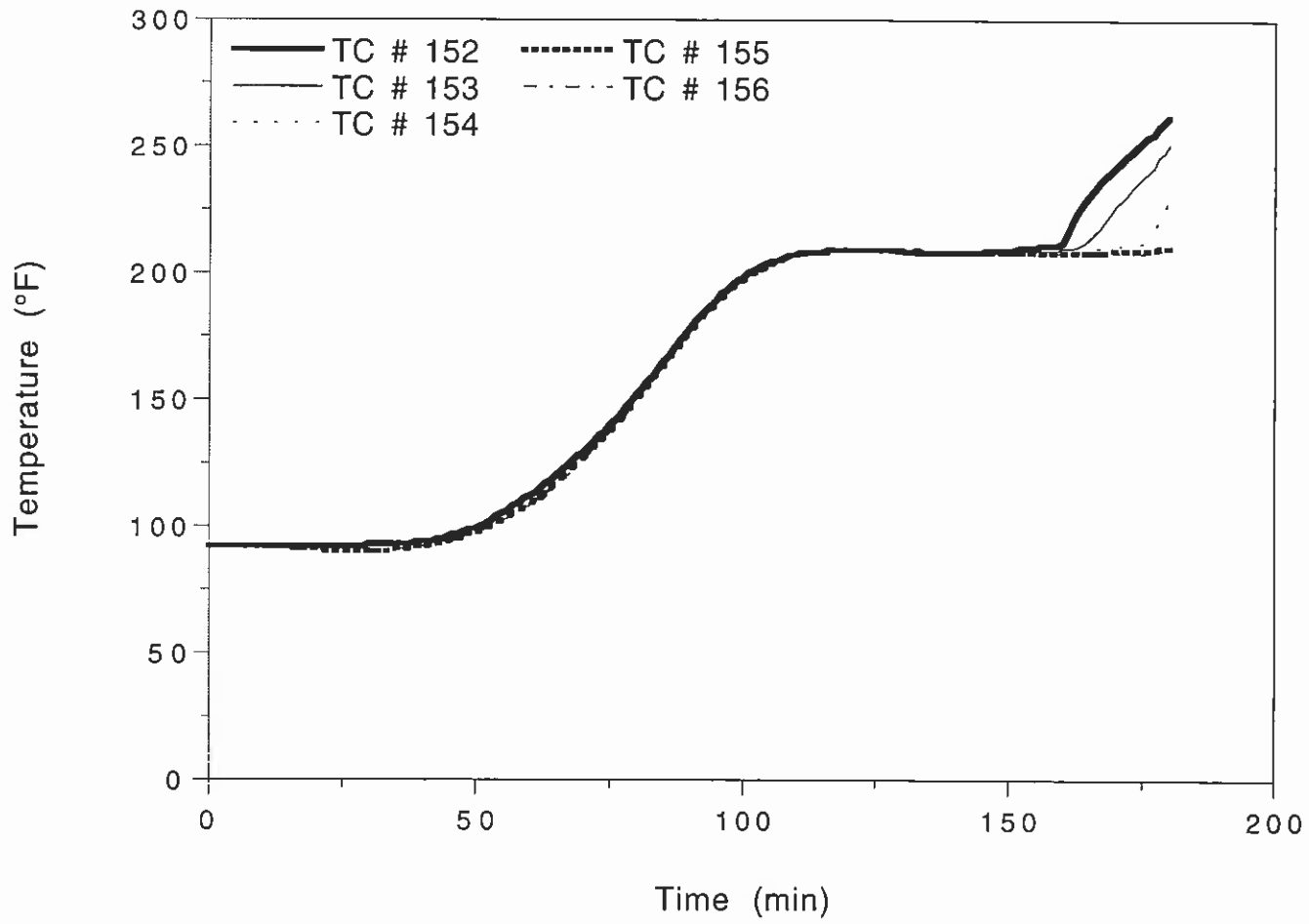
OMEGA POINT LABORATORIES

Peak Seals, Inc.
Project No. 14540-99417
24" Tray Bare #8 Temperatures



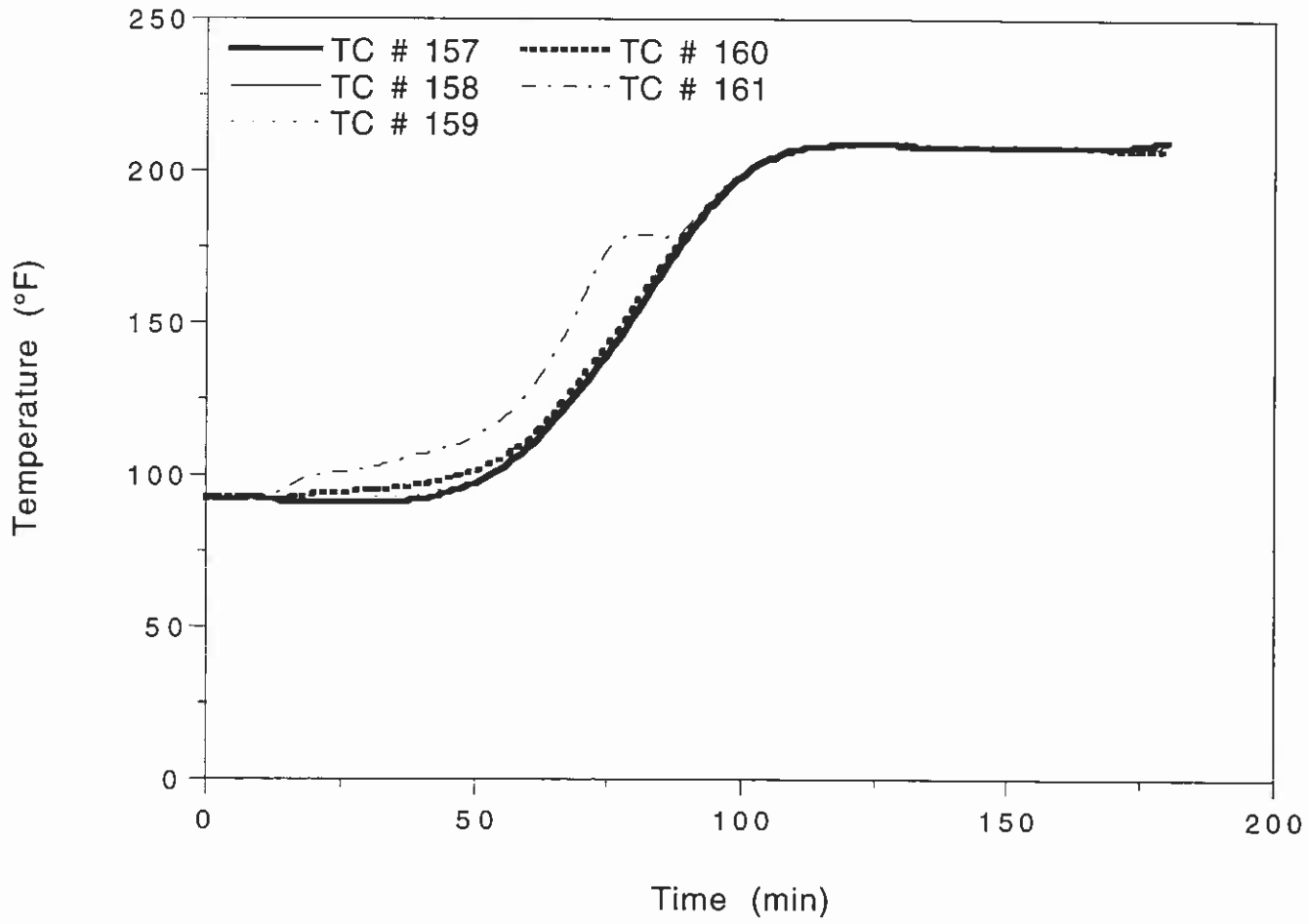
OMEGA POINT LABORATORIES

Peak Seals, Inc.
Project No. 14540-99417
24" Tray Bare #8 Temperatures



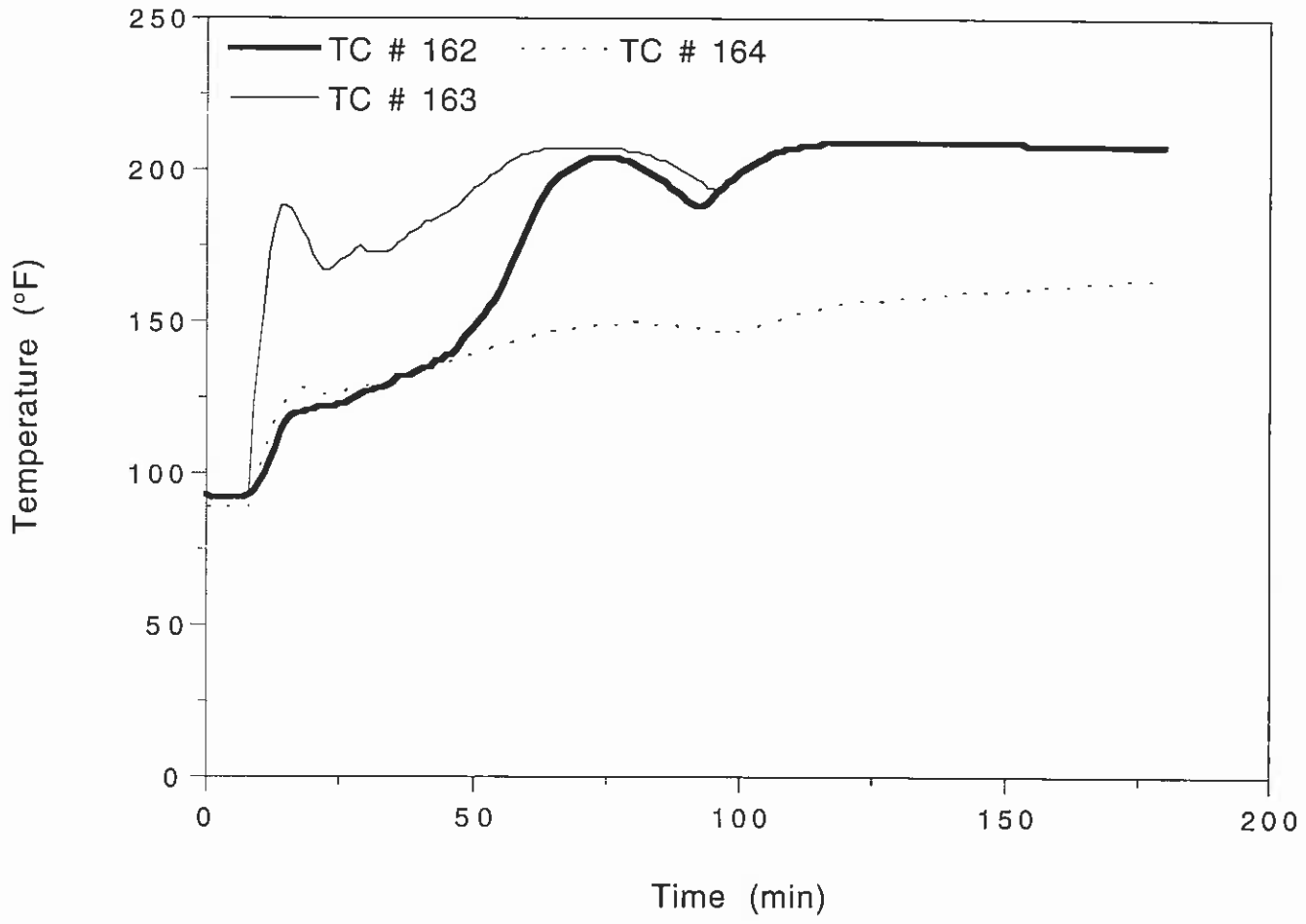
OMEGA POINT LABORATORIES

Peak Seals, Inc.
Project No. 14540-99417
24" Tray Bare #8 Temperatures



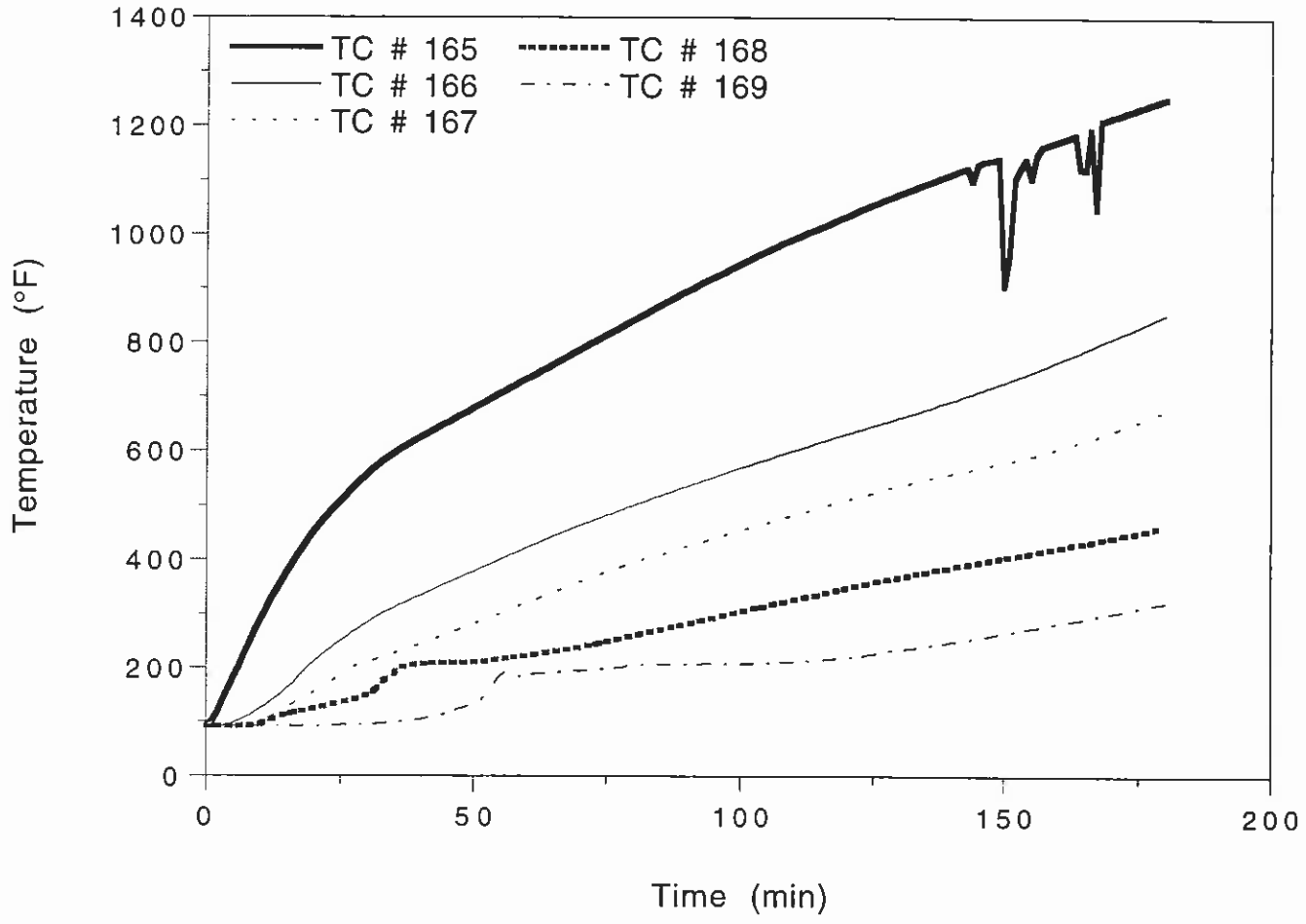
OMEGA POINT LABORATORIES

Peak Seals, Inc.
Project No. 14540-99417
24" Tray Bare #8 Temperatures



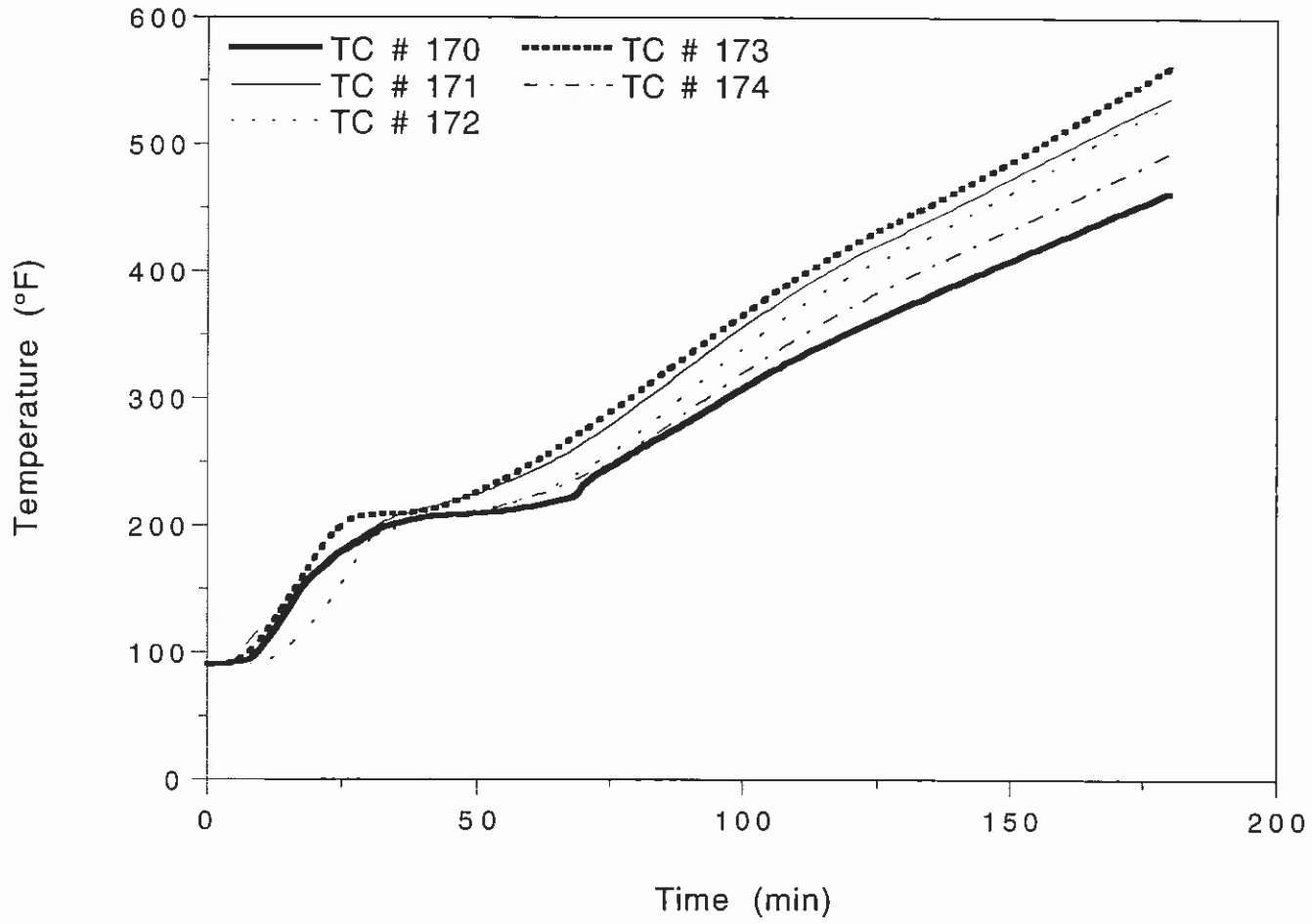
OMEGA POINT LABORATORIES

Peak Seals, Inc.
Project No. 14540-99417
Support Temperatures 24" Tray Side



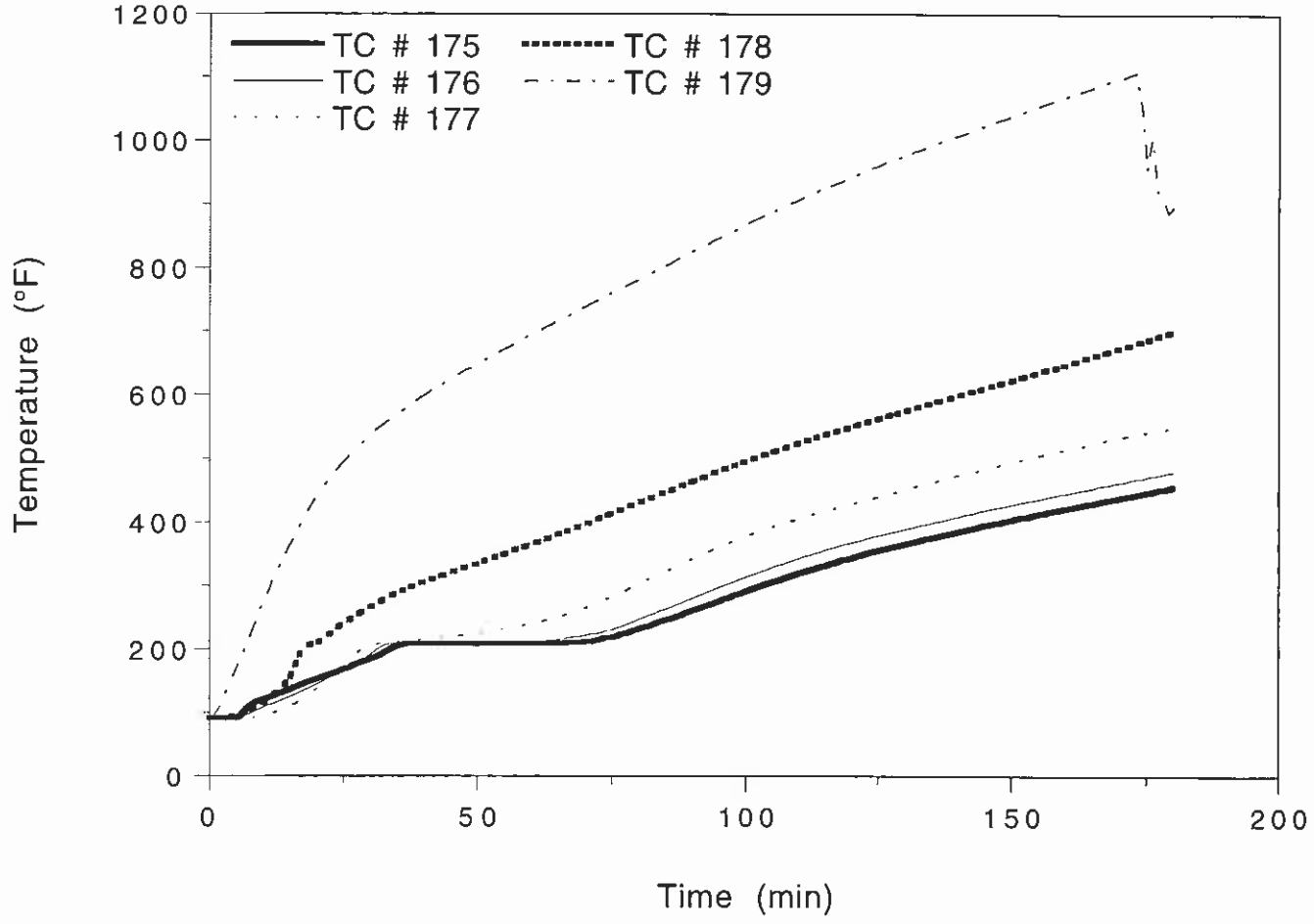
OMEGA POINT LABORATORIES

Peak Seals, Inc.
Project No. 14540-99417
Support Temperatures Center Section



OMEGA POINT LABORATORIES

Peak Seals, Inc.
Project No. 14540-99417
Support Temperatures 6" Tray Side



OMEGA POINT LABORATORIES

Peak Seals, Inc. Project No. 14540-99417 August 21, 1997

Time (min)	E119 Std (°F)	Furnace Avg (°F)	6" Tray Front Rail Avg (°F)	6" Tray Front Rail Max (°F)	6" Tray Rear Rail Avg (°F)	6" Tray Rear Rail Max (°F)	6" Tray #8 Avg (°F)
0	68	87	92	93	93	94	93
1	254	235	92	93	93	94	93
2	441	492	92	93	93	94	93
3	627	736	92	93	93	94	93
4	814	806	92	93	93	94	93
5	1000	887	92	93	93	94	93
6	1060	1018	92	93	93	94	93
7	1120	1120	92	93	93	94	92
8	1180	1153	92	93	93	94	92
9	1240	1195	92	93	93	94	92
10	1300	1255	92	93	93	94	92
11	1320	1299	92	93	93	94	92
12	1340	1318	92	93	93	94	93
13	1359	1361	92	93	93	95	93
14	1379	1388	92	94	93	96	93
15	1399	1388	92	94	93	97	93
16	1412	1436	92	95	93	97	93
17	1424	1439	92	95	93	98	93
18	1437	1463	93	96	93	99	93
19	1449	1462	93	97	93	100	93
20	1462	1442	93	97	93	100	93
21	1472	1444	93	98	93	101	93
22	1481	1473	93	99	93	102	93
23	1491	1510	93	100	93	103	93
24	1500	1512	93	101	94	104	93
25	1510	1506	93	101	94	105	93
26	1518	1507	93	102	94	106	93
27	1526	1524	94	103	94	106	93
28	1534	1541	94	104	94	107	93
29	1542	1554	94	106	94	108	93
30	1550	1555	94	107	94	109	93
31	1557	1553	94	108	95	110	94
32	1564	1551	95	110	95	111	94
33	1570	1564	95	112	95	112	94
34	1577	1582	95	113	95	113	94
35	1584	1584	96	115	96	114	94
36	1590	1587	96	117	96	115	94
37	1596	1595	96	118	96	116	95
38	1601	1604	97	120	97	118	95
39	1607	1612	97	121	97	119	95
40	1613	1615	98	123	98	121	95
41	1618	1615	98	124	98	122	96
42	1623	1626	99	125	99	123	96
43	1628	1637	99	127	99	125	96
44	1633	1634	100	128	100	126	97
45	1638	1632	100	130	100	127	97
46	1643	1645	101	131	101	128	98
47	1647	1648	102	132	102	130	98
48	1652	1651	102	134	103	131	99
49	1656	1654	103	136	103	133	99
50	1661	1658	104	137	104	134	100
51	1665	1662	105	139	105	135	101
52	1669	1666	106	140	106	137	101
53	1673	1674	107	141	107	138	102
54	1677	1677	108	143	108	140	103
55	1681	1678	109	144	109	142	104
56	1685	1681	110	145	111	143	105
57	1689	1684	111	146	112	145	106
58	1692	1689	112	147	113	146	107
59	1696	1696	114	148	115	148	108
60	1700	1703	115	150	116	149	110
61	1704	1702	117	151	118	151	111
62	1707	1704	118	152	119	152	112
63	1711	1707	120	153	121	153	114
64	1714	1710	122	154	123	155	115
65	1718	1716	124	155	125	156	117
66	1721	1719	126	157	126	157	119
67	1725	1729	128	158	128	158	121
68	1728	1737	130	159	130	160	123
69	1732	1737	132	160	133	161	125
70	1735	1736	134	161	135	163	127

OMEGA POINT LABORATORIES

Peak Seals, Inc. Project No. 14540-99417 August 21, 1997

Time (min)	E119 Std (°F)	Furnace Avg (°F)	6" Tray Front Rail Avg (°F)	6" Tray Front Rail Max (°F)	6" Tray Rear Rail Avg (°F)	6" Tray Rear Rail Max (°F)	6" Tray #8 Avg (°F)
71	1738	1736	136	163	137	164	129
72	1741	1738	139	164	139	166	132
73	1744	1741	141	166	142	168	134
74	1747	1744	143	167	144	170	136
75	1750	1747	146	169	147	172	139
76	1753	1751	148	171	149	173	141
77	1756	1753	151	173	152	175	144
78	1759	1755	153	174	154	177	147
79	1762	1759	156	176	157	179	149
80	1765	1762	158	178	159	181	152
81	1768	1764	161	180	161	182	154
82	1771	1772	163	181	164	184	156
83	1773	1775	165	183	166	186	159
84	1776	1776	167	185	168	188	161
85	1779	1779	169	187	170	190	164
86	1782	1780	171	188	172	191	166
87	1784	1781	173	190	174	193	168
88	1787	1784	175	192	176	195	170
89	1789	1789	177	194	178	197	172
90	1792	1792	179	195	180	199	173
91	1794	1793	180	197	182	201	175
92	1797	1794	182	199	183	203	177
93	1799	1796	184	201	185	204	179
94	1802	1798	185	203	186	206	180
95	1804	1802	187	204	188	208	182
96	1806	1809	188	206	189	210	183
97	1808	1813	189	208	191	211	185
98	1811	1805	191	209	192	213	186
99	1813	1811	192	211	193	214	187
100	1815	1822	193	212	194	216	189
101	1817	1820	194	214	195	217	190
102	1819	1819	195	215	196	218	191
103	1822	1821	196	216	197	220	192
104	1824	1825	197	218	198	221	193
105	1826	1830	198	219	199	222	194
106	1828	1835	199	220	200	223	195
107	1830	1826	200	221	201	224	196
108	1831	1825	201	222	201	226	197
109	1833	1827	201	224	202	227	197
110	1835	1827	202	225	203	228	198
111	1837	1834	203	226	204	229	199
112	1838	1838	203	227	204	230	199
113	1840	1835	204	228	205	231	200
114	1841	1837	205	229	205	232	200
115	1843	1839	205	230	206	233	201
116	1844	1842	206	231	206	235	201
117	1846	1842	206	231	207	236	202
118	1847	1844	206	232	207	237	202
119	1849	1846	207	233	208	238	203
120	1850	1851	207	234	208	239	203
121	1851	1850	208	234	209	240	203
122	1853	1851	208	235	209	241	204
123	1854	1854	208	236	210	242	204
124	1855	1853	209	237	210	244	204
125	1856	1855	209	238	210	245	205
126	1858	1854	209	238	211	246	205
127	1859	1857	210	239	211	247	205
128	1860	1857	210	240	212	249	205
129	1861	1861	210	241	212	250	205
130	1863	1865	210	242	213	251	206
131	1864	1865	211	243	213	252	206
132	1865	1864	211	243	213	254	206
133	1866	1867	211	244	214	255	206
134	1868	1865	211	245	214	256	206
135	1869	1867	212	246	215	258	206
136	1870	1870	212	247	216	259	207
137	1871	1871	212	248	216	260	207
138	1873	1873	213	249	217	261	207
139	1874	1875	213	250	217	263	207
140	1875	1876	213	252	218	264	207
141	1876	1877	214	253	218	266	208

OMEGA POINT LABORATORIES

Peak Seals, Inc. Project No. 14540-99417 August 21, 1997

Time (min)	E119 Std (°F)	Furnace Avg (°F)	6" Tray Front Rail Avg (°F)	6" Tray Front Rail Max (°F)	6" Tray Rear Rail Avg (°F)	6" Tray Rear Rail Max (°F)	6" Tray #8 Avg (°F)
142	1878	1877	214	254	219	267	208
143	1879	1880	215	255	219	268	208
144	1880	1882	215	257	220	270	208
145	1881	1882	216	258	221	271	209
146	1883	1883	216	259	221	273	209
147	1884	1885	217	260	222	274	209
148	1885	1886	218	262	223	276	209
149	1886	1887	218	263	224	277	210
150	1888	1889	219	265	225	279	210
151	1889	1891	220	266	225	281	211
152	1890	1890	221	268	226	282	211
153	1891	1891	222	269	227	284	212
154	1893	1893	222	271	228	286	212
155	1894	1895	223	272	229	287	213
156	1895	1896	224	274	230	289	213
157	1896	1896	225	275	231	291	214
158	1898	1896	226	277	232	292	215
159	1899	1897	227	279	234	294	217
160	1900	1899	228	280	235	296	218
161	1901	1902	230	282	236	298	219
162	1903	1903	231	284	237	300	221
163	1904	1904	232	286	238	301	222
164	1905	1905	233	288	240	303	223
165	1906	1907	234	289	241	305	225
166	1908	1907	236	291	242	307	226
167	1909	1909	237	293	244	309	228
168	1910	1910	238	295	245	310	229
169	1911	1911	239	297	247	312	231
170	1913	1911	241	299	248	314	232
171	1914	1911	242	301	249	316	233
172	1915	1912	244	303	251	318	235
173	1916	1912	245	305	253	320	236
174	1918	1914	247	307	254	322	238
175	1919	1917	248	309	256	324	239
176	1920	1918	250	311	257	325	240
177	1921	1919	251	313	259	327	242
178	1923	1920	253	315	260	329	244
179	1924	1920	255	317	262	331	245
180	1925	1920	256	319	264	333	247
Max Temp:			256	319	264	333	247
Max Allowed:			342	417	343	418	343

OMEGA POINT LABORATORIES

Peak Seals, Inc. Project No. 14540-99417 August 21, 1997

Time (min)	6" Tray #8 Max (°F)	24" Tray Front Rail Avg (°F)	24" Tray Front Rail Max (°F)	24" Tray Rear Rail Avg (°F)	24" Tray Rear Rail Max (°F)	24" Tray #8 Avg (°F)
0	93	92	94	93	93	92
1	93	92	94	93	93	92
2	93	92	94	93	93	92
3	93	92	94	93	93	92
4	93	92	94	93	93	92
5	93	92	94	93	93	92
6	93	92	94	93	93	92
7	93	92	94	93	93	92
8	93	92	93	93	93	93
9	93	93	104	93	93	94
10	93	94	146	93	93	95
11	93	96	195	93	104	96
12	93	96	198	95	141	96
13	93	97	199	96	163	97
14	93	97	200	96	175	98
15	93	97	201	97	176	98
16	93	97	200	97	175	98
17	94	97	197	97	174	98
18	94	97	187	97	171	98
19	94	97	180	97	169	98
20	94	97	173	97	166	98
21	94	97	169	97	164	98
22	95	97	166	97	162	98
23	95	97	166	97	161	98
24	95	97	169	97	161	98
25	96	98	172	97	161	98
26	96	98	175	97	161	98
27	96	98	176	97	162	98
28	97	98	180	97	163	98
29	97	99	182	98	164	98
30	97	99	178	98	165	98
31	98	99	178	98	165	98
32	98	99	177	99	166	99
33	99	99	176	99	166	99
34	99	99	177	100	166	99
35	100	100	178	100	167	99
36	100	100	181	101	168	99
37	101	101	182	102	169	100
38	102	101	185	102	170	100
39	103	102	186	103	172	100
40	104	102	187	104	173	101
41	104	103	188	105	180	101
42	105	103	189	105	186	102
43	106	104	189	106	191	102
44	107	105	191	107	194	103
45	108	106	192	108	196	103
46	109	106	193	108	198	104
47	110	107	195	109	200	105
48	111	108	198	110	202	106
49	112	109	200	111	203	107
50	113	110	201	112	203	107
51	114	111	201	113	203	108
52	115	112	202	114	203	110
53	116	113	203	115	203	112
54	117	114	203	116	202	113
55	118	116	204	118	201	114
56	119	117	204	119	200	115
57	121	118	205	120	200	117
58	122	119	205	121	201	118
59	123	121	205	123	202	119
60	124	122	205	124	203	121
61	125	123	206	126	203	122
62	127	125	206	127	204	124
63	129	127	207	129	204	126
64	131	128	207	130	205	128
65	133	130	207	132	205	129
66	136	132	207	133	205	131
67	138	133	207	135	206	132
68	141	135	207	137	206	134
69	144	137	207	138	206	136
70	147	139	207	140	206	137

OMEGA POINT LABORATORIES

Peak Seals, Inc. Project No. 14540-99417 August 21, 1997

Time (min)	6" Tray #8 Max (°F)	24" Tray Front Rail Avg (°F)	24" Tray Front Rail Max (°F)	24" Tray Rear Rail Avg (°F)	24" Tray Rear Rail Max (°F)	24" Tray #8 Avg (°F)
71	150	140	207	142	206	139
72	153	142	207	144	206	141
73	156	144	207	145	206	143
74	159	146	207	147	206	144
75	161	148	206	149	206	146
76	163	150	206	151	206	148
77	165	152	206	153	206	150
78	168	154	206	155	206	152
79	169	156	206	157	206	154
80	171	158	205	159	206	156
81	173	160	205	161	206	158
82	174	162	204	164	205	161
83	176	164	204	166	205	163
84	177	166	203	168	205	165
85	180	168	202	170	204	167
86	181	170	202	172	203	169
87	183	173	201	174	203	172
88	184	175	200	176	202	174
89	186	177	199	179	201	176
90	187	180	199	181	201	178
91	188	182	198	183	200	180
92	189	184	197	185	200	183
93	190	186	199	187	199	185
94	190	188	200	190	201	187
95	191	191	202	192	203	189
96	192	193	204	194	205	191
97	193	194	205	196	206	193
98	195	196	207	197	208	194
99	197	198	209	199	210	196
100	199	199	210	201	211	197
101	200	201	211	202	212	199
102	201	202	212	203	214	200
103	202	203	214	204	215	201
104	203	204	215	205	216	202
105	205	205	216	206	217	203
106	206	206	217	207	218	203
107	207	206	218	207	219	204
108	208	207	219	208	220	205
109	209	208	220	208	220	205
110	210	208	221	209	221	206
111	210	208	222	209	222	206
112	208	209	223	209	223	206
113	207	209	224	210	224	206
114	207	209	225	210	224	206
115	208	210	226	210	225	207
116	208	210	228	210	226	207
117	208	210	229	211	227	207
118	208	210	230	211	228	207
119	208	210	231	211	228	207
120	208	211	233	211	229	207
121	208	211	234	211	230	207
122	208	211	235	212	231	207
123	208	211	237	212	232	207
124	209	212	238	212	233	207
125	209	212	240	213	234	207
126	209	212	241	213	235	207
127	209	213	242	213	236	207
128	209	213	244	214	238	207
129	210	214	245	214	239	207
130	210	214	247	215	240	207
131	210	215	248	216	241	207
132	210	216	249	216	243	207
133	211	216	250	217	244	207
134	212	217	252	217	245	207
135	213	217	253	218	247	207
136	213	218	254	219	248	207
137	214	219	256	219	249	207
138	215	219	257	220	251	207
139	216	220	259	221	252	207
140	217	221	260	222	253	207
141	218	222	261	223	255	207

OMEGA POINT LABORATORIES

Peak Seals, Inc. Project No. 14540-99417 August 21, 1997

Time (min)	6" Tray #8 Max (°F)	24" Tray Front Rail Avg (°F)	24" Tray Front Rail Max (°F)	24" Tray Rear Rail Avg (°F)	24" Tray Rear Rail Max (°F)	24" Tray #8 Avg (°F)
142	219	222	263	223	256	207
143	221	223	264	224	257	207
144	223	224	265	225	259	207
145	224	225	267	226	260	207
146	226	226	268	227	261	207
147	228	227	270	228	263	207
148	230	228	271	228	264	207
149	232	229	273	229	265	208
150	234	230	274	230	266	208
151	237	231	276	231	268	208
152	239	232	277	232	269	208
153	241	233	279	233	270	209
154	244	235	280	234	272	209
155	246	236	282	235	273	210
156	248	237	284	236	274	210
157	251	238	285	237	276	210
158	253	239	287	238	277	210
159	255	241	289	239	278	211
160	257	242	290	240	280	211
161	260	243	292	242	281	212
162	262	244	293	243	283	212
163	264	246	295	244	284	213
164	266	247	297	245	286	213
165	269	248	298	247	287	214
166	271	250	300	248	289	214
167	274	251	301	249	291	215
168	276	252	303	251	292	216
169	279	254	305	252	294	216
170	281	255	307	254	296	217
171	283	257	309	255	297	218
172	286	258	311	257	299	219
173	288	260	312	258	301	220
174	290	261	314	260	303	222
175	292	263	316	261	305	223
176	294	265	318	263	307	224
177	297	266	320	264	309	226
178	299	268	322	266	311	228
179	301	269	323	268	313	229
180	303	271	325	269	315	231
Max Temp:	303	271	325	269	315	231
Max Allowed:	418	342	417	343	418	342

OMEGA POINT LABORATORIES

Peak Seals, Inc. Project No. 14540-99417 August 21, 1997

Time (min)	24" Tray #8 Max (°F)	TC # 1 (°F)	TC # 2 (°F)	TC # 3 (°F)	TC # 4 (°F)	TC # 5 (°F)	TC # 6 (°F)	TC # 7 (°F)	TC # 8 (°F)	TC # 9 (°F)	TC # 10 (°F)
0	93	91	93	93	93	93	93	92	92	92	92
1	93	91	92	93	93	93	93	92	92	92	92
2	93	91	92	93	93	93	93	92	92	92	92
3	93	91	93	93	93	93	93	92	92	92	92
4	93	91	92	93	93	93	93	92	92	92	92
5	93	91	92	93	93	93	93	92	92	92	92
6	93	91	92	93	93	93	92	92	92	92	92
7	93	91	92	93	93	93	93	92	92	92	92
8	93	91	92	93	93	93	93	92	92	92	92
9	124	91	92	93	93	93	92	92	92	92	92
10	141	91	92	93	93	93	93	92	92	92	92
11	157	91	92	93	93	93	92	92	92	92	92
12	173	91	92	93	93	93	92	92	92	92	92
13	182	91	92	93	93	93	92	92	92	92	92
14	188	92	92	93	93	93	92	92	92	92	92
15	188	92	93	93	93	93	92	92	92	92	92
16	187	92	92	93	93	93	92	92	92	92	92
17	184	92	93	93	93	93	92	92	92	92	92
18	180	93	93	93	93	93	92	92	92	92	92
19	177	93	93	93	93	93	92	92	92	92	92
20	172	94	93	93	93	93	92	92	92	92	92
21	169	94	93	93	93	93	92	92	92	92	92
22	167	94	93	93	93	93	92	92	92	92	92
23	167	95	93	93	93	93	92	92	92	92	92
24	168	95	93	93	93	93	92	92	92	92	92
25	170	96	94	93	93	93	92	92	92	92	92
26	171	96	94	93	93	93	92	92	92	92	92
27	172	97	94	93	93	93	92	92	92	92	92
28	174	97	94	93	93	93	93	92	92	92	92
29	175	98	94	93	93	93	93	92	92	92	92
30	173	98	94	93	93	93	93	92	92	92	92
31	173	98	95	93	93	93	93	92	92	92	92
32	173	99	95	93	93	93	93	93	92	93	93
33	173	100	95	93	93	93	93	93	92	93	93
34	173	100	95	93	93	93	93	93	92	93	93
35	174	101	96	93	93	93	93	93	93	93	93
36	176	101	96	93	93	93	93	93	93	93	93
37	177	102	96	94	93	93	93	93	93	93	94
38	179	102	96	94	93	93	93	93	93	93	94
39	180	103	97	94	93	93	93	93	93	94	94
40	181	104	97	94	93	93	94	93	93	94	95
41	183	104	97	94	93	94	94	94	93	94	95
42	183	105	98	94	94	94	94	94	93	95	96
43	184	106	98	94	94	94	94	94	94	95	96
44	185	107	99	95	94	94	95	94	94	95	97
45	186	108	99	95	94	95	95	95	94	96	97
46	187	109	100	95	94	95	95	95	94	96	98
47	188	110	100	95	94	95	95	95	95	97	98
48	190	111	101	95	95	96	96	96	95	97	99
49	192	112	102	96	95	96	96	96	95	98	100
50	194	113	103	96	95	97	97	97	96	99	101
51	195	115	103	96	95	97	97	97	96	99	102
52	196	116	104	97	96	98	98	98	97	100	102
53	198	117	105	97	96	99	99	99	98	101	103
54	199	118	106	98	97	100	99	99	98	102	104
55	200	120	107	98	97	101	100	100	99	103	105
56	202	121	108	99	98	102	101	101	100	104	106
57	203	122	109	99	98	104	103	103	101	105	108
58	204	123	110	100	99	105	104	104	101	106	109
59	205	125	112	101	100	107	106	106	103	107	110
60	205	126	113	102	101	108	108	107	104	108	111
61	206	127	114	103	102	110	111	109	105	110	113
62	206	129	115	104	103	112	113	111	106	111	114
63	207	130	117	105	105	114	116	113	108	112	115
64	207	131	118	106	106	117	118	116	109	114	117
65	207	132	120	108	107	119	121	118	111	115	119
66	207	134	121	109	109	121	124	120	113	117	120
67	207	135	123	111	111	124	126	123	114	119	122
68	207	136	125	113	112	126	129	125	116	121	124
69	207	138	126	114	114	129	132	127	118	123	126
70	207	139	128	116	116	131	134	130	120	125	128

OMEGA POINT LABORATORIES

Peak Seals, Inc. Project No. 14540-99417 August 21, 1997

Time 24" (min)	Tray #8 Max (°F)	TC # 1 (°F)	TC # 2 (°F)	TC # 3 (°F)	TC # 4 (°F)	TC # 5 (°F)	TC # 6 (°F)	TC # 7 (°F)	TC # 8 (°F)	TC # 9 (°F)	TC # 10 (°F)
71	207	141	130	118	118	134	137	132	122	127	130
72	207	142	132	120	120	136	140	135	124	129	133
73	207	143	134	122	122	139	142	137	126	132	135
74	207	145	136	124	124	141	145	140	129	134	137
75	207	146	138	126	126	144	147	143	131	137	140
76	207	147	140	128	128	146	150	145	134	139	143
77	207	149	142	130	130	149	152	148	137	142	145
78	207	150	144	133	132	151	155	150	139	145	148
79	206	152	146	135	135	154	157	153	142	147	151
80	206	153	148	138	137	156	160	155	145	150	153
81	206	154	150	141	140	158	162	158	148	153	156
82	205	156	153	143	142	161	164	160	150	156	158
83	205	157	155	146	145	163	166	162	153	158	160
84	204	158	157	149	148	165	169	164	156	160	163
85	203	160	159	152	151	167	171	167	158	163	165
86	203	161	161	155	154	169	173	169	160	165	167
87	202	162	163	157	156	171	175	171	163	167	169
88	201	163	165	160	159	173	177	173	165	169	171
89	200	165	167	163	162	175	179	175	167	171	173
90	199	166	169	165	164	177	181	177	170	173	175
91	198	167	171	168	167	179	183	179	172	175	177
92	197	169	173	170	169	181	184	181	174	177	179
93	196	170	175	173	172	182	186	183	176	179	180
94	195	172	176	175	174	182	187	184	178	181	182
95	196	174	178	177	176	184	189	186	180	183	184
96	196	176	180	179	178	186	190	187	182	184	185
97	198	177	181	180	180	186	191	189	184	186	187
98	199	179	183	182	182	188	192	190	185	187	188
99	200	181	185	184	184	189	193	191	187	188	189
100	201	182	186	185	185	190	194	192	188	190	191
101	202	184	188	187	187	191	195	193	189	191	192
102	203	185	189	189	188	192	196	195	191	192	193
103	204	187	190	190	190	193	197	196	192	193	194
104	205	188	191	191	191	194	198	196	193	194	195
105	206	189	192	192	192	195	198	197	194	195	196
106	207	191	194	193	193	196	199	198	195	196	197
107	207	192	195	194	194	197	200	199	196	197	198
108	208	193	196	195	195	198	200	200	197	198	199
109	208	194	197	196	196	199	201	200	198	199	200
110	208	195	197	197	197	199	202	201	199	199	200
111	208	196	198	198	198	200	202	202	199	200	201
112	209	197	199	199	199	200	203	202	200	201	202
113	209	198	200	200	200	201	203	203	201	201	202
114	209	199	201	200	200	202	204	203	201	202	203
115	209	199	201	201	201	202	204	204	202	203	203
116	209	200	202	202	202	203	205	204	202	203	204
117	209	200	202	202	202	203	205	205	203	204	204
118	209	201	203	203	203	204	206	205	203	204	205
119	209	202	204	203	203	204	206	206	204	205	205
120	209	202	204	204	204	205	206	206	204	205	206
121	209	203	205	204	204	205	207	206	205	206	206
122	209	203	205	205	205	206	207	207	205	206	207
123	209	204	205	205	205	206	208	207	206	206	207
124	210	204	206	206	206	207	208	207	206	207	207
125	210	205	206	206	206	207	208	208	207	207	208
126	210	205	207	206	206	207	209	208	207	207	208
127	210	206	207	207	207	208	209	208	207	207	208
128	210	206	207	207	207	208	210	209	207	208	208
129	210	206	207	207	207	208	210	209	208	208	209
130	210	207	208	207	208	209	210	209	208	208	209
131	210	207	208	208	208	209	211	210	208	208	209
132	211	207	208	208	208	210	211	210	208	208	209
133	211	207	208	208	208	210	212	211	208	209	209
134	211	208	209	208	209	211	212	211	209	209	210
135	211	208	209	209	209	211	213	211	209	209	210
136	211	208	209	209	209	212	214	212	209	209	210
137	212	208	209	209	209	212	214	213	209	209	210
138	212	208	209	209	209	213	215	213	209	209	210
139	213	208	210	209	209	214	215	214	209	209	211
140	213	208	210	209	209	214	216	214	209	210	211
141	213	209	210	210	209	215	217	215	210	210	212

OMEGA POINT LABORATORIES

Peak Seals, Inc. Project No. 14540-99417 August 21, 1997

Time (min)	24" Tray #8 Max (°F)	TC # 1 (°F)	TC # 2 (°F)	TC # 3 (°F)	TC # 4 (°F)	TC # 5 (°F)	TC # 6 (°F)	TC # 7 (°F)	TC # 8 (°F)	TC # 9 (°F)	TC # 10 (°F)
142	213	209	210	210	210	216	218	216	210	210	213
143	214	209	210	210	210	217	219	216	210	210	213
144	213	209	211	211	210	218	219	217	210	211	214
145	214	209	211	211	210	218	220	218	210	211	216
146	214	209	211	212	210	219	221	219	210	212	217
147	217	209	212	212	210	220	222	220	210	213	218
148	220	209	212	213	210	221	223	221	211	213	219
149	223	209	213	214	210	222	224	222	211	214	221
150	227	209	214	215	211	223	225	223	212	215	222
151	231	209	215	215	211	225	226	224	212	216	224
152	235	209	217	216	211	226	227	225	213	218	226
153	238	209	218	217	212	227	229	226	213	219	228
154	240	209	219	218	212	228	230	227	214	221	230
155	243	209	220	219	213	229	231	228	215	222	232
156	244	209	221	221	215	230	232	230	216	223	234
157	246	210	222	222	216	232	234	231	217	225	236
158	247	210	223	223	219	233	235	233	219	227	238
159	250	210	225	224	221	235	236	234	220	228	240
160	252	210	226	226	223	236	238	235	221	230	242
161	254	210	227	227	224	238	239	237	222	232	244
162	256	210	228	228	226	239	241	239	223	233	246
163	258	211	230	230	228	241	243	240	224	235	248
164	260	211	231	231	230	242	244	242	226	236	249
165	262	212	232	233	232	244	246	244	227	238	251
166	264	213	234	235	234	246	248	246	228	240	253
167	267	214	235	236	235	247	249	247	230	241	255
168	269	215	237	238	237	249	251	249	231	243	257
169	270	215	239	239	239	251	253	251	234	245	259
170	271	216	240	241	241	253	255	253	236	248	261
171	272	217	242	242	242	254	257	255	238	250	263
172	274	219	243	244	244	256	259	257	240	252	265
173	276	220	245	246	246	258	260	259	243	255	267
174	278	222	246	247	248	260	262	261	245	257	269
175	279	223	248	249	249	262	264	263	248	259	271
176	280	225	249	251	251	264	266	265	250	262	273
177	282	227	251	252	253	265	268	267	253	264	276
178	284	229	253	254	255	267	270	269	255	267	278
179	285	230	254	256	257	269	273	272	258	269	280
180	287	232	256	258	258	271	275	274	260	272	282
Max Temp:	287	232	256	258	258	271	275	274	260	272	282
Max Allowed:	417	416	418	418	418	418	418	417	417	417	417

OMEGA POINT LABORATORIES

Peak Seals, Inc. Project No. 14540-99417 August 21, 1997

Time (min)	TC # 11 (°F)	TC # 12 (°F)	TC # 13 (°F)	TC # 14 (°F)	TC # 15 (°F)	TC # 16 (°F)	TC # 17 (°F)	TC # 18 (°F)	TC # 19 (°F)	TC # 20 (°F)
0	92	92	92	92	92	92	92	92	92	93
1	92	92	92	92	92	92	92	92	92	93
2	92	92	92	92	92	92	92	92	92	93
3	92	92	92	92	92	92	92	92	92	93
4	92	92	92	92	92	92	92	92	92	93
5	92	92	92	92	92	92	92	92	92	93
6	92	92	92	92	92	92	92	92	92	92
7	92	92	92	92	92	92	92	92	92	93
8	92	92	92	92	92	92	92	92	92	92
9	92	92	92	92	92	92	92	92	92	92
10	92	92	92	92	92	92	92	92	92	92
11	92	92	92	93	92	92	92	92	92	92
12	92	92	92	93	92	92	92	92	92	92
13	92	92	92	93	92	92	92	92	92	92
14	92	92	92	94	92	92	92	92	92	92
15	92	92	93	94	92	92	92	92	92	92
16	92	92	93	95	92	92	92	92	92	92
17	92	92	93	95	92	92	92	92	92	92
18	92	92	93	96	92	92	92	92	92	92
19	92	92	93	97	92	92	92	92	92	92
20	92	92	94	97	93	92	92	92	92	92
21	92	92	94	98	93	92	92	92	92	92
22	92	92	94	99	93	92	92	92	92	92
23	92	93	94	100	93	92	92	92	92	92
24	92	93	95	101	93	92	92	92	92	92
25	92	93	95	101	93	92	92	92	92	92
26	92	93	95	102	94	92	92	92	92	92
27	92	93	96	103	94	93	92	92	92	92
28	93	93	96	104	94	93	92	92	92	92
29	93	93	97	106	94	93	93	92	92	92
30	93	93	97	107	95	93	93	92	92	92
31	93	94	98	108	95	93	93	92	92	92
32	93	94	98	110	95	93	93	92	92	92
33	93	94	99	112	96	94	93	93	92	92
34	94	95	100	113	96	94	93	93	92	93
35	94	95	101	115	97	95	94	93	92	93
36	94	96	101	117	98	95	94	93	92	93
37	95	96	102	118	99	96	94	93	93	93
38	95	97	103	120	100	96	95	94	93	93
39	96	98	104	121	101	97	95	94	93	93
40	96	98	105	123	101	98	96	94	93	93
41	97	99	106	124	102	98	96	95	93	93
42	97	100	107	125	103	99	97	95	93	94
43	98	100	108	127	104	100	98	96	94	94
44	98	101	109	128	105	101	98	96	94	94
45	99	102	110	130	106	102	99	97	94	94
46	100	103	111	131	107	103	100	97	95	95
47	101	104	113	132	108	103	100	98	95	95
48	101	105	114	134	109	104	101	99	95	96
49	102	105	115	136	111	105	102	99	96	96
50	103	107	116	137	112	106	103	100	96	97
51	104	108	118	139	113	108	104	101	97	97
52	105	109	120	140	114	109	105	102	98	98
53	106	110	121	141	116	110	106	103	98	99
54	107	111	123	143	117	111	107	104	99	99
55	109	113	124	144	118	112	108	105	100	100
56	110	114	125	145	120	114	110	106	101	101
57	111	115	127	146	121	115	111	107	102	102
58	112	116	128	147	122	116	112	109	103	104
59	113	117	129	148	123	117	113	110	104	105
60	115	119	131	150	125	118	114	111	105	106
61	116	120	132	151	126	120	116	112	106	108
62	117	122	134	152	127	121	117	114	108	109
63	119	123	135	153	129	122	119	115	109	111
64	120	125	137	154	130	124	120	117	110	112
65	122	126	139	155	131	125	122	118	112	114
66	124	128	140	157	133	127	124	120	113	116
67	125	130	142	158	134	129	125	122	115	118
68	127	131	144	159	136	130	127	124	117	120
69	129	133	146	160	137	132	129	125	119	123
70	131	135	148	161	139	134	131	127	121	125

OMEGA POINT LABORATORIES

Peak Seals, Inc. Project No. 14540-99417 August 21, 1997

Time (min)	TC # 11 (°F)	TC # 12 (°F)	TC # 13 (°F)	TC # 14 (°F)	TC # 15 (°F)	TC # 16 (°F)	TC # 17 (°F)	TC # 18 (°F)	TC # 19 (°F)	TC # 20 (°F)
71	133	137	150	163	140	136	133	130	123	128
72	135	140	152	164	142	138	136	132	125	131
73	138	142	154	166	144	140	138	134	127	135
74	140	144	157	167	146	142	140	137	130	138
75	143	146	159	169	148	144	143	140	133	142
76	145	148	161	171	151	147	145	142	135	145
77	147	151	163	173	153	149	148	145	138	149
78	150	153	165	174	155	152	150	148	141	154
79	152	155	168	176	157	154	153	151	145	158
80	155	157	170	178	159	157	156	154	148	163
81	157	159	172	180	161	159	158	157	151	167
82	160	162	174	181	164	162	161	160	154	171
83	162	164	175	183	166	164	163	162	157	174
84	164	166	177	185	168	166	166	165	160	177
85	166	168	179	187	170	168	168	168	164	180
86	168	170	181	188	172	170	171	170	166	182
87	170	172	183	190	174	172	173	172	169	184
88	172	174	185	192	176	175	175	174	172	186
89	173	175	186	194	178	177	177	176	175	187
90	175	177	188	195	179	178	179	178	177	188
91	177	179	190	197	181	180	181	180	180	190
92	179	181	191	199	183	182	183	182	183	191
93	181	183	193	201	184	184	184	185	185	192
94	182	185	194	203	186	185	186	187	186	193
95	184	186	196	204	188	187	188	189	188	194
96	186	188	197	206	189	188	190	190	189	196
97	187	189	198	208	190	190	191	191	190	197
98	188	190	199	209	192	191	192	193	192	198
99	190	192	201	211	193	192	193	194	193	199
100	191	193	202	212	194	193	194	195	194	200
101	192	194	203	214	195	194	196	196	195	201
102	193	195	204	215	196	196	197	197	196	202
103	195	196	205	216	197	197	197	197	197	203
104	196	197	206	218	198	198	198	198	198	204
105	196	198	207	219	199	199	199	199	199	204
106	197	199	208	220	200	199	200	200	200	205
107	198	200	208	221	200	200	200	200	201	205
108	199	201	209	222	201	201	201	201	202	206
109	200	202	210	224	202	201	202	202	202	206
110	201	202	211	225	202	202	202	202	203	207
111	201	203	211	226	203	202	203	203	203	207
112	202	204	212	227	203	203	203	203	204	207
113	202	204	213	228	204	203	204	204	204	208
114	203	205	213	229	205	204	204	204	205	208
115	203	205	214	230	205	204	205	205	205	208
116	204	206	215	231	206	205	205	205	206	209
117	205	206	215	231	206	205	206	206	206	209
118	205	207	216	232	207	206	206	206	206	209
119	205	207	217	233	207	206	206	206	207	209
120	206	208	218	234	207	206	207	206	207	209
121	206	208	218	234	208	207	207	207	207	209
122	207	209	219	235	208	207	207	207	207	210
123	207	209	220	236	208	207	207	207	208	210
124	207	209	220	237	209	207	208	207	208	210
125	208	210	221	238	209	208	208	208	208	210
126	208	210	222	238	210	208	208	208	208	210
127	208	210	222	239	210	208	208	208	208	210
128	208	211	223	240	210	208	208	208	208	210
129	209	211	224	241	211	209	209	208	209	210
130	209	211	224	242	211	209	209	208	209	210
131	209	212	225	243	212	209	209	209	209	210
132	209	212	226	243	212	209	209	209	209	210
133	210	213	227	244	213	209	209	209	209	210
134	210	213	227	245	213	209	209	209	209	210
135	211	214	228	246	214	209	209	209	209	210
136	211	215	229	247	214	210	210	209	209	210
137	212	216	230	248	215	210	210	209	209	210
138	213	217	231	249	215	210	210	209	209	210
139	214	218	232	250	216	210	210	209	209	210
140	215	220	234	252	217	210	210	209	209	210
141	216	221	235	253	218	211	210	209	209	210

OMEGA POINT LABORATORIES

Peak Seals, Inc. Project No. 14540-99417 August 21, 1997

Time (min)	TC # 11 (°F)	TC # 12 (°F)	TC # 13 (°F)	TC # 14 (°F)	TC # 15 (°F)	TC # 16 (°F)	TC # 17 (°F)	TC # 18 (°F)	TC # 19 (°F)	TC # 20 (°F)
142	217	223	236	254	218	211	211	210	209	210
143	219	224	237	255	219	211	211	210	209	210
144	220	226	239	257	220	212	211	210	210	210
145	222	228	240	258	221	212	212	210	210	210
146	224	230	241	259	222	213	212	210	210	210
147	225	232	243	260	223	214	213	210	210	210
148	227	233	245	262	225	215	214	210	210	210
149	229	235	246	263	226	217	215	210	210	210
150	231	237	248	265	228	218	216	210	210	211
151	233	239	249	266	229	220	217	210	210	211
152	235	241	251	268	231	221	218	210	210	211
153	237	243	253	269	232	223	219	210	210	212
154	239	245	254	271	234	224	220	210	210	213
155	241	247	256	272	236	226	221	211	210	213
156	243	249	258	274	237	227	222	211	210	214
157	245	251	259	275	239	229	223	211	210	215
158	247	252	261	277	241	230	225	211	211	215
159	248	254	263	279	242	232	226	211	211	216
160	250	256	265	280	244	233	227	212	211	216
161	252	258	266	282	245	235	229	212	211	217
162	254	260	268	284	247	237	230	213	211	217
163	256	262	270	286	249	239	232	216	211	218
164	258	264	272	288	251	241	233	218	211	219
165	260	266	274	289	253	243	235	219	211	219
166	262	268	276	291	255	245	236	221	211	220
167	264	270	278	293	256	247	238	223	211	221
168	266	272	280	295	258	249	240	225	212	221
169	268	274	282	297	260	251	242	227	213	222
170	270	276	284	299	262	252	243	228	214	223
171	272	278	286	301	264	254	245	230	215	223
172	274	280	288	303	266	256	247	232	216	224
173	276	282	290	305	268	258	249	234	217	225
174	278	284	292	307	270	260	250	236	218	226
175	280	286	294	309	272	262	252	237	220	227
176	282	288	296	311	274	264	254	239	221	228
177	284	290	298	313	276	266	256	241	222	229
178	286	292	300	315	278	268	258	243	224	231
179	288	294	302	317	280	270	260	245	225	232
180	290	296	304	319	282	272	262	247	226	233
Max Temp:	290	296	304	319	282	272	262	247	226	233
Max Allowed:	417	417	417	417	417	417	417	417	417	418

OMEGA POINT LABORATORIES

Peak Seals, Inc. Project No. 14540-99417 August 21, 1997

Time (min)	TC # 21 (°F)	TC # 22 (°F)	TC # 23 (°F)	TC # 24 (°F)	TC # 25 (°F)	TC # 26 (°F)	TC # 27 (°F)	TC # 28 (°F)	TC # 29 (°F)	TC # 30 (°F)
0	93	93	93	93	93	92	91	92	93	93
1	93	93	93	93	93	92	91	92	93	93
2	93	93	93	93	93	92	91	92	93	93
3	93	93	93	93	93	92	91	92	93	93
4	93	93	93	93	93	92	91	92	93	93
5	93	93	93	93	93	92	91	92	93	93
6	93	93	93	93	93	92	91	92	93	93
7	93	93	93	93	93	92	91	92	93	93
8	93	93	93	93	93	92	91	92	93	93
9	93	93	93	93	93	92	91	92	93	93
10	93	93	93	93	93	92	91	92	93	93
11	93	93	93	93	93	92	91	92	93	93
12	93	93	93	93	93	92	91	92	93	93
13	93	93	93	93	93	92	91	92	93	93
14	93	93	93	93	93	92	91	92	93	93
15	93	93	93	93	93	92	91	92	93	93
16	93	93	93	93	93	92	91	93	93	93
17	93	93	93	93	93	92	91	93	93	93
18	93	93	93	93	93	92	91	93	93	93
19	93	93	93	93	93	92	92	94	93	93
20	93	93	93	93	93	92	92	94	93	93
21	93	93	93	93	93	92	92	95	93	93
22	93	93	93	93	93	93	92	95	93	93
23	93	93	93	93	93	93	93	96	94	93
24	93	93	93	93	93	94	93	96	94	93
25	93	93	93	93	93	94	94	96	94	93
26	93	93	93	93	93	95	95	97	94	93
27	93	93	93	93	93	96	96	97	94	93
28	93	93	93	93	93	97	97	97	94	93
29	93	93	93	93	93	98	97	98	95	93
30	93	93	93	93	94	99	98	98	95	93
31	93	93	93	93	94	100	99	99	95	93
32	93	93	93	93	94	101	101	99	95	94
33	93	93	93	93	94	102	102	99	95	94
34	93	93	93	93	95	103	103	100	96	94
35	93	93	93	93	95	104	104	100	96	94
36	93	93	93	93	95	105	105	101	96	94
37	93	93	93	94	96	106	106	102	96	94
38	93	93	94	94	96	108	107	102	97	94
39	93	93	94	94	96	109	108	103	97	94
40	93	94	94	94	97	110	109	103	97	94
41	94	94	94	94	97	111	110	104	98	95
42	94	94	94	94	98	112	111	105	98	95
43	94	94	94	95	99	113	112	106	99	95
44	94	94	95	95	99	114	113	107	99	95
45	94	94	95	95	100	116	114	108	100	95
46	95	95	95	95	101	117	115	109	100	96
47	95	95	96	96	101	119	117	110	101	96
48	95	95	96	96	102	120	118	111	102	96
49	96	96	96	97	103	122	119	113	103	97
50	96	96	97	97	104	123	120	114	103	97
51	97	97	97	98	105	125	122	115	104	97
52	98	97	98	98	106	127	123	116	105	98
53	98	98	98	99	108	129	125	117	106	98
54	99	99	99	99	110	131	126	119	107	99
55	100	99	100	100	112	133	128	120	108	100
56	101	100	101	101	115	135	129	121	109	100
57	102	101	101	102	119	137	130	122	110	101
58	103	102	102	103	122	139	132	124	111	102
59	105	104	103	105	125	141	133	125	112	103
60	106	105	105	107	128	143	135	126	114	104
61	108	106	106	110	131	145	136	127	115	105
62	109	108	108	113	134	147	137	128	116	106
63	111	110	110	117	137	148	139	130	117	107
64	113	112	113	120	139	150	140	131	119	109
65	115	114	117	123	142	152	141	132	120	110
66	117	118	121	127	144	153	143	133	122	111
67	119	121	125	130	147	155	144	135	123	113
68	122	125	129	133	149	156	145	136	125	115
69	125	129	132	136	152	158	146	137	126	116
70	128	134	136	140	154	159	148	139	128	118

OMEGA POINT LABORATORIES

Peak Seals, Inc. Project No. 14540-99417 August 21, 1997

Time (min)	TC # 21 (°F)	TC # 22 (°F)	TC # 23 (°F)	TC # 24 (°F)	TC # 25 (°F)	TC # 26 (°F)	TC # 27 (°F)	TC # 28 (°F)	TC # 29 (°F)	TC # 30 (°F)
71	132	138	140	143	157	161	149	140	130	120
72	136	142	143	146	159	162	150	141	131	122
73	140	146	147	149	161	163	152	143	133	124
74	144	150	150	152	163	165	154	144	135	126
75	147	154	153	155	165	166	155	145	137	128
76	151	158	157	157	167	168	157	146	139	130
77	155	161	159	160	169	169	158	148	141	132
78	159	164	162	162	171	170	160	149	143	135
79	163	167	165	164	172	172	162	150	145	137
80	166	170	168	166	174	173	163	151	147	140
81	169	173	170	168	176	174	165	153	149	143
82	173	175	172	170	177	176	166	154	151	145
83	177	178	174	172	178	177	168	155	154	148
84	180	180	176	174	180	178	170	157	156	151
85	182	182	177	175	181	179	171	158	158	153
86	184	183	179	177	182	180	173	159	160	156
87	186	185	180	178	183	181	174	161	163	159
88	188	186	182	180	184	182	175	162	165	161
89	189	188	183	181	184	183	176	163	167	164
90	191	189	184	182	185	184	177	165	169	166
91	192	190	185	183	186	185	179	167	171	169
92	193	191	187	185	187	186	180	169	173	171
93	194	192	188	185	188	187	181	171	175	173
94	196	193	189	186	189	188	182	172	176	176
95	197	194	190	187	190	188	183	175	178	178
96	198	196	191	189	190	189	184	176	180	180
97	198	196	192	190	191	190	185	178	182	181
98	199	197	192	191	192	191	186	180	183	183
99	200	198	194	192	193	192	188	182	185	185
100	201	199	194	193	194	193	189	183	186	187
101	201	200	195	194	195	194	190	185	188	188
102	202	201	196	195	195	195	191	186	189	189
103	203	201	197	196	196	196	192	188	190	191
104	203	202	198	196	197	197	193	189	192	192
105	204	202	199	197	198	198	194	190	193	193
106	204	203	199	198	199	198	195	191	194	194
107	205	203	200	199	199	199	196	192	195	195
108	205	204	201	200	200	200	197	194	196	196
109	206	204	202	200	201	200	198	195	196	197
110	206	205	202	201	201	201	198	196	197	198
111	206	205	203	201	202	202	199	196	198	199
112	207	206	203	202	202	202	200	197	199	199
113	207	206	204	203	203	203	200	198	200	200
114	207	206	204	203	203	203	201	199	200	201
115	207	207	204	203	204	203	201	200	201	201
116	208	207	205	204	204	204	202	201	202	202
117	208	207	205	204	204	204	202	201	202	203
118	208	207	205	205	205	205	203	202	203	203
119	208	208	206	205	205	205	203	202	203	204
120	208	208	206	205	205	205	204	203	204	204
121	209	208	206	206	206	206	204	204	205	205
122	209	208	206	206	206	206	204	204	205	205
123	209	208	206	206	206	206	205	205	205	206
124	209	209	207	206	206	206	205	205	206	206
125	209	209	207	207	207	207	205	206	206	207
126	209	209	207	207	207	207	205	206	207	207
127	209	209	207	207	207	207	206	206	207	207
128	210	209	207	207	207	207	206	207	208	208
129	210	209	207	207	207	207	206	207	208	208
130	210	209	208	208	208	208	206	207	208	208
131	210	209	208	208	208	208	206	208	209	208
132	210	209	208	208	208	208	207	208	209	209
133	210	210	208	208	208	208	207	208	209	209
134	210	210	208	208	208	208	207	208	210	209
135	210	210	208	208	208	208	207	208	211	210
136	211	210	208	208	208	208	207	209	211	210
137	211	210	208	209	208	209	207	209	212	210
138	211	210	208	209	209	209	207	209	213	211
139	211	210	209	209	209	209	208	209	214	212
140	211	210	209	209	209	209	208	209	214	213
141	212	210	209	209	209	209	208	209	215	213

OMEGA POINT LABORATORIES

Peak Seals, Inc. Project No. 14540-99417 August 21, 1997

Time (min)	TC # 21 (°F)	TC # 22 (°F)	TC # 23 (°F)	TC # 24 (°F)	TC # 25 (°F)	TC # 26 (°F)	TC # 27 (°F)	TC # 28 (°F)	TC # 29 (°F)	TC # 30 (°F)
142	212	210	209	209	209	209	208	209	216	214
143	212	211	209	209	209	209	208	210	216	214
144	212	211	209	209	209	209	208	210	217	215
145	213	211	209	209	209	209	208	210	218	216
146	213	211	209	209	209	209	208	210	219	217
147	214	211	209	209	209	209	208	210	219	218
148	214	212	209	209	209	210	208	210	220	218
149	214	212	209	210	209	210	209	210	221	219
150	215	212	209	210	209	210	209	210	222	220
151	215	213	210	210	210	210	209	210	223	221
152	216	213	210	210	210	210	209	211	224	223
153	216	213	210	210	210	210	209	211	225	224
154	217	214	210	210	210	210	209	212	226	225
155	217	214	210	210	210	210	209	212	227	226
156	218	214	210	210	210	210	209	213	228	228
157	218	215	210	210	210	210	209	214	230	229
158	219	215	210	210	210	210	209	214	231	230
159	219	216	210	210	210	210	209	217	232	232
160	220	216	211	211	210	211	210	218	234	233
161	220	217	211	211	210	211	210	219	235	234
162	221	217	211	211	210	211	210	220	236	236
163	222	218	211	211	211	211	210	221	238	237
164	222	218	211	211	211	211	210	222	239	239
165	223	219	212	211	211	211	210	223	241	240
166	224	220	212	211	211	211	210	225	242	242
167	224	220	213	212	211	211	210	226	243	243
168	225	221	213	212	211	211	210	227	245	245
169	226	222	214	212	212	211	210	229	246	246
170	227	223	214	212	212	211	210	230	248	248
171	228	223	215	213	212	211	210	231	249	249
172	229	224	215	213	213	212	210	233	251	251
173	229	225	216	213	214	212	210	234	253	253
174	230	226	217	213	214	212	210	235	254	254
175	231	227	217	214	215	212	210	237	256	256
176	232	228	218	214	216	212	210	238	257	258
177	233	229	219	215	216	213	210	240	259	259
178	234	230	219	215	217	213	210	241	261	261
179	235	231	220	216	217	214	210	243	262	263
180	236	232	221	216	218	215	210	244	264	265
Max Temp:	236	232	221	216	218	215	210	244	264	265
Max Allowed:	418	418	418	418	418	417	416	417	418	418

OMEGA POINT LABORATORIES

Peak Seals, Inc. Project No. 14540-99417 August 21, 1997

Time (min)	TC # 31 (°F)	TC # 32 (°F)	TC # 33 (°F)	TC # 34 (°F)	TC # 35 (°F)	TC # 36 (°F)	TC # 37 (°F)	TC # 38 (°F)	TC # 39 (°F)	TC # 40 (°F)
0	93	93	93	93	92	92	92	92	92	92
1	93	93	93	93	92	92	92	92	92	92
2	93	93	93	92	92	92	92	92	92	92
3	93	93	93	92	92	92	92	92	92	92
4	93	93	93	92	92	92	92	92	92	92
5	93	93	93	92	92	92	92	92	92	92
6	93	93	93	92	92	92	92	92	92	92
7	93	93	93	92	92	92	92	92	92	92
8	93	93	93	92	92	92	92	92	92	92
9	93	93	93	92	92	92	92	92	92	92
10	93	93	93	92	92	92	92	92	92	92
11	93	93	93	92	92	92	92	92	92	92
12	93	93	93	92	92	92	92	92	92	92
13	93	93	93	92	92	92	92	92	92	92
14	93	93	93	92	92	92	92	92	92	92
15	93	93	93	92	92	92	92	92	92	93
16	93	93	93	92	92	92	92	92	92	93
17	93	93	93	92	92	92	92	92	92	93
18	93	93	93	92	92	92	92	92	92	93
19	93	93	93	92	92	92	92	92	92	93
20	93	93	93	92	92	92	92	92	92	94
21	93	93	93	92	92	92	92	92	92	94
22	93	93	93	92	92	92	92	92	92	94
23	93	93	93	92	92	92	92	92	92	95
24	93	93	93	92	92	92	92	92	92	95
25	93	93	93	92	92	92	92	92	92	95
26	93	93	93	92	92	92	92	92	92	96
27	93	93	93	92	92	92	92	92	93	96
28	93	93	93	92	92	92	92	92	93	96
29	93	93	93	92	92	92	92	92	93	97
30	93	93	93	92	92	92	92	92	93	97
31	93	93	93	92	92	92	92	93	93	98
32	93	93	93	93	92	92	92	93	93	98
33	93	93	93	93	92	93	93	93	94	99
34	93	93	93	93	92	93	93	93	94	100
35	93	93	93	93	92	93	93	93	95	100
36	93	93	93	93	93	93	93	94	95	101
37	94	94	93	93	93	93	93	94	96	102
38	94	94	93	93	93	93	94	94	96	103
39	94	94	94	93	93	94	94	95	97	103
40	94	94	94	93	93	94	95	95	97	104
41	94	94	94	94	93	94	95	96	98	105
42	94	94	94	94	93	95	95	97	99	106
43	94	95	95	94	94	95	96	97	99	107
44	94	95	95	94	94	95	96	98	100	108
45	95	95	95	95	94	96	97	98	101	109
46	95	95	95	95	94	96	98	99	102	110
47	95	96	96	95	95	97	98	100	103	112
48	95	96	96	96	95	97	99	101	104	113
49	96	97	97	96	96	98	100	102	105	114
50	96	98	97	97	96	99	101	103	106	116
51	96	98	98	97	97	100	102	104	107	117
52	97	99	99	98	97	101	103	105	109	118
53	97	100	99	99	98	101	104	106	110	120
54	98	101	100	99	99	102	105	107	111	122
55	99	102	101	100	99	103	106	109	113	123
56	100	103	102	101	100	104	107	110	114	124
57	100	104	103	102	101	106	109	111	115	126
58	101	106	104	104	102	107	110	112	117	127
59	102	107	106	105	103	108	111	114	118	129
60	103	108	107	106	104	109	113	115	119	131
61	105	110	109	108	106	111	114	117	121	132
62	106	111	111	110	107	112	116	118	122	134
63	107	113	113	111	108	114	117	120	124	136
64	108	115	115	113	110	115	119	122	126	137
65	110	117	117	115	111	117	121	123	127	139
66	111	119	119	116	113	119	123	125	129	141
67	113	121	121	118	115	121	125	127	130	142
68	115	123	123	120	116	123	127	129	132	144
69	116	126	126	122	118	125	129	130	134	146
70	118	128	128	124	120	127	131	132	136	148

OMEGA POINT LABORATORIES

Peak Seals, Inc. Project No. 14540-99417 August 21, 1997

Time (min)	TC # 31 (°F)	TC # 32 (°F)	TC # 33 (°F)	TC # 34 (°F)	TC # 35 (°F)	TC # 36 (°F)	TC # 37 (°F)	TC # 38 (°F)	TC # 39 (°F)	TC # 40 (°F)
71	120	130	130	126	122	129	133	135	138	150
72	122	133	133	128	124	132	135	137	140	152
73	124	135	135	130	126	134	138	139	142	155
74	126	137	138	133	129	136	140	141	144	157
75	128	140	141	136	131	139	142	144	146	159
76	130	142	143	139	134	142	145	146	149	161
77	132	145	146	142	136	144	148	148	151	163
78	134	147	148	144	139	147	150	151	153	166
79	136	149	151	147	142	149	153	153	155	168
80	138	152	154	150	145	151	155	156	157	170
81	141	154	156	152	147	154	158	158	159	172
82	144	156	159	155	150	156	160	160	161	174
83	146	159	161	158	153	158	163	162	163	176
84	149	161	164	161	155	161	165	164	165	178
85	152	163	166	163	158	163	167	166	168	180
86	154	166	168	166	160	165	169	168	169	182
87	157	168	171	168	163	167	172	170	171	183
88	160	170	173	171	165	170	174	173	173	185
89	162	172	175	173	167	172	175	174	175	187
90	165	174	177	175	170	174	177	176	177	189
91	167	176	179	178	172	176	179	178	179	190
92	170	178	181	180	174	177	181	180	181	192
93	172	180	183	181	176	179	183	182	182	193
94	174	181	185	183	178	181	184	183	184	195
95	176	183	186	185	180	182	186	185	185	196
96	178	184	188	186	181	184	187	186	187	197
97	180	186	189	188	183	185	188	188	188	199
98	181	187	190	189	185	187	190	189	190	200
99	183	189	192	191	186	188	191	191	191	201
100	185	190	193	192	187	190	192	192	192	202
101	187	191	194	193	189	191	193	193	193	203
102	188	192	195	194	190	192	194	194	195	204
103	190	193	196	195	191	193	195	195	196	205
104	191	193	196	196	192	194	196	196	197	206
105	192	194	197	197	194	195	197	197	198	207
106	193	195	198	198	195	196	198	198	199	208
107	194	196	199	199	196	197	199	199	199	209
108	195	197	199	199	196	198	200	200	200	210
109	196	198	200	200	197	199	201	200	201	211
110	197	199	201	201	198	200	201	201	202	212
111	198	200	201	202	199	200	202	202	203	213
112	199	200	202	202	200	201	203	203	203	214
113	200	201	203	203	200	202	203	203	204	215
114	200	201	203	203	201	202	204	204	205	216
115	201	202	204	204	202	203	204	204	205	217
116	202	203	204	204	202	203	205	205	206	218
117	202	203	205	205	203	204	205	205	207	219
118	203	204	205	205	203	204	206	206	208	220
119	203	204	206	206	204	205	206	206	209	221
120	204	205	206	206	204	205	207	207	210	222
121	205	205	207	207	205	206	207	208	211	223
122	205	206	207	207	205	206	208	208	212	224
123	205	206	208	207	206	206	208	209	214	225
124	206	207	208	208	206	207	209	209	215	226
125	206	207	208	208	206	207	209	210	216	227
126	207	208	209	209	207	207	210	210	217	228
127	207	208	209	209	207	208	210	211	218	229
128	207	209	210	210	207	208	211	212	220	230
129	208	209	210	210	208	208	212	213	221	231
130	208	210	211	210	208	209	213	214	222	232
131	208	210	211	211	208	209	214	216	223	233
132	208	211	212	211	208	210	216	217	225	234
133	208	211	212	212	209	210	217	219	226	236
134	209	212	213	212	209	211	218	221	227	237
135	209	212	213	213	209	212	220	223	228	238
136	209	213	214	214	209	213	221	225	230	239
137	209	214	215	214	210	214	222	227	231	241
138	209	214	215	215	210	215	223	228	232	242
139	209	215	216	215	210	216	224	230	234	243
140	210	216	217	216	210	217	226	231	235	245
141	210	216	218	217	211	218	227	232	236	246

OMEGA POINT LABORATORIES

Peak Seals, Inc. Project No. 14540-99417 August 21, 1997

Time (min)	TC # 31 (°F)	TC # 32 (°F)	TC # 33 (°F)	TC # 34 (°F)	TC # 35 (°F)	TC # 36 (°F)	TC # 37 (°F)	TC # 38 (°F)	TC # 39 (°F)	TC # 40 (°F)
142	210	217	218	218	211	219	228	234	238	248
143	210	218	219	218	212	219	229	235	239	249
144	210	219	220	219	212	220	231	237	241	251
145	211	219	221	220	213	221	232	238	242	252
146	211	220	222	221	214	222	233	240	244	254
147	212	221	223	222	215	223	235	241	246	255
148	213	222	224	223	216	224	236	243	247	257
149	214	223	225	224	217	225	237	244	249	259
150	215	224	226	225	218	226	239	246	250	260
151	216	225	227	227	219	227	240	248	252	262
152	218	226	229	228	220	228	241	249	254	264
153	219	228	230	229	221	229	243	251	256	266
154	221	229	232	231	221	230	245	253	257	267
155	222	231	233	232	222	231	246	254	259	269
156	224	232	235	233	223	232	248	256	261	271
157	225	234	236	235	224	233	250	258	263	273
158	226	236	238	236	225	235	251	259	264	275
159	228	237	239	237	225	236	253	261	266	277
160	229	239	241	239	226	238	255	263	268	278
161	231	240	243	240	227	241	257	265	270	280
162	232	242	244	242	229	243	258	267	272	282
163	234	244	246	244	230	245	260	269	274	284
164	235	245	248	245	233	247	262	271	276	286
165	237	247	249	247	236	249	264	273	278	288
166	238	249	251	249	239	251	266	275	280	290
167	240	251	253	251	241	254	268	277	282	292
168	242	252	255	253	244	256	270	279	284	294
169	243	254	257	255	246	258	272	280	286	295
170	245	256	259	257	249	260	274	282	288	297
171	247	258	260	259	251	262	276	285	290	299
172	248	259	262	261	253	264	278	287	292	301
173	250	261	264	264	256	267	280	289	294	303
174	252	263	266	266	258	269	282	291	296	305
175	253	265	268	268	260	271	285	293	298	307
176	255	267	270	270	262	273	287	295	300	309
177	257	269	272	272	265	276	289	297	302	311
178	259	271	274	274	267	278	291	300	304	313
179	261	273	276	276	269	280	293	302	306	315
180	262	275	278	278	271	282	296	304	309	317
Max Temp:	262	275	278	278	271	282	296	304	309	317
Max Allowed:	418	418	418	418	417	417	417	417	417	417

OMEGA POINT LABORATORIES

Peak Seals, Inc. Project No. 14540-99417 August 21, 1997

Time (min)	TC # 41 (°F)	TC # 42 (°F)	TC # 43 (°F)	TC # 44 (°F)	TC # 45 (°F)	TC # 46 (°F)	TC # 47 (°F)	TC # 48 (°F)	TC # 49 (°F)	TC # 50 (°F)
0	92	93	93	93	93	93	93	93	94	94
1	92	93	93	93	93	93	93	93	94	94
2	92	93	93	93	93	93	93	93	94	94
3	92	93	93	93	93	93	93	93	94	94
4	92	93	93	93	93	93	93	93	94	94
5	92	93	93	93	93	93	93	93	94	94
6	92	92	93	93	93	93	93	93	94	94
7	92	93	93	93	93	93	93	93	94	94
8	93	92	93	93	93	93	93	93	94	94
9	93	93	93	93	93	93	93	93	94	94
10	93	92	93	93	93	93	93	93	94	94
11	94	93	93	93	93	93	93	93	94	94
12	94	93	93	93	93	93	93	93	94	94
13	95	93	93	93	93	93	93	93	94	94
14	96	93	93	93	93	93	93	93	94	94
15	97	93	93	93	93	93	93	93	94	94
16	97	93	93	93	93	93	93	93	94	94
17	98	93	93	93	93	93	93	93	94	94
18	99	93	93	93	93	93	93	93	94	94
19	100	93	93	93	93	93	93	93	94	94
20	100	93	93	93	93	93	93	93	94	94
21	101	94	93	93	93	93	93	93	94	94
22	102	94	93	93	93	93	93	93	94	94
23	103	94	93	93	93	93	93	93	94	94
24	104	94	93	93	93	93	93	93	94	94
25	105	94	93	93	93	93	93	93	94	94
26	106	94	93	93	93	93	93	93	94	94
27	106	95	93	93	93	93	93	93	94	94
28	107	95	93	93	93	93	93	93	94	94
29	108	95	93	93	93	93	93	93	94	94
30	109	96	94	93	93	93	93	93	94	94
31	110	96	94	93	93	93	93	93	94	94
32	111	96	94	93	93	93	93	93	94	94
33	112	97	94	94	93	93	93	94	94	94
34	113	97	95	94	93	93	93	94	94	94
35	114	98	95	94	93	93	93	94	94	94
36	115	99	96	94	94	93	93	94	94	94
37	116	100	96	95	94	93	93	94	94	95
38	118	101	97	95	94	93	94	94	94	95
39	119	102	98	96	94	94	94	94	94	95
40	121	102	98	96	95	94	94	94	94	95
41	122	104	99	97	95	94	94	94	95	95
42	123	105	100	98	96	94	94	95	95	96
43	125	106	101	98	96	95	94	95	95	96
44	126	106	102	99	97	95	95	95	95	96
45	127	107	103	100	98	95	95	95	95	97
46	128	109	104	101	98	96	95	96	96	97
47	130	110	105	102	99	96	96	96	96	98
48	131	111	106	103	100	97	96	96	97	98
49	133	112	107	104	100	97	97	97	97	99
50	134	113	108	104	101	98	97	97	98	99
51	135	114	109	106	102	98	98	98	98	100
52	137	115	110	107	103	99	99	98	99	101
53	138	116	111	108	104	100	99	99	100	101
54	140	118	112	109	105	101	100	100	101	102
55	142	119	114	110	106	102	101	101	102	103
56	143	120	115	111	108	103	102	102	103	104
57	145	122	116	113	109	104	103	103	104	105
58	146	123	117	114	110	105	104	104	105	106
59	148	124	119	115	111	106	106	105	107	107
60	149	126	120	117	113	107	107	107	108	108
61	151	127	121	118	114	108	109	108	109	110
62	152	128	123	119	115	110	111	110	111	112
63	153	130	124	121	117	111	112	112	113	115
64	155	131	126	122	118	112	114	114	115	118
65	156	133	127	124	120	114	117	115	117	122
66	157	134	129	125	121	116	119	118	120	126
67	158	135	130	127	123	117	121	120	123	130
68	160	137	132	129	125	119	124	123	127	134
69	161	138	133	130	127	121	127	125	130	137
70	163	140	135	132	129	123	130	128	134	141

OMEGA POINT LABORATORIES

Peak Seals, Inc. Project No. 14540-99417 August 21, 1997

Time (min)	TC # 41 (°F)	TC # 42 (°F)	TC # 43 (°F)	TC # 44 (°F)	TC # 45 (°F)	TC # 46 (°F)	TC # 47 (°F)	TC # 48 (°F)	TC # 49 (°F)	TC # 50 (°F)
71	164	142	137	134	131	125	133	132	138	144
72	166	143	139	137	133	128	137	136	142	148
73	168	145	141	139	136	130	141	139	146	152
74	170	147	143	141	138	132	146	143	150	155
75	172	149	145	144	141	135	151	147	153	158
76	173	151	148	146	143	138	156	151	157	161
77	175	153	150	149	146	141	162	155	160	164
78	177	155	153	151	149	144	167	159	163	167
79	179	157	155	154	152	147	172	163	167	170
80	181	160	157	156	154	150	176	167	170	172
81	182	162	160	159	157	153	179	171	173	174
82	184	164	162	161	160	156	182	175	176	177
83	186	166	165	164	163	159	184	178	178	178
84	188	168	167	166	165	162	186	181	180	180
85	190	170	169	169	167	165	187	184	182	181
86	191	173	171	171	170	168	189	186	184	183
87	193	175	174	173	172	171	191	188	186	184
88	195	177	176	175	174	174	192	190	187	185
89	197	179	178	177	177	176	194	192	188	186
90	199	181	180	179	179	179	195	193	189	187
91	201	182	182	181	181	182	197	194	191	188
92	203	184	183	183	183	185	198	196	192	189
93	204	186	185	184	184	188	199	197	193	190
94	206	187	187	186	187	190	200	198	194	191
95	208	189	188	188	189	191	201	199	195	192
96	210	190	189	190	191	193	202	200	196	194
97	211	191	191	191	192	194	203	201	197	195
98	213	193	192	193	193	196	203	202	198	195
99	214	194	193	194	194	197	204	203	199	197
100	216	195	195	195	195	198	205	203	200	197
101	217	196	196	196	196	199	205	204	200	198
102	218	197	197	197	197	200	206	205	201	199
103	220	198	198	198	198	201	207	205	202	199
104	221	199	199	199	199	202	207	206	203	200
105	222	200	199	199	200	202	207	207	203	200
106	223	201	200	200	201	203	208	207	204	201
107	224	202	201	201	201	204	208	207	204	202
108	226	202	202	201	202	204	208	208	205	202
109	227	203	202	202	203	205	209	208	205	203
110	228	204	203	203	203	205	209	208	206	203
111	229	204	203	203	204	206	209	209	206	204
112	230	205	204	204	204	206	209	209	206	204
113	231	205	204	204	205	207	210	209	207	205
114	232	206	205	205	205	207	210	209	207	205
115	233	207	205	205	206	207	210	210	207	205
116	235	207	206	205	206	208	210	210	208	206
117	236	208	206	206	206	208	210	210	208	206
118	237	208	207	206	207	208	210	210	208	206
119	238	209	207	207	207	209	210	210	208	207
120	239	209	207	207	207	209	210	210	208	207
121	240	210	208	207	208	209	210	210	209	207
122	241	210	208	207	208	209	210	210	209	207
123	242	211	208	208	208	209	211	210	209	207
124	244	212	208	208	208	209	210	210	209	208
125	245	213	209	208	209	210	211	210	209	208
126	246	213	209	208	209	210	211	211	209	208
127	247	214	209	209	209	210	210	211	209	208
128	249	215	209	209	209	210	211	211	209	208
129	250	216	210	209	210	210	210	211	210	208
130	251	217	210	209	210	210	210	211	210	209
131	252	218	210	209	210	210	210	211	210	209
132	254	219	210	209	210	210	210	211	210	209
133	255	220	211	210	210	210	210	211	210	209
134	256	221	211	210	210	210	210	211	210	209
135	258	222	212	210	210	210	210	211	210	209
136	259	223	213	210	210	210	210	211	210	209
137	260	224	214	210	210	210	210	211	210	209
138	261	226	215	210	211	210	210	211	210	209
139	263	227	216	210	211	210	210	211	210	210
140	264	228	217	211	211	210	211	211	211	210
141	266	229	218	211	211	210	211	211	211	210

OMEGA POINT LABORATORIES

Peak Seals, Inc. Project No. 14540-99417 August 21, 1997

Time (min)	TC # 41 (°F)	TC # 42 (°F)	TC # 43 (°F)	TC # 44 (°F)	TC # 45 (°F)	TC # 46 (°F)	TC # 47 (°F)	TC # 48 (°F)	TC # 49 (°F)	TC # 50 (°F)
142	267	231	220	211	211	210	211	211	211	210
143	268	232	221	211	211	210	211	211	211	210
144	270	233	222	212	211	211	211	211	211	210
145	271	235	223	214	211	211	211	212	211	210
146	273	236	225	215	211	211	211	212	211	210
147	274	238	226	216	212	211	211	212	211	210
148	276	239	227	217	212	211	211	212	211	210
149	277	241	229	218	212	211	211	212	211	210
150	279	242	230	219	214	211	211	213	212	210
151	281	244	232	220	215	211	212	213	212	211
152	282	245	233	222	215	211	212	214	212	211
153	284	247	235	223	216	211	212	214	212	211
154	286	248	236	225	217	211	212	215	212	211
155	287	250	238	226	217	211	212	216	213	211
156	289	251	239	227	218	212	213	216	213	211
157	291	253	241	229	219	212	213	217	213	211
158	292	255	242	230	220	212	214	217	214	211
159	294	256	244	232	221	212	215	218	214	211
160	296	258	245	233	222	212	215	219	215	211
161	298	260	247	235	224	213	216	219	215	211
162	300	261	249	237	225	213	216	220	216	212
163	301	263	250	238	227	214	217	221	216	212
164	303	265	252	240	228	215	218	221	217	212
165	305	266	254	242	229	216	218	222	218	213
166	307	268	256	243	231	216	219	223	218	213
167	309	270	257	245	232	217	220	224	219	214
168	310	271	259	246	234	217	220	225	220	215
169	312	273	261	248	235	218	221	226	221	216
170	314	275	263	250	237	219	222	227	222	217
171	316	277	264	251	239	221	223	228	223	218
172	318	279	266	253	240	222	224	229	224	219
173	320	281	268	255	242	224	225	230	225	220
174	322	282	270	257	244	225	226	231	226	221
175	324	284	272	259	246	227	227	232	227	222
176	325	286	273	260	248	228	228	233	228	223
177	327	288	275	262	249	229	229	234	229	224
178	329	290	277	264	251	230	230	235	230	225
179	331	292	279	266	253	232	232	237	232	227
180	333	294	281	268	255	233	233	238	233	228
Max Temp:	333	294	281	268	255	233	233	238	233	228
Max Allowed:	417	418	418	418	418	418	418	418	419	419

OMEGA POINT LABORATORIES

Peak Seals, Inc. Project No. 14540-99417 August 21, 1997

Time (min)	TC # 51 (°F)	TC # 52 (°F)	TC # 53 (°F)	TC # 54 (°F)	TC # 55 (°F)	TC # 56 (°F)	TC # 57 (°F)	TC # 58 (°F)	TC # 59 (°F)	TC # 60 (°F)
0	94	94	93	92	92	93	93	94	93	93
1	94	94	93	92	92	93	93	94	93	93
2	94	94	93	92	92	93	93	94	93	93
3	94	94	93	92	92	93	93	94	93	93
4	94	94	93	92	92	93	93	94	93	93
5	94	94	93	92	92	93	93	94	93	93
6	94	94	93	92	92	93	93	94	93	93
7	94	94	93	92	92	93	93	94	93	93
8	94	93	93	92	92	93	93	93	93	93
9	94	93	93	92	92	93	93	93	93	93
10	94	94	93	92	93	93	93	93	93	93
11	94	94	93	92	93	93	93	94	93	93
12	94	93	93	92	94	93	93	93	93	93
13	94	93	93	92	94	93	93	93	93	93
14	94	93	93	92	95	94	93	93	93	93
15	94	93	93	92	95	94	93	93	93	93
16	94	93	93	92	96	94	93	93	93	93
17	94	93	93	92	96	94	94	93	93	93
18	94	93	93	92	97	94	94	93	93	93
19	94	93	93	92	97	95	94	93	93	93
20	94	93	93	92	98	95	94	93	93	93
21	94	93	93	92	98	95	94	93	93	93
22	94	93	93	92	98	95	94	93	93	93
23	94	93	93	92	99	96	94	93	93	93
24	94	94	94	93	99	96	94	93	93	93
25	94	94	94	93	99	96	94	93	93	93
26	94	94	95	94	99	96	94	94	93	93
27	94	94	96	94	100	97	94	94	93	93
28	94	94	96	95	100	97	94	94	93	93
29	94	94	97	95	100	97	94	94	93	93
30	94	94	98	96	100	97	94	94	93	93
31	94	94	99	97	100	97	95	94	93	93
32	94	94	100	98	101	98	95	94	93	94
33	94	95	101	99	101	98	95	94	94	94
34	94	95	102	100	101	98	95	94	94	94
35	94	95	103	100	102	98	95	94	94	94
36	94	95	104	101	102	99	95	94	94	94
37	95	96	105	102	102	99	96	94	94	94
38	95	96	106	103	103	99	96	94	94	94
39	95	97	107	104	104	100	96	94	94	94
40	95	97	108	105	105	100	96	94	94	95
41	95	98	109	106	107	101	97	95	94	95
42	96	98	110	107	109	102	97	95	95	95
43	96	99	111	108	111	103	97	95	95	95
44	96	100	112	109	114	104	98	95	95	96
45	97	100	114	110	116	105	98	95	95	96
46	97	101	115	111	118	107	99	96	95	96
47	97	102	116	113	120	108	99	96	96	97
48	98	103	118	114	122	110	100	96	96	97
49	98	104	120	115	124	112	100	97	96	97
50	99	105	122	116	126	113	101	97	97	98
51	99	106	124	118	128	115	102	97	97	98
52	100	107	126	119	130	116	102	98	98	99
53	101	108	128	120	131	118	103	98	98	100
54	101	110	130	122	132	119	104	99	99	100
55	102	112	132	123	134	120	105	100	100	101
56	103	116	135	125	134	121	106	100	101	102
57	104	119	137	126	135	122	107	101	102	103
58	105	123	139	128	136	123	108	102	102	104
59	107	126	141	129	137	124	109	103	103	105
60	109	129	143	131	138	124	110	104	105	106
61	112	132	145	133	138	125	111	105	106	108
62	115	134	147	134	139	125	112	106	107	109
63	118	137	149	136	139	126	113	107	109	111
64	122	140	151	138	140	127	114	109	110	112
65	125	143	153	140	140	127	115	110	112	114
66	128	146	155	142	141	128	117	111	114	116
67	132	149	157	143	141	129	119	113	115	118
68	135	151	158	145	142	130	120	115	117	120
69	138	154	160	147	143	131	122	116	119	121
70	141	156	162	149	143	132	123	118	121	123

OMEGA POINT LABORATORIES

Peak Seals, Inc. Project No. 14540-99417 August 21, 1997

Time (min)	TC # 51 (°F)	TC # 52 (°F)	TC # 53 (°F)	TC # 54 (°F)	TC # 55 (°F)	TC # 56 (°F)	TC # 57 (°F)	TC # 58 (°F)	TC # 59 (°F)	TC # 60 (°F)
71	144	159	163	151	144	133	125	120	123	125
72	147	161	165	152	145	134	127	122	125	127
73	151	163	167	154	146	135	129	124	127	129
74	154	165	168	156	146	137	131	126	129	131
75	157	167	170	158	147	138	133	128	131	134
76	159	169	171	159	148	140	135	130	133	136
77	162	171	173	161	149	141	137	133	135	138
78	164	173	174	163	150	143	139	135	138	140
79	166	175	176	165	151	145	141	137	141	143
80	168	176	177	166	152	147	144	139	142	146
81	170	178	178	168	153	149	147	142	145	148
82	171	179	180	170	155	151	149	144	148	151
83	173	180	181	171	157	155	152	147	149	153
84	175	181	182	173	159	157	155	149	152	156
85	176	183	183	174	160	160	158	152	155	159
86	178	184	184	175	163	163	161	155	157	161
87	179	185	185	177	165	166	164	158	161	164
88	181	186	186	178	168	168	167	162	165	167
89	182	187	187	179	170	171	170	165	167	170
90	183	188	188	180	173	174	173	169	171	173
91	184	189	189	181	176	177	176	172	175	176
92	185	190	189	182	179	180	180	175	177	180
93	186	190	190	183	182	183	182	179	181	182
94	188	191	190	184	184	186	185	182	183	185
95	189	192	191	185	187	189	188	185	186	188
96	190	193	192	186	190	192	191	188	189	190
97	191	193	192	187	192	194	193	190	192	193
98	192	194	193	188	194	196	195	193	194	195
99	193	195	194	189	196	198	197	195	196	197
100	194	196	195	189	198	199	199	197	198	199
101	195	197	195	190	199	201	201	199	199	200
102	196	197	196	191	201	202	202	201	201	202
103	196	198	197	192	203	203	203	202	203	203
104	197	199	198	193	204	204	204	204	204	204
105	198	199	199	194	205	205	205	205	205	205
106	199	200	199	195	206	206	206	206	206	206
107	200	201	200	196	207	207	207	207	207	207
108	200	201	201	196	207	207	207	207	207	207
109	201	202	201	197	208	208	208	208	207	208
110	202	202	202	198	208	208	208	208	208	208
111	202	203	202	199	208	209	209	208	208	208
112	203	203	203	199	209	209	209	209	208	209
113	203	204	203	200	209	209	209	209	209	209
114	204	204	204	200	209	209	209	209	209	209
115	204	205	204	201	209	209	209	209	209	209
116	205	205	205	202	209	210	210	209	209	209
117	205	205	205	202	209	210	210	209	209	210
118	205	206	205	203	210	210	210	210	209	210
119	206	206	206	203	210	210	210	210	209	210
120	206	206	206	203	210	210	210	210	209	210
121	206	207	206	204	210	210	210	210	210	210
122	207	207	206	204	210	210	210	210	210	210
123	207	207	207	205	210	210	210	210	210	210
124	207	207	207	205	210	210	210	210	210	211
125	207	207	207	205	210	210	210	210	210	211
126	208	208	207	206	210	210	210	210	210	212
127	208	208	208	206	210	210	210	210	210	212
128	208	208	208	206	210	210	210	210	210	213
129	208	208	208	206	210	210	210	210	210	214
130	208	208	208	207	210	210	211	210	211	215
131	208	209	208	207	210	210	211	210	211	215
132	209	209	208	207	210	211	212	210	211	215
133	209	209	209	207	210	211	213	210	212	217
134	209	209	209	208	210	211	217	210	213	217
135	209	209	209	208	210	210	219	210	214	218
136	209	209	209	208	210	210	221	210	215	219
137	209	209	209	208	210	211	222	210	215	220
138	209	209	209	208	210	211	223	210	216	221
139	209	210	209	208	210	211	225	211	216	222
140	210	210	209	208	210	211	226	211	217	223
141	210	210	209	209	210	211	227	211	218	224

OMEGA POINT LABORATORIES

Peak Seals, Inc. Project No. 14540-99417 August 21, 1997

Time (min)	TC # 51 (°F)	TC # 52 (°F)	TC # 53 (°F)	TC # 54 (°F)	TC # 55 (°F)	TC # 56 (°F)	TC # 57 (°F)	TC # 58 (°F)	TC # 59 (°F)	TC # 60 (°F)
142	210	210	210	209	210	213	228	213	218	225
143	210	210	210	209	210	215	229	214	219	226
144	210	210	210	209	210	217	230	215	220	227
145	210	210	210	209	210	218	231	217	220	228
146	210	210	210	209	210	219	232	218	221	229
147	210	210	210	209	210	220	233	219	222	229
148	210	210	210	209	210	222	234	220	223	230
149	210	210	210	209	210	224	235	221	224	231
150	210	211	210	209	211	225	236	222	224	232
151	210	211	210	210	211	226	237	223	225	233
152	210	211	210	210	211	228	238	224	226	234
153	211	212	210	210	211	229	239	225	227	235
154	211	212	210	210	214	230	240	226	228	236
155	211	212	211	210	216	231	241	228	229	238
156	211	213	211	210	218	232	242	229	230	239
157	211	213	211	210	219	234	243	230	232	240
158	211	213	211	210	220	234	245	231	233	241
159	211	214	211	210	221	236	246	232	235	243
160	211	214	211	210	222	237	247	234	236	244
161	211	214	211	210	223	237	248	235	237	245
162	212	215	211	210	224	239	249	236	239	247
163	212	215	211	210	226	241	250	238	240	248
164	212	215	212	210	227	242	252	239	242	250
165	212	216	212	211	228	244	253	240	243	251
166	212	216	212	211	229	245	254	242	245	253
167	212	216	213	211	231	247	256	243	246	255
168	213	217	214	211	232	248	257	245	248	256
169	213	217	214	211	233	250	259	246	250	258
170	214	218	214	211	235	251	260	248	251	260
171	214	218	215	211	236	253	262	249	253	261
172	215	219	216	211	238	254	263	251	254	263
173	216	219	216	211	240	256	264	252	256	265
174	216	220	217	211	242	257	266	254	258	267
175	217	220	217	211	243	259	267	255	259	268
176	218	221	218	211	245	261	269	257	261	270
177	219	221	218	211	247	262	271	259	263	272
178	220	222	219	211	249	264	272	260	265	274
179	221	223	220	211	251	266	274	262	266	276
180	222	223	220	211	253	267	275	263	268	278
Max Temp:	222	223	220	211	253	267	275	263	268	278
Max Allowed:	419	419	418	417	417	418	418	419	418	418

OMEGA POINT LABORATORIES

Peak Seals, Inc. Project No. 14540-99417 August 21, 1997

Time (min)	TC # 61 (°F)	TC # 62 (°F)	TC # 63 (°F)	TC # 64 (°F)	TC # 65 (°F)	TC # 66 (°F)	TC # 67 (°F)	TC # 68 (°F)	TC # 69 (°F)	TC # 70 (°F)
0	92	92	92	92	92	92	92	92	92	92
1	92	92	92	92	92	92	92	92	92	92
2	92	92	92	92	92	92	92	92	92	92
3	92	92	92	92	92	92	92	92	92	92
4	92	92	92	92	92	92	92	92	92	92
5	92	92	92	92	92	92	92	92	92	92
6	92	92	92	92	92	92	92	92	92	92
7	92	92	92	92	92	92	92	92	92	92
8	92	92	92	92	92	92	92	92	92	92
9	92	92	92	92	92	92	92	92	92	92
10	92	92	92	92	92	92	92	92	92	92
11	92	92	92	92	92	92	92	92	92	92
12	92	92	92	92	92	92	92	92	92	92
13	92	92	92	92	92	92	92	93	92	92
14	92	92	92	92	92	92	92	93	92	92
15	92	92	92	92	92	92	92	94	92	92
16	92	92	92	92	92	92	92	95	93	92
17	92	92	92	92	92	92	92	95	93	92
18	92	92	92	92	92	92	92	96	93	92
19	92	92	92	92	92	92	92	97	94	92
20	92	92	92	92	92	92	92	97	94	92
21	92	92	92	92	92	92	93	98	94	92
22	92	92	92	92	92	92	93	99	95	92
23	92	92	92	92	92	92	93	100	95	92
24	92	92	92	92	92	92	93	101	96	92
25	92	92	92	92	92	92	93	101	96	92
26	92	92	92	92	92	92	93	102	96	93
27	92	92	92	92	92	92	94	103	97	93
28	92	92	92	92	92	93	94	104	97	93
29	92	92	92	92	92	93	94	105	98	93
30	92	92	92	92	92	93	94	105	98	93
31	93	92	92	92	93	93	95	106	99	94
32	93	92	92	92	93	93	95	107	99	94
33	93	92	92	93	93	93	95	108	100	94
34	93	92	92	93	93	94	96	109	101	94
35	93	93	92	93	93	94	96	110	101	95
36	93	93	92	93	94	94	97	111	102	95
37	93	93	93	93	94	95	98	113	103	95
38	93	93	93	94	95	96	98	114	104	96
39	94	93	93	94	95	96	99	116	105	97
40	94	93	93	95	96	97	100	118	106	97
41	94	94	93	95	97	98	102	120	107	98
42	94	94	94	96	97	99	103	121	108	99
43	95	94	94	96	98	100	104	123	110	100
44	95	94	94	97	99	101	105	124	111	101
45	95	95	95	98	100	102	106	126	112	102
46	96	95	95	99	101	103	107	127	114	103
47	96	96	96	100	102	104	108	129	116	104
48	97	96	96	101	103	105	109	130	117	105
49	97	97	97	102	104	106	111	133	119	107
50	98	98	98	103	105	107	112	134	120	108
51	98	98	98	104	106	109	113	136	122	109
52	99	99	99	105	107	110	115	137	124	110
53	100	100	100	106	108	111	116	138	125	112
54	101	101	101	107	109	112	117	140	127	113
55	102	102	102	108	111	114	119	141	129	114
56	103	103	103	110	112	115	120	143	130	116
57	104	104	104	111	113	116	122	144	132	117
58	105	105	105	112	114	117	123	145	134	119
59	106	106	106	113	116	119	124	146	135	120
60	107	108	108	115	117	120	126	147	137	122
61	109	109	109	117	119	122	127	148	138	124
62	110	111	111	119	121	124	129	149	140	126
63	112	113	112	121	123	126	131	151	142	128
64	114	115	114	123	125	128	133	152	143	129
65	116	116	116	125	127	130	135	154	144	131
66	117	118	118	127	129	132	136	155	146	133
67	119	120	120	129	131	134	138	157	147	135
68	121	122	122	131	133	135	140	158	149	137
69	123	124	124	133	135	137	142	160	150	139
70	125	126	126	135	136	139	143	161	152	140

OMEGA POINT LABORATORIES

Peak Seals, Inc. Project No. 14540-99417 August 21, 1997

Time (min)	TC # 61 (°F)	TC # 62 (°F)	TC # 63 (°F)	TC # 64 (°F)	TC # 65 (°F)	TC # 66 (°F)	TC # 67 (°F)	TC # 68 (°F)	TC # 69 (°F)	TC # 70 (°F)
71	127	128	128	137	138	141	145	163	153	142
72	129	131	130	139	140	143	147	164	155	144
73	131	133	132	141	142	145	149	166	157	146
74	133	135	134	143	145	147	151	167	158	148
75	136	137	137	145	147	149	152	169	160	150
76	138	139	139	147	149	151	155	170	161	151
77	140	142	141	150	151	153	156	172	163	153
78	143	144	144	152	153	155	158	173	164	155
79	145	147	146	155	156	157	160	175	166	157
80	148	149	149	157	158	160	162	177	167	159
81	150	152	152	160	161	162	164	178	169	161
82	153	155	154	162	163	164	166	180	171	164
83	155	157	157	164	165	166	168	182	172	166
84	158	160	159	167	168	169	170	183	174	168
85	161	162	162	169	170	171	172	185	176	170
86	163	165	165	172	172	173	174	186	178	173
87	166	168	168	174	175	176	176	188	180	175
88	169	171	170	177	177	178	179	190	182	178
89	172	173	173	179	180	181	181	192	183	180
90	175	176	176	182	182	183	183	193	185	182
91	178	179	179	184	185	185	185	195	187	184
92	181	182	181	187	187	187	187	197	189	187
93	183	184	184	189	189	190	189	199	191	189
94	186	187	187	191	191	192	191	200	193	190
95	189	189	189	193	193	194	194	202	195	192
96	191	192	191	195	195	195	195	204	197	194
97	193	194	194	197	197	197	197	205	198	195
98	195	196	195	198	198	198	199	207	200	197
99	197	198	197	200	200	200	200	209	201	198
100	199	199	199	201	201	201	201	210	203	199
101	200	200	200	202	202	202	202	211	204	201
102	201	202	201	203	203	203	203	212	205	202
103	203	203	202	203	204	204	204	214	206	202
104	204	204	203	204	204	204	205	215	207	203
105	204	205	204	205	205	205	205	216	209	204
106	205	205	205	206	206	206	206	217	210	205
107	206	206	206	206	206	206	206	218	211	206
108	207	206	206	207	207	207	207	219	212	206
109	207	207	207	207	207	207	207	220	213	207
110	207	207	207	207	208	208	208	221	213	207
111	208	208	207	208	208	208	208	222	214	207
112	208	208	208	208	208	208	208	223	215	208
113	208	208	208	208	208	208	208	224	216	208
114	208	208	208	208	208	208	209	225	217	208
115	209	208	208	208	209	209	209	226	218	208
116	209	208	208	208	209	209	209	228	219	209
117	209	209	208	209	209	209	210	229	221	209
118	209	209	209	209	209	209	211	230	222	209
119	209	209	209	209	209	209	212	231	223	209
120	210	209	209	209	209	209	213	233	224	209
121	210	209	209	209	209	210	214	234	225	209
122	210	209	209	209	209	210	215	235	227	209
123	211	209	209	209	209	210	216	237	228	209
124	211	209	209	209	210	211	217	238	229	210
125	212	209	209	209	210	211	219	240	231	211
126	213	209	209	209	211	213	220	241	232	214
127	213	209	209	209	211	214	221	242	233	220
128	214	210	209	209	212	216	222	244	235	222
129	214	210	209	209	212	218	223	245	236	224
130	215	210	209	210	214	219	225	247	237	225
131	216	211	209	210	216	220	226	248	239	227
132	216	211	209	210	217	222	228	249	240	229
133	217	212	209	211	218	224	229	250	241	230
134	217	213	209	211	219	225	231	252	243	232
135	218	213	210	212	219	227	232	253	244	233
136	219	214	210	212	220	229	234	254	245	235
137	219	214	210	213	221	231	236	256	247	236
138	220	215	211	214	222	232	237	257	248	238
139	220	215	211	214	223	234	239	259	249	239
140	221	216	212	215	224	235	240	260	251	241
141	222	216	212	216	226	237	242	261	252	242

OMEGA POINT LABORATORIES

Peak Seals, Inc. Project No. 14540-99417 August 21, 1997

Time (min)	TC # 61 (°F)	TC # 62 (°F)	TC # 63 (°F)	TC # 64 (°F)	TC # 65 (°F)	TC # 66 (°F)	TC # 67 (°F)	TC # 68 (°F)	TC # 69 (°F)	TC # 70 (°F)
142	222	217	212	217	227	238	243	263	253	244
143	223	218	213	218	228	240	245	264	255	245
144	224	218	213	220	229	241	246	265	256	247
145	224	219	214	221	230	243	247	267	258	248
146	225	220	214	222	232	244	249	268	259	250
147	226	221	215	223	233	245	250	270	261	251
148	227	221	215	224	235	247	252	271	262	253
149	228	222	216	225	236	248	253	273	264	254
150	229	223	217	226	238	250	255	274	265	256
151	229	224	218	227	239	251	256	276	267	257
152	230	225	218	228	241	253	258	277	268	259
153	232	226	219	229	242	255	260	279	269	260
154	233	227	220	230	244	256	261	280	271	262
155	235	228	221	232	246	258	263	282	272	263
156	237	229	222	233	248	259	264	284	274	265
157	238	230	223	235	250	261	266	285	276	266
158	240	231	224	237	252	263	268	287	277	268
159	241	232	224	239	254	265	270	289	279	269
160	243	234	225	240	255	266	271	290	280	271
161	244	235	226	242	257	268	273	292	282	272
162	246	236	227	244	259	270	274	293	283	274
163	248	237	228	245	261	271	276	295	285	276
164	249	238	228	247	262	273	278	297	286	277
165	251	239	229	249	264	274	279	298	288	279
166	253	241	230	250	266	276	281	300	289	280
167	255	242	231	252	268	278	283	301	291	282
168	257	243	232	254	269	279	284	303	293	284
169	258	245	233	256	271	281	286	305	294	285
170	260	246	234	257	273	283	288	307	296	287
171	262	248	236	259	275	285	290	309	298	289
172	264	249	238	261	277	286	292	311	299	290
173	266	251	240	263	278	288	293	312	301	292
174	268	252	243	265	280	290	295	314	302	293
175	270	254	246	267	282	292	297	316	304	295
176	272	256	248	269	284	294	299	318	306	297
177	274	257	251	270	285	295	301	320	308	298
178	275	259	253	272	287	297	303	322	309	300
179	277	261	256	274	289	299	305	323	311	302
180	279	262	258	277	291	301	307	325	312	304
Max Temp:	279	262	258	277	291	301	307	325	312	304
Max Allowed:	417	417	417	417	417	417	417	417	417	417

OMEGA POINT LABORATORIES

Peak Seals, Inc. Project No. 14540-99417 August 21, 1997

Time (min)	TC # 71 (°F)	TC # 72 (°F)	TC # 73 (°F)	TC # 74 (°F)	TC # 75 (°F)	TC # 76 (°F)	TC # 77 (°F)	TC # 78 (°F)	TC # 79 (°F)	TC # 80 (°F)
0	92	92	92	92	92	92	93	93	93	92
1	92	92	92	92	92	92	93	93	93	92
2	92	92	92	92	92	92	93	93	93	92
3	92	92	92	92	92	92	93	93	93	92
4	92	92	92	92	92	92	93	93	93	92
5	92	92	92	92	92	92	93	93	93	92
6	92	92	92	92	92	92	93	93	93	92
7	92	92	92	92	92	92	93	93	93	92
8	92	92	92	92	92	92	93	93	93	92
9	92	92	92	92	92	92	93	93	93	93
10	92	92	92	92	92	92	93	93	93	93
11	92	92	92	92	92	92	92	93	93	94
12	92	92	92	92	92	92	92	93	93	96
13	92	92	92	92	92	92	92	93	93	99
14	92	92	92	92	92	92	92	93	93	102
15	92	92	92	92	92	92	92	93	94	107
16	92	92	92	92	92	92	92	93	94	111
17	92	92	92	92	92	92	92	92	94	114
18	92	92	92	92	92	92	92	93	95	116
19	92	92	92	92	92	92	92	93	95	117
20	92	92	92	92	92	92	92	93	95	118
21	92	92	92	92	92	92	92	93	96	118
22	92	92	92	92	92	92	92	93	96	119
23	92	92	92	92	92	92	92	93	97	120
24	92	92	92	92	92	92	92	93	97	122
25	92	92	92	92	92	92	92	93	97	124
26	92	92	92	92	92	92	92	93	98	124
27	92	92	92	92	92	92	92	93	98	123
28	92	92	92	92	92	92	92	93	99	124
29	93	92	92	92	92	92	92	93	99	126
30	93	92	92	92	92	92	92	93	100	128
31	93	93	92	92	92	92	92	94	100	129
32	93	93	92	92	92	92	93	94	101	131
33	93	93	93	92	92	93	93	94	102	133
34	93	93	93	92	93	93	93	94	102	132
35	94	93	93	92	93	93	93	94	102	132
36	94	94	93	93	93	93	93	94	102	133
37	94	94	93	93	93	93	93	95	103	134
38	94	94	93	93	93	93	93	95	104	135
39	95	95	94	93	93	93	93	95	104	137
40	96	95	94	93	94	94	94	95	105	139
41	96	96	94	93	94	94	94	96	105	138
42	97	96	95	94	94	94	94	96	106	138
43	98	97	95	94	94	94	94	96	106	138
44	98	98	96	94	95	95	95	96	107	141
45	99	98	97	95	95	95	95	97	107	142
46	100	99	97	95	96	95	96	97	108	145
47	101	100	98	96	96	96	96	98	109	147
48	102	101	99	96	97	97	97	98	110	150
49	103	102	100	97	97	97	97	98	112	152
50	104	103	101	98	98	98	98	99	112	155
51	105	104	102	98	99	98	98	100	112	157
52	106	105	103	99	100	99	99	100	113	158
53	107	106	104	100	100	100	100	101	114	162
54	108	107	105	101	101	101	101	101	117	165
55	110	108	106	102	102	102	101	102	117	167
56	111	110	107	103	103	103	102	103	118	171
57	112	111	108	104	105	104	103	104	121	175
58	114	112	110	105	106	105	105	105	122	179
59	115	114	111	106	107	106	106	106	125	183
60	117	116	113	108	108	107	107	107	125	186
61	118	117	114	109	110	109	108	108	128	190
62	120	119	116	111	111	110	110	109	130	193
63	122	121	118	112	113	112	111	111	132	195
64	124	123	120	114	115	114	113	112	135	198
65	126	125	122	116	117	116	115	114	139	199
66	128	127	124	118	119	118	117	116	142	199
67	130	129	126	120	121	120	118	117	145	200
68	132	131	128	122	123	122	120	119	150	202
69	134	133	130	124	125	124	122	121	154	203
70	136	135	132	126	127	126	124	123	159	204

OMEGA POINT LABORATORIES

Peak Seals, Inc. Project No. 14540-99417 August 21, 1997

Time (min)	TC # 71 (°F)	TC # 72 (°F)	TC # 73 (°F)	TC # 74 (°F)	TC # 75 (°F)	TC # 76 (°F)	TC # 77 (°F)	TC # 78 (°F)	TC # 79 (°F)	TC # 80 (°F)
71	137	137	134	128	129	128	127	126	164	204
72	139	139	136	130	131	130	129	128	168	204
73	141	141	138	132	133	132	131	130	172	205
74	143	143	140	134	135	134	133	133	176	205
75	146	145	143	137	138	137	136	136	179	205
76	148	147	145	139	140	139	138	138	180	204
77	150	149	147	141	142	141	141	141	182	204
78	152	152	149	144	145	144	143	144	183	204
79	155	154	152	146	147	146	145	146	183	203
80	157	157	154	149	150	149	148	149	183	203
81	160	159	157	151	153	152	151	152	183	202
82	162	162	159	154	155	154	154	154	182	201
83	164	164	162	157	158	157	157	157	182	200
84	167	167	164	159	161	160	159	159	181	199
85	170	169	167	162	164	163	162	162	180	198
86	172	172	170	165	166	166	165	165	180	197
87	175	174	172	168	169	169	168	167	179	195
88	177	177	175	171	172	171	171	170	179	194
89	180	179	178	173	175	174	173	172	180	193
90	182	182	180	176	177	177	176	175	181	192
91	184	184	183	179	180	180	179	177	182	190
92	187	186	185	181	182	182	181	180	184	189
93	189	188	187	184	185	185	184	182	186	188
94	191	190	189	186	187	187	186	185	188	189
95	192	192	191	188	189	189	188	187	190	191
96	194	194	193	190	191	191	190	189	192	192
97	196	195	194	192	193	193	192	191	193	194
98	197	197	196	194	194	195	194	193	195	195
99	198	198	197	196	196	196	196	195	196	197
100	200	199	199	197	197	198	197	196	198	198
101	201	200	200	198	199	199	199	198	199	199
102	202	201	201	200	200	200	200	199	200	201
103	203	202	202	201	201	201	201	200	201	202
104	203	203	203	202	202	202	202	202	202	203
105	204	204	204	203	203	203	203	203	203	203
106	205	205	204	204	204	204	204	204	204	204
107	206	205	205	205	205	205	205	204	205	205
108	206	206	206	205	205	206	206	205	206	206
109	207	207	206	206	206	206	206	206	206	206
110	207	207	207	206	207	207	207	206	207	207
111	207	207	207	207	207	207	207	207	207	207
112	208	208	208	207	207	207	207	207	207	207
113	208	208	208	208	208	208	208	207	207	208
114	208	208	208	208	208	208	208	208	208	208
115	208	208	208	208	208	208	208	208	208	208
116	209	209	208	208	208	208	208	208	208	208
117	209	209	209	208	208	208	208	208	208	208
118	209	209	209	209	208	208	208	208	208	208
119	209	209	209	209	209	208	208	208	208	208
120	209	209	209	209	209	209	209	208	208	209
121	209	209	209	209	209	209	209	209	208	209
122	209	209	209	209	209	209	209	209	209	209
123	210	209	209	209	209	209	209	209	209	209
124	210	209	209	209	209	209	209	209	209	209
125	210	210	209	209	209	209	209	209	209	209
126	211	210	209	209	209	209	209	209	209	209
127	212	210	210	209	209	209	209	209	209	209
128	214	211	210	209	209	209	209	209	209	209
129	216	213	210	209	209	209	209	209	209	209
130	217	214	210	209	209	209	209	209	209	209
131	218	215	211	209	210	209	209	209	209	209
132	219	216	211	210	210	209	209	209	209	209
133	221	217	212	210	210	209	209	209	209	209
134	222	218	213	210	210	209	209	209	209	209
135	223	218	213	210	210	210	209	209	209	209
136	224	219	214	210	210	210	209	209	209	209
137	226	220	215	210	210	211	209	209	209	209
138	227	222	215	210	210	212	209	209	209	209
139	228	223	216	210	211	212	209	210	209	209
140	229	224	217	210	211	213	210	210	209	209
141	231	225	218	210	211	213	210	210	209	209

OMEGA POINT LABORATORIES

Peak Seals, Inc. Project No. 14540-99417 August 21, 1997

Time (min)	TC # 71 (°F)	TC # 72 (°F)	TC # 73 (°F)	TC # 74 (°F)	TC # 75 (°F)	TC # 76 (°F)	TC # 77 (°F)	TC # 78 (°F)	TC # 79 (°F)	TC # 80 (°F)
142	232	226	218	211	212	214	210	210	209	209
143	234	227	219	212	212	215	210	210	209	209
144	235	228	220	212	213	215	211	210	209	209
145	237	230	221	213	214	216	211	210	209	210
146	239	231	222	214	215	217	211	210	209	212
147	241	233	223	215	216	217	211	210	210	213
148	242	234	223	216	217	218	211	210	210	216
149	244	236	225	217	218	219	212	210	211	217
150	246	238	226	218	219	220	213	210	213	219
151	247	240	227	219	220	221	214	210	214	221
152	249	241	228	220	221	222	215	210	216	222
153	250	243	229	221	222	222	215	210	217	224
154	252	244	230	222	223	223	216	211	218	225
155	254	246	232	223	224	224	216	211	219	226
156	255	247	234	224	225	225	217	211	219	227
157	257	249	236	225	226	226	218	212	220	228
158	258	250	237	226	227	227	218	213	221	229
159	260	252	239	227	228	228	219	213	222	230
160	262	254	240	228	229	229	220	214	223	230
161	263	255	242	229	230	229	221	214	224	231
162	265	257	243	230	231	230	222	215	225	232
163	266	258	245	231	232	231	222	216	225	233
164	268	260	246	232	233	233	223	216	226	234
165	270	262	247	233	234	234	224	217	227	235
166	271	263	249	234	236	235	225	218	228	236
167	273	265	250	236	237	236	226	219	229	237
168	275	266	252	237	239	237	227	220	230	238
169	276	268	253	238	240	238	228	221	231	239
170	278	269	254	240	241	239	228	222	232	240
171	280	271	256	241	243	241	229	223	233	241
172	281	273	257	242	244	242	230	224	234	242
173	283	274	259	244	245	243	231	225	235	243
174	285	276	261	245	247	244	232	226	236	244
175	286	278	262	247	248	245	233	227	237	245
176	288	280	264	248	250	246	234	228	238	246
177	290	281	266	250	251	248	235	229	240	248
178	291	283	267	251	253	249	236	230	241	249
179	293	285	269	253	255	250	236	231	242	250
180	295	287	271	254	256	252	237	232	243	251
Max Temp:	295	287	271	254	256	252	237	232	243	251
Max Allowed:	417	417	417	417	417	417	418	418	418	417

OMEGA POINT LABORATORIES

Peak Seals, Inc. Project No. 14540-99417 August 21, 1997

Time (min)	TC # 81 (°F)	TC # 82 (°F)	TC # 83 (°F)	TC # 84 (°F)	TC # 85 (°F)	TC # 86 (°F)	TC # 87 (°F)	TC # 88 (°F)	TC # 89 (°F)	TC # 90 (°F)
0	92	92	93	93	93	93	93	93	93	93
1	92	92	93	93	93	93	93	93	93	93
2	92	92	93	93	93	93	93	93	93	93
3	92	92	93	93	93	93	93	93	93	93
4	92	92	93	93	93	93	93	93	93	93
5	92	92	93	93	93	93	93	93	93	93
6	92	92	93	93	93	93	93	93	93	93
7	92	92	93	93	93	93	93	93	93	93
8	92	92	93	93	93	93	93	93	93	93
9	104	92	93	93	93	93	93	93	93	93
10	146	92	93	93	93	93	93	93	93	93
11	195	92	93	93	93	93	93	93	93	93
12	198	92	93	93	93	93	93	93	93	93
13	199	92	93	93	93	93	93	93	93	93
14	200	92	93	93	93	93	93	93	93	93
15	201	92	93	93	93	93	93	93	93	93
16	200	92	93	93	93	93	93	93	93	93
17	197	92	93	93	93	93	93	93	93	93
18	187	92	93	93	93	93	93	93	93	93
19	180	92	93	93	93	93	93	93	93	93
20	173	92	93	93	93	93	93	93	93	93
21	169	93	93	93	93	93	93	93	93	93
22	166	93	93	93	93	93	93	93	93	93
23	166	94	93	93	93	93	93	93	93	93
24	169	94	94	94	93	93	93	93	93	93
25	172	94	94	94	93	93	93	93	93	93
26	175	95	94	94	93	93	93	93	93	93
27	176	96	94	94	93	93	93	93	93	93
28	180	96	94	94	93	93	93	93	93	93
29	182	98	94	94	93	93	93	93	93	93
30	178	101	94	94	94	93	93	93	93	93
31	178	105	95	94	94	93	93	93	93	93
32	177	111	95	94	94	94	94	94	93	93
33	176	118	96	94	94	94	94	94	93	93
34	177	125	98	94	94	94	94	94	93	93
35	178	133	99	94	94	94	94	94	93	93
36	181	140	101	94	94	94	94	94	94	93
37	182	149	103	95	94	94	94	94	94	93
38	185	156	105	95	94	94	94	94	94	93
39	186	164	107	95	94	94	94	95	94	94
40	187	173	109	96	94	94	94	95	94	94
41	188	180	112	96	94	94	94	95	94	94
42	189	186	114	97	94	94	95	95	95	94
43	189	191	117	97	94	94	95	96	95	94
44	191	194	119	98	94	94	95	96	95	95
45	192	196	122	98	95	95	95	96	96	95
46	193	198	124	99	95	95	96	97	96	95
47	195	200	127	100	95	95	96	97	96	96
48	198	202	130	100	95	96	96	98	97	96
49	200	203	134	101	96	96	97	98	97	96
50	201	203	137	102	96	96	97	99	98	97
51	201	203	140	103	97	97	98	99	98	98
52	202	203	142	103	97	97	99	100	99	98
53	203	203	144	105	98	98	99	101	100	99
54	203	202	145	105	98	98	100	102	101	100
55	204	201	145	106	99	99	101	102	102	101
56	204	200	146	107	99	100	102	104	103	102
57	205	199	147	108	100	101	103	105	104	103
58	205	198	148	109	101	101	104	106	105	104
59	205	197	148	110	102	102	105	107	106	106
60	205	196	148	111	103	103	106	108	108	107
61	206	195	149	112	103	104	107	110	109	108
62	206	193	149	113	104	106	109	111	111	110
63	207	191	149	114	106	107	110	113	113	112
64	207	190	149	115	107	108	112	115	115	113
65	207	188	149	116	108	110	114	117	116	115
66	207	186	149	117	109	112	115	118	118	117
67	207	184	149	119	111	114	117	120	120	119
68	207	183	149	120	112	115	119	122	122	121
69	207	181	149	122	114	117	121	124	124	123
70	207	180	149	123	116	118	123	126	126	125

OMEGA POINT LABORATORIES

Peak Seals, Inc. Project No. 14540-99417 August 21, 1997

Time (min)	TC # 81 (°F)	TC # 82 (°F)	TC # 83 (°F)	TC # 84 (°F)	TC # 85 (°F)	TC # 86 (°F)	TC # 87 (°F)	TC # 88 (°F)	TC # 89 (°F)	TC # 90 (°F)
71	207	179	149	125	118	120	125	128	128	128
72	207	178	149	126	119	122	127	130	130	130
73	207	178	149	128	121	124	129	132	132	132
74	207	177	150	130	124	127	131	134	135	134
75	206	176	150	132	126	129	134	136	137	136
76	206	176	150	134	128	131	136	139	139	139
77	206	176	151	136	131	134	139	141	142	141
78	206	175	151	138	133	136	142	144	144	144
79	206	175	152	141	135	139	144	146	147	147
80	205	175	153	143	138	142	147	149	149	149
81	205	175	154	146	141	145	150	152	152	152
82	204	175	156	149	144	148	153	154	155	155
83	204	175	157	152	148	152	156	157	157	158
84	203	175	159	155	151	155	159	160	160	160
85	202	176	161	158	154	158	162	163	163	163
86	202	176	163	161	157	162	164	165	165	166
87	201	176	165	164	161	165	167	168	168	169
88	200	176	168	167	164	168	170	171	171	172
89	199	176	170	170	167	171	173	173	174	174
90	199	177	173	173	171	174	176	176	177	177
91	198	178	176	177	174	178	178	179	179	180
92	197	179	179	180	178	181	182	182	182	183
93	196	181	181	183	181	184	184	185	185	185
94	195	183	184	186	184	187	187	187	187	188
95	194	185	187	189	188	190	190	190	190	190
96	194	188	190	192	191	193	192	192	192	193
97	195	191	192	194	193	195	194	195	195	195
98	195	193	195	196	196	197	197	197	197	197
99	196	196	197	198	198	199	198	198	198	199
100	198	198	199	200	200	200	200	200	200	200
101	199	200	200	201	201	202	202	201	201	202
102	200	201	202	202	203	203	203	203	202	203
103	201	203	203	204	204	204	204	204	204	204
104	202	204	204	205	205	205	205	205	205	205
105	203	205	205	206	206	206	206	206	206	206
106	204	206	206	206	206	206	206	207	206	206
107	205	206	207	207	207	207	207	207	207	207
108	206	207	207	208	208	207	208	208	207	207
109	206	207	208	208	208	208	208	208	208	208
110	207	208	208	208	208	208	208	209	208	208
111	207	208	208	209	209	209	209	209	209	208
112	208	208	209	209	209	209	209	209	209	209
113	208	209	209	209	209	209	209	209	209	209
114	208	209	209	209	209	209	209	210	209	209
115	208	209	209	209	209	209	209	210	209	209
116	209	209	209	209	209	210	210	210	209	209
117	209	209	209	209	209	210	210	211	209	209
118	209	209	209	209	209	210	210	211	210	209
119	209	209	209	209	209	210	210	212	210	210
120	209	209	209	209	209	210	210	213	210	210
121	209	209	209	209	210	210	211	214	210	210
122	209	209	209	209	209	210	211	215	210	210
123	209	209	209	209	209	210	212	215	211	210
124	209	209	209	209	210	210	213	216	211	210
125	209	209	209	209	210	211	213	217	212	210
126	209	209	209	209	210	211	214	218	212	210
127	209	209	209	209	209	211	214	218	212	210
128	209	209	209	209	209	211	215	219	213	210
129	209	209	209	209	209	211	215	220	214	210
130	209	209	209	209	209	211	216	220	214	210
131	209	209	209	209	210	211	216	221	215	210
132	209	209	209	210	209	212	217	222	216	211
133	209	209	209	209	209	211	217	223	216	211
134	209	209	209	210	210	212	218	224	217	211
135	209	209	209	209	209	212	218	225	218	212
136	209	209	209	210	209	212	219	226	219	212
137	209	209	209	210	210	212	220	227	220	212
138	209	209	209	210	210	212	220	228	220	213
139	209	209	210	210	210	212	221	229	221	213
140	209	209	210	210	210	212	221	229	222	214
141	209	209	210	211	210	212	222	230	223	214

OMEGA POINT LABORATORIES

Peak Seals, Inc. Project No. 14540-99417 August 21, 1997

Time (min)	TC # 81 (°F)	TC # 82 (°F)	TC # 83 (°F)	TC # 84 (°F)	TC # 85 (°F)	TC # 86 (°F)	TC # 87 (°F)	TC # 88 (°F)	TC # 89 (°F)	TC # 90 (°F)
142	209	209	210	214	210	213	222	231	224	215
143	209	209	210	215	210	213	223	232	225	215
144	209	209	211	216	210	213	224	233	226	216
145	209	209	211	217	210	213	225	234	227	217
146	209	209	212	218	211	214	225	235	228	218
147	209	209	212	219	211	214	226	236	229	219
148	209	209	212	220	212	215	227	237	229	219
149	209	209	213	221	212	216	227	238	231	220
150	209	209	213	222	212	216	228	239	232	221
151	209	209	214	223	214	217	229	240	233	222
152	209	209	214	222	215	218	230	241	234	223
153	209	210	214	225	216	219	231	242	235	224
154	209	210	215	224	218	219	232	243	236	225
155	209	210	216	227	219	220	232	244	237	226
156	209	210	217	227	220	222	233	245	238	227
157	209	210	218	217	222	222	234	246	239	228
158	209	210	219	229	223	223	236	247	240	229
159	209	211	220	231	224	224	237	248	241	230
160	209	211	221	232	226	226	238	249	243	231
161	209	212	223	234	227	227	239	251	244	232
162	209	212	223	235	228	228	240	252	245	234
163	209	213	225	237	230	230	242	253	246	236
164	209	213	227	238	231	232	243	255	248	238
165	209	214	228	239	232	233	245	256	249	240
166	209	215	229	241	234	235	246	257	250	243
167	209	215	231	242	235	236	248	259	252	245
168	210	216	232	243	237	238	250	260	253	246
169	210	218	233	245	238	239	251	262	254	248
170	210	219	235	246	239	241	253	263	256	250
171	211	221	236	247	241	243	255	265	258	252
172	214	223	238	249	242	245	257	266	259	254
173	215	224	239	250	244	247	258	268	261	256
174	216	226	241	252	245	249	260	270	263	257
175	217	227	243	253	247	251	262	271	264	259
176	218	229	244	255	248	253	264	273	266	261
177	219	231	246	256	250	255	266	275	268	263
178	220	234	248	258	252	257	268	277	270	265
179	222	236	250	259	254	259	270	278	272	266
180	223	238	252	261	255	262	272	280	273	268
Max Temp:	223	238	252	261	255	262	272	280	273	268
Max Allowed:	417	417	418	418	418	418	418	418	418	418

OMEGA POINT LABORATORIES

Peak Seals, Inc. Project No. 14540-99417 August 21, 1997

Time (min)	TC # 91 (°F)	TC # 92 (°F)	TC # 93 (°F)	TC # 94 (°F)	TC # 95 (°F)	TC # 96 (°F)	TC # 97 (°F)	TC # 98 (°F)	TC # 99 (°F)	TC # 100 (°F)
0	93	93	93	93	92	92	92	92	92	92
1	93	93	93	93	92	92	92	92	92	92
2	93	93	93	93	92	92	93	92	92	93
3	93	93	93	93	92	92	92	92	92	92
4	93	93	93	93	92	92	92	92	92	92
5	93	93	93	92	92	92	92	92	92	92
6	93	93	93	93	92	92	92	92	92	92
7	93	93	92	92	92	92	92	92	92	92
8	93	93	93	92	92	92	92	92	92	92
9	93	93	93	93	92	92	92	92	92	92
10	93	93	93	93	92	92	92	92	92	92
11	93	93	93	93	92	92	92	92	92	92
12	93	93	93	92	93	92	92	92	92	92
13	93	93	93	93	93	93	92	92	92	92
14	93	93	92	92	93	93	92	92	92	92
15	93	93	93	92	93	93	92	92	92	92
16	93	93	92	92	93	93	92	92	92	92
17	93	93	92	93	94	93	92	92	92	92
18	93	93	92	93	94	93	92	92	92	92
19	93	93	92	93	94	93	92	92	92	92
20	93	93	92	93	95	93	92	92	92	92
21	93	93	93	93	95	94	92	92	92	92
22	93	93	93	93	96	94	93	92	92	92
23	93	93	93	93	96	94	93	92	92	92
24	93	93	93	93	96	94	93	93	92	92
25	93	93	93	93	97	95	93	93	93	92
26	93	93	93	93	97	95	93	93	93	93
27	93	93	93	93	98	95	93	93	93	93
28	93	93	93	93	98	96	93	93	93	93
29	93	93	93	93	99	96	93	93	93	93
30	93	93	93	94	99	96	93	93	93	93
31	93	93	93	94	100	97	93	93	93	93
32	93	93	93	94	100	97	94	93	93	93
33	93	93	93	94	101	98	94	93	93	93
34	93	93	94	94	102	98	94	94	93	93
35	93	94	94	95	103	99	94	94	94	93
36	93	94	94	95	104	99	95	94	94	93
37	94	94	94	95	105	100	95	94	94	94
38	94	94	95	96	106	101	95	95	94	94
39	94	95	95	96	107	101	96	95	95	94
40	94	95	95	96	108	102	96	95	95	94
41	95	95	96	97	109	103	97	96	95	95
42	95	96	96	97	110	104	97	96	96	95
43	95	96	97	98	112	105	98	97	96	95
44	96	97	97	99	113	107	98	97	97	96
45	96	97	98	100	115	108	99	98	97	96
46	97	98	99	100	116	109	100	98	98	97
47	97	99	99	101	118	110	100	99	99	98
48	98	99	100	102	120	112	101	100	100	98
49	99	100	101	103	122	113	102	100	100	99
50	99	101	102	104	124	115	103	101	101	100
51	100	102	103	106	126	116	104	102	102	101
52	102	104	105	107	128	118	105	103	103	102
53	103	105	107	108	131	120	106	104	105	103
54	104	107	109	110	133	121	108	106	106	104
55	105	108	110	112	136	123	109	107	107	106
56	107	110	112	113	138	125	110	108	108	107
57	108	111	113	115	141	126	112	110	110	108
58	110	113	115	117	143	128	114	112	111	109
59	111	114	116	119	145	130	116	113	113	111
60	113	116	118	121	146	131	118	115	115	112
61	115	117	119	124	148	133	120	118	117	114
62	117	119	122	126	149	135	122	120	119	116
63	119	122	124	128	150	136	124	122	121	118
64	121	124	126	130	151	138	126	125	124	121
65	123	126	128	132	152	139	128	127	126	123
66	125	128	130	133	153	141	130	129	128	125
67	127	130	132	135	154	142	132	131	130	127
68	129	132	134	137	155	143	134	133	132	129
69	131	134	136	139	156	145	136	135	134	131
70	133	136	138	141	157	146	138	137	136	133

OMEGA POINT LABORATORIES

Peak Seals, Inc. Project No. 14540-99417 August 21, 1997

Time (min)	TC # 91 (°F)	TC # 92 (°F)	TC # 93 (°F)	TC # 94 (°F)	TC # 95 (°F)	TC # 96 (°F)	TC # 97 (°F)	TC # 98 (°F)	TC # 99 (°F)	TC # 100 (°F)
71	135	138	140	143	158	148	139	139	138	135
72	137	140	142	145	159	149	141	141	140	137
73	139	142	145	147	161	150	143	143	142	139
74	141	144	147	149	163	152	145	145	144	141
75	144	147	149	151	164	153	148	147	147	144
76	146	149	152	154	166	155	150	149	149	146
77	148	152	154	156	168	157	152	152	151	148
78	151	154	157	158	170	159	155	154	154	151
79	154	157	159	160	172	161	157	157	156	153
80	156	159	162	163	173	163	160	160	159	156
81	159	162	164	165	175	165	162	162	161	159
82	161	164	167	168	177	167	165	165	164	161
83	163	167	169	170	179	170	167	167	166	164
84	166	169	171	173	181	172	169	169	168	166
85	168	171	173	175	183	174	172	172	171	169
86	171	174	175	177	185	177	174	175	173	172
87	174	176	178	179	187	179	177	177	176	174
88	176	179	180	181	189	181	179	180	178	177
89	179	181	182	183	191	183	182	182	180	179
90	181	183	185	186	193	186	184	184	183	182
91	184	186	187	188	195	188	186	187	185	184
92	186	188	189	190	197	190	189	189	187	186
93	189	191	191	192	199	192	191	191	189	188
94	191	193	193	194	201	194	193	193	191	190
95	194	195	195	196	203	195	194	195	193	192
96	196	197	197	197	205	197	196	196	195	194
97	198	198	199	199	206	199	198	198	197	196
98	199	200	200	200	208	200	199	199	198	198
99	201	201	201	202	210	202	201	200	199	199
100	202	202	203	203	211	203	202	202	201	200
101	203	203	204	204	212	204	203	203	202	201
102	204	204	204	205	214	205	204	204	203	202
103	205	205	205	206	215	207	205	205	204	204
104	206	206	206	206	216	208	205	205	205	204
105	206	207	207	207	217	209	206	206	205	205
106	207	207	207	207	218	210	207	207	206	206
107	207	207	207	208	219	211	207	207	207	207
108	208	208	208	208	220	211	208	208	207	207
109	208	208	208	209	220	212	208	208	208	208
110	208	209	209	209	221	213	208	209	208	208
111	209	209	209	210	222	214	209	209	208	208
112	209	209	209	210	223	214	209	209	209	209
113	209	209	210	211	224	215	209	210	209	209
114	209	210	210	211	224	216	210	210	209	209
115	209	210	210	211	225	216	210	210	209	209
116	209	210	211	212	226	217	210	211	210	209
117	209	210	211	212	227	218	210	210	210	209
118	210	210	211	213	228	219	211	211	210	210
119	210	210	212	213	228	220	211	211	210	210
120	210	210	212	214	229	220	211	211	210	210
121	210	211	212	214	230	221	212	211	210	210
122	210	211	213	215	231	223	213	211	210	210
123	210	211	213	216	232	224	215	212	210	210
124	210	212	213	217	233	225	216	212	211	210
125	210	213	213	217	234	226	217	213	212	210
126	210	214	215	218	235	227	218	213	212	210
127	210	215	216	219	236	228	219	214	212	211
128	211	216	217	220	238	230	220	216	213	211
129	211	218	218	221	239	231	221	218	214	212
130	212	219	220	221	240	233	222	220	216	213
131	212	219	221	222	241	234	223	221	218	214
132	213	220	223	224	243	236	225	223	220	215
133	213	221	225	226	244	238	226	225	221	215
134	214	222	226	227	245	239	227	226	223	216
135	216	223	228	229	247	240	228	228	224	217
136	216	224	230	230	248	242	230	230	226	218
137	217	225	232	232	249	243	232	232	227	218
138	218	227	234	234	251	245	234	233	229	219
139	219	228	236	236	252	246	236	235	231	220
140	220	230	238	238	253	247	238	236	232	221
141	221	231	240	239	255	249	240	238	234	222

OMEGA POINT LABORATORIES

Peak Seals, Inc. Project No. 14540-99417 August 21, 1997

Time (min)	TC # 91 (°F)	TC # 92 (°F)	TC # 93 (°F)	TC # 94 (°F)	TC # 95 (°F)	TC # 96 (°F)	TC # 97 (°F)	TC # 98 (°F)	TC # 99 (°F)	TC # 100 (°F)
142	222	233	241	241	256	250	242	239	235	223
143	222	234	243	242	257	251	244	241	236	224
144	223	236	244	244	259	253	246	242	238	225
145	224	238	246	245	260	254	247	244	239	226
146	225	240	247	247	261	255	249	245	240	226
147	226	241	249	248	263	256	250	247	242	227
148	227	243	250	249	264	258	252	248	243	228
149	229	245	252	251	265	259	253	250	244	229
150	230	246	253	252	266	260	255	251	246	230
151	232	248	254	253	268	262	256	253	247	230
152	233	249	256	255	269	263	258	254	248	232
153	235	251	257	256	270	264	259	256	250	233
154	236	252	258	257	272	266	261	257	251	234
155	238	254	260	259	273	267	262	259	252	235
156	239	255	261	260	274	268	264	261	254	236
157	241	257	262	261	276	269	265	262	255	237
158	243	258	264	262	277	271	267	264	257	239
159	245	259	265	264	278	272	268	265	258	240
160	246	261	266	265	280	274	270	267	260	242
161	248	262	268	266	281	275	271	268	261	243
162	250	264	269	268	283	276	273	270	263	244
163	251	265	271	269	284	278	274	271	265	246
164	253	267	272	271	286	279	276	273	266	248
165	254	269	274	272	287	281	277	274	268	250
166	256	270	275	274	289	282	279	276	269	252
167	258	272	277	276	291	284	280	277	271	254
168	259	273	278	277	292	285	282	279	272	256
169	261	275	280	279	294	287	283	281	274	258
170	263	276	281	281	296	288	285	282	276	259
171	264	278	283	283	297	290	287	284	277	261
172	266	279	284	284	299	292	288	285	279	263
173	268	281	286	286	301	293	290	287	281	265
174	269	283	288	288	303	295	291	289	283	266
175	271	284	290	290	305	297	293	290	284	268
176	273	286	292	292	307	298	295	292	286	270
177	275	288	294	294	309	300	296	294	288	272
178	277	290	296	296	311	302	298	296	289	274
179	279	292	298	298	313	304	300	297	291	275
180	281	294	300	300	315	306	301	299	293	277
Max Temp:	281	294	300	300	315	306	301	299	293	277
Max Allowed:	418	418	418	418	417	417	417	417	417	417

OMEGA POINT LABORATORIES

Peak Seals, Inc. Project No. 14540-99417 August 21, 1997

Time (min)	TC # 101 (°F)	TC # 102 (°F)	TC # 103 (°F)	TC # 104 (°F)	TC # 105 (°F)	TC # 106 (°F)	TC # 107 (°F)	TC # 108 (°F)	TC # 109 (°F)
0	92	93	93	93	93	93	93	92	91
1	92	92	93	93	93	93	93	92	91
2	92	92	93	93	93	93	93	92	91
3	92	92	93	93	93	93	93	92	91
4	92	92	93	93	93	93	93	92	91
5	92	92	93	93	93	93	93	92	91
6	92	92	93	93	93	93	93	92	91
7	92	92	93	93	93	93	93	92	91
8	92	92	93	93	93	93	93	92	91
9	92	92	93	93	93	93	93	92	91
10	92	92	92	93	93	93	93	92	91
11	92	92	92	93	93	93	93	104	91
12	92	92	92	93	93	93	95	141	91
13	92	92	93	93	93	93	99	163	91
14	92	92	93	93	93	94	106	175	92
15	92	92	92	93	93	94	112	176	91
16	92	92	92	93	93	94	112	175	92
17	92	92	93	93	93	95	117	174	92
18	92	92	92	93	93	95	117	171	92
19	92	92	93	93	93	95	119	169	92
20	92	92	92	93	93	96	119	166	92
21	92	92	92	93	93	96	120	164	92
22	92	92	92	93	93	96	121	162	92
23	92	92	93	93	93	97	122	161	92
24	92	92	93	93	93	97	123	161	93
25	92	92	92	93	94	97	123	161	93
26	92	92	93	93	94	98	125	161	93
27	92	93	93	93	94	98	126	162	93
28	92	93	93	93	94	99	127	163	93
29	92	93	93	93	94	99	127	164	93
30	92	93	93	93	94	100	129	165	94
31	93	93	93	93	94	100	130	165	94
32	92	93	93	93	94	100	131	166	94
33	92	93	93	93	94	101	134	166	94
34	93	93	93	93	95	102	136	166	94
35	93	93	93	94	95	102	137	167	94
36	93	93	93	94	95	102	135	168	95
37	93	93	94	94	95	103	135	169	95
38	93	94	94	94	96	103	137	170	95
39	93	94	94	94	96	104	138	172	96
40	93	94	94	94	96	104	139	173	96
41	94	94	94	95	96	105	140	174	96
42	94	95	95	95	97	106	144	175	97
43	94	95	95	95	97	106	143	176	97
44	95	95	95	95	97	107	145	178	97
45	95	96	96	96	97	107	147	179	98
46	95	96	96	96	98	107	145	181	98
47	96	97	97	97	98	108	148	183	99
48	96	97	97	97	99	109	151	186	100
49	97	98	98	98	99	110	154	188	101
50	98	99	98	98	100	111	156	190	101
51	98	99	99	99	100	112	159	192	102
52	99	100	100	99	101	113	161	193	103
53	100	101	100	100	101	114	164	195	103
54	101	102	101	101	102	115	166	196	104
55	102	103	102	102	103	116	169	197	105
56	103	104	103	103	103	117	171	199	106
57	104	105	104	104	104	119	177	200	107
58	105	106	105	105	105	120	180	201	108
59	106	108	106	106	106	123	184	202	109
60	108	109	108	107	107	124	188	203	110
61	109	111	109	108	109	127	191	203	111
62	111	112	111	110	110	128	194	204	112
63	112	114	113	112	111	131	197	204	114
64	115	116	114	113	113	135	199	205	115
65	116	118	116	115	114	138	201	205	116
66	118	120	118	117	116	142	202	205	117
67	121	122	120	119	118	147	203	206	118
68	123	124	122	121	119	150	203	206	119
69	125	126	124	123	122	155	204	206	121
70	127	128	126	125	124	160	205	206	122

OMEGA POINT LABORATORIES

Peak Seals, Inc. Project No. 14540-99417 August 21, 1997

Time (min)	TC # 101 (°F)	TC # 102 (°F)	TC # 103 (°F)	TC # 104 (°F)	TC # 105 (°F)	TC # 106 (°F)	TC # 107 (°F)	TC # 108 (°F)	TC # 109 (°F)
71	129	130	128	127	126	165	205	206	123
72	131	132	130	129	128	169	206	206	124
73	134	134	132	131	131	174	206	206	126
74	136	137	135	134	133	177	206	206	127
75	138	139	137	136	136	180	206	206	128
76	141	141	140	138	139	182	206	206	130
77	143	144	142	141	141	183	205	206	131
78	146	146	145	143	144	184	205	206	132
79	149	149	147	146	146	185	204	206	134
80	152	152	150	149	149	185	204	206	135
81	155	154	153	152	152	184	203	206	137
82	157	157	156	154	154	184	202	205	140
83	160	160	159	157	157	183	201	205	143
84	163	162	162	160	160	182	200	205	146
85	166	165	164	163	162	181	199	204	149
86	169	168	167	166	164	180	198	203	152
87	171	171	170	169	167	179	196	203	154
88	174	174	173	172	170	179	195	202	157
89	177	176	175	174	172	180	194	201	159
90	180	179	178	177	175	181	193	201	162
91	182	181	181	180	177	183	191	200	164
92	184	184	183	183	180	185	190	200	167
93	187	186	186	185	182	187	189	199	169
94	189	188	188	188	185	188	190	198	171
95	191	190	190	190	187	190	192	198	173
96	193	192	192	192	189	193	193	198	176
97	194	194	194	193	191	194	194	198	177
98	196	196	196	195	193	196	196	198	179
99	198	197	197	197	195	197	197	199	181
100	199	199	199	198	196	199	199	199	183
101	200	200	200	200	198	200	200	200	184
102	201	201	201	201	199	201	201	201	186
103	203	202	202	202	201	203	202	202	187
104	203	203	203	203	202	203	203	203	189
105	205	204	204	204	203	204	204	204	190
106	205	205	205	205	204	205	205	205	191
107	206	206	206	206	205	206	206	206	193
108	206	206	206	206	206	206	206	206	193
109	207	207	207	207	206	207	207	207	195
110	207	207	207	207	207	207	207	207	195
111	208	208	208	208	207	208	208	207	196
112	208	208	208	208	208	208	208	208	197
113	209	208	208	208	208	209	208	208	198
114	209	209	209	208	208	209	209	208	199
115	209	209	209	209	209	209	209	208	200
116	209	209	209	209	209	209	209	209	201
117	209	209	209	209	209	209	209	209	201
118	209	209	209	209	209	209	209	209	202
119	210	209	209	209	209	209	209	209	202
120	209	209	209	209	209	209	209	209	203
121	209	210	209	209	209	209	209	209	204
122	209	209	209	209	209	209	209	209	204
123	209	209	209	209	209	209	209	209	205
124	210	210	209	210	210	210	210	209	205
125	209	209	209	209	210	210	210	209	206
126	210	210	209	210	210	210	210	209	206
127	210	210	210	210	210	210	210	209	206
128	210	210	210	209	210	210	209	209	207
129	210	210	210	209	209	210	209	209	207
130	210	211	210	209	210	210	210	209	207
131	210	211	210	209	210	210	210	209	208
132	210	212	211	210	210	210	210	209	208
133	210	213	211	209	210	210	210	209	208
134	210	214	212	210	210	210	210	210	208
135	210	214	213	209	210	210	210	209	208
136	210	215	213	210	210	210	210	210	208
137	211	216	214	210	210	210	210	210	209
138	211	216	215	210	210	210	210	210	209
139	211	217	215	210	210	210	210	210	209
140	212	218	216	211	210	210	210	210	209
141	212	219	216	211	210	210	210	210	209

OMEGA POINT LABORATORIES

Peak Seals, Inc. Project No. 14540-99417 August 21, 1997

Time (min)	TC # 101 (°F)	TC # 102 (°F)	TC # 103 (°F)	TC # 104 (°F)	TC # 105 (°F)	TC # 106 (°F)	TC # 107 (°F)	TC # 108 (°F)	TC # 109 (°F)
142	213	220	217	212	210	210	210	210	209
143	214	220	218	212	210	211	211	210	209
144	215	221	218	213	210	211	211	210	209
145	216	222	219	214	210	211	211	210	210
146	217	223	220	215	211	211	211	210	210
147	218	224	220	215	211	211	212	210	210
148	219	225	221	216	211	212	212	211	210
149	219	225	222	217	211	212	213	210	210
150	220	226	223	218	211	212	214	211	210
151	221	227	223	218	211	213	215	211	210
152	222	228	224	219	212	214	216	211	210
153	222	228	225	219	211	214	216	210	210
154	223	229	226	220	212	215	217	211	210
155	224	230	226	221	212	216	218	211	210
156	224	231	227	222	212	217	219	211	210
157	225	232	228	222	212	218	220	211	210
158	225	233	229	223	212	218	220	211	210
159	227	234	230	224	213	219	221	211	210
160	228	235	231	224	213	220	222	211	210
161	230	236	232	225	214	221	224	211	210
162	231	237	233	226	214	222	225	211	210
163	233	238	233	226	215	222	226	211	210
164	234	239	234	227	216	223	227	211	210
165	236	241	235	228	217	224	228	211	210
166	238	242	236	229	217	225	229	211	210
167	240	243	238	229	219	226	230	211	210
168	242	244	239	230	220	227	232	211	210
169	243	246	240	231	221	228	232	211	210
170	245	247	240	231	222	228	233	211	210
171	247	249	241	232	223	230	235	211	211
172	249	250	242	233	224	230	235	211	211
173	251	252	243	234	225	231	237	211	211
174	253	253	244	235	227	233	238	211	211
175	254	255	244	236	228	234	239	211	212
176	256	256	245	237	229	235	240	211	213
177	258	258	246	237	230	236	241	211	215
178	259	259	247	238	231	237	242	211	216
179	261	261	248	239	232	238	243	211	218
180	263	263	249	240	233	240	244	211	220
Max Temp:	263	263	249	240	233	240	244	211	220
Max Allowed:	417	418	418	418	418	418	418	417	416

OMEGA POINT LABORATORIES

Peak Seals, Inc. Project No. 14540-99417 August 21, 1997

Time (min)	TC # 110 (°F)	TC # 111 (°F)	TC # 112 (°F)	TC # 113 (°F)	TC # 114 (°F)	TC # 115 (°F)	TC # 116 (°F)	TC # 117 (°F)	TC # 118 (°F)
0	93	93	93	93	93	93	93	93	93
1	93	93	93	93	93	93	93	93	93
2	92	93	93	93	93	93	93	93	93
3	92	93	93	93	93	93	93	93	93
4	92	93	93	93	93	93	93	93	93
5	92	93	93	93	93	93	93	93	93
6	93	93	93	93	93	93	93	93	93
7	92	93	93	93	93	93	93	93	93
8	92	93	93	93	93	93	93	93	92
9	92	93	93	93	93	93	93	93	93
10	92	93	93	93	93	93	93	93	92
11	92	93	93	93	93	93	93	93	92
12	92	93	93	93	93	93	93	93	92
13	93	93	93	93	93	93	93	93	92
14	93	93	93	93	93	93	93	93	92
15	92	93	93	93	93	93	93	93	92
16	93	93	93	93	93	93	93	93	92
17	93	93	93	93	93	93	93	93	92
18	93	93	93	93	93	93	93	93	92
19	93	93	93	93	93	93	93	92	92
20	93	93	93	93	93	93	93	92	92
21	93	93	93	93	93	93	93	92	92
22	93	93	93	93	93	93	93	92	92
23	93	93	93	93	93	93	93	93	92
24	93	93	93	93	93	93	93	92	92
25	93	93	93	93	93	93	93	92	92
26	93	93	93	93	93	93	93	92	92
27	94	93	93	93	93	93	93	92	92
28	94	93	93	93	93	93	93	92	92
29	94	94	93	93	93	93	93	93	93
30	94	94	93	93	93	93	93	93	93
31	94	94	93	93	93	93	93	93	93
32	94	94	93	93	93	93	93	93	93
33	95	94	93	93	93	93	93	93	93
34	95	94	94	93	93	93	93	93	93
35	95	94	94	93	93	93	93	93	93
36	95	94	94	93	93	93	93	93	93
37	95	94	94	93	93	93	93	93	93
38	96	95	94	93	93	93	93	93	94
39	96	95	94	94	93	93	93	93	94
40	96	95	94	94	94	93	93	94	94
41	97	95	94	94	94	94	94	94	94
42	97	95	94	94	94	94	94	94	95
43	97	95	95	94	94	94	94	94	95
44	98	96	95	94	94	94	94	95	96
45	98	96	95	94	94	95	95	95	96
46	99	96	95	95	95	95	95	95	96
47	99	97	95	95	95	95	95	96	97
48	100	97	96	95	96	96	96	96	97
49	101	97	96	96	96	96	96	97	98
50	101	98	96	96	96	96	96	97	99
51	102	98	97	97	97	97	97	98	99
52	103	99	97	97	97	97	97	98	100
53	104	100	98	98	98	98	98	99	101
54	104	100	99	98	98	98	98	100	102
55	106	101	99	99	99	99	99	100	103
56	106	102	100	100	100	100	100	101	104
57	108	103	101	101	101	101	101	102	105
58	109	104	102	102	102	102	102	103	106
59	110	105	103	103	103	104	103	104	107
60	111	106	104	104	105	105	105	106	108
61	112	107	106	106	106	106	106	107	110
62	114	109	107	107	108	108	108	109	111
63	115	110	108	108	109	110	109	110	113
64	116	111	110	110	111	111	111	112	114
65	118	113	111	112	112	113	113	113	116
66	119	114	113	113	114	115	114	115	118
67	121	116	115	115	116	116	116	117	119
68	122	118	116	117	118	118	118	119	121
69	124	119	118	119	120	120	120	121	123
70	125	121	120	121	122	122	122	123	125

OMEGA POINT LABORATORIES

Peak Seals, Inc. Project No. 14540-99417 August 21, 1997

Time (min)	TC # 110 (°F)	TC # 111 (°F)	TC # 112 (°F)	TC # 113 (°F)	TC # 114 (°F)	TC # 115 (°F)	TC # 116 (°F)	TC # 117 (°F)	TC # 118 (°F)
71	127	123	122	123	124	123	124	125	127
72	128	125	124	126	126	125	126	127	130
73	130	127	126	128	129	128	128	129	132
74	132	129	129	130	131	130	130	131	134
75	134	131	131	133	134	133	132	133	136
76	136	133	133	135	136	135	134	135	138
77	137	135	136	138	139	137	136	137	140
78	139	138	138	140	141	140	139	140	143
79	141	140	141	143	144	143	141	142	145
80	143	143	144	146	147	145	143	144	148
81	145	145	147	148	149	148	145	147	150
82	148	148	149	151	152	150	147	149	152
83	150	151	152	153	154	153	150	152	155
84	153	153	155	156	157	155	153	155	158
85	155	156	158	159	159	158	156	157	160
86	158	159	160	161	162	161	158	160	163
87	160	161	163	163	164	163	161	162	165
88	163	164	165	166	166	166	164	165	167
89	165	166	167	168	168	168	166	167	169
90	167	169	169	170	171	170	168	169	171
91	169	171	172	172	173	173	171	171	173
92	172	173	174	174	175	175	173	173	175
93	174	175	176	176	176	177	175	175	177
94	176	177	178	178	178	179	177	177	179
95	178	179	180	180	180	180	179	179	181
96	180	181	182	182	182	182	181	181	182
97	182	183	183	183	183	184	182	183	184
98	184	184	185	185	185	185	184	184	186
99	185	186	186	186	186	186	185	186	187
100	187	188	188	188	188	188	187	187	189
101	188	189	189	189	189	189	188	189	190
102	189	190	191	191	191	190	190	190	191
103	191	192	192	192	192	192	191	191	192
104	192	193	193	193	193	193	192	192	193
105	193	194	194	194	194	194	193	194	194
106	194	195	195	195	195	195	194	195	196
107	195	196	196	196	196	196	195	196	196
108	196	197	197	197	197	197	196	197	197
109	197	198	198	198	198	198	197	198	198
110	198	199	199	199	199	199	198	198	199
111	199	199	200	200	199	199	199	199	200
112	199	200	200	200	200	200	200	200	201
113	200	201	201	201	201	201	200	201	201
114	201	202	201	201	201	201	201	201	202
115	202	202	202	202	202	202	202	202	202
116	202	203	203	203	203	203	202	202	203
117	203	203	203	203	203	203	203	203	204
118	203	204	204	204	204	204	203	204	204
119	204	204	204	204	204	204	204	204	205
120	204	205	205	205	205	205	204	205	205
121	205	205	205	205	205	205	205	205	206
122	205	206	206	206	206	206	205	205	206
123	205	206	206	206	206	206	206	206	206
124	206	206	206	206	206	206	206	206	207
125	206	207	207	207	207	207	206	207	207
126	207	207	207	207	207	207	207	207	207
127	207	207	207	207	207	207	207	207	208
128	207	208	207	208	207	208	207	208	208
129	207	208	208	208	208	208	208	208	208
130	208	208	208	208	208	208	208	208	208
131	208	208	208	208	208	208	208	208	208
132	208	208	208	208	208	208	208	208	209
133	208	208	208	209	209	209	209	209	209
134	209	209	209	209	209	209	209	209	209
135	209	209	209	209	209	209	209	209	209
136	209	209	209	209	209	209	209	209	209
137	209	209	209	209	209	209	209	209	209
138	209	209	209	209	209	209	209	209	209
139	209	209	209	209	209	209	209	209	209
140	209	210	209	210	210	210	210	209	209
141	209	210	210	210	210	210	210	209	210

OMEGA POINT LABORATORIES

Peak Seals, Inc. Project No. 14540-99417 August 21, 1997

Time (min)	TC # 110 (°F)	TC # 111 (°F)	TC # 112 (°F)	TC # 113 (°F)	TC # 114 (°F)	TC # 115 (°F)	TC # 116 (°F)	TC # 117 (°F)	TC # 118 (°F)
142	209	210	210	210	210	210	210	210	210
143	210	210	210	210	210	210	210	210	210
144	210	210	210	210	210	210	210	210	210
145	210	210	210	210	210	210	210	210	210
146	210	210	210	210	210	210	210	210	210
147	210	210	210	210	210	210	210	210	210
148	210	210	210	210	210	210	210	210	210
149	210	210	210	210	210	210	210	210	210
150	210	210	210	210	210	210	210	210	210
151	210	210	210	210	210	210	210	210	210
152	210	210	210	210	210	210	210	210	211
153	210	210	210	210	210	210	210	210	213
154	210	210	210	210	211	210	210	210	214
155	210	210	210	211	211	211	210	210	218
156	210	210	210	211	213	211	211	211	222
157	210	210	210	212	216	212	211	212	226
158	210	210	210	215	220	218	215	216	229
159	210	210	211	219	223	222	219	221	232
160	210	210	211	222	226	225	223	225	235
161	210	211	214	225	229	228	226	229	238
162	210	211	219	228	231	231	229	232	240
163	210	211	222	230	233	233	232	234	242
164	210	213	225	233	236	236	234	237	245
165	211	216	228	235	238	238	237	239	247
166	211	221	231	237	240	240	239	241	249
167	212	226	233	239	242	242	241	243	251
168	216	229	236	241	244	244	243	246	253
169	220	232	238	244	246	246	246	248	255
170	224	235	240	245	248	248	248	250	258
171	228	237	242	247	250	251	250	252	260
172	231	239	244	249	252	253	252	255	262
173	233	242	246	251	254	255	254	257	264
174	235	244	248	253	256	257	257	259	266
175	238	246	250	255	258	259	259	261	269
176	240	247	252	257	260	261	261	264	271
177	242	249	254	259	262	264	264	266	273
178	243	251	256	261	264	266	266	268	275
179	245	253	258	263	267	268	268	271	278
180	247	255	259	265	269	270	270	273	280
Max Temp:	247	255	259	265	269	270	270	273	280
Max Allowed:	418	418	418	418	418	418	418	418	418

OMEGA POINT LABORATORIES

Peak Seals, Inc. Project No. 14540-99417 August 21, 1997

Time (min)	TC # 119 (°F)	TC # 120 (°F)	TC # 121 (°F)	TC # 122 (°F)	TC # 123 (°F)	TC # 124 (°F)	TC # 125 (°F)	TC # 126 (°F)	TC # 127 (°F)
0	93	93	92	92	92	92	93	93	93
1	93	93	92	92	92	92	93	93	93
2	93	93	92	92	92	92	93	93	93
3	93	93	92	92	92	92	92	93	93
4	93	93	92	92	92	92	92	93	93
5	93	93	92	92	92	92	92	93	93
6	93	93	92	92	92	92	92	93	93
7	92	92	92	92	92	92	92	93	93
8	92	92	92	92	92	92	92	93	93
9	92	92	92	92	92	92	92	93	93
10	92	92	92	92	92	92	92	93	93
11	92	92	92	92	92	92	92	93	93
12	92	92	92	93	92	92	92	93	93
13	92	92	92	93	92	92	92	93	93
14	92	92	93	93	92	92	92	93	93
15	92	92	93	93	93	92	92	93	93
16	92	93	93	93	93	92	92	93	93
17	92	93	93	94	93	92	92	93	93
18	92	93	93	94	93	92	92	93	93
19	92	93	93	94	93	92	92	93	93
20	92	93	93	94	93	93	92	93	93
21	92	93	93	94	93	93	92	93	93
22	92	93	93	95	93	93	92	93	93
23	92	93	94	95	93	93	92	93	93
24	92	93	94	95	94	93	92	93	93
25	93	93	94	96	94	93	93	93	93
26	93	93	94	96	94	93	93	93	93
27	93	93	94	96	94	93	93	93	93
28	93	93	95	97	94	93	93	93	93
29	93	93	95	97	95	93	93	93	93
30	93	94	95	97	95	93	93	93	93
31	93	94	95	98	95	94	93	93	93
32	93	94	96	98	96	94	93	93	93
33	93	94	96	99	96	94	93	93	93
34	93	94	96	99	96	94	93	93	93
35	93	94	97	100	97	94	93	93	93
36	94	95	97	100	97	95	94	93	93
37	94	95	98	101	98	95	94	93	93
38	94	95	98	102	98	95	94	94	93
39	94	96	99	103	99	96	94	94	93
40	95	96	99	104	99	96	95	94	93
41	95	97	100	104	100	97	95	94	94
42	96	97	100	105	101	97	96	94	94
43	96	98	101	106	102	98	96	95	94
44	96	98	102	107	102	98	97	95	94
45	97	99	103	108	103	99	97	96	95
46	97	99	103	109	104	100	98	96	95
47	98	100	104	110	105	100	98	96	95
48	98	100	105	111	106	101	99	97	96
49	99	101	106	112	107	102	100	98	96
50	100	102	107	113	108	103	100	98	97
51	101	103	108	114	109	104	101	99	97
52	101	104	109	115	110	104	102	100	98
53	102	104	110	116	111	105	103	100	99
54	103	105	111	117	112	106	104	101	100
55	104	106	112	118	113	107	105	102	100
56	105	107	113	119	114	108	106	103	101
57	106	108	114	121	115	110	107	104	102
58	107	110	115	122	116	111	108	105	103
59	108	111	117	123	117	112	109	106	104
60	110	112	118	124	118	113	110	107	106
61	111	113	119	125	120	114	111	109	107
62	112	115	120	127	121	115	113	110	108
63	114	116	122	128	122	116	114	111	110
64	115	117	123	129	123	118	115	113	111
65	117	119	125	131	125	119	117	114	113
66	118	120	126	132	126	121	118	116	115
67	120	122	128	134	127	122	120	118	117
68	122	124	129	134	129	124	122	120	119
69	124	126	131	136	130	125	124	122	121
70	126	127	133	138	132	127	126	124	123

OMEGA POINT LABORATORIES

Peak Seals, Inc. Project No. 14540-99417 August 21, 1997

Time (min)	TC # 119 (°F)	TC # 120 (°F)	TC # 121 (°F)	TC # 122 (°F)	TC # 123 (°F)	TC # 124 (°F)	TC # 125 (°F)	TC # 126 (°F)	TC # 127 (°F)
71	128	129	135	139	134	129	128	126	126
72	130	131	137	141	135	131	130	129	129
73	132	134	139	143	138	133	132	131	132
74	134	136	141	146	140	136	135	134	135
75	137	138	143	147	143	138	138	137	138
76	139	140	145	149	144	141	141	140	141
77	141	143	147	151	147	143	143	143	144
78	144	145	150	153	150	146	146	146	147
79	146	147	152	156	152	149	149	149	150
80	149	150	155	158	155	152	152	152	154
81	151	152	157	161	158	155	155	155	157
82	154	155	159	163	160	158	158	158	160
83	156	157	162	166	163	160	161	161	163
84	159	159	164	169	165	163	163	163	166
85	161	162	166	171	168	165	166	166	168
86	163	164	169	173	170	168	168	168	171
87	166	166	171	175	172	170	171	171	173
88	168	168	173	177	174	173	173	173	175
89	170	171	175	179	177	175	175	175	177
90	172	173	177	181	179	177	177	177	179
91	174	175	179	183	181	179	179	179	182
92	176	177	181	185	182	181	181	181	184
93	178	178	183	186	184	183	183	183	186
94	180	180	184	188	186	185	185	185	187
95	181	182	186	190	187	186	187	187	189
96	183	183	188	192	189	188	189	189	190
97	185	185	189	193	190	190	190	191	191
98	186	187	191	195	191	191	192	192	193
99	188	188	192	197	192	192	193	193	194
100	189	189	194	199	194	193	194	194	195
101	190	191	195	200	195	194	195	195	196
102	191	192	197	201	196	196	196	196	197
103	193	193	198	202	197	197	197	197	197
104	194	194	199	203	198	198	198	198	198
105	195	195	200	205	199	198	199	199	199
106	196	196	201	206	199	199	200	200	200
107	197	197	202	207	200	200	200	200	201
108	198	198	203	208	201	201	201	201	201
109	198	199	204	209	202	201	201	202	202
110	199	200	205	210	202	202	202	202	202
111	200	201	206	210	203	202	203	203	203
112	201	202	207	208	203	203	203	203	203
113	201	202	207	207	204	204	204	204	204
114	202	203	207	207	204	204	204	204	204
115	203	203	208	207	205	204	205	205	205
116	203	204	208	207	205	205	205	205	205
117	204	204	208	207	205	205	205	206	206
118	204	205	208	207	206	206	206	206	206
119	205	205	208	207	206	206	206	206	206
120	205	206	208	208	206	206	206	206	206
121	206	206	208	208	207	207	207	207	207
122	206	206	208	208	207	207	207	207	207
123	207	207	208	208	207	207	207	207	207
124	207	207	208	209	208	207	207	207	207
125	207	207	208	209	208	208	208	208	208
126	208	208	209	209	208	208	208	208	208
127	208	208	209	209	208	208	208	208	208
128	208	208	209	209	208	208	208	208	208
129	208	209	209	210	209	208	208	208	208
130	208	209	210	210	209	208	208	208	208
131	209	209	210	210	209	209	209	208	208
132	209	209	210	210	209	209	209	209	209
133	209	209	211	210	209	209	209	209	209
134	209	210	212	210	209	209	209	209	209
135	209	210	213	210	209	209	209	209	209
136	209	210	213	210	209	209	209	209	209
137	209	210	214	211	209	209	209	209	209
138	210	211	215	211	209	209	209	209	209
139	210	211	216	211	209	209	209	209	209
140	210	212	217	211	210	209	209	209	209
141	210	214	218	211	210	209	209	209	209

OMEGA POINT LABORATORIES

Peak Seals, Inc. Project No. 14540-99417 August 21, 1997

Time (min)	TC # 119 (°F)	TC # 120 (°F)	TC # 121 (°F)	TC # 122 (°F)	TC # 123 (°F)	TC # 124 (°F)	TC # 125 (°F)	TC # 126 (°F)	TC # 127 (°F)
142	210	216	219	211	210	209	209	209	209
143	211	218	221	211	210	209	210	209	209
144	212	221	223	211	210	210	210	210	210
145	214	223	224	212	210	210	210	210	210
146	215	225	226	212	210	210	210	210	210
147	217	227	228	212	210	210	210	210	210
148	218	228	230	213	210	210	210	210	210
149	220	230	232	215	210	210	210	210	210
150	222	232	234	219	210	210	210	210	210
151	225	234	237	223	211	210	210	210	210
152	227	236	239	227	211	210	210	210	210
153	230	238	241	231	211	210	210	210	210
154	232	240	244	234	211	210	210	210	210
155	234	242	246	237	211	210	210	210	210
156	236	244	248	241	211	210	210	210	210
157	238	246	251	244	211	211	210	210	210
158	241	248	253	247	211	211	210	210	210
159	243	250	255	250	212	211	210	210	210
160	245	252	257	253	214	211	211	210	211
161	247	254	260	256	220	211	211	210	211
162	250	256	262	259	228	211	211	210	211
163	252	259	264	262	235	211	211	210	211
164	254	261	266	265	241	215	211	210	211
165	256	263	269	268	245	219	211	210	211
166	258	265	271	271	249	224	211	210	211
167	260	267	273	274	252	230	211	210	211
168	262	269	276	276	255	235	212	211	211
169	264	271	278	279	258	239	214	211	211
170	267	273	280	281	260	242	218	211	211
171	269	276	282	283	263	245	221	211	211
172	271	278	284	286	265	247	225	211	211
173	273	280	287	288	268	250	230	211	211
174	275	282	289	290	270	253	234	211	211
175	277	284	291	292	272	255	238	213	211
176	280	287	293	294	274	258	242	217	211
177	282	289	295	297	276	260	245	222	212
178	284	291	297	299	278	263	248	228	214
179	286	293	300	301	281	265	251	234	217
180	288	295	302	303	283	267	254	238	220
Max Temp:	288	295	302	303	283	267	254	238	220
Max Allowed:	418	418	417	417	417	417	418	418	418

OMEGA POINT LABORATORIES

Peak Seals, Inc. Project No. 14540-99417 August 21, 1997

Time (min)	TC # 128 (°F)	TC # 129 (°F)	TC # 130 (°F)	TC # 131 (°F)	TC # 132 (°F)	TC # 133 (°F)	TC # 134 (°F)	TC # 135 (°F)	TC # 136 (°F)
0	93	93	93	93	93	93	93	91	89
1	93	93	93	93	93	93	93	91	89
2	93	93	93	93	93	93	93	91	89
3	93	93	93	93	93	93	93	91	89
4	93	93	93	93	93	93	93	91	89
5	93	93	93	93	93	93	93	91	89
6	93	93	93	93	93	93	93	91	89
7	93	93	93	93	93	93	93	91	89
8	93	93	93	93	93	93	93	91	89
9	93	93	93	93	93	93	93	91	89
10	93	93	93	93	93	93	92	91	89
11	93	93	93	93	93	93	93	91	89
12	93	93	93	93	93	93	93	91	89
13	93	93	93	93	93	93	92	91	89
14	93	93	93	93	93	93	93	91	89
15	93	93	93	93	93	93	92	91	89
16	93	93	93	93	93	93	92	91	89
17	93	93	93	93	93	93	92	91	89
18	93	93	93	93	93	93	93	91	89
19	93	93	93	93	93	93	93	91	89
20	93	93	93	93	93	93	93	92	89
21	93	93	93	93	93	93	93	92	89
22	93	93	93	93	93	93	93	92	89
23	93	93	93	93	93	93	93	92	89
24	93	93	93	93	93	93	93	92	89
25	93	93	93	93	93	93	93	93	90
26	93	93	93	93	93	93	93	93	90
27	93	93	93	93	93	93	93	93	90
28	93	93	93	93	93	93	94	94	90
29	93	93	93	93	93	93	94	94	90
30	93	93	93	93	93	93	94	95	90
31	93	93	93	93	93	94	95	95	90
32	93	93	93	93	93	94	95	96	90
33	93	93	93	93	93	94	95	97	90
34	93	93	93	94	93	94	96	97	91
35	93	93	93	94	94	94	96	98	91
36	93	93	93	94	94	94	97	98	91
37	93	93	93	94	94	95	97	99	91
38	93	93	93	94	94	95	98	100	91
39	93	93	94	94	94	95	98	100	91
40	93	93	94	94	94	95	99	101	92
41	93	94	94	94	94	96	100	102	92
42	94	94	94	94	95	96	100	103	92
43	94	94	94	94	95	97	101	103	92
44	94	94	94	95	95	97	102	104	92
45	94	94	95	95	96	97	103	105	93
46	94	95	95	95	96	98	103	106	93
47	95	95	95	96	96	98	104	106	93
48	95	95	96	96	97	99	105	107	93
49	96	96	96	97	97	100	106	108	94
50	96	96	97	97	98	100	107	109	94
51	96	97	98	98	98	101	109	110	94
52	97	97	98	99	99	102	110	111	94
53	98	98	99	99	100	103	112	112	95
54	98	99	100	100	100	104	114	113	95
55	99	99	101	101	101	105	115	114	95
56	100	100	102	102	102	106	117	115	96
57	101	101	103	103	104	108	119	116	96
58	102	102	104	104	105	110	121	117	96
59	103	103	105	105	106	113	122	118	97
60	104	105	107	107	108	115	124	119	97
61	105	106	108	108	110	118	125	121	98
62	107	107	109	110	112	121	127	122	98
63	108	109	111	111	114	123	129	123	98
64	110	111	113	114	117	126	131	125	99
65	112	113	115	116	120	129	133	127	99
66	114	115	118	119	124	132	136	129	100
67	116	117	120	122	127	135	138	131	100
68	118	119	123	125	131	139	141	133	101
69	120	122	126	129	134	142	144	135	101
70	123	125	129	132	137	146	147	137	102

OMEGA POINT LABORATORIES

Peak Seals, Inc. Project No. 14540-99417 August 21, 1997

Time (min)	TC # 128 (°F)	TC # 129 (°F)	TC # 130 (°F)	TC # 131 (°F)	TC # 132 (°F)	TC # 133 (°F)	TC # 134 (°F)	TC # 135 (°F)	TC # 136 (°F)
71	125	128	132	136	141	150	150	139	102
72	128	131	136	139	145	153	153	142	103
73	131	134	139	143	148	156	155	144	104
74	134	138	143	146	151	159	158	147	104
75	138	142	147	150	155	161	160	149	105
76	141	146	151	153	158	163	162	151	106
77	145	152	154	157	161	165	164	153	106
78	150	157	158	160	163	168	167	155	107
79	154	162	161	163	166	169	168	157	108
80	158	166	164	166	168	171	170	159	108
81	162	169	167	168	170	173	171	161	109
82	165	172	169	170	172	174	173	163	110
83	169	175	171	173	174	176	175	164	110
84	172	177	174	175	176	177	176	166	111
85	175	180	175	177	177	179	178	168	112
86	177	181	177	178	179	180	179	169	112
87	179	183	179	180	180	181	180	170	113
88	180	184	181	181	181	182	181	172	114
89	182	186	182	182	182	183	182	173	114
90	184	187	183	184	183	184	183	174	115
91	185	188	185	185	184	185	184	175	116
92	186	189	186	186	186	186	185	176	116
93	187	190	187	187	187	187	186	177	117
94	188	190	189	189	188	188	187	178	118
95	189	191	190	190	189	189	188	179	118
96	190	191	191	191	190	190	189	181	119
97	192	192	192	192	191	191	190	182	119
98	193	193	193	193	192	192	191	183	120
99	194	194	194	194	193	193	192	184	121
100	195	195	195	195	194	194	193	185	122
101	196	196	196	196	195	195	195	187	122
102	197	197	197	197	196	196	195	188	123
103	197	198	198	198	197	197	196	189	124
104	198	199	198	199	198	198	197	190	124
105	199	199	199	199	199	199	198	191	125
106	200	200	200	200	200	200	199	192	126
107	200	201	200	201	200	200	200	193	126
108	201	201	201	201	201	201	200	193	127
109	202	202	202	202	202	202	201	194	128
110	202	202	202	202	202	202	201	195	128
111	203	203	203	203	203	203	202	196	129
112	203	203	203	203	203	203	203	196	129
113	204	204	204	204	204	204	203	197	130
114	204	204	204	204	204	204	204	198	131
115	205	205	205	205	204	204	204	198	131
116	205	205	205	205	205	205	204	199	132
117	205	205	205	206	205	205	205	199	132
118	206	206	206	206	205	205	205	200	133
119	206	206	206	206	206	206	205	200	134
120	206	206	206	206	206	206	206	201	134
121	207	207	206	207	206	206	206	201	135
122	207	207	207	207	207	207	206	201	135
123	207	207	207	207	207	207	207	202	136
124	207	207	207	207	207	207	207	202	137
125	207	207	207	207	207	207	207	203	137
126	208	208	208	208	207	207	207	203	138
127	208	208	208	208	208	208	207	203	138
128	208	208	208	208	208	208	208	204	139
129	208	208	208	208	208	208	208	204	139
130	208	208	208	208	208	208	208	204	140
131	208	208	208	208	208	208	208	204	140
132	208	208	208	208	208	208	208	204	141
133	209	209	208	208	208	208	208	205	141
134	209	209	209	209	208	208	208	205	142
135	209	209	209	209	209	208	208	205	142
136	209	209	209	209	209	209	209	205	143
137	209	209	209	209	209	209	209	205	143
138	209	209	209	209	209	209	209	205	144
139	209	209	209	209	209	209	209	206	144
140	209	209	209	209	209	209	209	206	145
141	209	209	209	209	209	209	209	206	145

OMEGA POINT LABORATORIES

Peak Seals, Inc. Project No. 14540-99417 August 21, 1997

Time (min)	TC # 128 (°F)	TC # 129 (°F)	TC # 130 (°F)	TC # 131 (°F)	TC # 132 (°F)	TC # 133 (°F)	TC # 134 (°F)	TC # 135 (°F)	TC # 136 (°F)
142	209	209	209	209	209	209	209	206	146
143	209	209	209	209	209	209	209	206	146
144	210	210	209	210	209	209	209	207	147
145	210	210	210	210	209	209	209	207	148
146	210	210	210	210	209	209	209	207	148
147	210	210	210	210	209	209	209	207	148
148	210	210	210	210	209	210	209	207	149
149	210	210	210	210	210	210	210	207	149
150	210	210	210	210	210	210	210	207	150
151	210	210	210	210	210	210	210	207	151
152	210	210	210	210	210	210	210	208	151
153	210	210	210	210	210	210	210	208	151
154	210	210	210	210	210	210	210	208	152
155	210	210	210	210	210	210	210	208	153
156	210	210	210	210	210	210	210	208	153
157	211	211	210	210	210	210	210	208	153
158	211	211	210	210	210	210	210	208	154
159	211	211	210	211	210	210	210	209	154
160	211	211	211	211	210	210	210	209	155
161	211	211	211	211	210	210	210	209	155
162	211	211	211	211	210	210	210	209	156
163	211	211	211	211	211	211	211	209	156
164	211	211	211	211	211	211	211	209	157
165	211	211	211	211	211	211	211	209	157
166	211	211	211	211	211	211	211	209	157
167	211	211	211	211	211	211	211	209	158
168	211	211	211	211	211	211	211	209	158
169	211	211	211	211	211	211	211	209	159
170	211	211	211	211	211	211	211	210	159
171	211	211	211	211	211	211	211	210	160
172	211	211	211	211	211	211	211	210	160
173	211	211	211	211	211	211	211	210	160
174	211	211	211	211	211	211	211	210	161
175	211	211	211	211	211	211	211	210	161
176	211	211	211	211	211	211	211	210	162
177	211	211	211	211	211	211	211	210	162
178	211	211	211	211	211	211	211	210	162
179	211	211	211	211	211	211	211	210	162
180	211	211	211	211	211	211	211	210	163
Max Temp:	211	211	211	211	211	211	211	210	163
Max Allowed:	418	418	418	418	418	418	418	416	414

OMEGA POINT LABORATORIES

Peak Seals, Inc. Project No. 14540-99417 August 21, 1997

Time (min)	TC # 137 (°F)	TC # 138 (°F)	TC # 139 (°F)	TC # 140 (°F)	TC # 141 (°F)	TC # 142 (°F)	TC # 143 (°F)	TC # 144 (°F)	TC # 145 (°F)
0	92	93	93	93	93	93	93	93	93
1	92	93	93	93	93	93	93	93	93
2	92	93	93	93	93	93	93	93	92
3	92	93	93	93	93	93	93	93	93
4	92	93	93	93	93	93	93	93	93
5	92	93	93	93	93	93	93	93	92
6	92	93	93	93	93	93	93	93	93
7	92	93	93	93	93	93	93	93	93
8	92	93	93	93	93	93	93	93	93
9	92	93	93	93	93	93	93	93	93
10	92	93	93	93	93	93	93	93	92
11	92	93	93	93	93	93	93	93	92
12	92	93	93	93	93	93	93	93	92
13	92	93	93	93	93	93	93	93	92
14	92	93	93	93	93	93	93	93	93
15	93	93	93	93	93	92	92	92	92
16	93	93	93	93	93	93	92	92	92
17	93	93	93	93	93	92	92	92	92
18	93	94	94	93	93	92	92	92	92
19	93	94	94	93	93	93	93	92	92
20	93	94	94	93	93	93	92	92	92
21	93	94	94	93	93	93	92	92	92
22	93	94	94	93	93	93	92	92	92
23	93	94	94	93	93	93	92	92	92
24	93	94	94	93	93	93	92	92	92
25	94	94	94	93	93	92	92	92	92
26	94	94	94	93	93	93	92	92	92
27	94	94	94	93	93	93	93	93	93
28	94	94	94	94	93	93	93	93	93
29	94	94	94	94	93	93	93	93	93
30	94	94	94	94	93	93	93	93	93
31	94	95	94	94	93	93	93	93	93
32	94	95	94	94	93	93	93	93	93
33	95	95	94	94	93	93	93	93	93
34	95	95	94	94	93	93	93	93	93
35	96	95	94	94	93	93	93	93	93
36	97	95	94	94	93	93	93	93	93
37	98	96	95	94	93	93	93	93	93
38	99	96	95	94	93	93	93	93	93
39	101	97	95	94	94	93	93	93	93
40	102	97	95	94	94	94	93	93	93
41	104	98	96	95	94	94	94	94	94
42	106	99	96	95	94	94	94	94	94
43	109	100	97	95	94	94	94	94	94
44	111	101	97	95	95	94	94	94	95
45	114	102	98	96	95	95	95	95	95
46	117	104	98	96	95	95	95	95	95
47	119	105	99	97	96	96	95	95	96
48	121	106	100	97	96	96	96	96	96
49	123	106	100	98	97	97	96	96	97
50	125	107	101	98	97	97	97	97	98
51	127	108	102	99	98	98	98	98	98
52	128	109	102	99	99	99	98	98	99
53	129	110	103	100	100	100	99	99	100
54	129	111	104	101	100	102	100	100	101
55	129	112	105	102	101	103	101	101	102
56	129	113	106	102	102	104	102	102	103
57	129	114	107	103	103	106	104	103	104
58	129	114	108	104	105	107	105	105	106
59	129	115	109	105	106	108	106	106	107
60	129	116	110	107	107	110	108	107	108
61	128	117	111	108	108	112	109	109	110
62	128	118	112	109	110	114	111	111	112
63	128	118	113	111	112	116	113	113	113
64	128	119	115	112	114	118	115	114	115
65	128	121	116	114	116	119	117	116	117
66	128	122	118	115	117	121	119	118	119
67	129	123	119	117	119	123	121	120	121
68	129	124	121	119	121	124	123	122	123
69	129	125	123	121	123	127	125	124	125
70	130	127	124	123	124	129	126	126	127

OMEGA POINT LABORATORIES

Peak Seals, Inc. Project No. 14540-99417 August 21, 1997

Time (min)	TC # 137 (°F)	TC # 138 (°F)	TC # 139 (°F)	TC # 140 (°F)	TC # 141 (°F)	TC # 142 (°F)	TC # 143 (°F)	TC # 144 (°F)	TC # 145 (°F)
71	130	128	126	125	126	131	128	128	129
72	131	130	128	127	129	133	130	130	131
73	132	132	130	129	130	135	133	132	133
74	133	133	132	131	133	137	135	134	135
75	134	135	134	133	135	139	137	137	137
76	135	137	137	135	137	142	139	139	140
77	137	139	139	138	139	144	141	141	142
78	139	141	141	141	142	146	144	144	144
79	141	144	144	144	145	149	147	146	147
80	143	147	146	146	147	152	149	149	150
81	145	149	149	149	149	154	152	152	152
82	148	152	152	152	153	157	155	154	155
83	150	155	155	155	156	160	157	157	157
84	153	158	158	156	158	162	160	159	160
85	156	161	160	159	160	165	163	162	163
86	159	164	164	162	163	167	165	165	165
87	161	166	166	166	166	171	168	168	168
88	164	169	169	168	170	174	171	170	171
89	167	172	172	171	172	175	173	173	173
90	170	175	175	175	175	178	176	176	176
91	173	178	178	177	178	181	179	179	179
92	176	181	181	181	181	184	182	182	182
93	179	184	184	182	183	186	185	184	185
94	182	187	186	185	186	188	187	187	187
95	185	189	189	188	189	192	190	190	190
96	188	192	191	191	193	193	192	192	192
97	190	194	193	193	194	195	194	194	195
98	193	196	196	196	196	197	197	196	197
99	195	198	198	197	198	199	198	198	199
100	197	199	199	199	200	200	200	200	200
101	199	201	201	201	201	201	201	201	201
102	201	203	203	203	203	202	202	203	203
103	202	203	203	204	204	204	204	204	204
104	203	204	204	205	205	205	204	205	205
105	204	205	205	205	206	205	205	205	206
106	205	206	206	206	207	206	206	206	206
107	206	207	207	207	207	207	207	207	207
108	206	207	207	207	208	207	207	207	207
109	207	208	208	208	208	207	207	207	208
110	207	208	208	208	208	208	208	208	208
111	208	208	208	208	208	208	208	208	208
112	208	208	208	209	209	208	208	208	209
113	208	209	209	209	209	208	208	208	209
114	208	209	209	209	209	209	209	209	209
115	208	209	209	209	209	209	209	209	209
116	208	209	209	209	209	209	209	209	209
117	209	209	209	209	209	209	209	209	209
118	209	209	209	209	209	209	209	209	209
119	209	209	209	209	209	209	209	209	209
120	209	209	209	209	209	209	209	209	209
121	209	209	209	209	209	209	209	209	209
122	209	209	209	209	209	209	209	209	209
123	209	209	209	209	209	209	209	209	209
124	209	209	209	209	209	209	209	209	209
125	209	209	209	209	209	209	209	209	209
126	209	209	209	209	209	209	209	209	209
127	209	209	209	209	209	209	209	209	209
128	209	209	209	209	209	209	209	209	209
129	209	209	209	209	209	209	209	209	209
130	209	209	209	209	209	209	209	208	209
131	209	209	209	209	209	209	209	209	209
132	209	209	209	209	209	209	208	208	209
133	209	209	209	209	209	209	208	208	209
134	209	209	209	209	209	209	208	209	209
135	209	209	209	209	209	209	208	209	209
136	209	209	209	209	209	208	208	208	209
137	209	209	209	209	209	209	208	209	209
138	209	209	209	209	209	208	208	208	209
139	209	209	209	209	209	208	208	208	209
140	209	209	209	209	209	208	208	209	209
141	209	209	209	209	209	208	208	209	209

OMEGA POINT LABORATORIES

Peak Seals, Inc. Project No. 14540-99417 August 21, 1997

Time (min)	TC # 137 (°F)	TC # 138 (°F)	TC # 139 (°F)	TC # 140 (°F)	TC # 141 (°F)	TC # 142 (°F)	TC # 143 (°F)	TC # 144 (°F)	TC # 145 (°F)
142	209	209	209	209	209	208	208	209	209
143	209	209	209	209	209	208	208	209	209
144	209	209	209	209	209	208	208	209	209
145	209	209	209	209	209	208	209	209	209
146	209	209	209	209	209	208	209	209	209
147	209	209	209	209	209	209	209	209	209
148	209	209	209	209	209	208	208	209	209
149	209	209	209	209	209	208	208	209	209
150	209	209	209	209	209	209	209	209	209
151	209	209	209	209	209	209	209	209	209
152	209	209	209	209	209	209	208	209	209
153	209	209	209	209	209	209	209	209	209
154	209	209	209	209	209	209	209	209	209
155	209	209	209	209	209	209	209	209	209
156	209	209	209	209	209	209	209	209	209
157	209	209	209	209	209	209	209	209	209
158	209	209	209	209	209	209	209	209	209
159	209	209	209	209	209	209	209	209	209
160	209	209	209	209	209	209	209	209	209
161	209	209	209	209	209	209	209	209	209
162	209	209	209	209	209	209	209	209	209
163	209	209	209	210	209	210	209	209	209
164	209	209	209	210	209	210	209	210	209
165	209	209	209	210	210	210	210	210	209
166	209	209	209	210	210	210	210	209	209
167	209	209	209	210	210	211	210	210	209
168	209	209	209	210	210	211	210	210	210
169	209	209	209	210	210	211	210	209	209
170	209	209	210	210	211	212	210	210	210
171	209	209	209	210	211	214	211	211	210
172	209	209	209	211	213	215	211	211	211
173	209	209	209	213	216	217	214	212	212
174	209	209	210	215	218	219	217	217	218
175	209	209	211	218	220	221	220	222	223
176	209	209	214	220	221	223	223	227	227
177	208	210	217	222	223	225	226	230	231
178	208	210	219	226	226	228	230	234	234
179	208	210	222	228	229	231	234	237	238
180	208	212	226	231	232	234	238	240	242
Max Temp:	209	212	226	231	232	234	238	240	242
Max Allowed:	417	418	418	418	418	418	418	418	418

OMEGA POINT LABORATORIES

Peak Seals, Inc. Project No. 14540-99417 August 21, 1997

Time (min)	TC # 146 (°F)	TC # 147 (°F)	TC # 148 (°F)	TC # 149 (°F)	TC # 150 (°F)	TC # 151 (°F)	TC # 152 (°F)	TC # 153 (°F)	TC # 154 (°F)
0	93	92	92	92	92	92	92	92	92
1	93	93	93	93	93	92	92	92	92
2	92	92	92	92	92	92	92	92	92
3	93	93	93	92	92	92	92	92	92
4	93	93	93	92	92	92	92	92	92
5	92	92	92	92	92	92	92	92	92
6	93	92	92	92	92	92	92	92	92
7	93	92	92	92	92	92	92	92	92
8	93	92	92	92	92	92	92	92	92
9	92	92	92	92	92	92	92	92	92
10	92	92	92	92	92	92	92	92	92
11	92	92	92	92	92	92	92	92	92
12	92	92	92	92	92	92	92	92	92
13	92	92	92	92	92	92	92	92	92
14	92	92	92	92	92	92	92	92	92
15	92	92	92	92	92	92	92	92	92
16	92	92	92	92	92	92	92	92	92
17	92	92	92	92	92	92	92	92	92
18	92	92	92	92	92	92	92	92	92
19	92	92	92	92	92	92	92	92	92
20	92	92	92	92	92	93	92	92	92
21	92	92	92	92	92	92	92	92	91
22	92	92	92	92	92	92	92	92	91
23	92	92	93	93	93	92	92	92	91
24	92	92	93	93	93	92	92	92	91
25	92	92	92	92	93	92	92	92	91
26	92	92	93	93	93	92	92	92	91
27	92	92	93	93	93	93	92	92	91
28	92	93	93	93	93	93	92	92	91
29	92	93	93	93	93	93	92	92	91
30	93	93	93	93	93	93	93	92	91
31	93	93	93	93	93	93	93	92	91
32	93	93	93	93	93	93	93	92	91
33	93	93	93	93	93	93	93	92	91
34	93	93	93	93	94	93	93	92	91
35	93	93	93	94	94	93	93	92	91
36	93	93	94	94	94	94	93	93	92
37	93	93	94	94	94	94	93	93	92
38	93	94	94	94	95	94	93	93	92
39	93	94	94	95	95	94	94	93	92
40	94	94	95	95	95	95	94	93	93
41	94	95	95	95	96	95	94	94	93
42	94	95	95	96	96	95	94	94	94
43	95	96	96	96	97	96	95	95	94
44	95	96	96	97	98	96	95	95	95
45	96	97	97	98	98	97	96	96	95
46	96	98	98	98	99	98	97	97	96
47	97	98	98	99	100	98	97	97	97
48	98	99	99	100	101	99	98	98	97
49	98	100	100	101	102	100	99	99	98
50	99	101	101	101	103	101	99	100	99
51	100	102	102	103	111	102	100	100	100
52	101	103	103	107	130	105	101	101	101
53	102	104	105	111	135	108	102	102	102
54	103	105	107	114	139	111	104	104	103
55	104	107	108	116	140	113	105	105	104
56	105	108	109	116	141	114	106	106	105
57	107	109	111	118	144	116	108	107	107
58	108	111	112	119	147	117	109	109	108
59	109	112	113	120	150	118	111	110	109
60	111	114	115	122	153	120	112	112	111
61	112	116	117	124	157	122	113	113	112
62	114	118	119	125	163	123	115	115	114
63	116	120	120	128	171	125	117	117	116
64	118	122	122	130	171	128	118	118	118
65	120	124	124	131	165	129	120	120	120
66	122	126	126	132	162	130	122	122	122
67	124	128	128	133	161	131	124	124	124
68	126	130	130	135	162	132	126	126	126
69	128	132	132	136	164	134	128	128	128
70	130	134	134	138	164	135	129	130	130

OMEGA POINT LABORATORIES

Peak Seals, Inc. Project No. 14540-99417 August 21, 1997

Time (min)	TC # 146 (°F)	TC # 147 (°F)	TC # 148 (°F)	TC # 149 (°F)	TC # 150 (°F)	TC # 151 (°F)	TC # 152 (°F)	TC # 153 (°F)	TC # 154 (°F)
71	132	136	136	140	166	137	131	132	132
72	134	138	138	141	164	139	133	134	134
73	136	140	140	143	164	140	136	136	136
74	138	142	141	144	164	142	137	138	138
75	140	144	144	146	167	144	140	141	140
76	143	146	146	148	167	146	142	143	143
77	145	149	148	150	168	148	144	145	145
78	147	151	151	152	170	150	147	148	147
79	150	154	153	154	170	152	149	150	150
80	152	156	155	156	172	155	152	153	153
81	155	158	158	158	172	157	154	155	155
82	157	160	160	160	174	159	157	158	158
83	160	163	162	162	178	162	159	160	160
84	162	165	165	165	181	165	162	163	163
85	165	168	167	167	183	167	165	166	166
86	167	170	170	169	183	170	167	168	168
87	170	173	172	172	186	173	170	171	171
88	173	175	175	174	187	175	173	174	174
89	175	178	177	177	188	178	175	176	177
90	178	181	180	180	190	180	178	179	179
91	181	183	183	183	191	183	181	182	182
92	184	186	186	186	193	185	183	184	184
93	186	188	188	188	194	187	185	186	186
94	189	191	190	191	195	189	187	188	188
95	191	193	193	193	196	191	189	190	190
96	193	195	195	195	196	193	192	192	192
97	195	197	196	197	198	195	193	194	194
98	197	199	198	199	199	197	195	196	196
99	199	200	200	200	200	198	197	197	197
100	201	201	201	201	201	200	198	199	199
101	202	202	202	202	202	201	200	200	200
102	203	203	203	203	203	202	201	201	201
103	204	204	204	204	204	203	202	202	202
104	205	205	205	205	204	204	203	204	203
105	206	206	206	206	205	205	204	204	204
106	206	206	206	206	206	206	205	205	205
107	207	207	207	207	206	206	205	206	206
108	207	207	207	207	207	207	206	206	206
109	208	208	208	208	207	207	207	207	207
110	208	208	208	208	208	208	207	207	207
111	208	208	208	208	208	208	208	208	208
112	208	208	208	208	208	208	208	208	208
113	208	208	209	208	208	208	208	208	208
114	209	209	209	209	209	208	208	208	208
115	209	209	209	209	209	209	208	208	208
116	209	209	209	209	209	208	209	209	208
117	209	209	209	209	209	209	209	209	209
118	209	209	209	209	209	209	209	209	209
119	209	209	209	209	209	209	209	209	209
120	209	209	209	209	209	209	209	209	209
121	209	209	209	209	209	209	209	209	209
122	209	209	209	209	209	209	209	209	209
123	209	209	209	209	209	209	209	209	209
124	209	209	209	209	210	209	209	209	209
125	209	209	209	209	210	209	209	209	209
126	209	209	209	209	210	209	209	209	209
127	209	209	209	209	210	209	209	209	209
128	209	209	209	209	210	209	209	209	209
129	209	209	209	210	210	209	209	209	209
130	209	209	209	209	210	209	209	209	208
131	209	209	209	209	210	209	208	209	208
132	208	208	209	209	211	209	208	209	208
133	209	209	209	210	211	209	209	209	208
134	209	209	209	210	211	209	208	208	208
135	209	209	209	210	211	209	208	208	208
136	208	209	209	210	211	209	208	208	208
137	209	209	209	210	212	209	208	208	208
138	209	209	209	210	212	209	208	208	208
139	209	209	209	210	213	209	208	208	208
140	209	209	209	210	213	209	208	208	208
141	209	209	209	210	213	210	208	208	208

OMEGA POINT LABORATORIES

Peak Seals, Inc. Project No. 14540-99417 August 21, 1997

Time (min)	TC # 146 (°F)	TC # 147 (°F)	TC # 148 (°F)	TC # 149 (°F)	TC # 150 (°F)	TC # 151 (°F)	TC # 152 (°F)	TC # 153 (°F)	TC # 154 (°F)
142	209	209	209	210	213	210	208	208	208
143	209	209	209	210	214	210	208	208	208
144	209	209	209	210	213	210	208	208	208
145	209	209	209	210	214	210	208	208	208
146	209	209	210	210	214	210	209	208	208
147	209	209	210	211	217	211	209	208	208
148	209	209	209	211	220	210	209	209	208
149	209	209	210	211	223	210	209	209	208
150	209	209	210	212	227	210	209	209	208
151	209	209	210	215	231	212	209	209	208
152	209	209	211	219	235	215	210	209	208
153	209	209	211	223	238	218	210	209	208
154	209	210	212	226	240	220	210	209	208
155	209	210	212	229	243	223	210	209	209
156	209	210	212	231	244	226	211	209	209
157	209	210	215	234	246	228	211	209	209
158	209	210	217	236	247	231	211	209	209
159	210	211	220	239	250	233	211	209	209
160	210	211	223	241	252	235	212	210	209
161	210	211	225	243	254	237	216	210	209
162	210	211	228	245	256	240	221	210	209
163	211	211	231	247	258	242	225	211	209
164	211	212	233	249	260	244	228	212	210
165	211	212	235	251	262	246	231	214	210
166	211	214	238	253	264	248	233	216	210
167	211	217	239	255	267	249	236	218	210
168	211	220	243	257	269	251	238	221	211
169	212	224	246	259	270	253	240	224	211
170	212	230	248	261	271	255	242	227	211
171	216	235	251	263	272	256	244	229	211
172	220	239	254	266	274	258	246	231	211
173	224	242	257	268	276	260	248	234	212
174	228	246	260	270	278	261	250	236	212
175	232	248	262	272	279	263	252	238	212
176	235	251	264	274	280	265	254	240	214
177	239	253	266	276	282	266	255	242	218
178	242	256	268	278	284	268	258	246	221
179	245	258	271	280	285	270	260	248	225
180	248	261	273	282	287	272	262	251	231
Max Temp:	248	261	273	282	287	272	262	251	231
Max Allowed:	418	417	417	417	417	417	417	417	417

OMEGA POINT LABORATORIES

Peak Seals, Inc. Project No. 14540-99417 August 21, 1997

Time (min)	TC # 155 (°F)	TC # 156 (°F)	TC # 157 (°F)	TC # 158 (°F)	TC # 159 (°F)	TC # 160 (°F)	TC # 161 (°F)	TC # 162 (°F)	TC # 163 (°F)
0	92	92	92	93	93	93	93	93	92
1	92	92	93	93	93	93	93	92	91
2	92	92	92	93	93	93	93	92	92
3	92	92	92	93	93	93	93	92	92
4	92	92	92	93	93	93	93	92	92
5	92	92	92	93	93	93	93	92	92
6	92	92	92	93	93	93	93	92	91
7	92	92	92	92	93	93	93	92	92
8	92	93	93	93	93	93	93	93	93
9	92	92	93	93	93	93	93	94	124
10	92	92	92	93	93	93	93	97	141
11	92	92	92	92	92	92	93	100	157
12	92	92	92	92	92	92	93	104	173
13	92	92	92	92	92	92	94	108	182
14	92	92	91	92	92	92	95	114	188
15	92	91	91	92	92	92	96	117	188
16	91	91	91	91	92	93	97	119	187
17	91	91	91	91	92	93	98	120	184
18	91	91	91	91	92	93	99	120	180
19	91	91	91	91	92	93	99	121	177
20	91	91	91	91	92	94	100	121	172
21	91	91	91	91	92	94	100	122	169
22	90	91	91	91	92	94	100	122	167
23	90	91	91	91	92	94	101	122	167
24	90	91	91	91	92	94	101	122	168
25	90	91	91	91	92	94	101	123	170
26	90	91	91	91	92	94	101	123	171
27	90	91	91	91	92	94	102	124	172
28	90	91	91	91	92	95	102	125	174
29	90	91	91	91	92	95	102	126	175
30	90	91	91	91	93	95	103	127	173
31	90	91	91	91	93	95	103	127	173
32	90	91	91	91	93	95	103	128	173
33	90	91	91	92	93	95	104	128	173
34	90	91	91	91	93	95	104	129	173
35	91	91	91	92	93	96	105	130	174
36	91	91	91	92	93	96	105	132	176
37	91	91	91	92	93	96	106	132	177
38	91	92	92	92	93	96	106	132	179
39	92	92	92	92	93	97	107	133	180
40	92	92	92	92	94	97	107	134	181
41	92	93	92	93	94	97	107	135	183
42	93	93	93	93	94	98	108	135	183
43	93	93	93	94	95	98	108	137	184
44	94	94	94	94	95	98	109	137	185
45	94	94	94	95	95	99	109	139	186
46	95	95	95	95	96	99	110	139	187
47	95	95	95	96	96	100	110	141	188
48	96	96	96	96	97	100	111	144	190
49	97	97	97	97	98	101	112	146	192
50	97	97	97	98	98	101	113	148	194
51	98	98	98	99	99	102	114	150	195
52	99	99	99	100	100	103	115	152	196
53	100	100	100	101	101	104	116	155	198
54	101	101	101	102	102	105	117	157	199
55	102	102	102	103	102	105	118	160	200
56	103	103	103	104	104	106	120	164	202
57	105	104	105	106	105	108	121	168	203
58	106	105	106	107	106	109	123	172	204
59	107	107	107	108	107	110	125	176	205
60	108	108	109	110	108	111	127	180	205
61	110	109	110	111	110	113	129	184	206
62	111	111	112	113	112	115	132	188	206
63	113	113	114	115	113	116	134	191	207
64	115	114	116	117	116	119	137	194	207
65	117	116	118	119	117	120	140	196	207
66	119	118	120	121	120	123	143	198	207
67	121	120	122	123	122	125	146	199	207
68	123	122	124	125	124	127	149	200	207
69	125	124	126	127	126	129	153	201	207
70	127	126	128	129	128	131	157	202	207

OMEGA POINT LABORATORIES

Peak Seals, Inc. Project No. 14540-99417 August 21, 1997

Time (min)	TC # 155 (°F)	TC # 156 (°F)	TC # 157 (°F)	TC # 158 (°F)	TC # 159 (°F)	TC # 160 (°F)	TC # 161 (°F)	TC # 162 (°F)	TC # 163 (°F)
71	129	128	130	131	130	134	160	203	207
72	131	131	132	133	132	136	164	204	207
73	133	133	135	136	134	138	168	204	207
74	135	135	137	138	136	140	171	204	207
75	137	137	139	140	139	143	174	204	207
76	140	139	142	142	141	145	176	204	207
77	142	142	144	144	144	147	177	204	207
78	145	144	146	147	146	150	178	203	207
79	147	147	149	149	149	152	179	203	206
80	150	149	152	152	152	155	179	202	206
81	152	152	154	154	154	158	179	201	206
82	155	155	157	157	157	160	179	200	205
83	158	157	160	160	160	163	179	199	205
84	161	160	163	163	163	165	179	198	204
85	163	163	165	165	165	168	178	197	203
86	166	166	168	168	168	170	178	196	203
87	169	168	171	171	171	173	179	194	202
88	171	171	173	174	174	175	179	193	201
89	174	174	176	177	176	178	180	192	200
90	177	177	178	180	179	180	182	190	199
91	179	179	181	182	181	182	184	189	198
92	182	182	183	185	184	184	186	188	197
93	184	184	185	187	186	186	188	188	196
94	186	186	188	189	188	188	190	189	194
95	188	188	189	191	190	190	191	191	194
96	190	190	191	193	192	192	193	193	193
97	192	192	193	195	194	194	195	194	194
98	194	194	195	196	196	195	196	196	195
99	196	196	197	197	197	197	198	197	197
100	197	197	198	199	198	198	199	199	198
101	199	199	199	200	200	199	200	200	199
102	200	200	201	201	201	201	201	201	200
103	201	201	202	202	202	202	202	202	202
104	202	202	203	203	203	203	203	203	203
105	203	204	204	204	204	204	204	204	204
106	204	204	204	205	205	205	205	205	205
107	205	205	205	205	205	205	206	206	205
108	206	206	206	206	206	206	206	206	206
109	207	207	207	207	207	206	207	207	207
110	207	207	207	207	207	207	207	207	207
111	207	207	207	207	208	207	208	207	207
112	208	208	208	208	208	208	208	208	208
113	208	208	208	208	208	208	208	208	208
114	208	208	208	208	208	208	208	208	208
115	208	208	208	208	208	208	209	208	208
116	208	209	208	208	208	208	209	209	209
117	209	209	209	208	208	208	209	209	209
118	209	209	209	208	208	208	209	209	209
119	209	209	209	209	209	209	209	209	209
120	209	209	209	208	208	208	209	209	209
121	209	209	209	209	209	209	209	209	209
122	209	209	209	209	209	209	209	209	209
123	209	209	209	209	209	209	209	209	209
124	209	209	209	209	209	209	209	209	209
125	209	209	209	209	209	209	209	209	209
126	209	209	209	209	209	209	209	209	209
127	209	209	209	209	209	209	209	209	209
128	209	209	209	209	209	209	209	209	209
129	209	209	209	209	209	209	209	209	209
130	208	208	208	208	208	208	209	209	209
131	208	209	209	208	208	208	209	209	209
132	208	209	209	208	208	208	209	209	209
133	208	208	208	208	208	208	209	209	209
134	208	208	208	208	208	208	209	209	209
135	208	208	208	208	208	208	209	209	209
136	208	208	208	208	208	208	209	209	209
137	208	208	208	208	208	208	209	209	209
138	208	208	208	208	208	208	209	209	209
139	208	208	208	208	208	208	209	209	209
140	208	208	208	208	208	208	209	209	209
141	208	208	208	208	208	208	209	209	209

OMEGA POINT LABORATORIES

Peak Seals, Inc. Project No. 14540-99417 August 21, 1997

Time (min)	TC # 155 (°F)	TC # 156 (°F)	TC # 157 (°F)	TC # 158 (°F)	TC # 159 (°F)	TC # 160 (°F)	TC # 161 (°F)	TC # 162 (°F)	TC # 163 (°F)
142	208	208	208	208	208	208	209	209	209
143	208	208	208	208	208	208	209	209	209
144	208	208	208	208	208	208	209	209	209
145	208	208	208	208	208	208	209	209	209
146	208	208	208	208	208	208	209	209	209
147	208	208	208	208	208	208	209	209	209
148	208	208	208	208	208	208	209	209	209
149	208	208	208	208	208	208	209	209	209
150	208	208	208	208	208	208	209	209	209
151	208	208	208	208	208	208	209	209	209
152	208	208	208	208	208	208	209	209	209
153	208	208	208	208	208	208	209	209	209
154	208	208	208	208	208	208	209	208	208
155	208	208	208	208	208	208	209	208	208
156	208	208	208	208	208	208	209	208	208
157	208	208	208	208	208	208	209	208	208
158	208	208	208	208	208	208	209	208	208
159	208	208	208	208	208	208	209	208	208
160	208	208	208	208	208	208	209	208	208
161	208	208	208	208	208	208	209	208	208
162	208	208	208	208	208	208	209	208	208
163	208	208	208	208	208	208	209	208	208
164	208	208	208	208	208	208	209	208	208
165	208	208	208	208	208	208	209	208	208
166	208	208	208	208	208	208	208	208	208
167	208	208	208	208	208	208	208	208	208
168	208	208	208	208	208	208	208	208	208
169	209	208	208	208	208	208	208	208	208
170	209	208	208	208	207	207	208	208	208
171	209	208	208	208	207	207	208	208	208
172	209	208	208	208	207	207	208	208	208
173	209	208	208	208	207	207	208	208	208
174	209	208	209	208	207	207	208	208	207
175	209	208	209	208	207	207	206	208	207
176	209	208	209	208	207	207	208	208	207
177	209	208	209	208	207	207	208	208	207
178	210	209	210	208	207	207	208	208	207
179	210	209	210	209	207	207	208	208	207
180	210	209	210	209	208	207	208	208	207
Max Temp:	210	209	210	209	209	209	209	209	209
Max Allowed:	417	417	417	418	418	418	418	418	417

OMEGA POINT LABORATORIES

Peak Seals, Inc. Project No. 14540-99417 August 21, 1997

Time (min)	TC # 164 (°F)	TC # 165 (°F)	TC # 166 (°F)	TC # 167 (°F)	TC # 168 (°F)	TC # 169 (°F)	TC # 170 (°F)	TC # 171 (°F)	TC # 172 (°F)
0	89	91	91	91	91	92	91	91	91
1	89	99	91	91	91	92	91	91	91
2	89	116	91	91	91	92	91	91	91
3	89	138	92	91	91	92	91	91	91
4	89	160	94	92	91	92	91	92	91
5	89	179	98	92	91	92	92	92	91
6	89	200	102	93	91	92	92	92	91
7	89	223	107	94	92	92	93	93	91
8	89	245	112	96	92	92	94	95	91
9	94	266	118	97	92	92	97	97	91
10	102	287	125	100	95	92	102	102	92
11	107	307	131	105	100	92	108	108	93
12	113	326	139	110	104	92	113	115	95
13	118	343	146	117	108	92	119	121	97
14	121	361	154	123	111	92	126	128	100
15	124	377	163	129	114	92	132	135	104
16	126	393	172	134	116	92	139	141	108
17	127	408	183	140	118	92	146	147	112
18	128	423	193	145	120	92	152	153	116
19	128	438	204	151	122	92	157	159	121
20	127	451	212	156	124	92	161	163	125
21	127	464	221	162	126	92	165	168	130
22	126	475	229	168	129	93	168	172	136
23	126	487	236	174	131	93	172	176	141
24	126	497	244	180	133	93	176	179	148
25	127	508	251	187	136	94	179	182	154
26	127	518	258	193	138	94	181	185	161
27	128	528	265	200	141	94	184	188	168
28	129	538	271	205	143	95	186	190	175
29	129	547	278	208	147	95	189	193	182
30	129	556	284	211	150	96	192	196	187
31	129	565	290	214	155	96	194	198	192
32	129	573	296	217	164	97	197	201	196
33	129	581	302	220	175	98	199	203	199
34	129	588	307	223	184	98	200	205	202
35	130	595	312	227	189	99	201	207	204
36	130	601	317	230	202	100	202	208	206
37	131	607	321	233	201	101	203	209	207
38	132	613	326	237	203	102	204	210	208
39	132	618	331	241	206	103	205	212	208
40	133	624	335	244	207	105	206	213	209
41	134	629	339	248	207	107	206	214	209
42	135	635	344	252	208	108	207	215	209
43	135	640	348	255	208	111	207	216	209
44	136	646	352	259	209	113	207	218	210
45	136	651	357	262	208	116	208	219	210
46	137	656	361	266	209	120	208	220	210
47	137	662	365	270	209	124	208	221	210
48	138	667	370	274	209	127	208	223	211
49	139	672	374	277	209	130	209	224	211
50	139	678	378	281	210	133	209	225	212
51	140	683	382	285	210	137	209	226	212
52	141	688	387	289	211	146	210	228	213
53	141	693	391	292	212	162	210	229	214
54	142	699	395	296	214	173	210	231	215
55	142	704	400	300	215	185	211	233	216
56	143	709	404	304	217	192	212	234	217
57	143	715	409	308	218	185	212	236	218
58	144	720	413	313	220	183	213	238	219
59	144	726	417	317	221	185	214	240	221
60	145	731	422	320	222	187	214	242	223
61	145	736	426	324	224	188	215	244	224
62	146	741	430	328	225	190	216	246	226
63	146	747	434	332	227	190	217	248	228
64	147	752	439	336	229	190	218	250	230
65	147	758	443	340	230	190	219	253	232
66	147	763	447	344	231	192	220	255	234
67	147	769	451	348	232	193	221	257	237
68	147	774	455	351	234	194	222	260	239
69	148	780	459	355	236	195	225	262	241
70	148	785	463	359	237	194	231	265	244

OMEGA POINT LABORATORIES

Peak Seals, Inc. Project No. 14540-99417 August 21, 1997

Time (min)	TC # 164 (°F)	TC # 165 (°F)	TC # 166 (°F)	TC # 167 (°F)	TC # 168 (°F)	TC # 169 (°F)	TC # 170 (°F)	TC # 171 (°F)	TC # 172 (°F)
71	148	791	467	362	240	195	235	268	246
72	148	796	470	366	242	195	238	270	249
73	149	801	474	370	244	196	241	273	251
74	149	807	478	373	246	197	243	276	254
75	149	812	482	377	248	198	246	279	257
76	149	818	485	381	251	199	248	282	259
77	149	823	489	384	253	200	251	285	262
78	149	829	493	388	255	201	253	288	265
79	149	834	497	391	257	205	256	291	268
80	150	840	500	394	259	205	258	294	271
81	150	845	504	398	261	206	261	297	275
82	150	851	507	401	264	206	263	300	278
83	149	856	511	404	266	207	266	303	281
84	149	862	515	407	268	207	268	306	285
85	149	867	518	410	270	207	270	309	288
86	149	873	522	413	272	207	273	312	292
87	149	878	525	416	275	207	275	316	295
88	149	884	529	419	277	207	277	319	299
89	148	889	532	422	279	207	280	322	302
90	148	894	535	425	281	207	282	325	306
91	148	899	539	428	283	207	285	328	309
92	148	904	542	430	286	207	287	331	313
93	148	910	546	433	288	208	290	335	316
94	147	915	549	436	290	208	292	338	319
95	147	919	552	439	292	208	294	341	323
96	147	924	556	442	295	208	297	344	326
97	146	929	559	445	297	208	300	347	330
98	147	934	562	448	299	208	302	350	333
99	147	939	566	451	302	208	305	353	336
100	147	944	569	454	304	208	307	356	339
101	147	949	572	457	306	208	310	359	343
102	148	954	575	459	309	208	312	362	346
103	148	959	579	462	311	209	315	365	349
104	149	964	582	465	313	209	317	368	352
105	149	968	585	468	315	209	320	370	355
106	150	973	588	471	318	210	322	373	358
107	150	978	592	474	320	210	324	376	361
108	151	983	595	477	322	211	327	379	364
109	152	987	598	480	324	211	329	382	367
110	152	991	601	483	326	212	331	384	370
111	153	995	604	486	329	213	333	387	373
112	153	1000	607	488	331	213	336	390	376
113	154	1004	610	491	333	214	338	392	379
114	154	1008	614	494	335	215	340	395	381
115	154	1012	617	497	337	216	342	397	384
116	155	1016	620	500	339	216	344	400	387
117	155	1020	623	503	341	217	346	402	389
118	155	1025	626	505	343	218	348	405	392
119	156	1029	629	508	346	219	350	407	394
120	156	1033	632	511	348	220	352	409	396
121	156	1037	635	513	350	221	354	412	399
122	156	1042	638	516	352	222	356	414	401
123	157	1046	641	519	354	223	358	416	403
124	157	1050	644	521	356	225	360	418	405
125	157	1054	647	524	358	227	362	420	407
126	157	1058	650	527	360	229	364	422	409
127	157	1062	653	529	362	230	366	424	411
128	157	1066	656	532	364	232	368	426	413
129	158	1070	659	534	365	233	370	428	415
130	158	1074	662	537	367	234	372	430	417
131	158	1077	665	539	369	236	374	433	420
132	158	1081	668	541	371	237	376	435	422
133	158	1085	671	544	373	238	377	437	424
134	158	1089	674	546	375	240	379	439	426
135	158	1093	677	548	377	241	381	441	428
136	158	1096	680	551	379	243	383	443	430
137	159	1100	683	553	381	244	385	445	433
138	159	1104	687	555	383	246	387	447	435
139	159	1108	690	557	384	247	389	449	437
140	159	1111	693	559	386	249	390	452	439
141	159	1115	696	561	388	250	392	454	441

OMEGA POINT LABORATORIES

Peak Seals, Inc. Project No. 14540-99417 August 21, 1997

Time (min)	TC # 164 (°F)	TC # 165 (°F)	TC # 166 (°F)	TC # 167 (°F)	TC # 168 (°F)	TC # 169 (°F)	TC # 170 (°F)	TC # 171 (°F)	TC # 172 (°F)
142	160	1119	700	563	390	252	394	456	444
143	160	1122	703	565	392	253	396	458	446
144	160	1097	706	567	393	255	398	460	448
145	160	1129	710	569	395	257	399	462	451
146	160	1133	713	572	397	259	401	464	453
147	160	1136	717	574	399	260	403	467	455
148	160	1137	720	576	400	262	405	469	457
149	160	1140	724	578	402	264	407	471	460
150	160	904	727	580	404	265	408	473	462
151	161	960	731	582	406	267	410	475	464
152	161	1103	735	584	407	269	412	478	467
153	161	1123	739	587	409	271	414	480	469
154	161	1138	742	589	411	273	416	482	472
155	161	1103	746	592	413	274	417	484	474
156	161	1146	750	594	415	276	419	486	476
157	162	1162	754	597	417	278	421	489	479
158	162	1166	758	600	418	280	423	491	481
159	162	1169	763	603	420	282	425	493	484
160	162	1173	767	606	422	284	427	495	486
161	162	1176	771	609	424	285	428	497	488
162	162	1180	775	612	426	287	430	499	491
163	163	1184	779	615	428	289	432	502	493
164	163	1121	783	618	429	291	434	504	496
165	163	1119	788	621	431	293	436	506	498
166	163	1195	792	624	433	295	437	508	501
167	163	1046	796	627	435	297	439	510	503
168	163	1210	801	631	437	299	441	512	505
169	163	1213	805	634	439	301	443	515	508
170	163	1217	809	638	441	303	445	517	510
171	163	1220	814	642	443	305	446	519	513
172	164	1223	818	645	445	307	448	521	515
173	164	1227	822	649	447	309	450	523	517
174	164	1230	827	653	449	311	452	525	520
175	163	1234	831	657	451	313	453	527	522
176	164	1237	836	661	453	315	455	529	524
177	164	1241	840	665	456	317	457	531	526
178	164	1244	845	669	458	319	459	533	528
179	164	1248	849	673	460	321	461	535	531
180	164	1251	853	677	462	323	462	537	533
Max Temp:	164	1251	853	677	462	323	462	537	533
Max Allowed:	414								

OMEGA POINT LABORATORIES

Peak Seals, Inc. Project No. 14540-99417 August 21, 1997

Time (min)	TC # 173 (°F)	TC # 174 (°F)	TC # 175 (°F)	TC # 176 (°F)	TC # 177 (°F)	TC # 178 (°F)	TC # 179 (°F)	Ambient (°F)	Furnace # 1 (°F)
0	91	91	91	91	91	91	91	84	89
1	90	91	91	91	91	91	97	84	205
2	91	91	91	91	91	91	111	84	375
3	91	91	91	91	91	91	130	84	568
4	91	91	91	91	91	93	149	84	677
5	92	93	91	91	91	95	168	84	766
6	94	99	96	92	91	98	188	84	877
7	97	104	106	97	91	101	209	84	972
8	100	109	112	101	92	105	231	85	1036
9	104	114	117	105	94	110	252	85	1087
10	109	118	121	109	95	115	272	85	1132
11	115	121	123	112	97	121	292	85	1168
12	121	125	126	115	100	127	311	85	1202
13	127	129	130	118	103	135	329	85	1234
14	134	133	133	122	106	143	347	85	1269
15	140	137	136	125	110	154	364	85	1280
16	147	142	140	129	114	174	381	85	1315
17	153	146	143	133	119	194	397	86	1333
18	160	151	147	137	125	204	413	86	1352
19	167	156	150	141	131	208	428	86	1361
20	173	160	153	145	138	210	441	86	1351
21	179	164	156	149	146	214	453	86	1348
22	186	167	159	154	154	221	463	86	1364
23	191	171	162	158	162	227	474	86	1393
24	196	174	165	162	170	234	485	86	1410
25	199	178	168	167	178	239	495	86	1411
26	203	181	171	171	184	245	504	87	1411
27	205	184	175	176	191	250	513	86	1426
28	206	186	178	181	198	256	521	86	1440
29	207	188	181	186	203	261	529	87	1453
30	207	189	184	192	206	266	537	86	1459
31	208	191	187	198	208	270	544	87	1460
32	208	193	191	204	210	275	551	86	1459
33	209	194	196	208	211	279	557	86	1467
34	209	196	201	209	211	284	563	87	1483
35	209	198	205	210	212	288	569	87	1489
36	209	201	207	210	213	292	575	87	1492
37	209	204	209	210	214	295	581	87	1500
38	210	205	209	210	214	299	587	87	1509
39	210	207	209	210	215	302	593	88	1518
40	211	208	209	210	216	305	598	87	1524
41	212	208	209	210	216	308	604	88	1526
42	213	208	209	209	217	311	609	87	1534
43	214	209	209	209	218	314	614	88	1543
44	215	209	209	209	219	317	619	87	1545
45	217	209	209	209	220	320	624	88	1545
46	219	209	209	209	221	323	629	88	1555
47	220	210	209	209	222	326	634	88	1560
48	222	210	209	209	223	329	639	88	1562
49	224	210	209	209	224	331	643	88	1567
50	226	211	208	209	225	334	648	88	1572
51	228	211	209	209	226	337	652	88	1575
52	230	212	209	209	227	340	657	89	1579
53	232	213	209	209	229	343	661	89	1586
54	234	214	209	209	230	346	666	89	1591
55	236	216	209	210	232	349	671	88	1595
56	238	217	209	210	233	352	675	89	1597
57	240	218	209	210	235	355	680	89	1601
58	243	220	209	211	236	358	684	89	1605
59	245	221	209	211	238	361	689	89	1612
60	248	222	209	212	240	364	693	89	1620
61	250	224	209	212	242	367	698	89	1620
62	253	225	209	213	244	370	702	89	1622
63	255	226	209	214	246	373	707	89	1625
64	258	228	210	215	248	376	711	89	1630
65	261	230	210	216	251	380	716	89	1635
66	263	231	210	217	253	383	720	89	1639
67	266	233	211	219	256	386	724	90	1648
68	269	235	211	220	259	389	729	90	1657
69	272	237	211	221	262	393	734	90	1658
70	274	239	212	222	265	396	738	90	1658

OMEGA POINT LABORATORIES

Peak Seals, Inc. Project No. 14540-99417 August 21, 1997

Time (min)	TC # 173 (°F)	TC # 174 (°F)	TC # 175 (°F)	TC # 176 (°F)	TC # 177 (°F)	TC # 178 (°F)	TC # 179 (°F)	Ambient (°F)	Furnace # 1 (°F)
71	277	241	212	224	268	399	743	90	1659
72	280	243	214	225	272	403	747	90	1660
73	283	245	216	227	275	406	751	90	1664
74	286	247	218	229	279	409	755	90	1666
75	289	249	219	231	282	413	760	91	1670
76	291	252	221	234	286	416	764	91	1675
77	294	254	224	237	290	419	768	91	1678
78	297	257	226	240	294	423	773	91	1681
79	300	259	229	243	299	426	777	91	1685
80	303	262	232	247	303	430	781	91	1688
81	306	265	234	250	307	433	786	92	1691
82	310	268	237	254	311	437	790	91	1698
83	313	270	240	257	315	440	795	91	1702
84	316	273	243	261	319	444	799	92	1705
85	319	276	246	264	323	447	804	91	1709
86	322	279	248	267	327	450	808	91	1711
87	325	282	251	271	331	454	813	91	1712
88	328	285	254	274	335	457	817	92	1715
89	331	288	258	278	339	460	821	92	1719
90	334	291	261	281	343	464	826	91	1722
91	338	294	264	284	347	467	830	92	1725
92	341	297	267	288	350	470	834	92	1727
93	344	299	270	291	354	473	838	92	1728
94	347	302	273	294	357	477	843	92	1732
95	350	305	276	298	361	480	847	92	1735
96	353	308	279	301	364	483	851	93	1741
97	356	311	282	304	368	486	855	93	1746
98	359	314	285	307	371	489	859	93	1742
99	362	317	288	311	374	492	863	93	1746
100	365	320	291	314	378	495	868	93	1755
101	368	322	294	317	381	498	872	93	1756
102	371	325	297	320	384	501	876	94	1756
103	374	328	300	323	387	504	880	94	1759
104	377	331	303	326	390	507	884	94	1762
105	380	334	306	330	393	510	888	95	1769
106	383	336	308	333	395	513	892	94	1772
107	386	339	311	335	398	515	896	94	1769
108	388	342	314	338	401	518	900	94	1769
109	391	344	317	341	403	521	903	94	1771
110	394	347	320	344	406	524	907	93	1772
111	397	350	322	346	408	527	911	93	1778
112	399	352	325	349	411	529	914	94	1781
113	402	355	327	351	413	532	918	93	1780
114	404	357	330	354	415	534	922	94	1783
115	407	360	332	357	418	537	925	94	1785
116	410	362	335	359	420	540	929	94	1788
117	412	365	337	361	422	542	932	93	1791
118	414	367	340	364	424	545	936	94	1792
119	417	369	342	366	427	547	939	94	1794
120	419	372	344	368	429	550	943	94	1799
121	422	374	346	370	431	552	946	94	1800
122	424	376	349	372	433	555	950	94	1802
123	426	378	351	375	435	557	953	94	1804
124	429	381	353	377	438	560	957	94	1804
125	431	383	355	379	440	562	960	94	1807
126	433	385	357	381	442	565	964	95	1807
127	435	387	359	383	444	567	967	95	1809
128	437	389	361	385	447	570	970	95	1810
129	439	392	363	387	449	572	973	96	1814
130	442	394	365	389	451	574	976	95	1817
131	444	396	367	391	453	577	979	95	1818
132	446	398	369	393	456	579	983	95	1819
133	448	400	371	395	458	582	986	95	1822
134	450	402	374	397	460	584	989	95	1823
135	452	404	375	399	462	586	992	95	1824
136	455	406	377	401	465	589	995	96	1826
137	457	408	379	403	467	591	999	96	1827
138	459	410	381	405	469	594	1002	97	1829
139	461	412	383	407	471	596	1005	96	1831
140	463	414	385	409	474	599	1008	96	1833
141	466	416	387	411	476	601	1011	96	1835

OMEGA POINT LABORATORIES

Peak Seals, Inc. Project No. 14540-99417 August 21, 1997

Time (min)	TC # 173 (°F)	TC # 174 (°F)	TC # 175 (°F)	TC # 176 (°F)	TC # 177 (°F)	TC # 178 (°F)	TC # 179 (°F)	Ambient (°F)	Furnace # 1 (°F)
142	468	418	389	413	478	603	1014	97	1835
143	470	420	391	415	480	606	1018	96	1837
144	472	422	393	417	482	608	1021	96	1840
145	475	424	395	419	485	611	1024	97	1842
146	477	426	397	421	487	613	1027	97	1842
147	479	428	399	423	489	616	1030	97	1845
148	481	430	400	424	491	618	1033	97	1846
149	484	432	402	426	493	621	1036	98	1847
150	486	433	404	428	495	623	1039	97	1849
151	488	435	406	430	497	626	1042	97	1850
152	491	437	408	432	500	628	1046	98	1851
153	493	439	409	434	502	631	1049	98	1853
154	495	441	411	435	504	633	1052	98	1855
155	498	443	413	437	506	636	1055	98	1856
156	500	445	415	439	508	638	1058	99	1858
157	503	447	417	441	510	641	1061	98	1858
158	506	449	418	443	512	643	1064	99	1858
159	508	451	420	445	514	646	1067	100	1859
160	511	453	422	446	516	648	1070	99	1862
161	513	455	423	448	518	651	1073	100	1865
162	516	457	425	450	520	653	1076	100	1867
163	519	459	427	452	521	656	1079	100	1869
164	521	461	429	453	523	659	1082	99	1869
165	524	463	430	455	525	661	1085	100	1871
166	526	465	432	457	527	664	1088	100	1871
167	529	467	434	459	529	666	1091	99	1874
168	531	469	436	460	531	669	1094	99	1875
169	534	471	437	462	532	671	1096	100	1876
170	536	473	439	464	534	674	1099	100	1877
171	539	475	441	465	536	677	1102	100	1878
172	541	477	442	467	538	679	1105	100	1878
173	544	479	444	469	539	682	1108	101	1879
174	546	481	446	470	541	685	1055	101	1881
175	549	483	448	472	543	687	957	100	1884
176	551	485	449	474	544	690	1006	101	1885
177	554	488	451	475	546	693	921	100	1888
178	556	490	453	477	547	695	914	99	1890
179	558	492	454	479	549	698	888	100	1891
180	561	494	456	480	550	701	897	100	1891
Max Temp:	561	494	456	480	550	701	1108		
Max Allowed:									

OMEGA POINT LABORATORIES

Peak Seals, Inc. Project No. 14540-99417 August 21, 1997

Time (min)	Furnace # 2 (°F)	Furnace # 3 (°F)	Furnace # 4 (°F)	Furnace # 5 (°F)	Furnace # 6 (°F)	Furnace # 7 (°F)	Furnace # 8 (°F)
0	89	89	89	84	89	84	84
1	217	268	184	268	320	210	190
2	424	488	398	545	606	369	348
3	634	697	654	820	825	521	523
4	707	768	750	921	855	612	627
5	767	844	816	1052	916	697	717
6	871	962	933	1232	1030	789	822
7	958	1058	1033	1352	1124	869	913
8	1007	1099	1081	1365	1161	934	976
9	1047	1138	1118	1403	1198	989	1027
10	1088	1182	1165	1486	1246	1028	1067
11	1120	1220	1207	1547	1289	1049	1094
12	1152	1250	1236	1561	1313	1086	1131
13	1180	1284	1270	1631	1346	1102	1154
14	1214	1316	1305	1650	1377	1138	1190
15	1219	1317	1308	1648	1371	1166	1216
16	1247	1354	1337	1722	1420	1169	1235
17	1267	1369	1357	1699	1426	1203	1262
18	1292	1393	1384	1720	1453	1215	1282
19	1308	1403	1397	1692	1447	1247	1310
20	1303	1390	1384	1641	1418	1266	1328
21	1302	1385	1380	1659	1407	1282	1341
22	1316	1402	1397	1713	1428	1299	1357
23	1340	1435	1428	1770	1479	1314	1368
24	1353	1452	1445	1738	1485	1326	1384
25	1359	1448	1444	1708	1475	1339	1402
26	1364	1448	1444	1707	1468	1350	1420
27	1377	1465	1464	1739	1485	1356	1430
28	1391	1480	1479	1762	1502	1371	1445
29	1404	1493	1497	1774	1516	1380	1458
30	1413	1497	1502	1760	1517	1396	1471
31	1419	1497	1500	1756	1512	1410	1480
32	1423	1498	1498	1743	1508	1419	1486
33	1429	1506	1510	1765	1519	1426	1497
34	1442	1521	1525	1790	1538	1431	1504
35	1450	1526	1529	1782	1541	1442	1513
36	1455	1530	1530	1780	1542	1453	1518
37	1463	1538	1542	1790	1551	1460	1523
38	1472	1549	1546	1792	1561	1469	1531
39	1479	1556	1550	1802	1569	1480	1541
40	1485	1558	1557	1804	1573	1487	1549
41	1489	1560	1564	1799	1573	1492	1554
42	1497	1566	1568	1813	1581	1503	1564
43	1505	1575	1577	1831	1592	1510	1572
44	1510	1577	1577	1814	1590	1516	1574
45	1512	1574	1575	1801	1586	1525	1578
46	1519	1584	1583	1822	1597	1533	1589
47	1523	1585	1588	1826	1601	1542	1597
48	1528	1589	1589	1822	1603	1549	1601
49	1532	1591	1594	1827	1607	1554	1607
50	1536	1594	1594	1830	1611	1561	1610
51	1541	1595	1593	1829	1614	1572	1615
52	1546	1599	1595	1833	1617	1580	1622
53	1550	1605	1602	1847	1626	1585	1628
54	1555	1608	1604	1852	1629	1589	1634
55	1560	1611	1608	1847	1631	1593	1639
56	1565	1612	1610	1845	1633	1600	1643
57	1569	1617	1614	1848	1635	1606	1647
58	1574	1620	1618	1851	1640	1611	1651
59	1578	1624	1625	1862	1646	1617	1659
60	1584	1632	1632	1871	1654	1622	1665
61	1588	1630	1631	1863	1652	1629	1668
62	1593	1632	1633	1864	1652	1637	1670
63	1598	1637	1638	1868	1656	1643	1671
64	1603	1640	1640	1869	1659	1649	1676
65	1608	1645	1644	1880	1665	1654	1680
66	1612	1649	1648	1876	1668	1657	1686
67	1619	1659	1659	1890	1678	1658	1694
68	1627	1667	1666	1898	1686	1664	1704
69	1630	1667	1667	1894	1687	1671	1703
70	1631	1665	1665	1891	1686	1680	1705

OMEGA POINT LABORATORIES

Peak Seals, Inc. Project No. 14540-99417 August 21, 1997

Time (min)	Furnace # 2 (°F)	Furnace # 3 (°F)	Furnace # 4 (°F)	Furnace # 5 (°F)	Furnace # 6 (°F)	Furnace # 7 (°F)	Furnace # 8 (°F)
71	1633	1665	1664	1888	1686	1687	1707
72	1637	1667	1667	1891	1687	1694	1711
73	1644	1671	1672	1888	1689	1701	1716
74	1647	1673	1672	1893	1692	1708	1720
75	1650	1676	1676	1895	1696	1713	1724
76	1656	1683	1684	1902	1700	1718	1729
77	1659	1686	1685	1901	1703	1720	1732
78	1663	1688	1688	1901	1706	1724	1734
79	1668	1692	1694	1902	1707	1727	1739
80	1672	1695	1697	1904	1710	1731	1742
81	1677	1699	1701	1907	1713	1736	1745
82	1683	1705	1707	1919	1721	1743	1753
83	1687	1709	1710	1920	1726	1743	1754
84	1692	1712	1713	1920	1729	1745	1756
85	1697	1714	1716	1917	1731	1752	1761
86	1698	1716	1715	1915	1733	1753	1762
87	1699	1717	1715	1916	1734	1752	1763
88	1701	1719	1718	1921	1736	1759	1766
89	1707	1725	1727	1926	1740	1769	1774
90	1709	1727	1727	1930	1744	1771	1775
91	1714	1730	1730	1927	1747	1770	1775
92	1713	1730	1727	1924	1748	1770	1776
93	1715	1732	1728	1929	1749	1771	1778
94	1720	1736	1733	1930	1752	1773	1782
95	1723	1739	1736	1935	1756	1781	1786
96	1729	1745	1744	1942	1761	1792	1793
97	1735	1750	1750	1943	1764	1802	1801
98	1730	1744	1741	1929	1758	1794	1793
99	1731	1747	1741	1945	1765	1796	1796
100	1740	1759	1755	1958	1775	1809	1807
101	1743	1758	1756	1950	1774	1812	1807
102	1742	1756	1751	1945	1773	1804	1804
103	1745	1759	1754	1949	1776	1810	1806
104	1749	1763	1759	1953	1779	1817	1813
105	1755	1772	1771	1957	1787	1820	1819
106	1759	1775	1771	1965	1789	1830	1823
107	1757	1769	1766	1945	1781	1824	1816
108	1756	1768	1764	1947	1781	1822	1814
109	1758	1770	1766	1951	1784	1821	1815
110	1758	1769	1764	1949	1783	1817	1815
111	1764	1777	1771	1966	1793	1826	1821
112	1766	1779	1772	1969	1796	1822	1823
113	1766	1778	1771	1959	1791	1824	1821
114	1768	1780	1773	1960	1793	1826	1823
115	1770	1781	1775	1963	1796	1830	1824
116	1774	1785	1780	1969	1800	1837	1828
117	1776	1788	1781	1967	1801	1832	1831
118	1778	1789	1783	1967	1802	1838	1832
119	1780	1790	1784	1970	1804	1844	1835
120	1783	1794	1787	1979	1811	1851	1839
121	1784	1795	1788	1974	1809	1849	1839
122	1786	1797	1790	1973	1810	1846	1841
123	1788	1799	1791	1979	1814	1849	1842
124	1789	1798	1790	1975	1811	1845	1842
125	1790	1802	1793	1978	1815	1847	1845
126	1791	1800	1791	1975	1813	1849	1844
127	1793	1802	1794	1978	1817	1856	1846
128	1794	1803	1794	1977	1816	1858	1847
129	1797	1807	1798	1985	1824	1862	1849
130	1799	1811	1803	1987	1829	1868	1856
131	1801	1811	1801	1987	1826	1868	1856
132	1802	1811	1802	1981	1825	1867	1854
133	1805	1815	1805	1989	1829	1861	1857
134	1805	1815	1805	1983	1828	1860	1856
135	1807	1817	1807	1988	1830	1854	1856
136	1809	1819	1809	1991	1833	1861	1857
137	1811	1819	1810	1988	1833	1868	1861
138	1812	1821	1811	1992	1835	1871	1863
139	1814	1824	1814	1996	1839	1869	1865
140	1816	1825	1815	1995	1840	1870	1864
141	1818	1827	1817	1998	1844	1872	1866

OMEGA POINT LABORATORIES

Peak Seals, Inc. Project No. 14540-99417 August 21, 1997

Time (min)	Furnace # 2 (°F)	Furnace # 3 (°F)	Furnace # 4 (°F)	Furnace # 5 (°F)	Furnace # 6 (°F)	Furnace # 7 (°F)	Furnace # 8 (°F)
142	1818	1826	1815	1994	1842	1876	1867
143	1820	1829	1818	2001	1844	1879	1869
144	1822	1832	1821	2002	1849	1881	1870
145	1825	1835	1825	1998	1850	1875	1869
146	1825	1833	1823	2003	1848	1883	1871
147	1828	1837	1827	2007	1853	1883	1873
148	1829	1837	1827	2010	1853	1883	1874
149	1830	1839	1828	2008	1854	1887	1877
150	1831	1841	1830	2009	1856	1885	1879
151	1833	1842	1830	2018	1857	1887	1878
152	1834	1842	1831	2008	1856	1889	1879
153	1836	1844	1833	2008	1859	1887	1880
154	1837	1847	1835	2012	1862	1889	1882
155	1839	1848	1836	2019	1864	1888	1881
156	1840	1849	1836	2022	1865	1889	1883
157	1841	1849	1837	2019	1864	1886	1883
158	1841	1848	1836	2014	1862	1892	1883
159	1842	1850	1839	2012	1865	1891	1886
160	1845	1854	1844	2016	1870	1893	1889
161	1847	1856	1844	2024	1874	1901	1889
162	1848	1857	1845	2022	1873	1899	1891
163	1850	1859	1846	2027	1876	1897	1892
164	1851	1860	1847	2029	1876	1898	1892
165	1852	1861	1848	2028	1876	1901	1894
166	1853	1861	1849	2026	1876	1900	1894
167	1855	1864	1851	2034	1880	1899	1895
168	1856	1865	1852	2033	1879	1902	1896
169	1857	1866	1854	2031	1880	1901	1897
170	1858	1867	1854	2029	1881	1901	1897
171	1859	1867	1854	2031	1881	1902	1898
172	1859	1868	1854	2034	1881	1904	1898
173	1860	1869	1855	2031	1882	1903	1897
174	1862	1871	1859	2027	1884	1905	1901
175	1865	1875	1862	2034	1890	1906	1904
176	1866	1875	1862	2033	1889	1914	1905
177	1869	1879	1866	2037	1894	1911	1903
178	1871	1882	1869	2039	1898	1908	1905
179	1871	1880	1868	2037	1894	1910	1905
180	1871	1880	1868	2034	1893	1912	1905
Max Temp:							
Max Allowed:							

OMEGA POINT LABORATORIES

Peak Seals, Inc. Project No. 14540-99417 August 21, 1997

Time (min)	Furnace # 9 (°F)	Furnace # 10 (°F)
0	84	84
1	246	245
2	611	761
3	948	1168
4	984	1158
5	1060	1236
6	1232	1429
7	1361	1562
8	1367	1509
9	1385	1556
10	1478	1674
11	1569	1722
12	1555	1699
13	1630	1784
14	1646	1780
15	1617	1734
16	1712	1844
17	1667	1810
18	1686	1856
19	1651	1801
20	1601	1735
21	1597	1741
22	1645	1809
23	1714	1864
24	1690	1833
25	1666	1809
26	1657	1798
27	1679	1821
28	1698	1847
29	1710	1856
30	1702	1835
31	1690	1808
32	1682	1797
33	1700	1819
34	1722	1864
35	1720	1852
36	1720	1848
37	1729	1849
38	1738	1869
39	1749	1873
40	1748	1861
41	1742	1847
42	1755	1875
43	1769	1892
44	1760	1874
45	1755	1868
46	1770	1893
47	1773	1886
48	1775	1892
49	1777	1887
50	1781	1894
51	1783	1903
52	1787	1903
53	1797	1913
54	1799	1912
55	1799	1904
56	1800	1909
57	1802	1907
58	1808	1917
59	1814	1918
60	1821	1927
61	1816	1922
62	1817	1923
63	1819	1920
64	1818	1919
65	1825	1923
66	1827	1929
67	1841	1942
68	1848	1953
69	1846	1951
70	1842	1941

OMEGA POINT LABORATORIES

Peak Seals, Inc. Project No. 14540-99417 August 21, 1997

Time (min)	Furnace # 9 (°F)	Furnace # 10 (°F)
71	1838	1937
72	1837	1934
73	1834	1929
74	1835	1932
75	1836	1931
76	1839	1928
77	1840	1931
78	1840	1931
79	1843	1931
80	1845	1932
81	1846	1928
82	1853	1937
83	1856	1942
84	1854	1935
85	1853	1935
86	1855	1941
87	1858	1944
88	1860	1944
89	1863	1942
90	1865	1948
91	1865	1948
92	1868	1954
93	1871	1953
94	1871	1953
95	1876	1957
96	1880	1958
97	1881	1957
98	1870	1944
99	1880	1960
100	1891	1970
101	1884	1961
102	1886	1967
103	1888	1967
104	1890	1966
105	1891	1963
106	1895	1969
107	1882	1954
108	1880	1952
109	1882	1955
110	1882	1957
111	1888	1963
112	1895	1975
113	1893	1968
114	1892	1967
115	1894	1969
116	1894	1969
117	1891	1965
118	1897	1967
119	1895	1968
120	1902	1966
121	1899	1967
122	1896	1966
123	1901	1973
124	1901	1971
125	1900	1972
126	1901	1973
127	1906	1970
128	1902	1968
129	1905	1971
130	1908	1970
131	1907	1973
132	1905	1972
133	1910	1977
134	1906	1970
135	1911	1973
136	1916	1976
137	1917	1977
138	1915	1979
139	1918	1979
140	1919	1979
141	1919	1979

OMEGA POINT LABORATORIES

Peak Seals, Inc. Project No. 14540-99417 August 21, 1997

Time (min)	Furnace # 9 (°F)	Furnace # 10 (°F)
142	1919	1982
143	1922	1981
144	1921	1979
145	1921	1977
146	1922	1978
147	1922	1978
148	1923	1979
149	1925	1980
150	1928	1983
151	1929	1985
152	1928	1984
153	1929	1984
154	1930	1984
155	1934	1987
156	1932	1988
157	1939	1987
158	1933	1989
159	1935	1985
160	1934	1987
161	1933	1989
162	1935	1989
163	1934	1991
164	1939	1993
165	1940	1993
166	1945	1992
167	1945	1995
168	1945	1996
169	1947	1997
170	1948	1996
171	1949	1997
172	1947	1998
173	1948	1997
174	1951	1997
175	1950	2000
176	1950	1999
177	1945	1997
178	1948	1996
179	1950	1996
180	1952	1996
Max Temp:		
Max Allowed:		

OMEGA POINT LABORATORIES

Appendix E

QUALITY ASSURANCE

OMEGA POINT LABORATORIES

Quality Assurance Statement

Omega Point Laboratories, Inc. is an independent, wholly owned company incorporated in the state of Texas, devoted to engineering, inspection, quality assurance and testing of building materials, products and assemblies. The company has developed and implemented a Quality Assurance Program designed to provide its clients with a planned procedure of order and document processing for inspection and testing services it provides to assure conformity to requirements, codes, standards and specifications. The Program is designed to meet the intent of ANSI 45.2 Quality Assurance Program Requirements for Nuclear Power Plants, and complies with the requirements of the ASME Code, SPPE, Military Standards and other less stringent programs. It is the Laboratory's intention to adhere strictly to this Program, to assure that the services offered to its clients remains of the highest quality and accuracy possible.

The overall responsibility of the supervision, operation and coordination of this Quality Assurance Program is that of the Quality Assurance Manager, a person not involved with the performance of the inspection or testing services, and who is under the full time employ of the Laboratory. This individual is responsible for implementing and enforcing all procedures presented in the Quality Assurance Manual and the Procedures Manual. All personnel involved with activities which fall under the scope of this Program are required to cooperate with the letter and intent of this Program.

All QA Surveillance documents remain on file at the Laboratory, and are available for inspection by authorized personnel in the performance of an on-site QA Audit. All materials, services and supplies used herein were obtained with appropriate QA Certifications of Compliance, which may be found in the following pages.

OMEGA POINT LABORATORIES

Event Log

OMEGA POINT LABORATORIES

EVENT LOG

PEAK SEALS

Client # 14540

Projects 99416 & 99417

Omega Point Laboratories, Inc.
16015 Shady Falls Road
Elmendorf, Texas 78112-9784
210-635-8100 / FAX: 210-635-8101
800-966-5253

OPL EVENT LOG

PEAK SEALS / 3M
Client # 14540

NOTE:
This Log is used to document the date and note each step during the completion of the test projects referenced below. The assigned project numbers and brief description of these test assemblies are:

Proj. No. 99416: Three hour fire endurance test of 3M fire barrier system containing a 1" diameter steel conduit, a 5" diameter steel conduit and a 3" diameter steel conduit with a 12"x 12"x 8" junction box.

Proj. No. 99417: Three hour fire endurance test of 3M fire barrier system containing a 24" wide steel cable tray and a 6" wide steel cable tray.

Page 1 of ___

ITEM	DATE	INIT'L
Deg Priest President of OPL issues Proposal No. P960104-01 to Randy Brown of Peak Seals Inc. for the Fire Test of 3M Protective Envelope Systems for Three Hour Fire Exposures.	1/4/96	CH
Peak Seals Inc. issues Purchase Order #1162 to begin OPL Project #99416 and #99417.	1/8	CH
OPL Technicians begin work on the test slab previously used on OPL Proj. #99123 to adapt it for use on proj. #99416. The slab penetrations for the previous project are sealed in by damming up the bottom and filling with concrete grout.	1/8/96	CH
This slab is measured and the penetrations marked for proj. 99416 by OPL technicians. These penetrations designated are verified by OPL QA/QC personnel using drawings from Peak Starting OPL Project Mgr. with a tolerance of ± 1/2".	1/9/96	CH
The new penetrations for Project 99416 are drilled by a local contractor and verified by OPL QA/QC.	1/10	CH
Peak Seals Test Plan CTP-3005 Rev. 0 issued	1/10/96	CH

OPL EVENT LOG

PEAK SEALS / 3M
Client # 14540

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Proj. No. 99417: Three hour fire endurance test of 3M fire barrier system containing a 24" wide steel cable tray and a 6" wide steel cable tray.

ITEM	DATE	INIT'L
Thermocouple attachment to the bare #8 copper wires which will be pulled into the conduits begins by OPL technicians on #99416.	1/10/96	CH
Completed thermocouples on the bare #8 wires are verified by OPL QA/QC personnel on Project #99416.	1/10	CH
OPL technicians install the conduits and supports for Proj. 99416. The engineering thermocouples are started on the outside surface of the conduits by OPL technicians.	1/11	CH
All thermocouples are completed on proj. 99416 and the thermocouples attached to the bare #8 copper wires are pulled into the conduits by OPL technicians.	1/12	CH
OPL QA/QC personnel verify the conduit placement and complete thermocouple verification on proj. 99416.	1/15	CH
Peak Seals installation crew arrives at OPL at noon to begin proj. 99416. The Peak Seals staff on site consists of:	1/15	CH
Mike Jordan Installer	1/15/96	CH

OPL EVENT LOG

PEAK SEALS / 3M
Client # 14540

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Proj. No. 99417: Three hour fire endurance test of 3M fire barrier system containing a 24" wide steel cable tray and a 6" wide steel cable tray.

ITEM	DATE	INIT'L
Mike Murphy QC mgr	1/15/96	CH
Leo Werner Installer		
Randy Guidry Installer		
After a short meeting to discuss installation procedures the insulation of the conduits on proj. 99416 begins. The 3M materials used are:	1/15	CH
3M Interam E 54A Fire Wrap Mat		
Dow Corning (RTV Sealant) 732		
3M 898 Filament Tape		
Installation of the 3M Fire Barrier system begins on the conduit assembly #99416 by the Peak Seals and is witnessed by OPL QA/QC personnel.	1/15	CH
2" spacers or (standoffs) are applied on all horizontal, JB, radius and LB's. (Spacers are placed to maintain sufficient air space. most are 12" apart. They are caulked on both edges using Dow Corning RTV Sealant 732.) The spacers are put on before the first layer. They are placed next to couplings and deck interface.	1-15-	[illegible]
1st layer is applied to the 3" radius	1-15	[illegible]
using the 4 piece wrap method.	1-15-96	[illegible]

OPL EVENT LOG

PEAK SEALS / 3M
Client # 14540

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Proj. No. 99417: Three hour fire endurance test of 3M fire barrier system containing a 24" wide steel cable tray and a 6" wide steel cable tray.

Page 4 of __

ITEM	DATE	INIT'L
The 1st layer is applied to the 3" horizontal with cut outs over the support section using the circumference wrap method with a 4" lap over. The 2nd layers are applied to the radius and horizontal section on the 3".	1-15-96	[illegible]
1st and 2nd layers are applied to the 3" LB	1-15	[illegible]
using the one piece corner method.	1/15	[illegible]
First and second layers are applied to the 5" LB using pieces large enough to minimize the number of joints. 1st layer is applied to the 5" ~~horizontal~~ horizontal section of conduit using the circumference wrap with 4" over lap. 2nd layer is applied next to LB on the horizontal section.	1-15	[illegible]
First, second, third and forth layers are applied to the JB using the 4 piece wrap method.	1-15	[illegible]
Fifth layer is applied to the JB using the 4 piece wrap method, the sixth layer uses the circumference wrap method, the top and bottom pieces are cut as necessary to cover the JB plus 8" over lap.	1-16	[illegible]
The over lap is banded with SS Band to within 1" of edge. Then 2 SS Bands are installed on each side of the JB.	1-16-96	[illegible]

OPL EVENT LOG

PEAK SEALS / 3M
Client # 14540

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Proj. No. 99417: Three hour fire endurance test of 3M fire barrier system containing a 24" wide steel cable tray and a 6" wide steel cable tray.

Page 5 of ___

ITEM	DATE	INIT'L
Second layer of 3M E 54A Mat is	1-16-96	[illegible]
instaled on the radius and horizontal		
section of the 3" conduit.		
Two inch spacer are cut and	1-16	[illegible]
applied over the 2nd layer of		
material on all sections.		
The third layer is applied to		
the horizontal, radius and LB on		
the 3" conduit.		
After the second layer is completed	1/16	[illegible]
on the 5" ~~conduit~~ LB, 2" spacers are		
applied. Third layer is applied.		
Fourth layer is applied on the		
horizontal. First layer is applied		
to the 5" radius using the 4 piece		
wrap method. Second layer is		
applied to the 5" radius.	1-16	[illegible]
First layer is applied over 2"	1-16	[illegible]
spacers on the 1" radius using		
the two piece wrap method. First		
layer is applied to the vertical		
and horizontal sections using		
the circumference wrap method.		
With the spacers next to the LB on		
the 1" the first layer goes completely		
over the LB. This will be the 2 piece corner method		
Shipment of 3M material arrives.	1-17-96	[illegible]
Second layer applied to the one inch	1-17-96	[illegible]
conduit. Spacers applied. Third and		
fourth layers applied to the 1" radius.		
Using the 2 piece wrap method. Fourth layer		
is started on the horizontal of the 1" conduit	1-17-96	[illegible]

OPL EVENT LOG

PEAK SEALS / 3M
Client # 14540

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Proj. No. 99417: Three hour fire endurance test of 3M fire barrier system containing a 24" wide steel cable tray and a 6" wide steel cable tray.

Page 6 of __

ITEM	DATE	INIT'L
Fourth layer is applied to the LB. On the 3" conduit the material is supported by SS Bands, looped around the LB to secure. The fourth layer is completed on the horizontal section. Fifth layers are completed on the LB, horizontal and Radius. 4" Collars are applied over butt joints, caulked and taped. All layers on the 5" LB is the one piece corner method.	1-17-96	[illegible]
Fourth layer on the 5" LB, Radius and horizontal is being applied.	1-17-96	[illegible]
Fifth layer is applied up to the radius section on the 5".	1-17-96	[illegible]
Support pieces are cut to fit for the support section under the 5". The 1st, 2nd, 3rd, 4th + 5th layer using the 4 piece method are then applied. Then taped and secured with SS Bands.	1-17	[illegible]
The third layer is being applied over the spacers on the 1" conduit. The circumference wrap method is used on the horizontal section and also the vertical section. The two pieces meet at the LB and this is the 2 piece corner method over the LB. Fourth and fifth layers are applied. Collars are applied over butt joints caulked and taped.	1-18-96	[illegible]
T-49 Tape is applied over collars on 3"	1-18-96	[illegible]

OPL EVENT LOG

PEAK SEALS / 3M
Client # 14540

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Proj. No. 99417: Three hour fire endurance test of 3M fire barrier system containing a 24" wide steel cable tray and a 6" wide steel cable tray.

Page 7 of ___

ITEM	DATE	INIT'L
Hanger sections are being cut and applied using the 4 piece method except where the small section of hanger protrudes under the 3" conduit Shim pieces are placed on either side of the hanger then the five layers of bottom pieces will come up over the hanger	1-18-96	[illegible]
Side pieces are cut to fit and where the two T hangers meet the horizontal hanger, a cap is made of E54 Mat to protect the 5 layers of the hanger section.	1-18	[illegible]
Fifth layer is complete on the 5" LB. Fourth and fifth layers are applied to the radius using the 4 piece method. Collars are being applied over butt joints. Two inch strips of E54 Mat are cut and applied over the seams on the 5" LB taped and then SS bands are applied.		
Dow Corning RTV Sealant 732 caulk is placed around the material next to the concrete deck.	1-18	[illegible]
~~Stainless Steel Bands are applied every 12" ± 0.~~ [illegible] 1/18 [illegible] 1/18		
All seams are taped w/T 49 and stainless steel bands are installed every 12" ± 0.		
Peak Seals installers depart.	1-18-96	[illegible]

OPL EVENT LOG

PEAK SEALS / 3M
Client # 14540

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Proj. No. 99417: Three hour fire endurance test of 3M fire barrier system containing a 24" wide steel cable tray and a 6" wide steel cable tray.

Page 8 of __

ITEM	DATE	INIT'L
Final inspection of the test assembly is made by OPL QA/QC personnel. The test assembly is moved and placed on the testing furnace by OPL technicians.	1-22-96	SP
OPL technicians attach 179 thermocouples to the data acquisition equipment.	1-22	SP
Pre test checklist is performed by Herb Stansberry, OPL Project Manager. On site to witness the fire test of Project 99416 are:	1-22	SP
Des Priest Omega Point Laboratory	1-22	SP
Herb Stansberry " " "		
Terry Hitchcock " " "		
Condie Humphrey " " "		
Alda Patton " " "		
Laudencio Castañon " " "		
Richard Beasley " " "		
Oscar Estrada " " "		
Randy Brown Peak Seals		
Mike Murphy " "		
Mike Jordan " "		
Test begins at 1:20 pm and is completed after three hours and is followed by a five minute hose stream test from a distance of five feet. This test uses a fog nozzle with a 30° spray pattern with the pressure at 75 PSI. The	1-22	SP
	1-22-96	SP

OPL EVENT LOG

PEAK SEALS / 3M
Client # 14540

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Proj. No. 99417: Three hour fire endurance test of 3M fire barrier system containing a 24" wide steel cable tray and a 6" wide steel cable tray.

ITEM	DATE	INIT'L
pressure gage used is OPL Equipment # 92LE004 with recalibration required 3-2-96.	1/22/96	SP
Tear down and examination of project #99416 was done by OPL technicians, Project Manager Herb Stanskerry and OPL QA/QC personnel.	2-27-96	SP
	2-27-96	SP
End of documentation on project # 99416	2/27/96	SP
Work ~~repair~~ regimen Project #99417 by OPL technicians. A test slab previously used ~~metcap~~ is adapted for use in Project #99417	1/25/96	SP
Penetrations are marked by OPL technicians. The penetrations designated and verified by OPL QA/QC personnel using drawings provided by Project Manager Herb Stanskerry of OPL.	1/25/96	SP
The new penetrations for Project #99417 are drilled by a local contractor and reverified by OPL QA/QC personnel.	1/25/96	SP
Thermocouple attached to the	1/25/96	SP

OPL EVENT LOG

PEAK SEALS / 3M
Client # 14540

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Proj. No. 99417: Three hour fire endurance test of 3M fire barrier system containing a 24" wide steel cable tray and a 6" wide steel cable tray.

Page 10 of ___

ITEM	DATE	INIT'L
bare #8 copper wire, which are secured on each ring, on both the 6" and 24" cable trays by OPL technicians and they are verified by OPL QA/QC.	1/25/96	S
Cable trays are installed onto the test slab and TC's are installed.	1/26/96	S
Cable trays and thermocouples are verified by OPL QA/QC personnel.	1/29/96	S
Work resume on Project #99417 under new proposal # S970808-03 and Peak Seals new PO. Scope of the job remains the same.	8/5/97	S
Deck is pulled from storage additional Thermocouples are installed onto the supports. All Thermocouples are reverified.	8/7/97	S
Thermocouples on the support are verified and altered as required by OPL QA/QC personnel.	8/11/97	S
Peak Seals Crew arrives Mike Murphy, Charles Spriggs, Don Bigby and James Farrar. Peak Seals brought the 3M E54A mat with them.	8/11/97	S

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Proj. No. 99417: Three hour fire endurance test of 3M fire barrier system containing a 24" wide steel cable tray and a 6" wide steel cable tray.

Page 11 of ___

ITEM	DATE	INIT'L
First layer of 3M ES4A mat is installed on both the 6" and 24" cable trays as per drawing provided by Peak Seals.	8/11/97	SP
First layer is completed on the 24" tray. Standoffs (2") are applied after the first layer at intervals not to exceed 15" or as necessary to maintain the required air space.	8/11/97	SP
2nd layer is installed over part of 1st layer.	8/11/97	SP
1st layer is installed on part of the 6" cable tray, standoffs are installed. 2nd + 3rd layer is installed.	8/11/97	SP
1st layer is complete on the 6" cable tray, 2nd and 3rd layers are complete. 4th, 5th + 6th layers are in various stages of completion.	8/12/97	SP
2nd layer completed on 24" cable tray.		
Where butt joints meet if there is more than an 1/8" gap Dow Corning 732 Multi Purpose Sealant and/or 3M 150 FireDam Caulk are used to ~~cap~~ fill in the gap.	8/12/97	SP
On the 5th layer of the 6" cable tray a piece of the foil is missing and the fiber mat is showing through	8/12/97	SP
	8/12/97	SP

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Page 12 of ___

ITEM	DATE	INIT'L
This area is repaired by using a piece of 3M T49 Tape	8/12/97	S
Dow Corning 732 Multi Purpose Sealant and/or 3M Fire Dam 150 Caulk is used when butt joints have more than an 1/8" gap. Then the seam is covered with 3M T49 tape.	8/12/97	S
The 6th layer over the support on the 6" tray is applied also the 6" layer is installed on the radius & vertical sections on one end of the 6" cable tray.	8/12/97	S
The support is stuffed with cut to fit pieces of 3M #54 MAT and will be held with stainless steel Band.		
The 3rd layer is complete on the 24" tray.	8/12/97	S
4" Collars are installed over all final layer with joints on the 6" cable tray. 4th and 5th layers complete on entire 6" tray. 6th layer started on the other end of cable tray.	8/13/97	S
~~Protective material (3M 54A MAT) cut to fit~~		
The support next to the 6" tray has five layers except the bottom which has 6 layers. There are only 4 layers inside support next to 6" tray. The space was too tight. Caulk was added the gap was more than 1/8".	8/13/97	S
	8/13/97	S
	8/13/97	S

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Proj. No. 99417: Three hour fire endurance test of 3M fire barrier system containing a 24" wide steel cable tray and a 6" wide steel cable tray.

ITEM	DATE	INIT'L
The 6th layer inside radius piece is cut and the sides are notched to lay flat. Bottom piece is also notched. Side pieces are applied.	8/13/97	S
The 4th and 5th layers are installed on the 24" tray	8/13/97	S
Six layers of 3M 54A mat is installed on the bottom of the 24" tray support. This material was prefabricated and off set with the section under the 6" tray.	8/14/97	S
End of support next to 24" tray the pieces are staggered and there are 5 layers all the way around top & sides. material is held in place using SS Bands.	8/14	S
6" tray is complete with all 6 layers of 3M ESA mat. 4" collars on all butt joints and SS bands, 2 on each collar thereon 12 oc. (+ 1/2" -0") minimum one band per piece.		
24" tray complete with all 6 layers of 3M ESA mat. 4" collars on all butt joint and held with SS band 2 one each collar the on 12 oc (+1/2-0").	8-14-96	S
Peak Seals installers depart.	8-14-96	S

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Proj. No. 99417: Three hour fire endurance test of 3M fire barrier system containing a 24" wide steel cable tray and a 6" wide steel cable tray.

Page 14 of __

ITEM	DATE	INIT'L
Final inspection of the test assembly is made by OPL QA/QC personnel. The test assembly is moved and placed into the furnance by	8-20-97	SP
OPL technicians.	8-20-97	SP
OPL technicians attach 179 thermocouples to the data acquisition equipment.		
Pre burn checklist is performed by Herb Stansberry, OPL project manager. As site to witness the fire test of Project 99417 are:		
Des Priest Omega Point Laboratory		
Herb Stansberry " " "		
Kerry Hitchcock " " "		
Cecil Patton " " "		
Richard Beasley " " "		
Oscar Estrada " " "		
Laudencio Castañon " "		
Mike Murphy Peak Seals		
Charlie Spriggs " "		
Randy Brown " "		
Cheryl Brown " "		
Test begins a 9:24am and is completed after (3) three hours and 30 min. it is followed by a five (5) minute hose stream test from a distance of five feet. This test uses a fog	8-21-97	SP

OPL EVENT LOG

PEAK SEALS / 3M
Client # 14540

NOTE:
This Log is used to document the date and note each step during the completion of the test projects referenced below. The assigned project numbers and brief description of these test assemblies are:

Proj. No. 99416: Three hour fire endurance test of 3M fire barrier system containing a 1" diameter steel conduit, a 5" diameter steel conduit and a 3" diameter steel conduit with a 12"x 12"x 8" junction box.

Proj. No. 99417: Three hour fire endurance test of 3M fire barrier system containing a 24" wide steel cable tray and a 6" wide steel cable tray.

Page 15 of ___

ITEM	DATE	INIT'L
nozzel with a 30° spray pattern	8-21-97	8
with the pressure at 75 psi. The		
pressure gage used is OPL		
equipment 92LE004 with		
recalibration required 1-14-98	8-21-97	8
Tear down and examination	8-29-97	8
of project #99417 was done by		
OPL technicians, Project Manager		
Herb Stansberry and OPL QA/QC		
Personnel.	8-29-97	8

Installation Details

OMEGA POINT LABORATORIES

For -18A
02/04/87

QUALITY ASSURANCE TRAINING RECORD
(ON-THE-JOB)

NAME DONALD BAGBY PAGE 1 OF 1

DESCRIPTION OF TRAINING ACTIVITY	TRAINED BY	DATE
TEST PLAN CTP-2005 THREE HOUR FIRE ENDURANCE TEST	[illegible]	8/11/97
3M INTERAM™ FIRE WRAP.		

223

Fo -18A
02/04/87

QUALITY ASSURANCE TRAINING RECORD
(ON-THE-JOB)

NAME L. CHARLES SPRIGGS PAGE 1 OF 1

DESCRIPTION OF TRAINING ACTIVITY	TRAINED BY	DATE
TEST PLAN CTP-2005 THREE HOUR FIRE ENDURANCE TEST	LDM	8/11/97
3M INTERAM™ FIRE WRAP		

277

Form -18A
02/04/87

QUALITY ASSURANCE TRAINING RECORD
(ON-THE-JOB)

NAME JAMES FARRAR PAGE 1 OF 1

DESCRIPTION OF TRAINING ACTIVITY	TRAINED BY	DATE
TEST PLAN CTP-2005 THREE HOUR FIRE ENDURANCE TEST	LTDM	8/11/97
3M INTERAM™ FIRE WRAP		

225

Form ___ 006 *
Rev. 0 04/23/

CABLE TRAY

DAILY INSPECTION REPORT
3M INTERAM™ THREE HOUR FIRE PROTECTIVE SYSTEM

WORK LOCATION:	PROJECT INFORMATION:
BLDG. N/A ELEV. N/A	PROJECT NAME: 3 HOUR FIRE TEST
AREA/ROOM: N/A	PROJECT LOCATION: OMEGA POINT
	REPORT NO. 001 DATE: 8/11/97
	PROJECT NO. 14540-99417

REFERENCE QCP 2006 PARAGRAPHS 6.9 & 6.10

LAYER/ ITEM I.D.	DESCRIPTION OF APPLICATION	Adequate Cleanliness (sat / unsat)	12" Marking Heat Tiler Interfer. (sat / unsat)	Cable Drop Complete (sat / unsat)	Layer I.D. (sat / unsat)	Long-tudinal Overlap (sat / unsat)	Joints Caulked & Taped (sat / unsat)	4 piece Overlap ~~1st Piece~~ Layer (sat / unsat)	4 piece Overlap Final Layer (sat / unsat)	Butt Joints Caulked ≥1/8 ≤1/4" (sat / unsat)	Butt Joint Gaps ≤1/4" (sat / unsat)
1ST/24"	START: ALL END: "	✓	✓	N/A	✓	✓	(1.) ✓	✓	N/A	(1.) ✓	✓
1ST/6"	START: ALL END: "	✓	✓	N/A	✓	✓	(1.) ✓	✓	N/A	(1.) ✓	✓
2ND/6"	START: ALL END: "	N/A	N/A	N/A	✓	✓	(1.) ✓	✓	N/A	(1.) ✓	✓
	START: END:										
	START: END:										
	START: END:										
	START: END:										
	START: END:										
	START: END:										
	START: END:										

COMMENTS: (1.) ONLY AS NECESSARY REFER TO QTP-2005 REV. 3

PEAK SEALS QUALITY CONTROL: [signature] DATE: 8/11/97 PAGE 1 OF 4

226.

Form QC-2006
Rev. 0 04/23/

CABLE TRAY

DAILY INSPECTION REPORT
3M INTERAM™ THREE HOUR FIRE PROTECTIVE SYSTEM

WORK LOCATION:	PROJECT INFORMATION:	
BLDG. N/A ELEV. N/A	PROJECT NAME: 3 HOUR FIRE TEST	REPORT NO. 002 DATE: 8/12/97
AREA/ROOM: N/A	PROJECT LOCATION: OMEGA POINT	PROJECT NO. 14540-99417

REFERENCE QCP 2006 PARAGRAPHS 6.9 & 6.10

LAYER/ ITEM I.D.	DESCRIPTION OF APPLICATION	Adequate Cleanliness	12" Marking Heat T'fer Interfer.	Cable Drop Complete	Layer I.D.	Long-tudinal Overlap	Joints Caulked & Taped	4 piece Overlap ~~1st~~ Layer	4 piece Overlap Final Layer	Butt Joints Caulked ≥1/8 ≤1/4"	Butt Joint Gaps ≤1/4"
		sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat
2ND/24"	START: ALL END: "	N/A	N/A	N/A	✓	✓	(1.) ✓	✓	N/A	(1.) ✓	✓
3RD/24"	START: ALL END: "	N/A	N/A	N/A	✓	✓	(1.) ✓	✓	N/A	(1.) ✓	✓
3RD/6"	START: ALL END: "	N/A	N/A	N/A	✓	✓	(1.) ✓	✓	N/A	(1.) ✓	✓
4TH/6"	START: ALL END: "	N/A	N/A	N/A	✓	✓	(1.) ✓	✓	N/A	(1.) ✓	✓
	START: END:										
	START: END:										
	START: END:										
	START: END:										
	START: END:										
	START: END:										

COMMENTS: (1.) ONLY AS NECESSARY REFER TO CTP-2005 REV. 3

PEAK SEALS QUALITY CONTROL: [signature] DATE: 8/12/97

Form: 006
Rev. 0 04/23/

CABLE TRAY

DAILY INSPECTION REPORT
3M INTERAM™ THREE HOUR FIRE PROTECTIVE SYSTEM

WORK LOCATION:	PROJECT INFORMATION:	
BLDG. N/A ELEV. N/A	PROJECT NAME: 3 HOUR FIRE TEST	REPORT NO. 003 DATE: 8/13/97
AREA/ROOM: N/A	PROJECT LOCATION: OMEGA POINT	PROJECT NO. 14540-99417

REFERENCE QCP 2006 PARAGRAPHS 6.9 & 6.10

LAYER/ ITEM I.D.	DESCRIPTION OF APPLICATION	Adequate Cleanliness	12" Marking Heat T'fer Interfer	Cable Drop Complete	Layer I.D.	Long-tudinal Overlap	Joints Caulked & Taped	4 piece Overlap ~~1st-2nd~~ Layer	4 piece Overlap Final Layer	Butt Joints Caulked ≥1/8 ≤1/4"	Butt Joint Gaps ≤1/4"
4TH / 24"	START: ALL END: "	N/A	N/A	N/A	✓	✓	(1.) ✓	✓	N/A	(1.) ✓	✓
5TH / 24"	START: ALL END: "	N/A	N/A	N/A	✓	✓	(1.) ✓	✓	N/A	(1.) ✓	✓
6TH / 6"	START: ALL END: "	N/A	N/A	N/A	✓	✓	(1.) ✓	(2.) ✓	(2.) ✓	(1.) ✓	✓
	START: END:										
	START: END:										
	START: END:										
	START: END:										
	START: END:										
	START: END:										
	START: END:										

COMMENTS: (1.) ONLY AS NECESSARY. REFER TO QTR-2005 REV.3 (2.) ONLY ON ONE RADIUS

PEAK SEALS QUALITY CONTROL: [signature] DATE: 8/1/97

Form. QC-006
Rev. 0 04/23/

CABLE TRAY

DAILY INSPECTION REPORT
3M INTERAM™ THREE HOUR FIRE PROTECTIVE SYSTEM

WORK LOCATION:	PROJECT INFORMATION:	
BLDG. N/A ELEV. N/A	PROJECT NAME: 3 HOUR FIRE TEST	REPORT NO. 004 DATE: 8/14/97
AREA/ROOM: N/A	PROJECT LOCATION: OMEGA POINT	PROJECT NO. 14540-99417

REFERENCE QCP 2006 PARAGRAPHS 6.9 & 6.10

LAYER/ ITEM I.D.	DESCRIPTION OF APPLICATION	Adequate Cleanliness (sat / unsat)	12" Marking Heat T'ter Interfer. (sat / unsat)	Cable Drop Complete (sat / unsat)	Layer I.D. (sat / unsat)	Long-ludinal Overlap (sat / unsat)	Joints Caulked & Taped (sat / unsat)	4 piece Overlap ~~1st~~ Layer (sat / unsat)	4 piece Overlap Final Layer (sat / unsat)	Butt Joints Caulked ≥1/8 ≤1/4" (sat / unsat)	Butt Joint Gaps ≤1/4" (sat / unsat)
6TH/24"	START: ALL END: "	N/A	N/A	N/A	✓	✓	(1.)	N/A	✓	(1.) ✓	✓
SUPPORT	START: ALL END: "	✓	✓	N/A	✓	N/A	(2.) ✓	✓	N/A	N/A	✓
	START: END:										
	START: END:										
	START: END:										
	START: END:										
	START: END:										
	START: END:										
	START: END:										
	START: END:										

COMMENTS: (1.) ONLY AS NECESSARY REFER TO QTP-2005 REV. 3 (2.) ONLY THROUGH JOINTS CAULKED; TAPED ON OUTERLAYER ONLY

PEAK SEALS QUALITY CONTROL: [signature] DATE: 8/14/97 PAGE 4 OF 4

229.

Form 006
Rev. 0 04/23/

CABLE TRAY

FINAL INSPECTION REPORT
3M INTERAM™ THREE HOUR FIRE PROTECTIVE SYSTEM

WORK LOCATION:	PROJECT INFORMATION:	
BLDG. N/A ELEV. N/A	PROJECT NAME: 3 HOUR FIRE TEST	REPORT NO. 005 DATE: 8/14/97
AREA/ROOM: N/A	PROJECT LOCATION: OMEGA POINT	PROJECT NO. 14540-99417

PEAK SEALS REFERENCE DRAWINGS: PST-2005

UTILITY REFERENCE DRAWINGS: N/A

COMMENTS:

REFERENCE QCP 2006 PARAGRAPHS 6.11 & 6.12

LAYER/ ITEM I.D.	DESCRIPTION OF APPLICATION	Proper Layer Count	Collars & Cover strips	Taping Joints etc.	Support Coverage	Heat T'fer Interfer.	Bands 12" max 1 per pc.	2 Bands min Collar	Bands Termin.	Termin. Sealed	Penetrations Sealed
		sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat
FINAL/24"	START: ALL	✓	(1.) ✓	✓	✓	N/A	(1.) ✓	✓	✓	✓	(2.) N/A
	END: "										
FINAL/6"	START: ALL	✓	(1.) ✓	✓	✓	N/A	(1.) ✓	✓	✓	✓	(2.) N/A
	END: "										
	START:										
	END:										
	START:										
	END:										
	START:										
	END:										

REFERENCE QCP 2006 PARAGRAPH 6.13

ITEM I.D.	DESCRIPTION OF REPAIRED AREA:	GAPS 1/8" TO ≤ 1/4" Tears & Gaps Taped	GAPS 1/8" TO ≤ 1/4" Gaps >1/8", ≤ 1/4" Caulked/ Taped	INNER LAYER PATCH ≤ 1/8" Gap	INNER LAYER PATCH Gaps Taped	OUTER LAYER PATCH 2" Min. Overlap	OUTER LAYER PATCH Overlaps Caulked & Taped	OUTER LAYER PATCH Proper Restraint
		sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat
	START:							
	END:							
	START:							
	END:							

COMMENTS: (1) EXCEPT AS INDICATED BY CTP-2005 REV. 3 (2.) PERFORMED BY LABORATORY.

PEAK SEALS QUALITY CONTROL: [signature] DATE: 8/14/97 PAGE 1 OF 1

230

Certifications of Calibration and Conformance

OMEGA POINT LABORATORIES

Omega Point Laboratories, Inc.

16015 Shady Falls Rd..
Elmendorf, Texas 78112
800-966-5253 FAX 210-635-8101

Certificate of Calibration

Certification No.:	92045
Calibration Date:	5/6/97
Recalibration Date:	11/6/97
Manufacturer:	Omega Point Laboratories, Inc.
Model No.:	100 Channel DAU
Serial No.:	1041
Equipment Description:	100 Channel Data Acquisition System with Fluke Computer Front End
Calibration Sources:	Calibrator/Thermometer, Model #840A, Serial #T-156701

PERFORMANCE:

Better than -0.93 / +1.11 on all 100 channels

Calibration Performed/Approved by:

Herbert W. Stansberry II,
Manager, Fire Resistance Testing Services

OMEGA POINT LABORATORIES

Omega Point Laboratories, Inc.

16015 Shady Falls Rd..
Elmendorf, Texas 78112
800-966-5253 FAX 210-635-8101

Certificate of Calibration

Certification No.:	92046
Calibration Date:	5/6/97
Recalibration Date:	11/6/97
Manufacturer:	Omega Point Laboratories, Inc.
Model No.:	200 Channel DAU
Serial No.:	1042
Equipment Description:	200 Channel Data Acquisition System with Fluke Computer Front End and Extender Chassis
Calibration Sources:	Calibrator/Thermometer, Model #840A, Serial #T-156701

PERFORMANCE:

Better than -0.87 / +1.23 on all 200 channels

Calibration Performed/Approved by:

Herbert W. Stansberry II,
Manager, Fire Resistance Testing Services

OMEGA POINT LABORATORIES

Q/A RECEIVING REPORT

OMEGA POINT LABORATORIES

CLIENT/PROJECT NAME Omega Point Labs
CLIENT/PROJECT NUMBER OPL Equipment
RECEIVED FROM Metroplex Metrology
PROJECT LOCATION Omega Point Labs

REPORT NUMBER 1653 - OPL
DATE RECEIVED 1-20-97
DATE INSPECTED 1-20-97
INSPECTED BY: C. Patton

ITEM DESCRIPTION	P.O. NO.	QUANTITY Order	QUANTITY Rec'd	QUANTITY B.O.	I.D. NO.	COND MATL Y/N	CERT. RECD Y/N	CONTAINER INTEGRITY	EXCEPTIONS	ACCEPTANCE Accept	ACCEPTANCE Hold	ACCEPTANCE Reject	REMARKS
Metric Weight Set	105340	1	1	Ø	88LE003	Y	Y	GOOD	None	X			Calibration Service
0-100 PSI Pressure Gage	105340	1	1	Ø	92LE004	Y	Y	GOOD	None	X			

FORM
1/29/93

234

OMEGA POINT LABORATORIES
16015 SHADY FALLS RD.
ELMENDORF, TEXAS 78112
PH. (210) 635-8100

PURCHASE ORDER
10534Q

235

Date 1/9/97
Page: 1

Order From: Metroplex Metrology Laboratory
2309 E. Loop 820 North
Fort Worth TX
76118

Deliver to: Omega Point Laboratories, Inc.
16015 Shady Falls Road
Elmendorf, Texas 78112-9784

Vendor # 0380

Your Item Number / Item Description	Our Reference	Qty Ordered	Units	Unit Cost	Extension
Calibration of 0-100 psi Pressure Gage SN 92LE004	001	1.00	Each	$25.00	$25.00
Analytical Metric Weight Set SN 88LE003	002	1.00	Each	$136.00	$136.00

"See Special Instructions Regarding Purchasing Specifications for Quality Assurance Requirements."
QA Approval [signature]
Date 1-9-97

Special Instructions:
Please provide calibration services per attached Vendor Purchasing Specification and QA Requirements.

Subtotal:	$161.00
Freight:	$0.00
Tax amount:	$0.00
Total Value:	$161.00

380625/11

Company OMEGA POINT LABORATORIES Cert Nmbr 1000072566
16015 SHADY FALLS ROAD

ELMENDORF TX 78112

METROPLEX METROLOGY LAB, INC.

CERTIFICATE OF CALIBRATION

2309 E. Loop 820 North
Fort Worth, Tx. 76118
(817)589-8300 Fax (817)589-8311

Type:	PRESSURE GAGE	Workorder	066995
Manufact	MCDANIEL CONTROLS	Tech	08
Serial	92LE004	Temp F	72
Size	0-100 PSI	Humid % R H	45
Model #	JD		
Cal Proc	D-25B		
Cal Date	01/14/97		
Next Cal	01/14/98		
Apprvd Sub			

Type	Uncertain	Cal Date	Cal Due
HEISE DIGITAL PRESSURE INDICATOR-30/200	+/-.035%	10/23/96	10/23/97

Cal I D # + Nist Nbr
(23290)737/202491-60

Condition
RECEIVED IN TOLERANCE
SEE ATTACHED

Accuracy
SEE ATTACHED

Adjustment Notes

Repair Notes

Metroplex Metrology Lab, Inc. certifies this instrument has been calibrated using standards traceable to the National Institute of Standards and Technology, derived from natural physical constants, derived from ratio measurements, or compared to consensus standards. Metroplex Metrology Lab, Inc.'s calibration system complies to the requirements of ANSI/NCSL Z540-1 / ISO 10012-1 (formerly MIL-STD-45662A)

Frank Bloedau, Sr. Metrologist

CERTIFICATE NO. 10000725666 Page 2 of 2 Calibration Date: 11/4/97

P.O # 105714Q

Next Due: 11/4/98

METROPLEX METROLOGY LAB

Customer: Omega Point

Pressure Gauge (Grades A-3A)
CALIBRATION DATA REPORT

MANUFACTURER: McDaniel Controls I.D. NO.: 97LF004 SERIAL NO.:

RANGE: 0-100 PSI MODEL: 3D ACCURACY: +/- 1%

ACCURACY RANGE	APPLIED LOAD	AS RECEIVED	AFTER ADJUSTMENT
10% Upscale	10 PSI	10.07 PSI	
25% Upscale	25	24.84	
50% Upscale	50	50.06	
75% Upscale	75	75.35	
100% Upscale	100	100.15	
75% Downscale	75	75.35	
50% Downscale	50	50.06	
25% Downscale	25	24.84	
10% Downscale	10	10.07	

EQUIPMENT USED: 1924

SPECIFICATION: Manufacturer's Specifications / ASME B40.1-1991

RECEIVED CONDITION:
In Tolerance [X]
Required Adjustment [ ]
Required Repair [ ]

RETURNED CONDITION:
In Tolerance [X]
REJECTED [ ]
Reason:

REMARKS: Liquid Filled Gauge

TECHNICIAN: Charles L. McPherson III STAMP:

MML-WS524 *Signature*

OMEGA POINT LABORATORIES
16015 SHADY FALLS ROAD
ELMENDORF, TX 78112

CERT#1000072567

METROPLEX METROLOGY LAB, INC.

CERTIFICATE OF CALIBRATION

2309 EAST LOOP 820 NORTH
FORT WORTH, TEXAS 76118
(817)589-8300 FAX (817)589-8311

DESCRIPTION:	METRIC WEIGHT SET	**TEMPERATURE:**	72DEG.F
MANUFACTURER:	TROEMNER	**HUMIDITY:**	45%RH
MODEL #:	NONE	**TECHNICIAN ID#:**	16
SERIAL #:	88LE003		
CAL DATE:	01-16-97		
DUE DATE:	01-16-98		

RECEIVED CONDITION: IN TOLERANCE
RETURNED CONDITION: IN TOLERANCE

CALIBRATION PROCEDURE: MANUAL
CALIBRATION EQUIPMENT USED:

STANDARD	TRACE#	CAL DATE	DUE DATE
WEIGHT SET #STD01	OBS96506	08-13-96	08-13-97

METROPLEX METROLOGY LAB, INC. CERTIFIES THIS INSTRUMENT HAS BEEN CALIBRATED USING STANDARDS TRACEABLE TO **THE NATIONAL INSTITUTUE OF STANDARDS AND TECHNOLOGY**, DERIVED FROM NATURAL PHYSICAL CONSTANTS, DERIVED FROM RATIO MEASUREMENTS, OR COMPARED TO CONSENSUS STANDARDS. METROPLEX METROLOGY LAB, INC.'S CALIBRATION SYSTEM COMPLIES TO THE REQUIREMENTS OF ANSI/NCSL Z540-1/ISO 10012-1 (FORMERLY MIL-STD-45662A).

FRANK BLOEDAU, SR. METROLOGIST

OMEGA POINT LABORATORIES P.O. # 10534 Q

CERT#: 1000072567

S/N: 88LE003

MARKED		ACTUAL	UNCERTAINTY
100 GMS	+/-2.0MGS	99.999823 GMS	.000056GMS
50 GMS	+/-1.2MGS	49.999967GMS	.000029GMS
20 GMS	+/-.70MGS	20.000097GMS	.000017GMS
20. GMS	+/-.70MGS	19.999957GMS	.000017GMS
10 GMS	+/-.50MGS	9.9999577GMS	.0000096GMS
5 GMS	+/-.36MGS	5.0000264GMS	.0000063GMS
2 GMS	+/-.26MGS	1.9999955GMS	.0000050GMS
2. GMS	+/-.26MGS	2.0000535GMS	.0000050GMS
1 GMS	+/-.20MGS	1.0001161GMS	.0000037GMS
500 MGS	+/-.16MGS	.5000382GMS	.0000020GMS
200 MGS	+/-.12MGS	.2000591GMS	.0000014GMS
200. MGS	+/-.12MGS	.2001053GMS	.0000014GMS
100 MGS	+/-.10MGS	.1000165GMS	.0000011GMS
50 MGS	+/-.085MGS	.05002500GMS	.00000089GMS
20 MGS	+/-.070MGS	.01996010GMS	.00000086GMS
20. MGS	+/-.070MGS	.02001141GMS	.00000086GMS
10 MGS	+/-.060 MGS	.00998875GMS	.00000087GMS

VENDOR PURCHASING SPECIFICATION AND

QUALITY ASSURANCE REQUIREMENTS

Vendor Metroplex Metrology

Purchase Order No. 10534Q

Any or all of the following Quality Assurance requirements shall be incorporated as conditions to this procurement when corresponding box is marked. Failure to comply with any requirement specified herein may result in rejection and/or return of shipment at seller's expense.

1.0 QUALITY PROGRAM

☒ Seller shall furnish all items on this Purchase Order in accordance with Quality Program approved by Buyer.

2.0 QUALITY VERIFICATION

When additional quality verification activities are required as a condition to this procurement, invoices will not be paid until satisfactory completion of such activities. Excessive rejection rates may result in removal from buyer's Approved Vendors List.

☒ Receiving Inspection - Buyer shall inspect items upon receipt to verify compliance with purchase order requirements. Rejected items shall be returned at seller's expense.

☐ Independent Laboratory Tests - Samples of materials furnished shall be tested independently for conformance to specification requirements proir to final acceptance. Rejected materials shall be returned at seller's expense.

☒ Document Review - Final acceptance shall be based on satisfactory review of required certifications and other supporting documents.

3.0 CERTIFICATIONS

When certifications are required as a condition to this procurement, the seller shall furnish one reproducible copy either with or prior to each shipment. Shipments will not be accepted and invoices will not be paid until certifications are in buyer's possession.

VENDOR Metroplex Metrolog
PURCHASE ORDER NO. 105340

7.0 PACKING/SHIPPING

☒ All materials shall be packaged in air tight, moisture free containers and shall be free from all foreign substances such as dirt, oil, grease or other deleterious material.

☐ All materials and equipment shall be suitably crated, boxed or otherwise prepared for shipment to prevent damage during handling and shipping. Wherever practical, equipment shall be palletized for ease of unloading and storage at destination. each container shall be clearly marked with buyer's purchase order number.

QUALITY ASSURANCE APPROVAL C Battles DATE 1-9-97

Q/A RECEIVING REPORT

OMEGA POINT LABORATORIES

CLIENT/PROJECT NAME Omega Point Labs
CLIENT/PROJECT NUMBER OPL Equipment
RECEIVED FROM Rothe
PROJECT LOCATION Omega Point Labs

REPORT NUMBER 1626 . OPL
DATE RECEIVED 11-1-96
DATE INSPECTED 11-1-96
INSPECTED BY: C Fallon

ITEM DESCRIPTION	P.O. NO.	QUANTITY Order	QUANTITY Rec'd	QUANTITY B.O.	I.D. NO.	GOOD MATL Y/N	CERT REQ'D Y/N	CONTAINER INTEGRITY	EXCEPTIONS	ACCEPTANCE Accept	ACCEPTANCE Hold	ACCEPTANCE Reject	REMARKS
CALIBRATOR/ THERMOMETER	10411Q	1	1	Ø	SN-T-156701	Y	Y	GOOD	None	X			Calibration Service

FORM
1/29/93

OMEGA POINT LABORATORIES
16015 SHADY FALLS RD.
ELMENDORF, TEXAS 78112
PH. (210) 635-8100

PURCHASE ORDER

10411Q

Date 10/28/96
Page: 1

Order From: Rothe Development, Inc.
4614 Sinclair Rd.
San Antonio TX
78222

Deliver to: Omega Point Laboratories, Inc.
16015 Shady Falls Road
Elmendorf, Texas 78112-9784

Vendor # 0161

Your Item Number / Item Description	Our Reference	Qty Ordered	Units	Unit Cost	Extension
840A Calibrator/Themometer, SN-T-156701 C° & F° (K, J & T)	001	1.00	each	$60.00	$60.00
Calibration Service	002	1.00	each	$0.00	$0.00

"See Special Instructions Regarding Purchasing Specifications for Quality Assurance Requirements."
QA Approval C Patton
Date 10-28-96

Special Instructions: Please include Certificate of Conformance to attached Specification Sheet and Calibration Data traceable to NIST.

Subtotal:	$60.00
Freight:	$0.00
Tax amount:	$0.00
Total Value:	$60.00

280625

VENDOR PURCHASING SPECIFICATION AND QUALITY ASSURANCE REQUIREMENTS

Vendor Rothe Development, Inc

Purchase Order No. 10411Q

Any or all of the following Quality Assurance requirements shall be incorporated as conditions to this procurement when corresponding box is marked. Failure to comply with any requirement specified herein may result in rejection and/or return of shipment at seller's expense.

1.0 QUALITY PROGRAM

☒ Seller shall furnish all items on this Purchase Order in accordance with Quality Program approved by Buyer.

2.0 QUALITY VERIFICATION

When additional quality verification activities are required as a condition to this procurement, invoices will not be paid until satisfactory completion of such activities. Excessive rejection rates may result in removal from buyer's Approved Vendors List.

☒ Receiving Inspection - Buyer shall inspect items upon receipt to verify compliance with purchase order requirements. Rejected items shall be returned at seller's expense.

☐ Independent Laboratory Tests - Samples of materials furnished shall be tested independently for conformance to specification requirements proir to final acceptance. Rejected materials shall be returned at seller's expense.

☒ Document Review - Final acceptance shall be based on satisfactory review of required certifications and other supporting documents.

3.0 CERTIFICATIONS

When certifications are required as a condition to this procurement, the seller shall furnish one reproducible copy either with or prior to each shipment. Shipments will not be accepted and invoices will not be paid until certifications are in buyer's possession.

VENDOR Rothe Development
PURCHASE ORDER NO. 10411Q

☐ Certificate of Compliance/Conformance Required - Certification that materials and/or services comply with purchase order requirements. Certification shall reference purchase order number and traceability numbers (when applicable).

☐ Certified Test Report Required - Certification that material complies with applicable material specification(s) and the purchase order. Include actual results of required tests.

☒ Certificate of Calibration Required - Certification shall be traceable to National Bureau of Standards. (Renamed NIST, Nat. Institute of Science & Technology)

4.0 AUDITS/RIGHT OF ACCESS

☒ The buyer reserves the right to audit your facility to verify compliance with purchase order, code and specification requirements with minimum of ten (10) days notice.

☒ Shipments shall only originate from facilities approved by the buyer.

☐ Buyer reserves the right to inspect any or all work included in this order at seller's facility with as early notice as practicable.

5.0 IDENTIFICATION

☐ Seller shall identify each item with a unique traceability number by physical marking or tagging. Traceability numbers shall be traceable to certifications and packing lists.

☒ Seller shall identify each container with a unique identification number. The identification number shall be traceable to certifications and packing lists.

6.0 10 CFR, PART 21

☐ The material, equipment and/or services to be furnished under the provisions of this purchase order are involved in the testing of basic components of a Nuclear Regulatory Commission (NCR) licensed facility. Accordingly, the seller is subject to the provisions of 10 CFR, Part 21 (Reporting of Defects and Non-compliance)

PURCHASING SPECIFICATIONS
PAGE 3 OF 3

VENDOR Rothe Development
PURCHASE ORDER NO. 104114

7.0 PACKING/SHIPPING

☒ All materials shall be packaged in air tight, moisture free containers and shall be free from all foreign substances such as dirt, oil, grease or other deleterious material.

☐ All materials and equipment shall be suitably crated, boxed or otherwise prepared for shipment to prevent damage during handling and shipping. Wherever practical, equipment shall be palletized for ease of unloading and storage at destination. each container shall be clearly marked with buyer's purchase order number.

QUALITY ASSURANCE APPROVAL C Patton DATE 10-28-96

EQUIPMENT DELIVERY RECEIPT

Date: 11/01/96
-the Development, Inc.
rology Services Division
4614 Sinclair Rd.
San Antonio, TX 78222-2099
(210)648-3131

Control: 556
Company: Omega Point Laboratories
Contact: Ms. Connie Humphrey
Address: 16015 Shady Falls Road
City: Elmendorf, TX 78112-9784
Phone: 635-8100

Item	W.O. #	Customer P.O.	Mfgr.	Model	Serial No.	Description
1	56424	10411Q	Tegam	840A	T-156701	Calibrator/Thermometer

ITEMS RECEIVED BY:
Name (Please Print): _____ Date: _____

Signature: _____

RDI 3139

Rothe Development, Inc.
4614 SINCLAIR RD. SAN ANTONIO, TEXAS 78222-2099
210-648-3131 FAX: 210-648-4091

METROLOGY SERVICES DIVISION
PRECISION MEASUREMENT EQUIPMENT LABORATORY
TRACEABLE TO NIST

CHARGE # 107 CONTROL # 556 - 22268

WORK ORDER # 56424

CUSTOMER

RECEIVED FROM Omega Point Laboratories DATE 10/29/96

ADDRESS 16015 Shady Falls Road
Elmendorf, TX 78112-9794 PHONE# 635-8100

CONTACT (NAME) Ms. Connie Humphrey FAX#

PURCHASE ORDER # 104110

CUSTOMER COMMENTS TAXABLE 8.25%
RUSH

ITEM

MFG Tegam

MODEL 8409

SERIAL # T-156701

TYPE Calibrator/Thermometer

ACCES RCVD. Case, Manual, Acces

- [ ] REPAIR
- [ ] OPERATIONAL CHECK
- [x] CALIBRATION

CALIBRATION DATE 1NOV96

DATE DUE 1NOV97

CALIBRATION INTERVAL 12 mo.

- [x] RECEIVED IN SPECS.
- [ ] RECEIVED INOPERATIVE
- [ ] RECEIVED OUT OF SPECS

CKT REF #	QTY.	MFG PART #	DESCRIPTION	COST

ROTHE TECH.	OUR P.O. #
IVW	
REPAIR LABOR HRS.	SERVICE CODE
	J

PARTS TOTAL		
REPAIR LABOR		
SHIPPING		
TEAR DOWN CHARGE		
CALIBRATION		
TAX	4	88
TOTAL	67	88

'S 20,30,256,150

OMMENTS CAL DATA REQUIRED

RK PERFORMED:

Cal'd

M 73 °F SPECS: MFG RDI

36 % PROCEDURE: MFG RDI OTHER

RDI 2002

HIP VIA: _____ DATE: _____ RECEIVED BY: _____

Rothe Development Inc.

Metrology Services Division

4614 SINCLAIR RD., SAN ANTONIO, TEXAS 78222 210-648-3131 FAX 210-648-4091

Certificate of Calibration

45562

CAL DATE: 11/01/96

DUE DATE: 11/01/97

ISSUED TO: Omega Point Laboratories
16015 Shady Falls Road
Elmendorf, TX 78112-9784
635-8100

MFG Tegam

MODEL 6430

SERIAL # T-15571

TYPE Calibrator/Thermometer

CONTROL: 556 - 22268
TECHNICIAN #: 11
SPECIFICATIONS: MFG
PROCEDURE: MFG
WORK ORDER #: 56424
CUSTOMER PO #: 104110

RECEIVED IN-SPECS ☒
OUT-OF-SPECS ☐

All Calibration measurements performed at ROTHE DEVELOPMENT INC. METROLOGY SERVICES meet the requirements of MIL-STD-45662A, and are traceable to the National Institute of Standards and Technology through primary NIST Calibration or Secondary Calibration performed by other Metrological facilities. Ambient conditions: Temperature 73°F , Relative Humidity 36% .

Test Report Number and Calibration Standards Used

[illegible]	Model #	Mfgr	Serial #	Description	Cal Date	Int	Cal Due
[illegible]	5700A	FLUKE	4475111	CALIBRATOR	[illegible]	3	[illegible]
[illegible]	34598	HP	2823401-11	DMM	[illegible]	1	[illegible]
[illegible]	12001B100XA1	Burns	419013	Platinum Resistance Therm	[illegible]	12	08/13/97
[illegible]	TRC-III	OMEGA	41017	OMEGA POINT REFERENCE	11/01/95	12	11/01/96

------ Test Report Numbers ------
[illegible] FLUKE [illegible]# [illegible]
[illegible] FLUKE [illegible]# [illegible]
[illegible] [illegible] TEST# [illegible]
[illegible] [illegible] TEST# [illegible]
[illegible] [illegible] Transmission

INSPECTED BY Joe A Mendoza
COMMENTS:

NOTE: The collective uncertainty of the measurment standards does not exceed 25% (1=4:1) of the instrument specification tested unless noted in COMMENTS section.

RDI 1001

ROTHE DEVELOPMENT METROLOGY SERVICES

CALIBRATION DATA: TEGAM 840A DIGITAL TEMPERATURE CALIBRATOR

CUSTOMER: Omega Point Laboratories
WO NUMBER: 56474
SERIAL: T-156701
CUST ID:

DATE: 1NOV96
TECH: 11
INST NO: 222608

CALIBRATION DATA TAKEN

INCOMING ✓
OUTGOING ✓

CONDITION OF EQUIPMENT

IN TOLERANCE ✓
OUT OF TOLERANCE

INPUT MEASUREMENT MODE

TEMPERATURE ACCURACY

TYPE J

°C	mV INPUT	TOLERANCE	READING
-200	-7.890 mV	±.6	-199.9
-100	-4.632 mV	±.6	-99.9
0.0	0.0 mV	±.3	0.0
100	+5.268 mV	±.3	100.0
500	+27.388 mV	±.3	500.0
750	+42.283 mV	±.3	749.9

TYPE K

°C	mV INPUT	TOLERANCE	READING
-190	-5.730 mV	±.6	-189.9
-100	-3.553 mV	±.6	-99.8
0	0.0 mV	±.3	0.0
100	+4.095 mV	±.3	100.0
500	+20.640 mV	±.3	500.0
1000	+41.269 mV	±.3	1000.0
1300	+52.398 mV	±.3	1300.0

TYPE T

°C	mV INPUT	TOLERANCE	READING
-190	-5.439 mV	±.6	-189.9
-100	-3.378 mV	±.6	-99.8

Rothe Development, Inc.

4614 SINCLAIR RD. SAN ANTONIO, TEXAS 78222-2099

210-648-3131 FAX: 210-648-4091

METROLOGY SERVICES DIVISION
PRECISION MEASUREMENT EQUIPMENT LABORATORY
TRACEABLE TO NIST

CHARGE # 107

CONTROL # 556 - [illegible]

WORK ORDER # 56424

CUSTOMER

RECEIVED FROM Omega Point Laboratories

DATE 10/29/96

ADDRESS 16015 Shady Falls Road
Elmendorf, TX 78112-9784

PHONE# 635-310[illegible]

CONTACT (NAME) Ms. Connie Humphrey

FAX#

PURCHASE ORDER # 104110

CUSTOMER COMMENTS TAXABLE 8.25%.
RUSH

ITEM

MFG Tegam

MODEL 840A

SERIAL # T-156701

TYPE Calibrator/Thermometer

ACCES. RCVD. Case, Manual, Acces

Q/A RECEIVING REPORT

OMEGA POINT LABORATORIES

CLIENT/PROJECT NAME: Omega Point Labs
CLIENT/PROJECT NUMBER: OPL Equipment
RECEIVED FROM: PMC
PROJECT LOCATION: Omega Point Labs

REPORT NUMBER: 1536 - OPL
DATE RECEIVED: 9-8-95
DATE INSPECTED: 9-11-95
INSPECTED BY: C Patton

ITEM DESCRIPTION	P.O. NO.	QUANTITY Order	QUANTITY Rec'd	QUANTITY B.O.	I.D. NO.	COND MATL Y/N	CERT. REQD Y/N	CONTAINER INTEGRITY	EXCEPTIONS	ACCEPTANCE Accept	ACCEPTANCE Hold	ACCEPTANCE Reject	REMARKS
TC Wire	9788Q	20'	19.500'	-0	KK-TA/TA-24	X	Y	GOOD	None	X			Spool #'s 124605, 124606, 124607 + 124608

FORM
1/29/93

OMEGA POINT LABORATORIES
16015 SHADY FALLS RD.
ELMENDORF, TEXAS 78112
PH. (210) 635-8100

PURCHASE ORDER

No. 9788-Q

Date	Ordered By	Terms	F.O.B.	Ship Via
07/28/95	Patton	Net 30 days	Origination	UPS

PMC Corporation
57 Harvey Road
Londonberry, NH 03053

Ship To Omega Point Laboratories
16015 Shady Falls Rd.
Elmendorf TX 78112

Item	Description	Price	Unit	Qty	Ext Price
1	KK-TA/TA-24 TEFLON TC WIRE	350.000	Each	20	7,000.00
2	CALIBRATION SERVICES	250.000	Each	1	250.00

"See Special Instructions Regarding Purchasing Specifications for Quality Assurance Requirements."
QA Approval C Patton
Date 7-28-95

Special Instructions:
Please include Certificates of Conformance and Calibration Data traceable to NIST.

Special Notes:
Specification No.
MS-9788 Q-OPL

Sub Total	$7,250
Disc.	$0
Tax	$0
Total Purchase	$7,250.00

080625/11-89

PMC CORPORATION
57 HARVEY ROAD, LONDONDERRY, NH 03053 • (603) 432-WIRE
SPECIALIZING IN WIRE, CABLE & TEMPERATURE • FAX (800) 639-5701

CERTIFICATE OF CALIBRATION

TO: OMEGA POINT LABS
16015 SHADY FALLS
ELMENDORF, TX 78112

Date: 08/30/95
Cust PO#: 9788Q
Job #: 22822

CALIBRATION RESULTS ARE TRACEABLE TO THE NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY (NIST) AND MEET SPECIAL LIMITS DEVIATION TOLERANCES AS DEFINED IN ISA MC96.1 (FORMERLY ANSI) AND ASTM-E-230. THESE RESULTS ARE ALSO IN CONFORMANCE WITH SPEC # MS-9788Q-OPL.

TEST RESULTS FOR: PMC P/N: KK-TA/TA-24

Footage: 5,500 Outside Spool
4,500 Inside Spool

Test Temperature (°F)	Outside Spool # 124608	Inside Spool # 124605
200	0.3	0.2
600	-0.6	-0.8
800	-0.6	-0.8
1000	1.6	1.4

REPORTED RESULTS ARE DEVIATIONS FROM TEST TEMPERATURES. FOR CORRECTION FACTORS REVERSE THE SIGNS.

THE MATERIAL REFERENCED ABOVE HAS BEEN CALIBRATED UTILIZING TECHNIQUES CONSISTENT WITH THE GUIDELINES SET FORTH IN ANSI Z540-1 AND ASTM E-220.

SECONDARY STANDARD THERMOCOUPLE: TYPE K
SPOOL # POS LEG: 19742
SPOOL # NEG LEG: 19743
CALIBRATION DATE: 06/*27/95

NIST #: 255168

(SINGLE USE THERMOCOUPLE FROM CALIBRATED REEL)

DIGITAL VOLT METER
MODEL: KAYE INSTRUMENTS: X1525C
SERIAL #: 110208
CALIBRATION DATE: 01/20/95

NIST #: 252488-93
252491-93

ICE POINT THERMOCOUPLE REFERENCE
MODEL: KAYE INSTRUMENTS: K-170-SP
SERIAL #: 306177
CALIBRATION DATE: 01/31/95

NIST #: 9431301

John Robinson
QUALITY ASSURANCE TECHNICIAN

Jake Jacob
QUALITY ASSURANCE MANAGER

OMEGA POINT LABORATORIES
MATERIAL PURCHASING SPECIFICATIONS

SPECIFICATION NUMBER: MS-- 9788 Q-OPL

VENDOR: PMC

VENDOR PRODUCT NUMBER: KK-TA/TA-24

PRODUCT DESCRIPTION: Teflon Coated Thermocouple Wire

Material as defined above shall be provided in accordance with the Critical Characteristics as listed below:

TEST	DESCRIPTION	SPECIFICATION RANGES MINIMUM	MAXIMUM
ASTM E230-93	Std. Temperature-EMF Tables for Standardized Thermocouples	Temp. Range +32°F to +545°F Special Limits of Error ±2°F	

QUALITY ASSURANCE REQUIREMENTS

1.0 QUALITY PROGRAM

Seller shall furnish this item in accordance with Quality Program approved by Omega Point Laboratories. Material specified herein is to be produced and tested in accordance with vendor quality standards, methods, guidelines and manufacturing instructions as defined in that Quality Program.

2.0 QUALITY VERIFICATION

Receiving Inspection - Buyer shall inspect items upon receipt to verify compliance with purchase order requirements. Rejected items shall be returned at seller's expense.

Document Review - Final acceptance shall be based on satisfactory review of required certifications and/or supporting documents.

3.0 CERTIFICATIONS

3.1 Certification that supplied materials comply with this material specification and listing Critical Characteristics shall be provided. This certificates shall reference Omega Point Labs purchase order number and specification number for all material furnished under this specification. This Certification shall be signed by the appropriate vendor representative.

3.2 The material furnished under this specification shall be a product that complies with the following:

3.2.1 Has been tested and passed all tests specified herein.

3.2.2 Manufacturing methods for this material have not changed. Vendor will advise Omega Point in writing of any changes in the manufacturing prior to material manufacture.

3.2.3 Raw materials used in the manufacture of this material meet Vendor specifications.

4.0 AUDITS/RIGHTS OF ACCESS

Omega Point Labs reserves the right to audit your facility to verify compliance with the purchase order and specification requirements with a minimum ten (10) day notice.

5.0 IDENTIFICATION

Seller shall identify each item with a unique traceability number by physical marking or tagging. These identification numbers shall be traceable to certifications and packing lists.

6.0 PACKING/SHIPPING

All materials shall be packaged in air tight, moisture free containers and shall be free of foreign substances such as dirt, oil, grease or other deleterious materials.

All materials shall be suitably crated, boxed or otherwise prepared for shipment to prevent damage during handling and shipping.

QUALITY ASSURANCE APPROVAL

C Humphrey

Title Quality Assurance Mgr.

Date 7/28/95

CH

AVL Verification

Class: B

OMEGA POINT LABORATORIES

PFA Insulated Thermocouple Wire

PRODUCT CODE: TA/TA

Our customers have grown to expect only the highest quality products from PMC. We are continuously committed to meet the specific needs of industry and our customers. This construction includes Teflon* PFA insulataion extruded on the single conductors which are then laid parallel and jacketed with Teflon PFA.

Teflon PFA (perfluoroalkoxy) was released in 1972 by Dupont. It possesses similar properties of the other Teflon products such as outstanding electrical characteristics, resistance to virtually all chemicals and excellent flame resistance.

PFA is a true thermoplastic material extrudable by conventional means, and available in long continuous lengths. This construction provides flexibility and toughness with stress crack resistance, resistance to weather, non-aging characterisics, and low coefficient of friction for ease of pulling through conduit.

Like TFE, suggested upper continuous temperature is 500°F (260°C), however, it does not have TFE's solder iron resistance.

The thermocouple grade products shown are used to form temperature sensors and the extension grade products become the interconnecting link in the temperature sensing system.

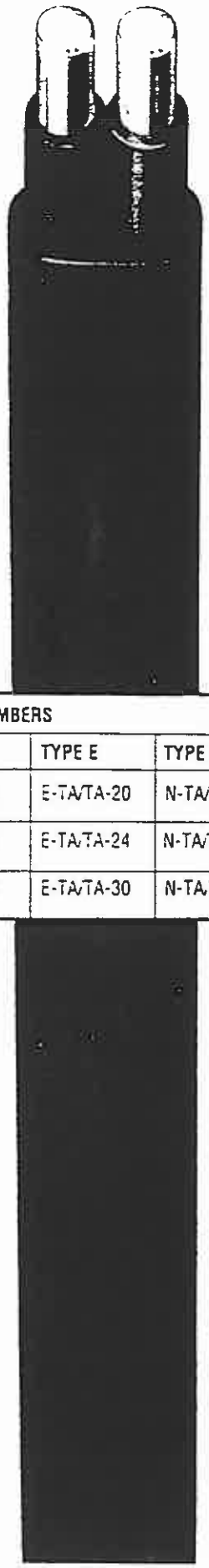
You will find our qualified sales and engineering staff eager to assist in selecting a design to meet the requirements of your specific application. Variations of this construction are available upon request, including aluminum Mylar* to reduce noise problems found in so many of today's plants.

Typical applications include aircraft and automotive engine testing, rapid transit cables, and down hole cable in the oil industry.

Calibrated conductors for high system accuracy

500°F (260°C) PFA insulation for improved electrical properties and high temperature applications

500°F (260°C) PFA jacket for chemical inertness to solvents, acids and oils



GRADE OF WIRE	GAUGE SIZE	WIRE TYPE	PART NUMBERS				
			TYPE J	TYPE K	TYPE T	TYPE E	TYPE N
THERMOCOUPLE	20	SOLID	J-TA/TA-20	K-TA/TA-20	T-TA/TA-20	E-TA/TA-20	N-TA/TA-20
THERMOCOUPLE	24	SOLID	J-TA/TA-24	K-TA/TA-24	T-TA/TA-24	E-TA/TA-24	N-TA/TA-24
THERMOCOUPLE	30	SOLID	J-TA/TA-30	K-TA/TA-30	T-TA/TA-30	E-TA/TA-30	N-TA/TA-30

The above part numbers represent the more popular constructions. However, other designs are available upon request.

PMC CORPORATION
57 Harvey Road
Londonderry, NH
03053

Tel. (603) 432-9473
FAX (603) 432-0435

*Registered trademark of E.I. DuPont Inc.

PMC CORPORATION
57 HARVEY ROAD, LONDONDERRY, N.H. 03053 • (603) 432-WIRE
SPECIALIZING IN WIRE, CABLES & TEMPERATURE

SOLD TO

OMEGA POINT LABS, INC.
16013 SHADY FALLS ROAD
ELMENDORF, TX 78112

SHIP TO

OMEGA POINT LABS, [illegible]
16013 SHADY FALLS [illegible]
ELMENDORF, TX 78[illegible]

78238

DATE RECEIVED	CUSTOMER NO.	E	O	T	PMC JOB NO.
7/23/95	OMEG001	59	50	60	228-22

CUSTOMER P.O. NUMBER	REQUESTED SHIP	SCHEDULED SHIP	CODE
47380	8/31/95	[illegible]	1. MFT 5. METERS 2. CFT 6. FEET 3. POUNDS 7. LOT 4. EACH NET 8. OTHER

SHIP VIA	F.O.B.	TERMS
UPS	LONDONDERRY, NH	NET 15

ITEM	QUANTITY ORDERED	PART NUMBER / DESCRIPTION	QUANTITY SHIPPED
	20000.00	KK-TA/TA-24	19,500
[illegible]	1.00	CALIBRATION AT 200, 300, 500, 1000°F I/O REF. SPEC #M30/980G-OPL CAL DATA REQUIRED	1

UNIT PRICES ARE BASED ON COPPER AT $ lb., SILVER AT $ /TROY OZ. HOWEVER UNIT PRICES INVOICED WILL BE BASED ON MATERIAL COST ON DATE OF SHIPMENT.

SPECIAL INSTRUCTIONS:

UPS SURFACE

DATE SHIPPED	BILL OF LADING NO.	NO. OF PACKAGES	WEIGHT	PPD	COL.	PARTIAL	COMPLETE	PACKED BY
8-31-95		2	142	✓			✓	[illegible]

PACKING SLIP

PROJECT NAME: OMEGA POINT LABORATORIES

PROJECT LOCATION: ELMENDORF, TX.

PROJECT NUMBER: 14540-99417

RECEIVED FROM: CORPORATE

REPORT NUMBER: 001

DATE RECEIVED: 08-11-97

DATE INSPECTED: 08-11-97

INSPECTED BY: MDM

RECEIVING REPORT

FORM QC-15
03/01/80

Rev. 1-01/27/81

Rev. 2-12/01/83

REF: QCP 0008

ITEM (include unit description)	P.O. NO. ORDER NO.	QUANTITY			I.D. NUMBER	CONTROL MAT'L	CERT REC'D	CONTAINER INTEGRITY	EXCEPTIONS	ACCEPTANCE			REMARKS
		ORDER	REC'D	B.O.						ACCEPT	HOLD	REJECT	
3M INTERAM E-54A MAT	1453	15	15		5360912323 /0063344011	YES	YES	GOOD	NONE	YES			
3M INTERAM E-54A MAT	1453	5	5		5360912316 /0063344011	YES	YES	GOOD	NONE	YES			
3M INTERAM E-54A MAT	1453	9	9		5360912343 /0063344011	YES	YES	GOOD	NONE	YES			
3M INTERAM E-54A MAT	1453	3	3		5360912346 /0063344011	YES	YES	GOOD	NONE	YES			
3M INTERAM E-54A MAT	1453	6	6		5360912345 /0063344011	YES	YES	GOOD	NONE	YES			
3M INTERAM E-54A MAT	1453	2	2		5360912314 /0063344011	YES	YES	GOOD	NONE	YES			
3M INTERAM E-54A MAT	1453	2	2		5360912332 /0063344011	YES	YES	GOOD	NONE	YES			

WHITE - QC Job File Yellow - Purchasing Pink - Rec. Dept Gold - QC Numerical Control

CERTIFICATE OF COMPLIANCE

CERTIFICATION NUMBER:	7299999/1079	CERTIFICATION DATE:	08/08/97
CUSTOMER:	OMEGA POINT LABORATORIES 16015 SHADY FALLS ROAD ELMENDORF, TEXAS 78112-9784	PRODUCT:	3M E54A INTERAM
CUSTOMER ORDER NUMBER:	OUR PO 1453	VENDOR:	PEAK SEALS INC.
CUSTOMER SPECIFICATION NUMBER:	N/A	QUANTITY:	42 ROLLS
IDENTIFICATION NUMBER:	5360912323/0063344011 @ 15 Rolls 5360912316/0063344011 @ 5 Rolls 5360912343/0063344011 @ 9 Rolls 5360912346/0063344011 @ 3 Rolls 5360912345/0063344011 @ 6 Rolls 5360912314/0063344011 @ 2 Rolls 5360912332/0063344011 @ 2 Rolls	EXPIRATION DATE:	N/A

CERTIFICATION REQUIREMENTS:

We hereby certify that all items furnished herein meet the requirements of the applicable product specifications, the above referenced customer order number, and supporting specifications. Vendor material certifications are attached.

Shelf Life - Not applicable to this item.

QUALITY ASSURANCE DEPT.
DORCAS SMITHWICK
QUALITY ADMINISTRATOR

12/31/96 08:31 3M TMD 052032 001

3M General Offices

3M Center
St. Paul, MN 5
612-733-1110

Post-it™ brand fax transmittal memo 7671	# of pages ▸ 1
To LIZ BILKE	From SUSAN HACKNEY
Co. P.S.A. SEALS	Co. 3M
Dept.	Phone # 612-736-3603
Fax # 715-256-3111	Fax #

3M

CERTIFICATE OF CONFORMANCE

DESCRIPTION: 3M Interam™ E-54A or E54C Mat
A= Aluminum Foil
C= Stainless Steel Foil

This product was tested according to ASTM standards:
ASTM E119 Fire Tests Of Building Construction and Materials.
ASTM E84 Surface Burning Characteristics Of Building Materials.

The surface burning characteristics are:
Flame spread 0.7
Smoke development 0.0

Critical Characteristics:

3M	Description	Unit	Specification Ranges Minimum	Maximum	Test Result
TP-30	Thickness	Inch	0.350	0.450	0.418
TP-29	Weight Per Area	g/24 in²	109.4	153.8	127.25
TP-21	Loss On Ignition	% Weight	24	34	31.62
TP-27	Moisture	% Weight	0	5	0.22
TP-48	Tensile	kPa	100	N/A	468

This product contains no asbestos or PCB's and meets the applicable purchasing specification for the materials supplied under the purchasing order listed below.

Pallet Serial No.	S071	
Customer P.O. No.	1273	
Invoice No.	ZR11982	
Lot No.	5360912323 5360912316 5360912343 0063344011 0063344011 0063344011	5360912346 0063344011
3M Part No.	98-0400-0698-7	5360912345 0063344011
Quantity	75 rolls	
Shelf Life	Not applicable	5360912314 0063344011
Date of Manufacture	September, 1996	5360912332 0063344011

12-31-96

PROJECT NAME: OMEGA POINT LABORATORIES

PROJECT LOCATION: ELMENDORF, TX.

PROJECT NUMBER: 14540-99417

RECEIVED FROM: CORPORATE

REPORT NUMBER: 002

DATE RECEIVED: 08-11-97

DATE INSPECTED: 08-11-97

INSPECTED BY: MDM

RECEIVING REPORT

FORM QC-15
03/01/80

Rev. 1-01/27/81

Rev. 2-12/01/83

REF: QCP 0008

ITEM (include unit description)	P.O. NO. ORDER NO.	QUANTITY			I.D. NUMBER	CONTROL MAT'L	CERT REC'D	CONTAINER INTEGRITY	EXCEPTIONS	ACCEPTANCE			REMARKS
		ORDER	REC'D	B.O.						ACCEPT	HOLD	REJECT	
3M INTERAM T-49 FOIL TAPE	1453	12	12		6150-4-5	YES	YES	GOOD	NONE	YES			
3M INTERAM T-49 FOIL TAPE	1453	12	12		6172-2-6	YES	YES	GOOD	NONE	YES			
3M INTERAM T-49 FOIL TAPE	1453	2	2		6150-9-1	YES	YES	GOOD	NONE	YES			

WHITE - QC Job File Yellow - Purchasing Pink - Rec. Dept Gold - QC Numerical Control

CERTIFICATE OF COMPLIANCE

CERTIFICATION NUMBER:	7299999/1080	CERTIFICATION DATE:	08/08/97
CUSTOMER:	OMEGA POINT LABORATORIES 16015 SHADY FALLS ROAD ELMENDORF, TEXAS 78112-9784	PRODUCT:	INTERAM T49 FOIL TAPE
CUSTOMER ORDER NUMBER:	OUR PO 1453	VENDOR:	PEAK SEALS INC.
CUSTOMER SPECIFICATION NUMBER:	N/A	QUANTITY:	26 ROLLS
IDENTIFICATION NUMBER:	12 X 6150-4-5 12 X 6172-2-6 2 X 6150-9-1	EXPIRATION DATE:	N/A

CERTIFICATION REQUIREMENTS:

We hereby certify that all items furnished herein meet the requirements of the applicable product specifications, the above referenced customer order number, and supporting specifications. Vendor material certifications are attached.

Shelf Life - Not applicable to this item.

DORCAS SMITHWICK
QUALITY ADMINISTRATOR

3M General Offices

3M Center
St. Paul, MN 55144-1000
612 733 1110

* * * * * * * * *

* CERTIFICATE OF CONFORMANCE *

* * * * * * * * *

DESCRIPTION: **Interam™ T-49 Tape**

This material is classified by Underwriters Laboratories as an Electrical Circuit Protective Material for use in electrical circuit protective systems #2, 3, 4, 6, 7, and 8 for a one (1) hour rating, and systems #6, 7, and 8 for a three (3) hour fire rating. This material is classified by Underwriters Laboratories as part of the structural steel protective system #X204 in the Fire Resistance Directory.

This product was tested according to:
ASTM E119 Fire Tests Of Building Construction and Materials.

This product is tested according to 3M Standard Number GP-17 and meets product requirements.

Pallet Serial No. S217

Customer P.O. No. 1395

Invoice No. ZR15043

Lot No. 6172-2-6, 6150-4-5, 6150-9-5, and 4341-9-12

3M Part No. 98-0400-0172-3

Quantity 36 rolls

SM Hackney
Quality Manager or designee

05-28-97
Date

PROJECT NAME: OMEGA POINT LABORATORIES

PROJECT LOCATION: ELMENDORF, TX.

PROJECT NUMBER: 14540-99417

RECEIVED FROM: CORPORATE

REPORT NUMBER: 003

DATE RECEIVED: 08-11-97

DATE INSPECTED: 08-11-97

INSPECTED BY: MDM

RECEIVING REPORT

FORM QC-15
03/01/80

Rev. 1-01/27/81

Rev. 2-12/01/83

REF: QCP 0008

ITEM (include unit description)	P.O. NO. ORDER NO.	QUANTITY			I.D. NUMBER	CONTROL MAT'L	CERT REC'D	CONTAINER INTEGRITY	EXCEPTIONS	ACCEPTANCE			REMARKS
		ORDER	REC'D	B.O.						ACCEPT	HOLD	REJECT	
3M INTERAM FIRE DAM 150 CAULK 10.5 OZ TUBE	1453	10	10		7637C7	YES	YES	GOOD	NONE	YES			

WHITE - QC Job File Yellow - Purchasing Pink - Rec. Dept Gold - QC Numerical Control

265

CERTIFICATE OF COMPLIANCE

CERTIFICATION NUMBER:	7299999/1081	CERTIFICATION DATE:	08/08/97
CUSTOMER:	OMEGA POINT LABORATORIES 16015 SHADY FALLS ROAD ELMENDORF, TEXAS 78112-9784	PRODUCT:	INTERAM FIREDAM 150 CAULK
CUSTOMER ORDER NUMBER:	OUR PO 1453	VENDOR:	PEAK SEALS INC.
CUSTOMER SPECIFICATION NUMBER:	N/A	QUANTITY:	10 TUBES
IDENTIFICATION NUMBER:	7637C7	EXPIRATION DATE:	31 AUG 1998

CERTIFICATION REQUIREMENTS:

We hereby certify that all items furnished herein meet the requirements of the applicable product specifications, the above referenced customer order number, and supporting specifications. Vendor material certifications are attached.

Shelf Life - Twelve (12) months from date of certification, last day of the month.

QUALITY ASSURANCE DEPT.
DORCAS SMITHWICK
QUALITY ADMINISTRATOR

3M General Offices

3M Center
St. Paul, MN 55144-1000
612 733 1110

CERTIFICATE OF COMPLIANCE

DESCRIPTION: **Interam™ FireDam™ 150 Caulk**

This product was tested according to:
ASTM E119 Fire Tests Of Building Construction and Materials.
ASTM E814 Fire Tests Of Through-Penetration Fire Stops.
ASTM E84 Surface Burning Characteristics Of Building Materials.

The surface burning characteristics are:

Flame spread	0.0
Smoke development	2.2

Critical Characteristics:

3M	Description	Unit	Specification Ranges Minimum	Maximum	Test Result
TP-67	Semco caulk rate	gm/min	500	N/A	860
TP-67	Boeing Flow	Inches	0	0.5	0.1
TP-67	Weight/Gallon	lbs/gal	13.5	14.5	14.2
TP-67	Loss on Ignition	% Weight	42.5	44.1	42.9
TP-67	Non-Volatile Content	% Weight	77	87	80.9

This product contains no asbestos or PCB's and meets the applicable purchasing specification for the materials supplied under the purchasing order listed below.

Pallet Serial No.	S088
Customer P.O. No.	1372
Invoice No.	ZR14392
Lot No.	7637C7
3M Part No.	98-0400-0723-3
Quantity	24 cartridges
Shelf Life	one year from Jan. 1997 when kept from freezing by storing above 4°C (40°F)

SM Hackney
Quality Manager

04-03-97
Date

RLS/3-18-96

PROJECT NAME: OMEGA POINT LABORATORIES

PROJECT LOCATION: ELMENDORF, TX.

PROJECT NUMBER: 14540-99417

RECEIVED FROM: CORPORATE

REPORT NUMBER: 004

DATE RECEIVED: 08-11-97

DATE INSPECTED: 08-11-97

INSPECTED BY: MDM

RECEIVING REPORT

FORM QC-15
03/01/80

Rev. 1-01/27/81

Rev. 2-12/01/83

REF: QCP 0008

ITEM (include unit description)	P.O. NO. ORDER NO.	QUANTITY			I.D. NUMBER	CONTROL MAT'L	CERT REC'D	CONTAINER INTEGRITY	EXCEPTIONS	ACCEPTANCE			REMARKS
		ORDER	REC'D	B.O.						ACCEPT	HOLD	REJECT	
DC 732 BLACK 10.3 OZ. TUBE	1453	48	48		ETO47833	YES	YES	GOOD	NONE	YES			

WHITE - QC Job File Yellow - Purchasing Pink - Rec. Dept Gold - QC Numerical Control

CERTIFICATE OF COMPLIANCE

CERTIFICATION NUMBER:	7299999/1082	CERTIFICATION DATE:	08/08/97
CUSTOMER:	OMEGA POINT LABORATORIES 16015 SHADY FALLS ROAD ELMENDORF, TEXAS 78112-9784	PRODUCT:	DC-732-BLACK Dow Corning 732 Adhesive Sealant, 10.3oz Tubes
CUSTOMER ORDER NUMBER:	OUR PO 1453	VENDOR:	PEAK SEALS INC.
CUSTOMER SPECIFICATION NUMBER:	N/A	QUANTITY:	48 TUBES 1 CASE
IDENTIFICATION NUMBER:	ET047833	EXPIRATION DATE:	28 FEB 2000

CERTIFICATION REQUIREMENTS:

We hereby certify that all items furnished herein meet the requirements of the applicable product specifications, the above referenced customer order number, and supporting specifications. Vendor material certifications are attached.

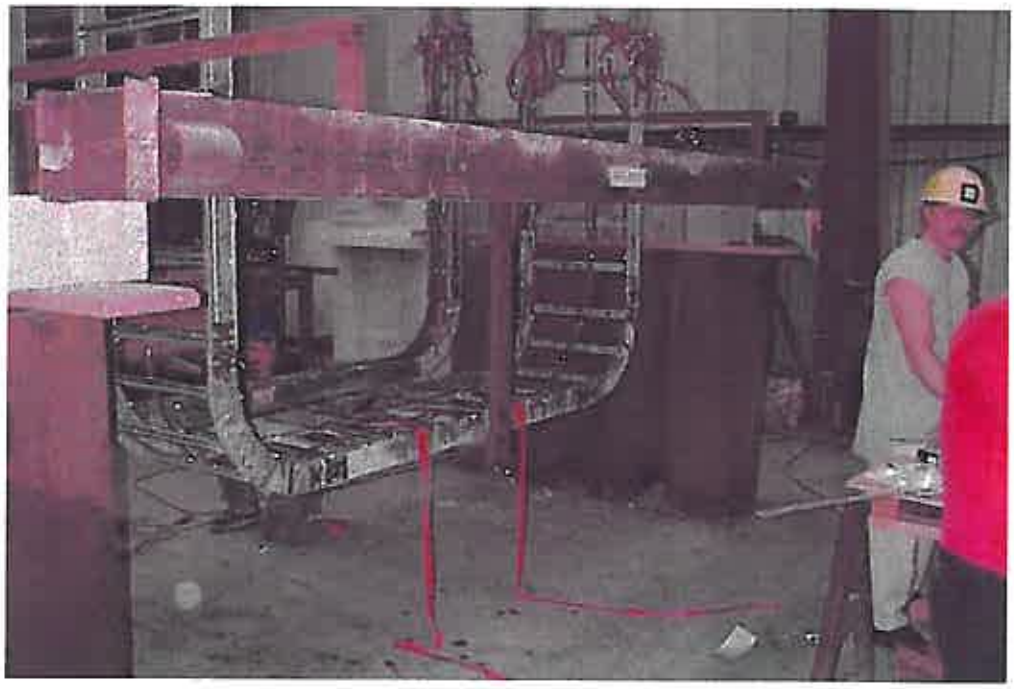
Shelf Life - Thirty(30) months from date of certification, last day of the month.

QUALITY ASSURANCE DEPT.
DORCAS SMITHWICK
QUALITY ADMINISTRATOR

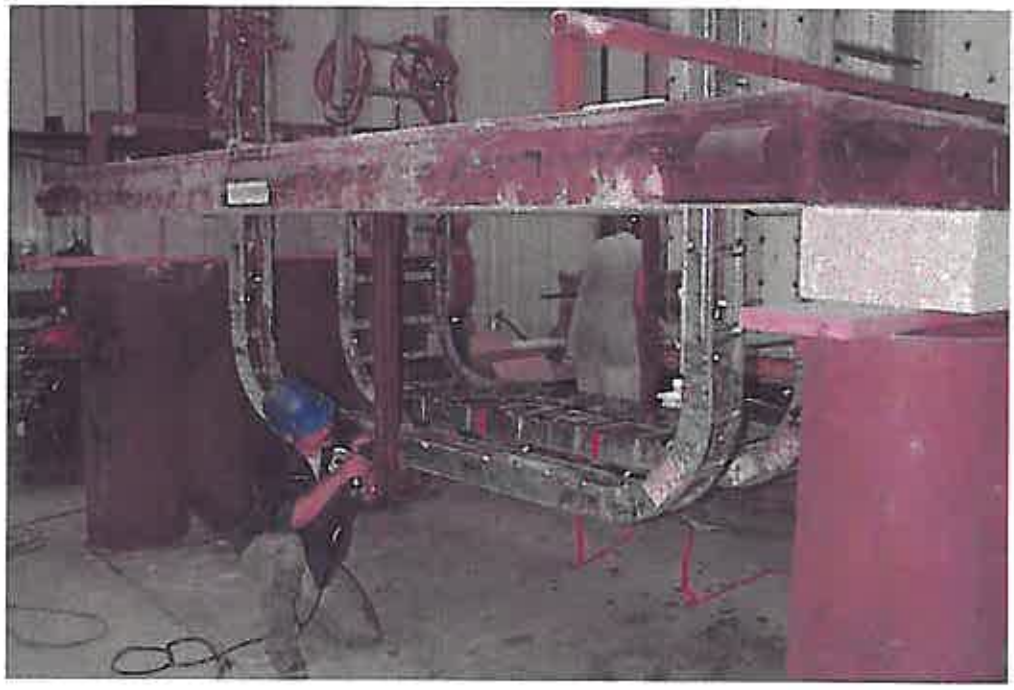
Appendix G

PHOTOGRAPHS

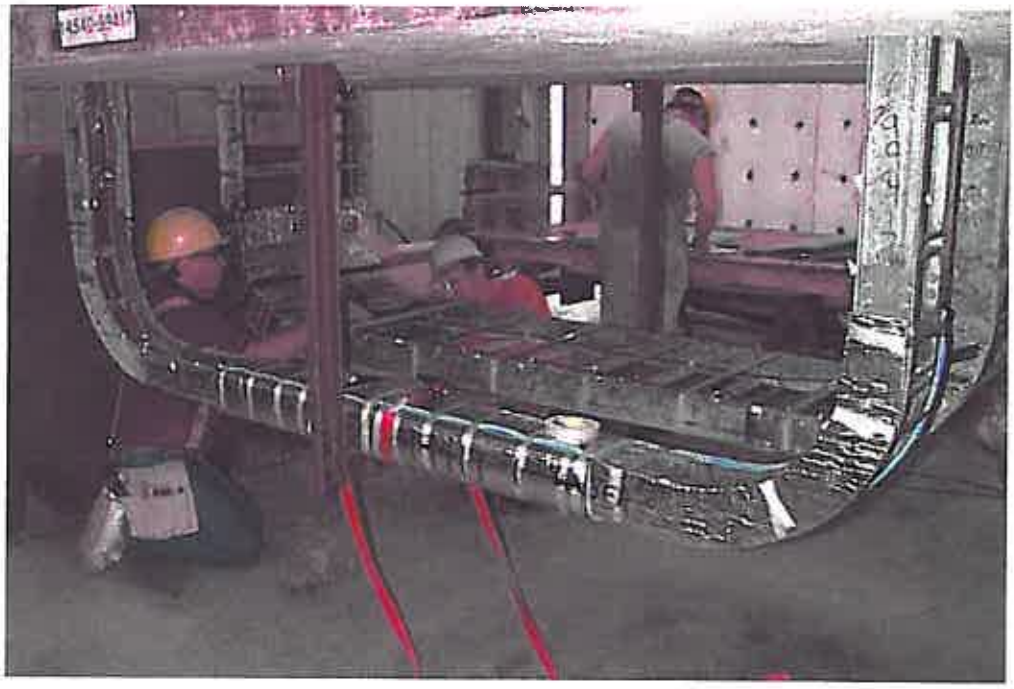
OMEGA POINT LABORATORIES



Cable trays installed in slab and prepared for cladding.



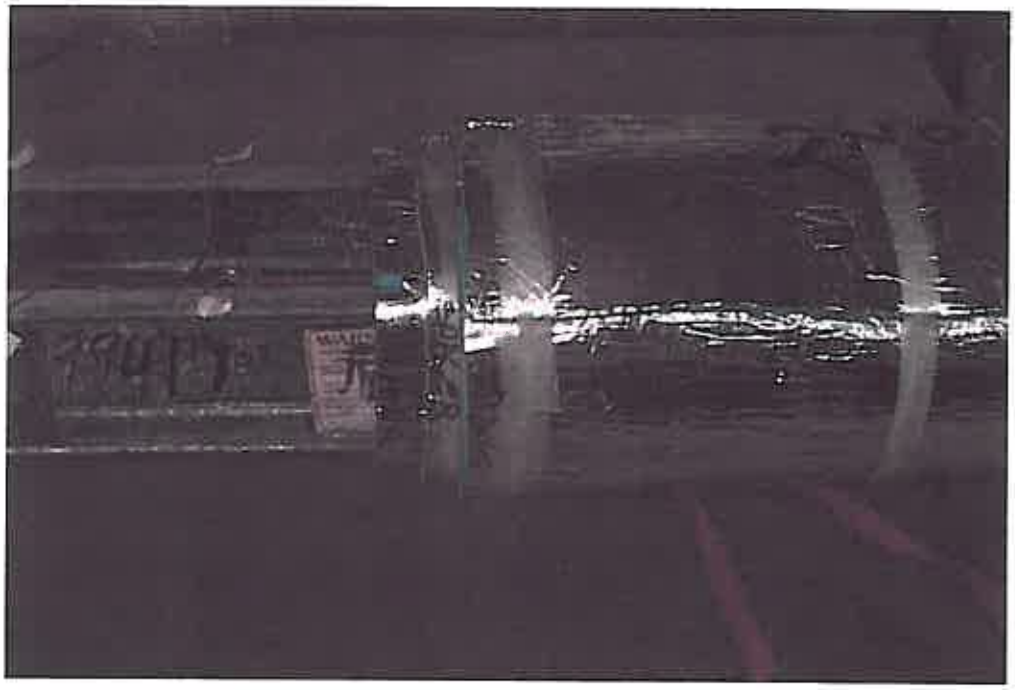
Thermocouples installed onto cable tray support.



Mat material installed onto cable trays.

Mat material installed onto cable trays.

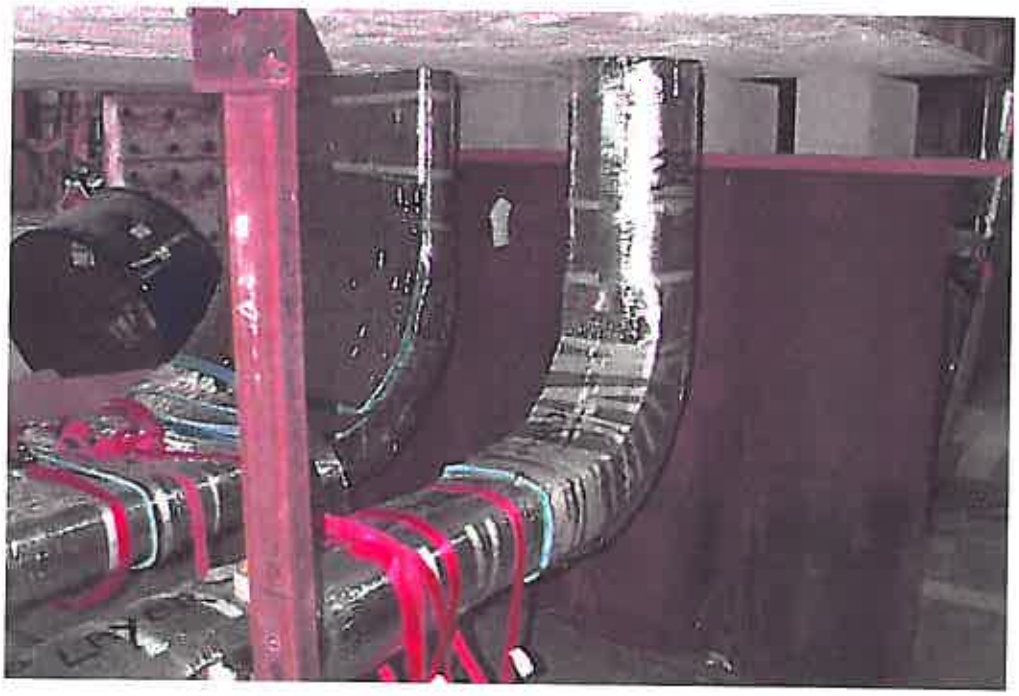
Mat material installed onto 6" cable tray straight section.



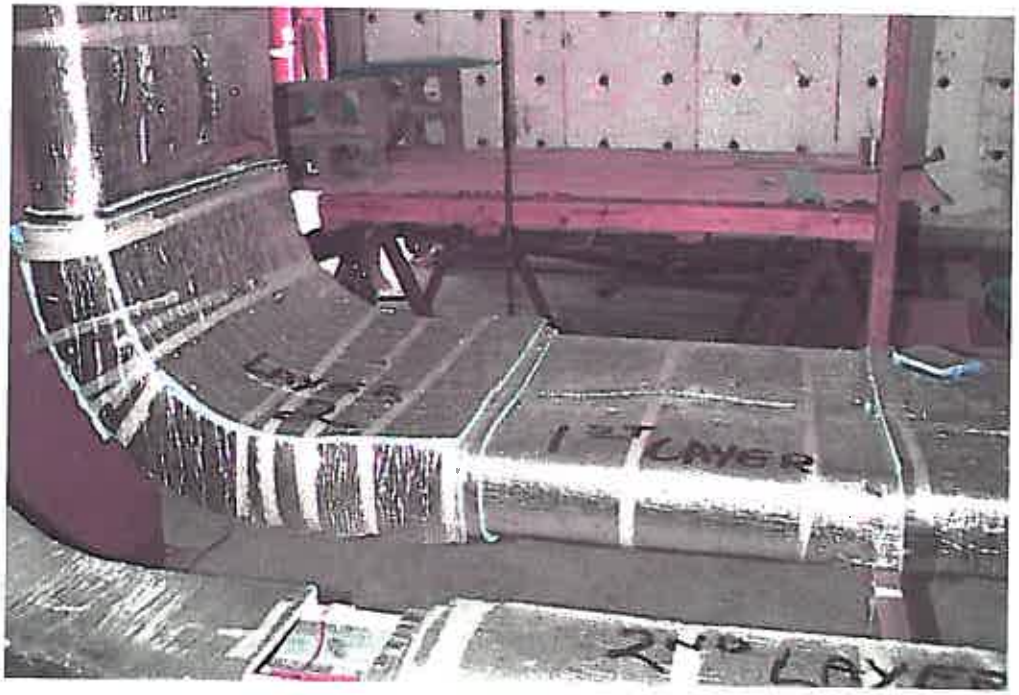
Mat material seam offsets on 6" cable tray straight section.

Mat material installed onto 24" cable tray.

Mat material installed onto 24" cable tray.

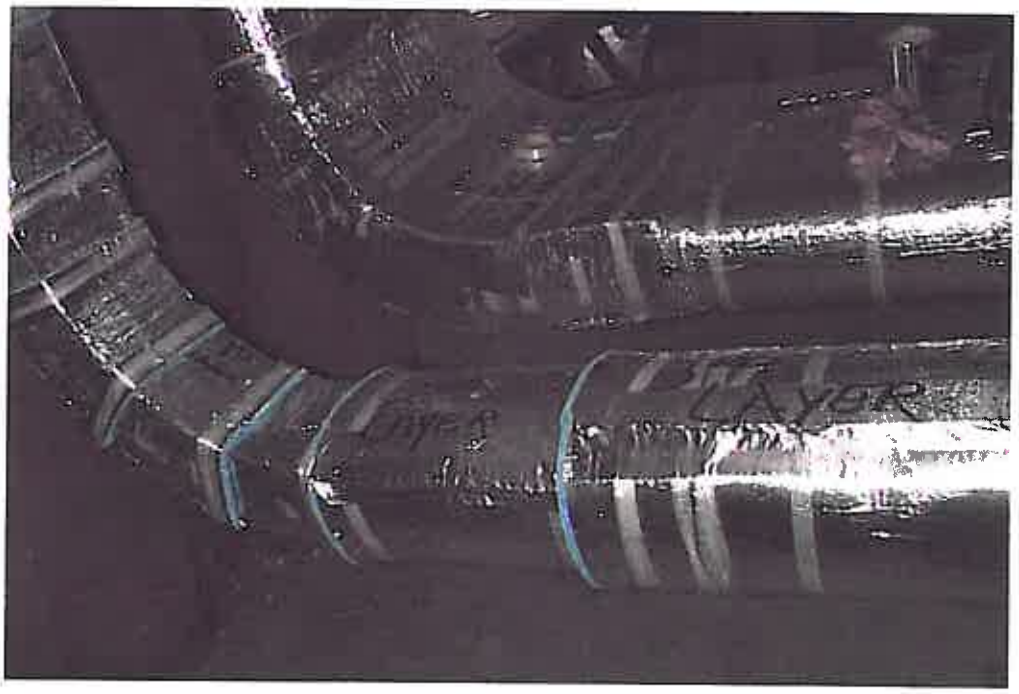


Mat material installed onto 6" cable tray.

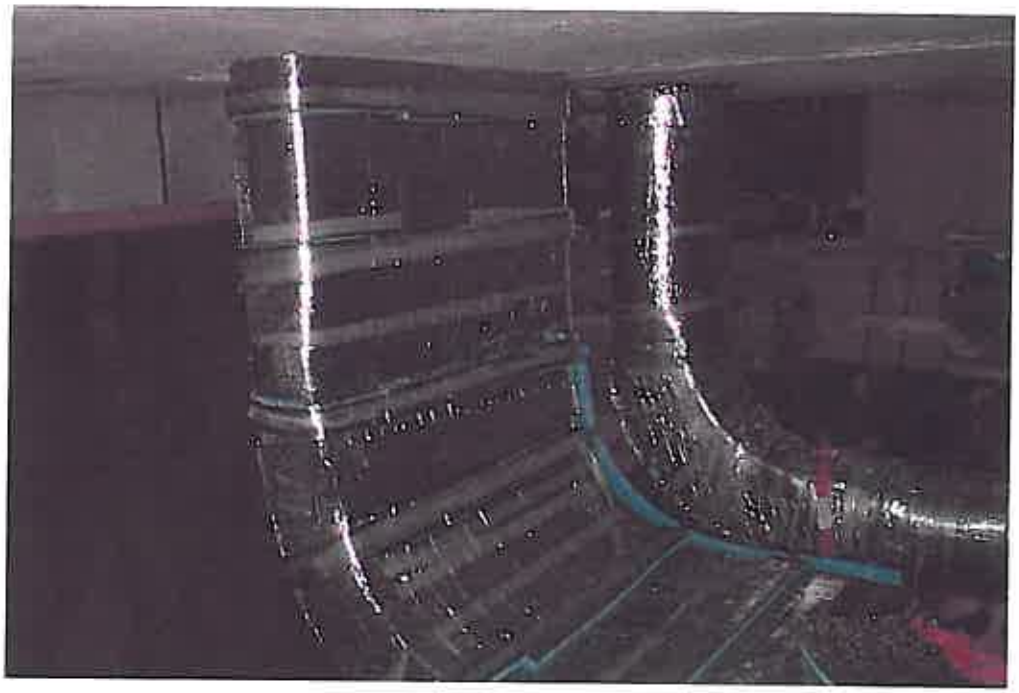


Mat material (second layer) installed onto cable trays.

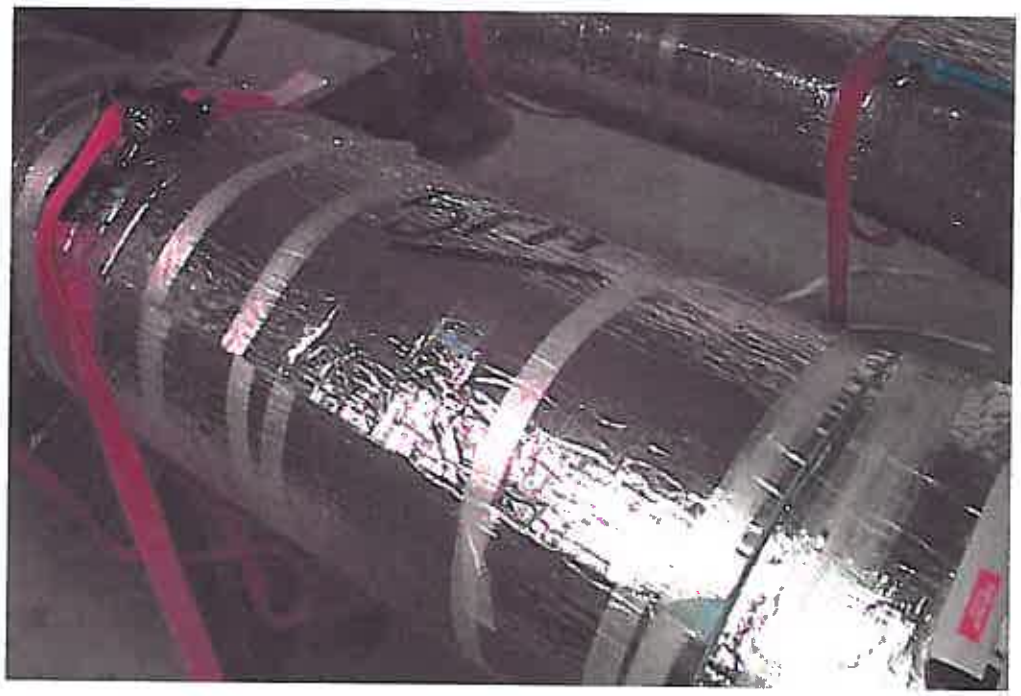
Dow Corning 732 applied to seams in 6" tray near support.



Mat material (third layer) applied to both cable trays.



Mat material applied to both cable trays.



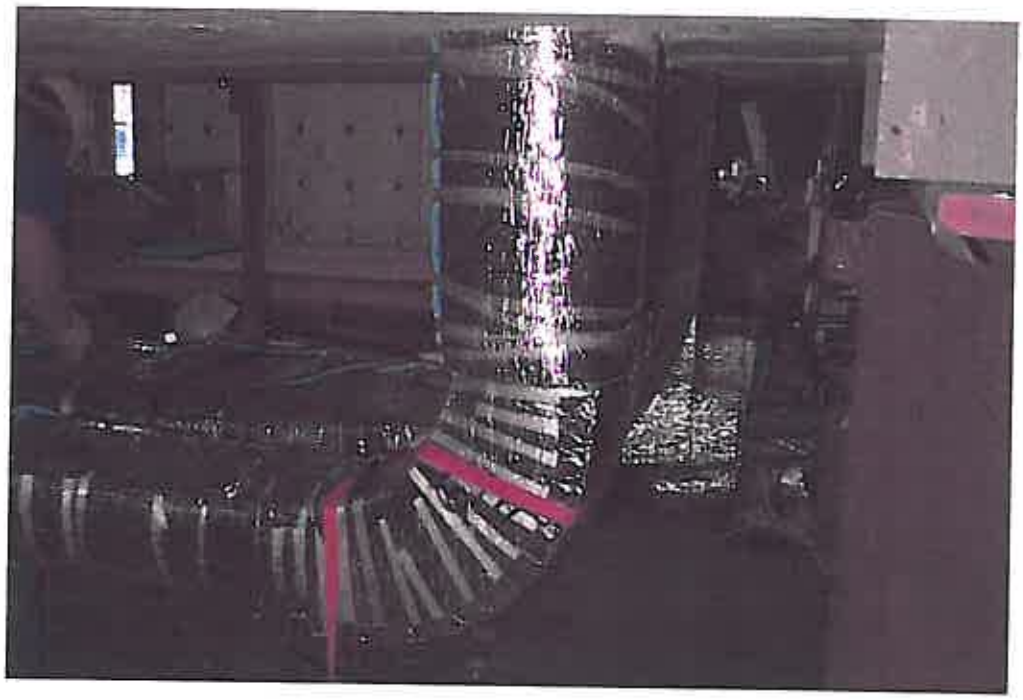
Mat material applied to both cable trays.

Mat material (second layer) applied to 24" cable tray radial bend.

Mat material (third layer) applied to 6" cable tray radial bend.

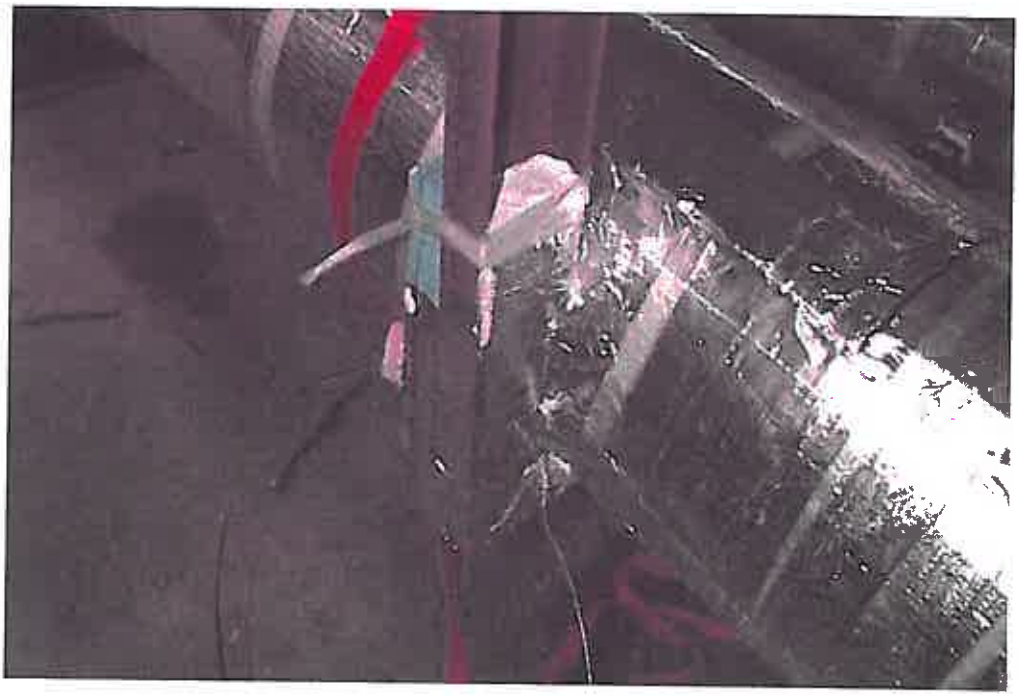
Mat material applied to 6" cable tray vertical section.

FireDam 150 Caulk used in seams in mat material on support.



Mat material (sixth layer) applied to 6" cable tray radial bend.

Mat material applied to support member.

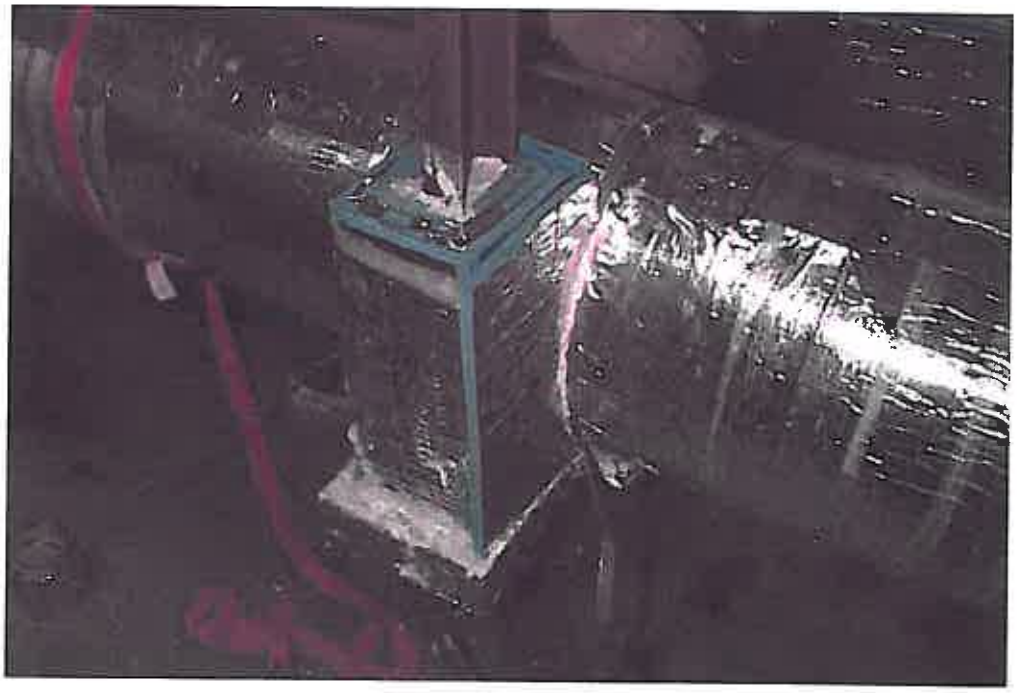


Mat material applied to support member (note use of FireDam 150 Caulk).

Mat material applied to support member (note use of FireDam 150 Caulk).

Mat material cut to fit around 6" cable tray on support vertical.

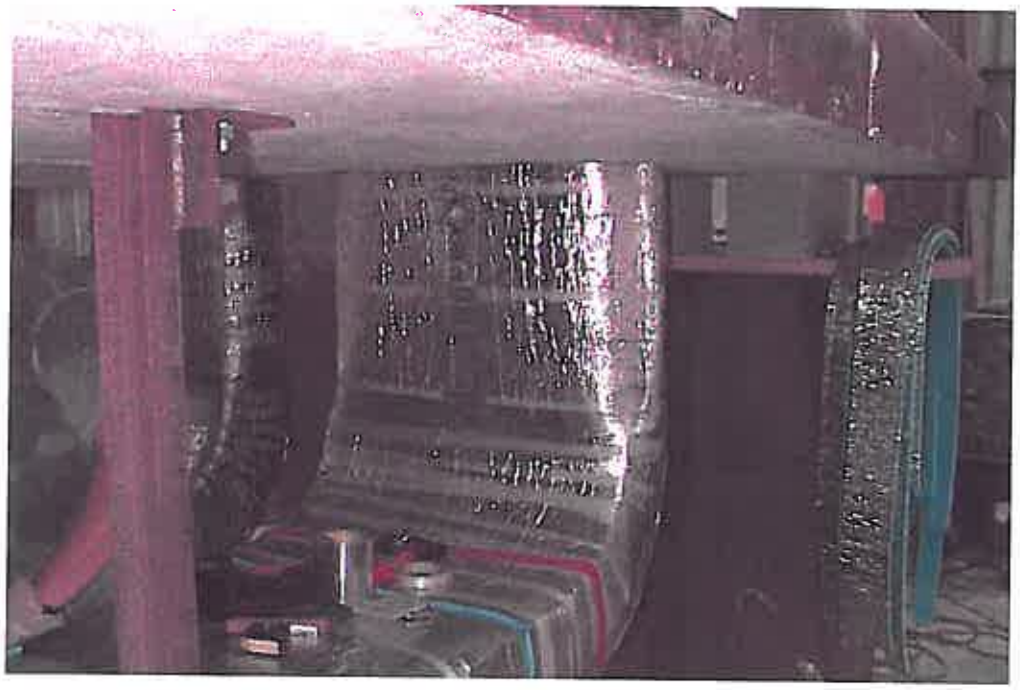
Mat material installed adjacent to 6" cable tray on support vertical.



Mat material installed on support vertical adjacent to 6" cable tray.

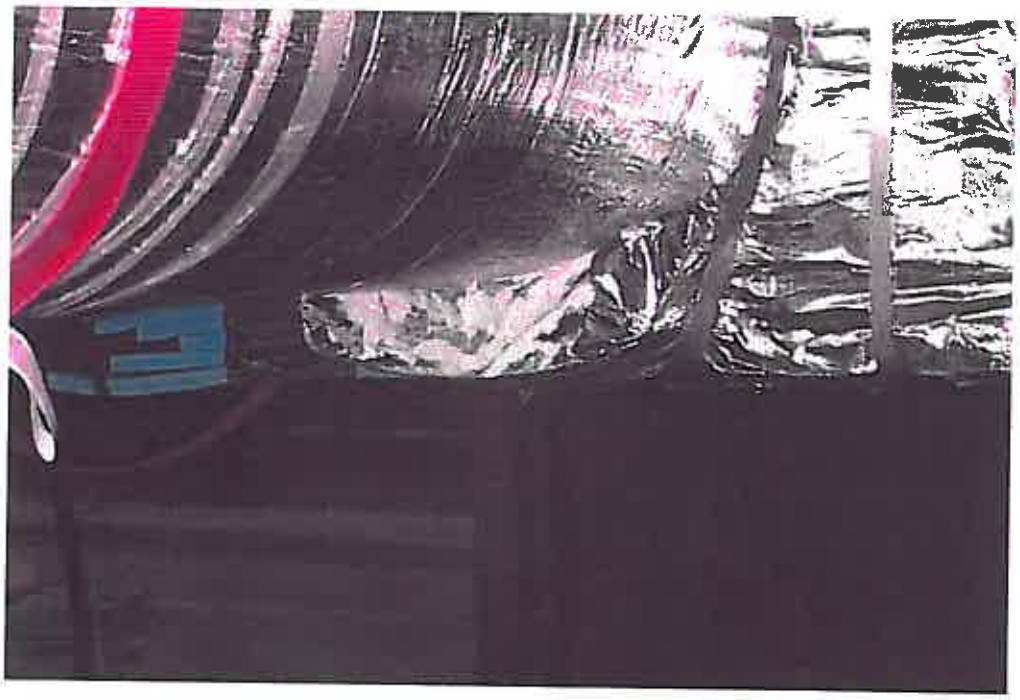
Mat material (sixth layer) installed on 6" cable tray radial bend.

Mat material (fifth layer) installed on 24" cable tray.



Mat material (fifth layer) installed on 24" cable tray radial bend.

Material installed onto support vertical section adjacent to 6" cable tray.



Mat material installed onto support horizontal member.

Completed support vertical section adjacent to 6" cable tray.

Mat material installed onto horizontal support member.

Mat material (sixth layer) installed onto 24" cable tray radial bend.

Mat material (sixth layer) installed onto 6" cable tray radial bend.

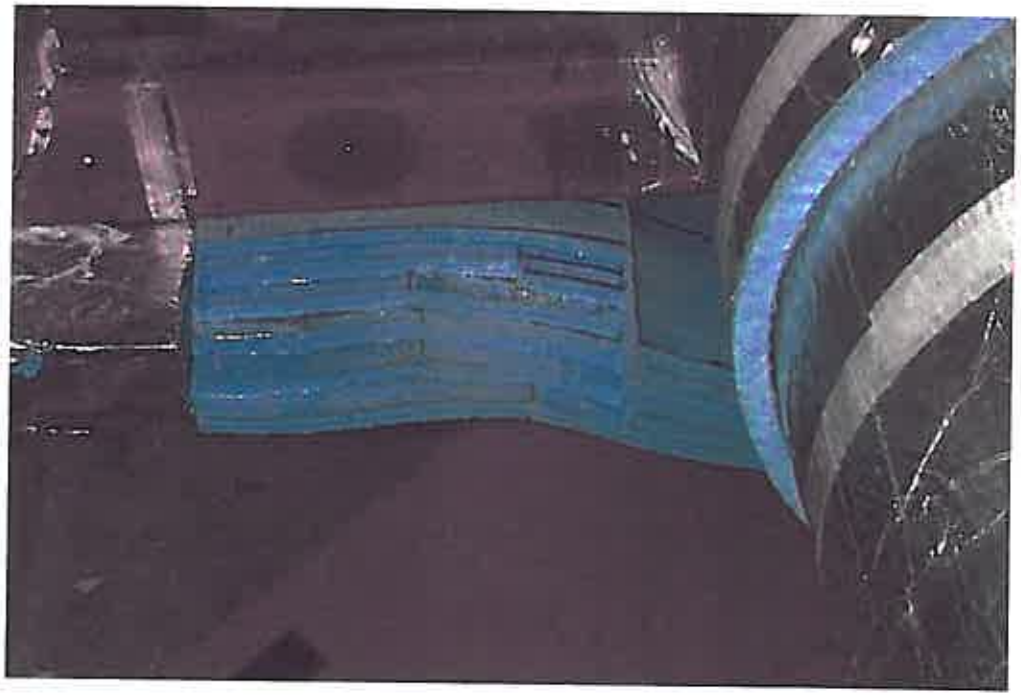
Mat material cut and prepared for installation onto support horizontal section.

Pre-assembled mat material installed onto horizontal support member.

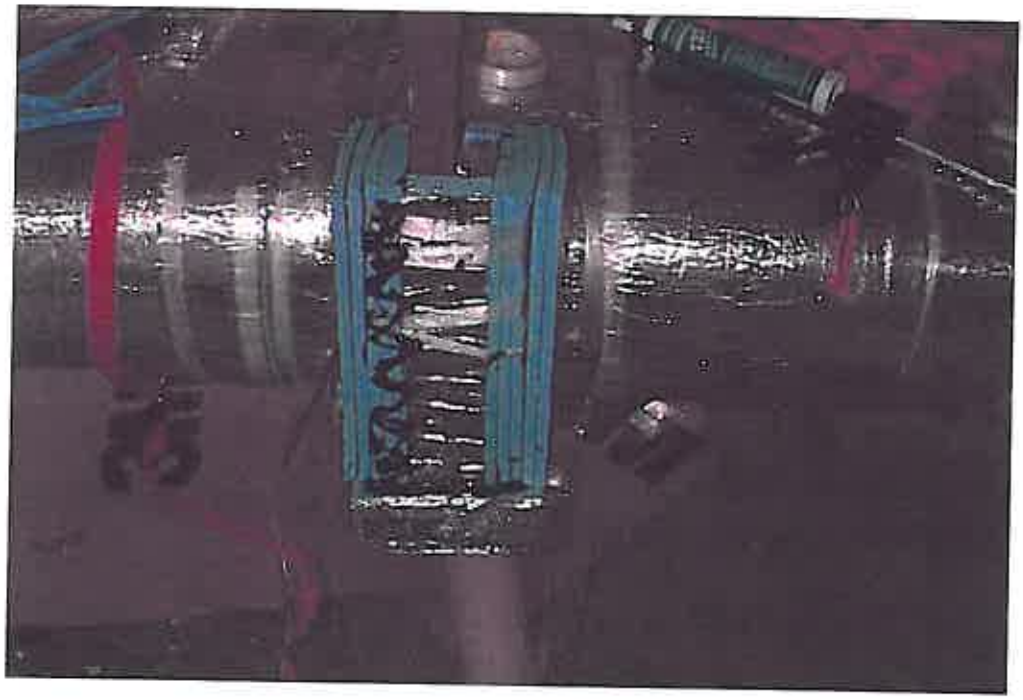
Mat material interlocked on underside of support member.

Mat material interlocked on underside of support member.

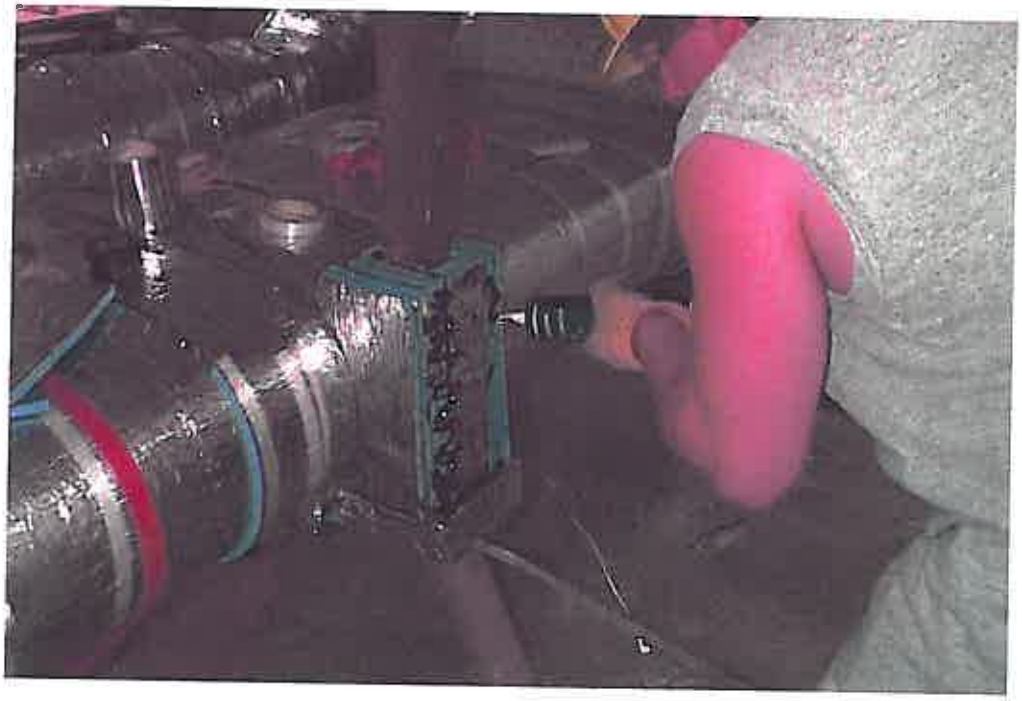
Mat material on support vertical adjacent to 24" cable tray.



Mat material interlocked on underside of support member.



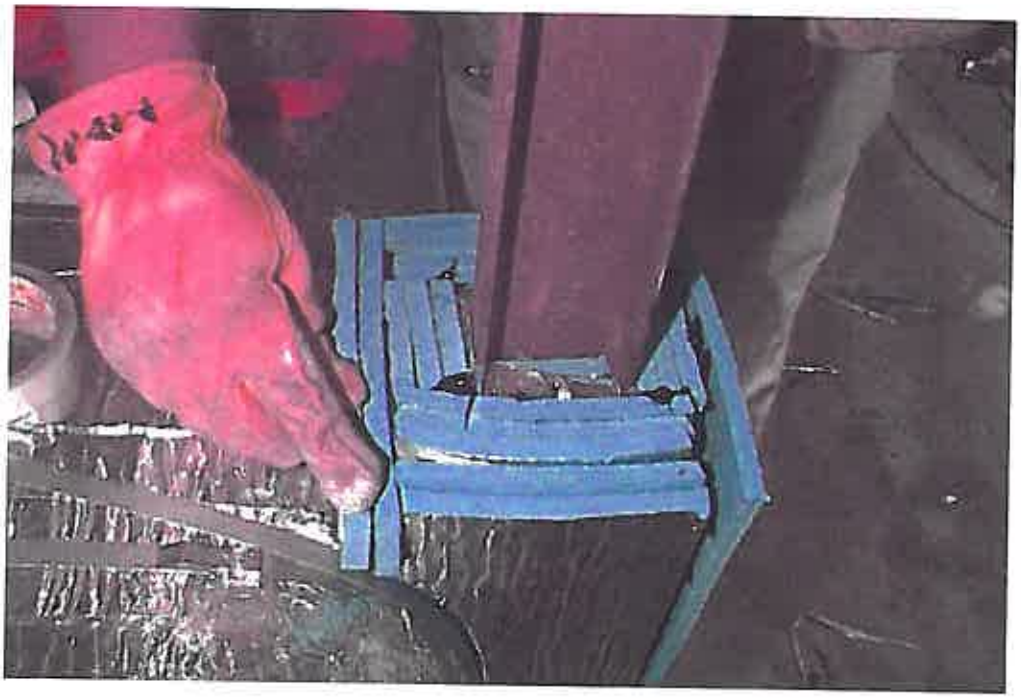
Mat material installed (with DC 732) on support vertical adjacent to 24" cable tray.



Mat material installed (with DC 732) on support vertical adjacent to 24" cable tray.

Mat material installed (with DC 732) on support vertical adjacent to 24" cable tray.

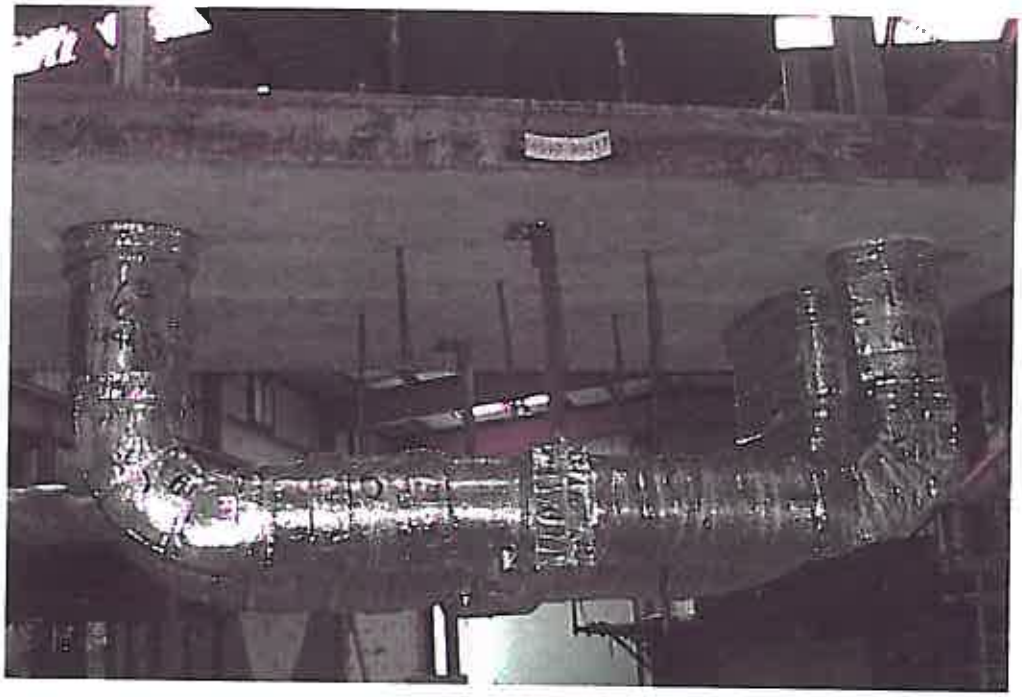
Mat material installed (with DC 732) on support vertical adjacent to 24" cable tray.



Mat material installed (with DC 732) on support vertical adjacent to 24" cable tray.

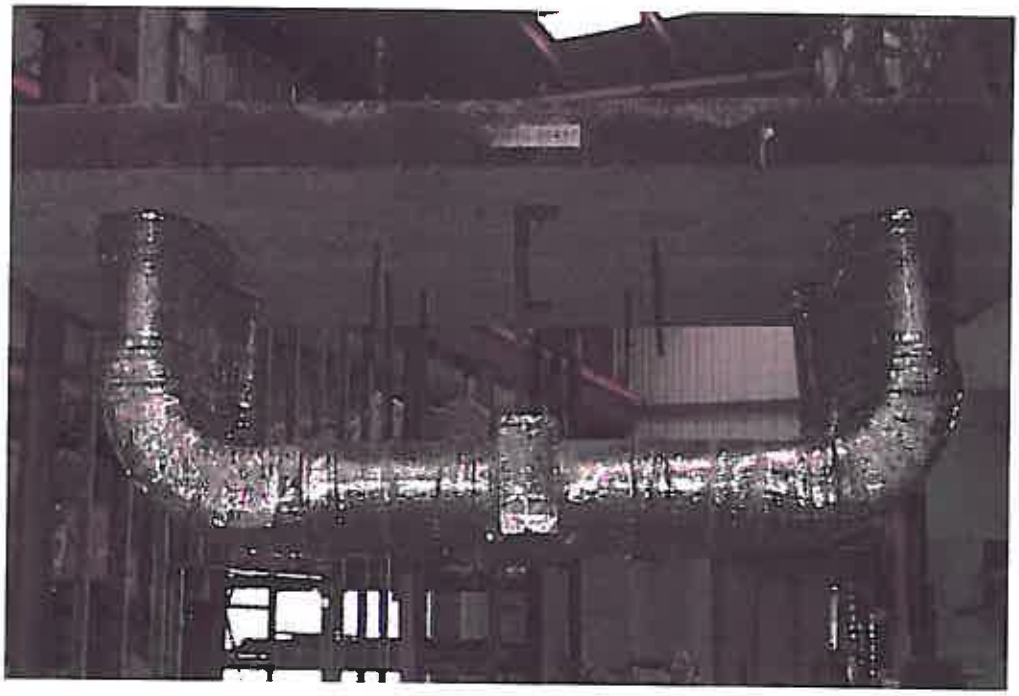
Mat material installed (with DC 732) on support vertical adjacent to 24" cable tray.

Collars installed around cable trays at slab interface.



Rear of completed test assembly.

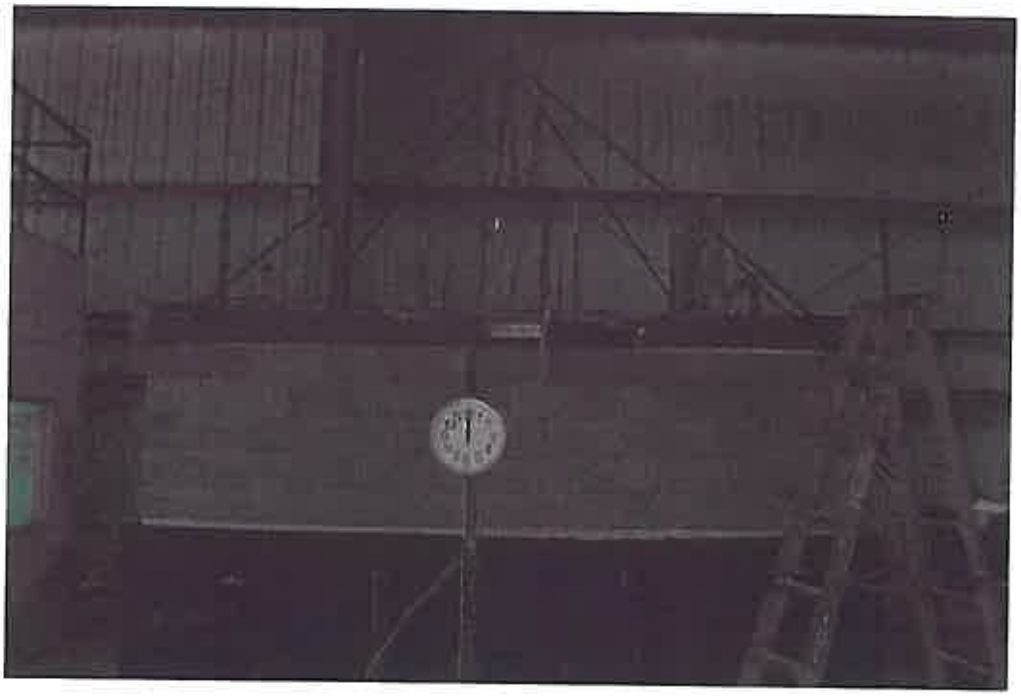
Right end view of completed test article.



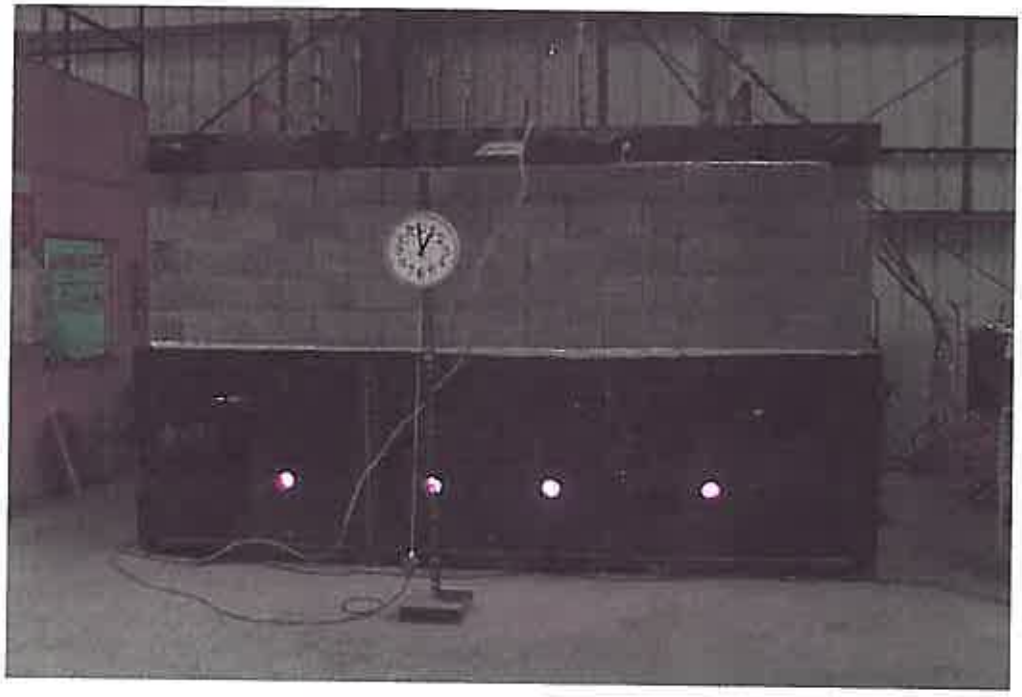
Front view of completed test article.

Left end view of completed test article.

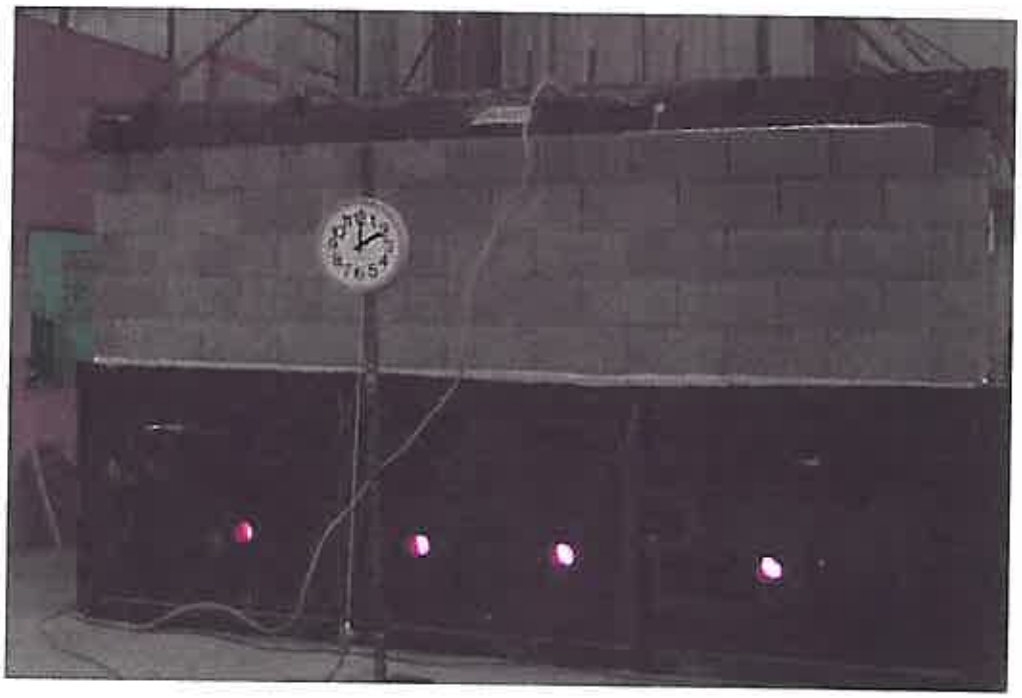
Test slab installed onto test furnace.



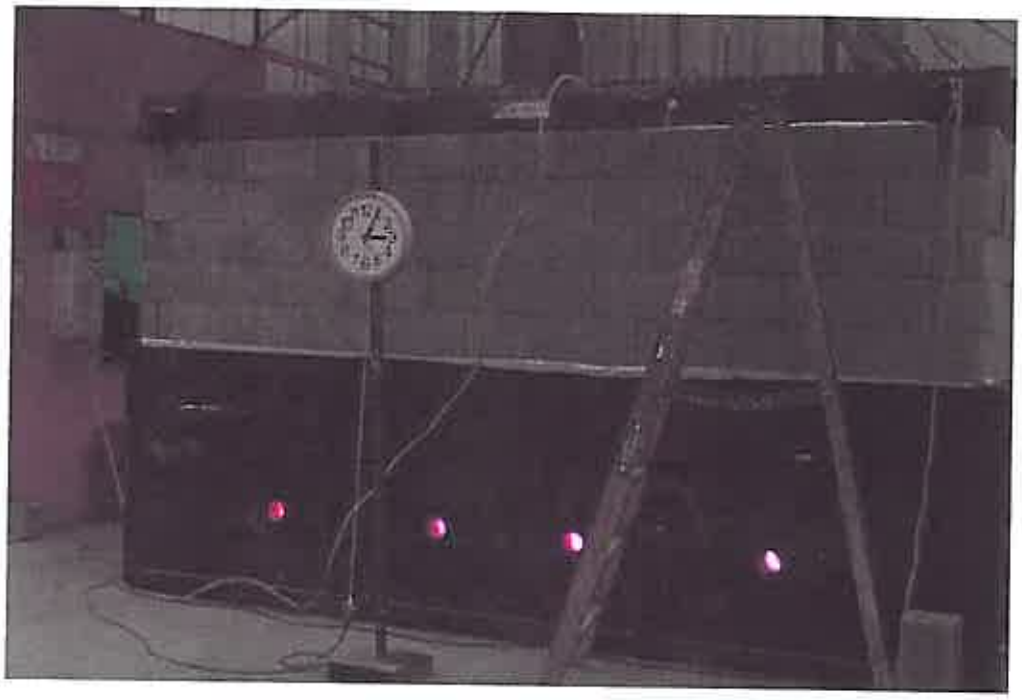
Test furnace prior to start of fire exposure.



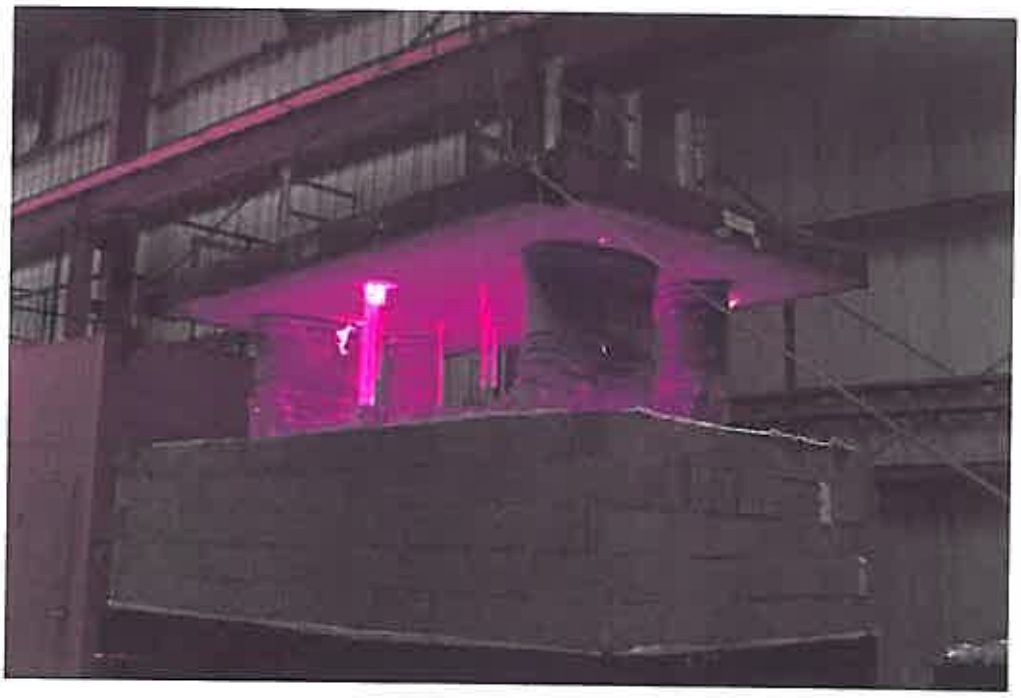
Test furnace after one hour of fire exposure.



Test furnace after two hours of fire exposure.

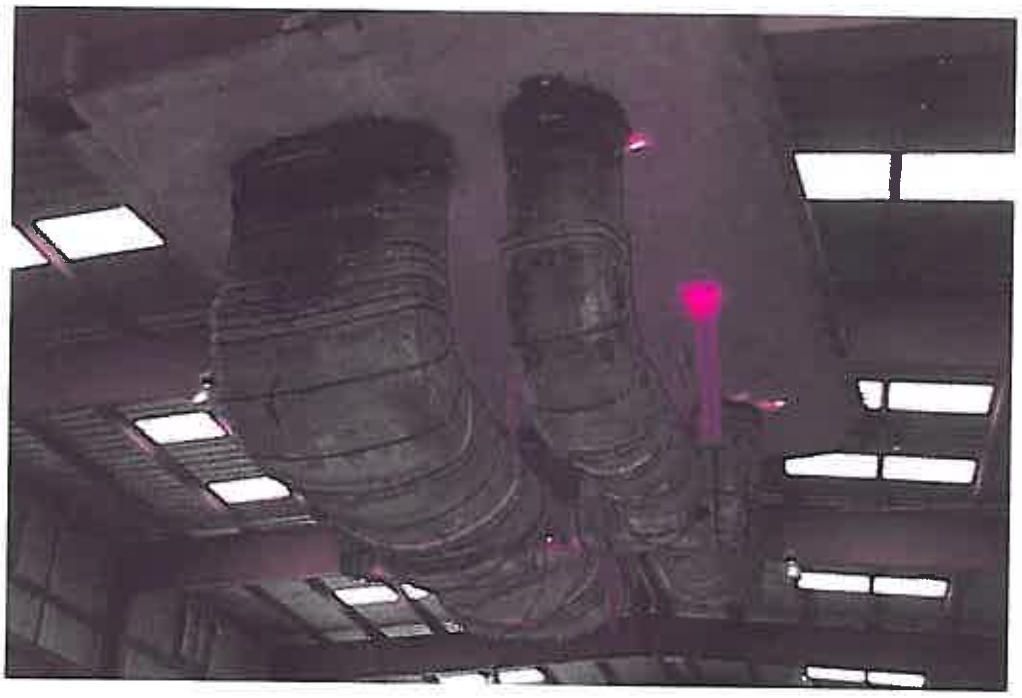


Test furnace after three hours of fire exposure.



Test slab removed from furnace after fire exposure.

Test article after fire exposure.



Underside of test slab prior to water hose stream exposure.

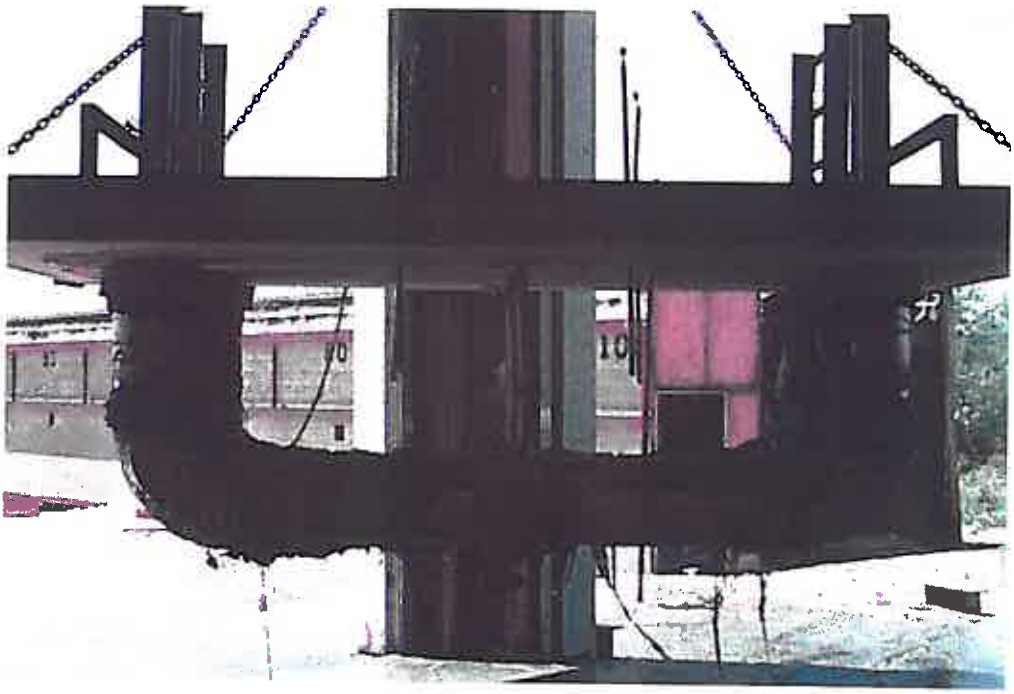
Water hose stream test.

Water hose stream test.

Water hose stream test.

Water hose stream test.

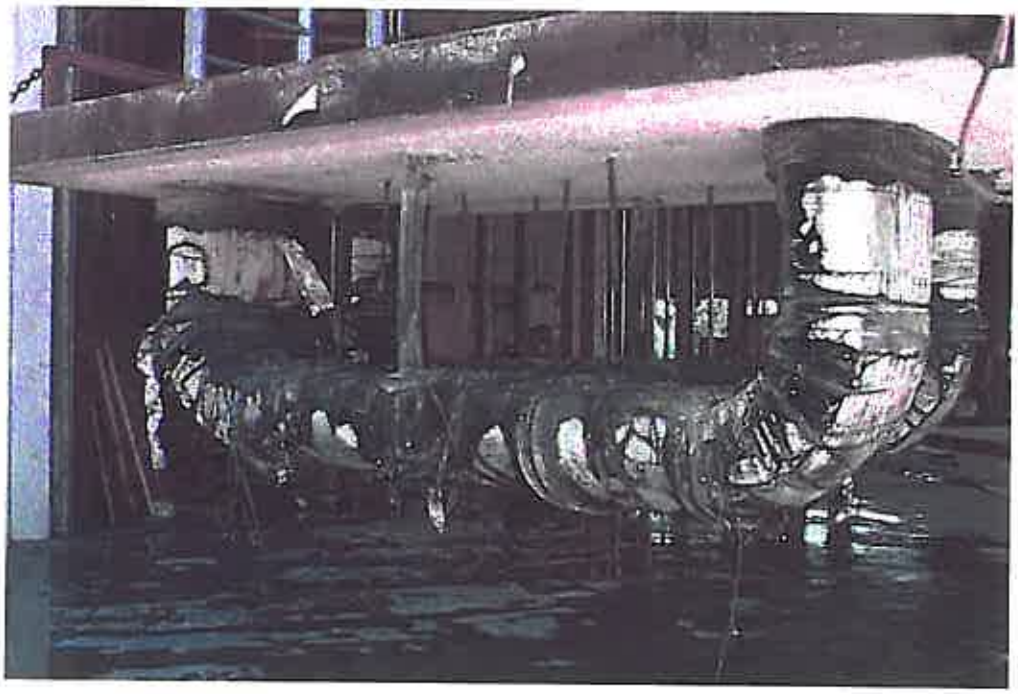
Water hose stream test.



Test article after water hose stream test.

Left end of test article after water hose stream test.

Right end of test article after water hose stream test.



Front of test article after water hose stream test.

Collar on 24" cable tray after water hose stream test.

Collar on 6" cable tray after water hose stream test.

Collar on 6" cable tray after water hose stream test.

Collar on 24" cable tray after water hose stream test.

Support vertical section adjacent to 6" cable tray.

Support vertical section adjacent to 6" cable tray.

Cut-away of typical remaining cable tray mat material.

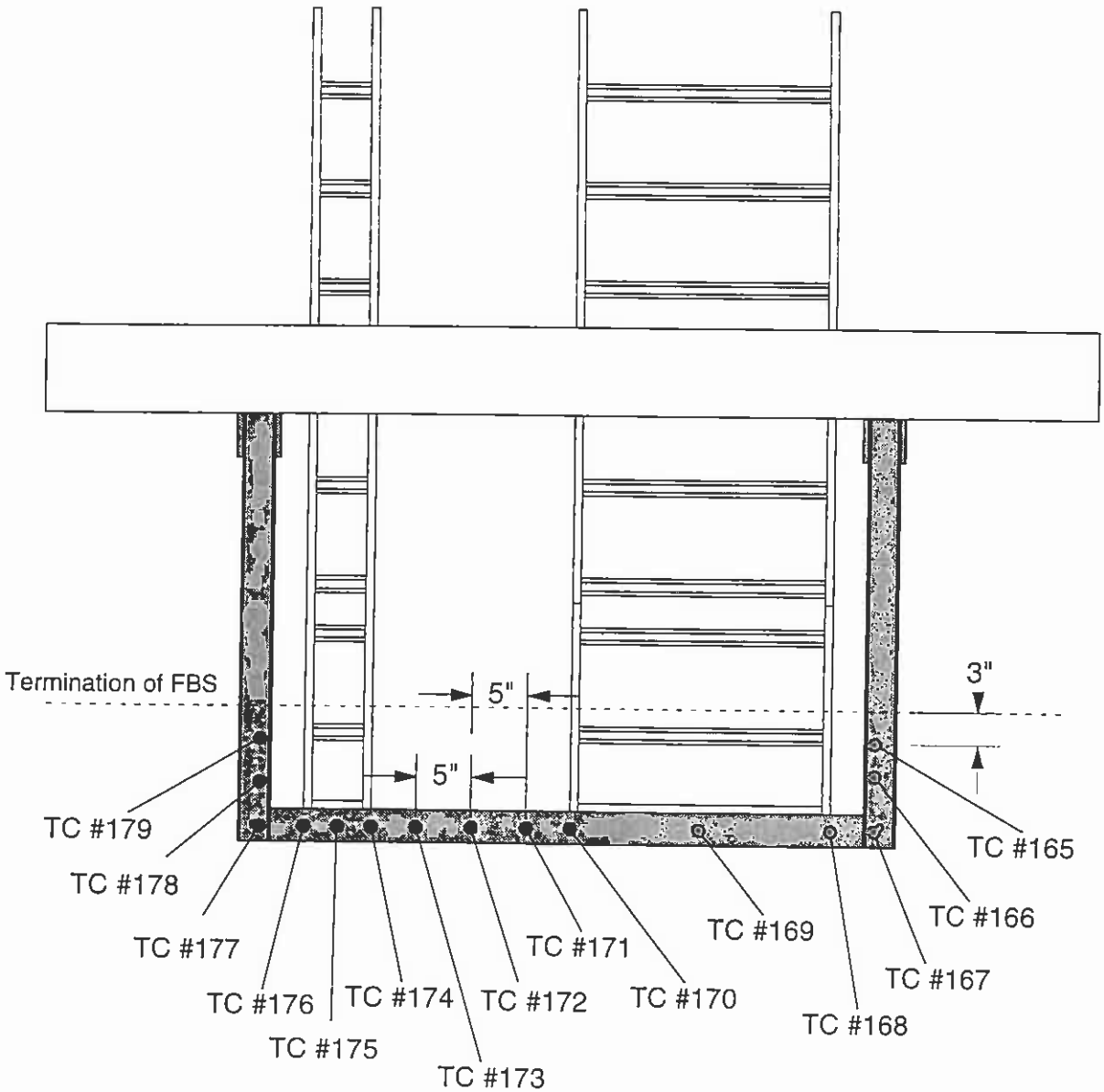
Cut-away of typical remaining cable tray mat material.

Cut-away of typical remaining cable tray mat material.

Cut-away of typical remaining cable tray mat material.

Cut-away of mat material on vertical support member.

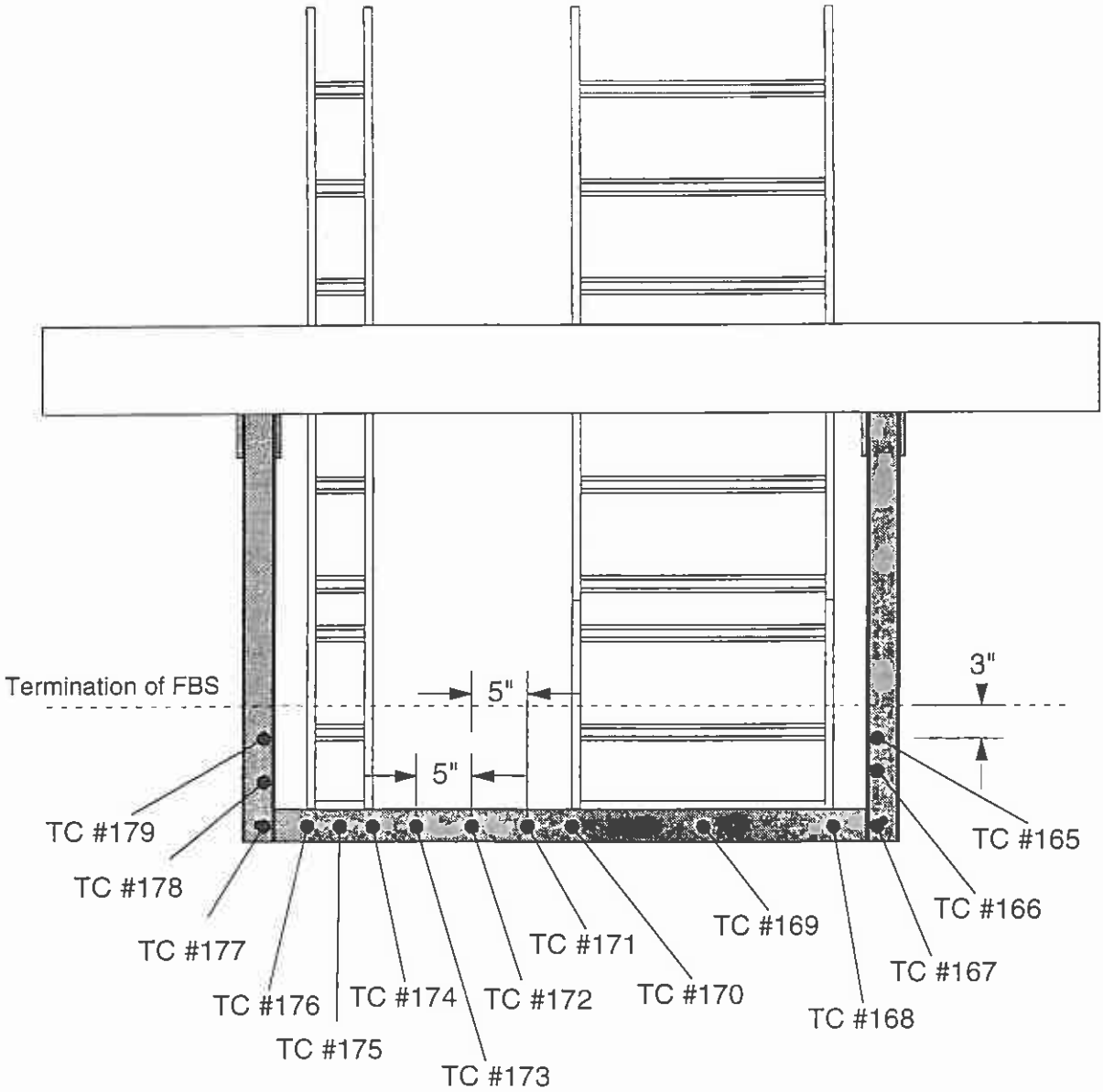
Cut-away of mat material on vertical support member.



Note:
Type K, chromel-alumel, 24 GA, electrically welded thermocouples were attached to the cable tray hanger as shown. The thermocouples were located at the center of each tray, at the side rail, and nominally every 4" from the rail (up to 12"). The thermojunctions were fastened under the heads of screws threaded into the metal support, at the vertical mid-height of the channel. The cladding applied to the vertical portions of the support terminated approximately 3±1/4" above TC # 165 and TC #179.

OMEGA POINT LABORATORIES, INC. Project No. 14840-99417
Peak Seals, Inc.
Fig. 9 Thermocouple Locations - Support Hanger, Rev. 2
Drawn By: 10/2/97 Approved By: 10/2/97
Client Appr'l: N/A

OMEGA POINT LABORATORIES

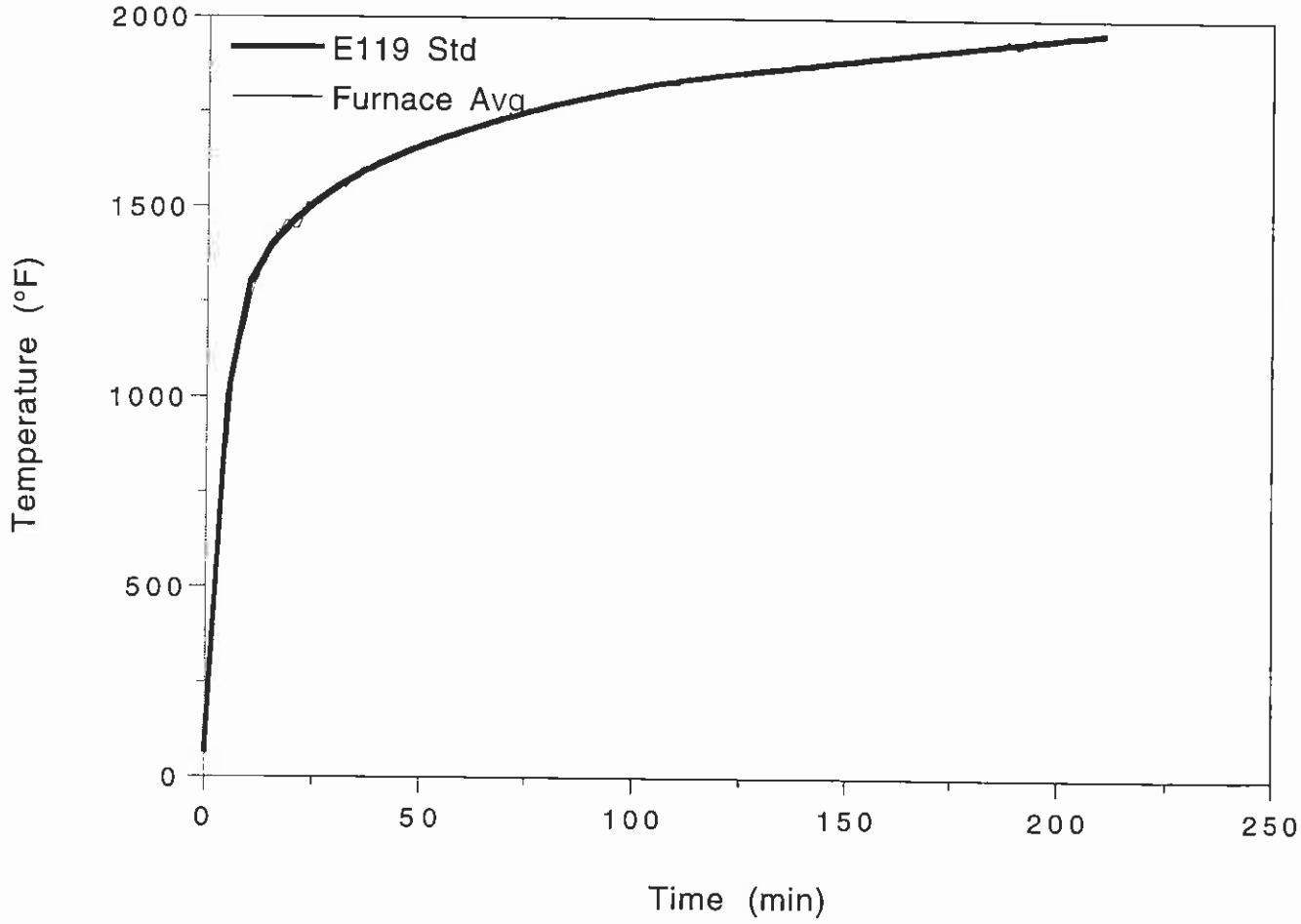


Note:
Type K, chromel-alumel, 24 GA, electrically welded thermocouples were attached to the cable tray hanger as shown. The thermocouples were located at the center of each tray, at the side rail, and nominally every 4" from the rail (up to 12"). The thermojunctions were fastened under the heads of screws threaded into the metal support, at the vertical mid-height of the channel. The cladding applied to the vertical portions of the support terminated approximately 3±1/4" above TC # 165 and TC #179.

OMEGA POINT LABORATORIES, INC. Project No. 14840-99417
Peak Seals, Inc.
Fig. 9 Thermocouple Locations - Support Hanger, Rev. 2
Drawn By: 10/2/97 Approved By: 10/2/97
Client Appr'l: N/A

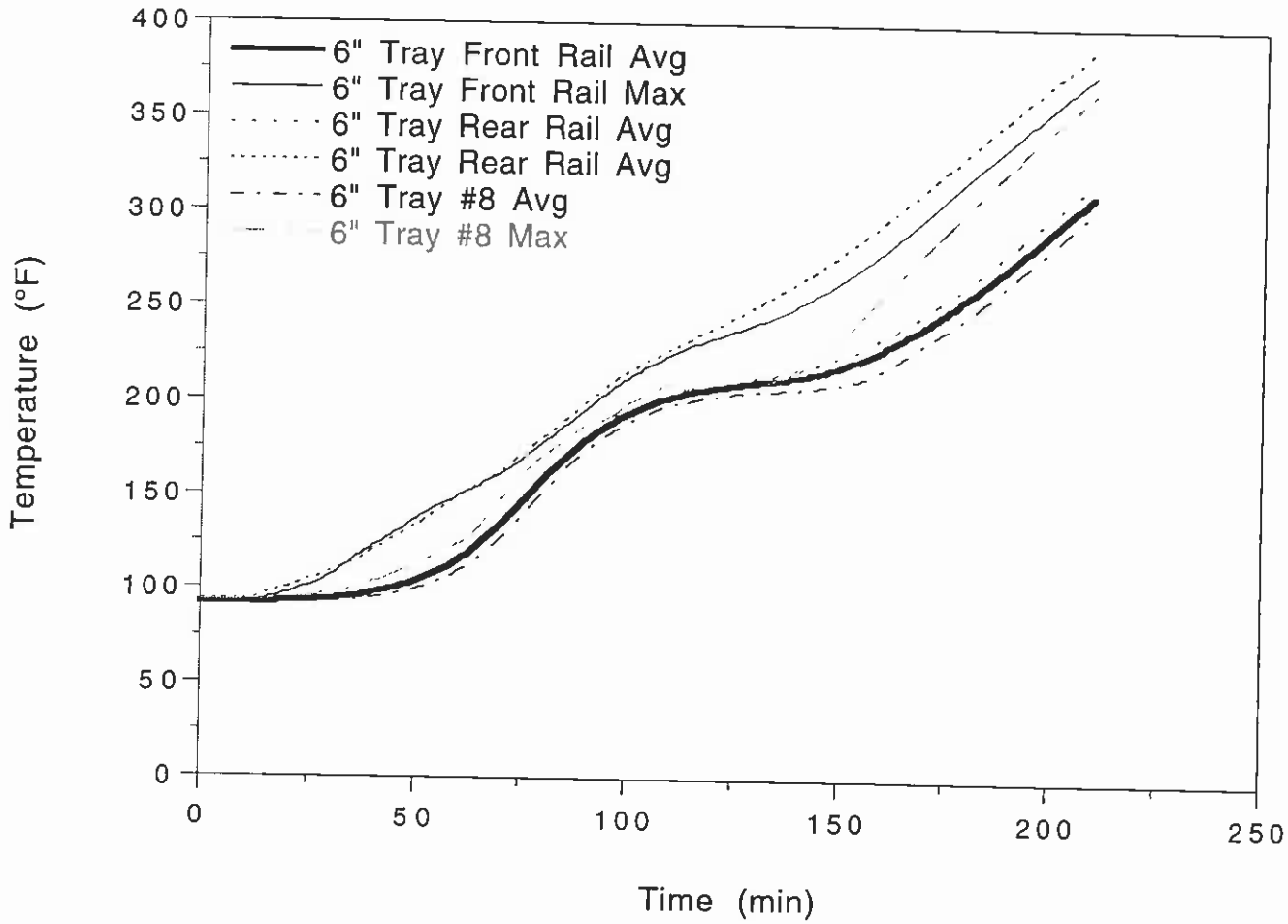
OMEGA POINT LABORATORIES

Peak Seals
Project No. 14840-99417
Furnace Temperatures



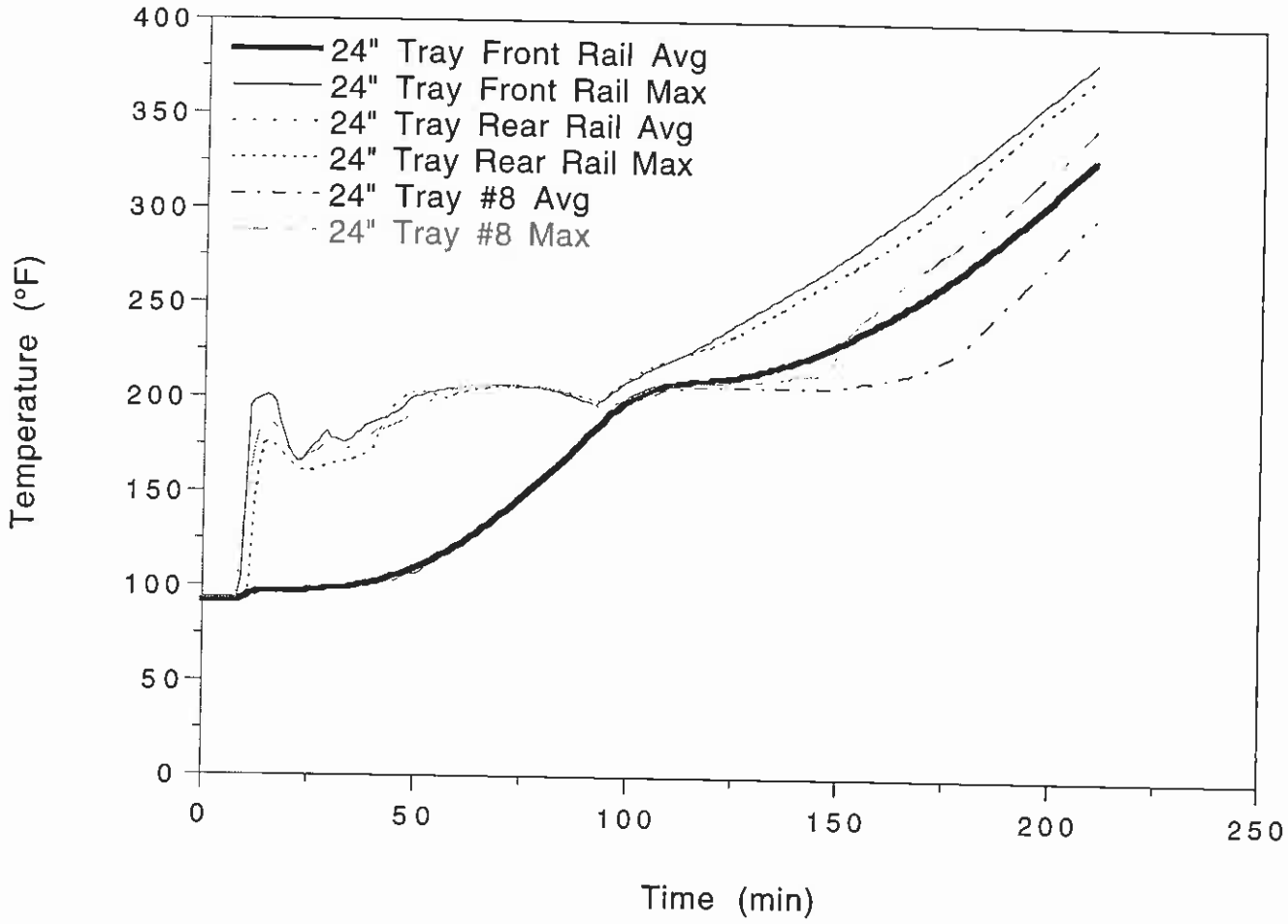
OMEGA POINT LABORATORIES

Peak Seals
Project No. 14840-99417
6" Cable Tray Temperatures



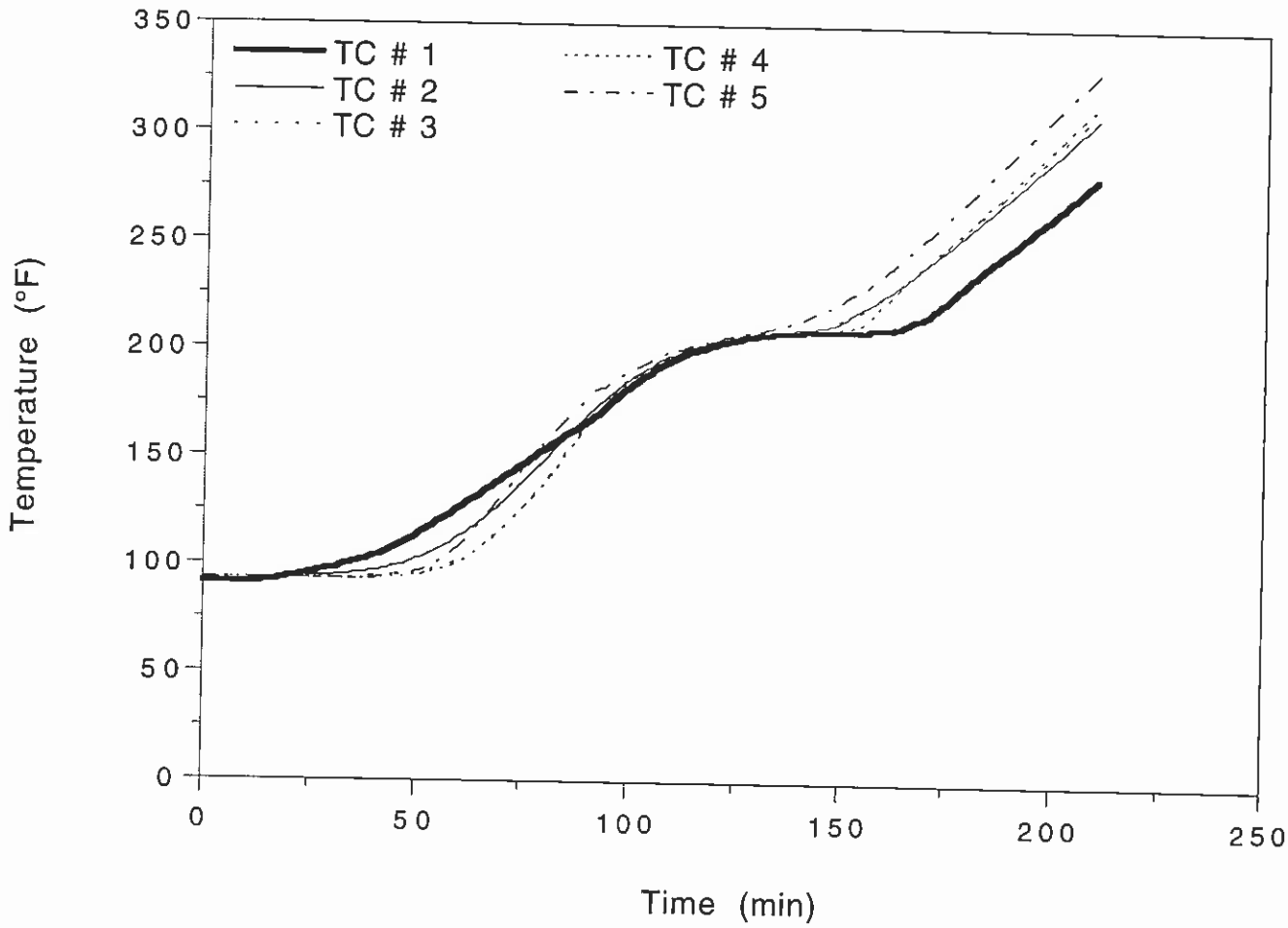
OMEGA POINT LABORATORIES

Peak Seals
Project No. 14840-99417
24" Cable Tray Temperatures



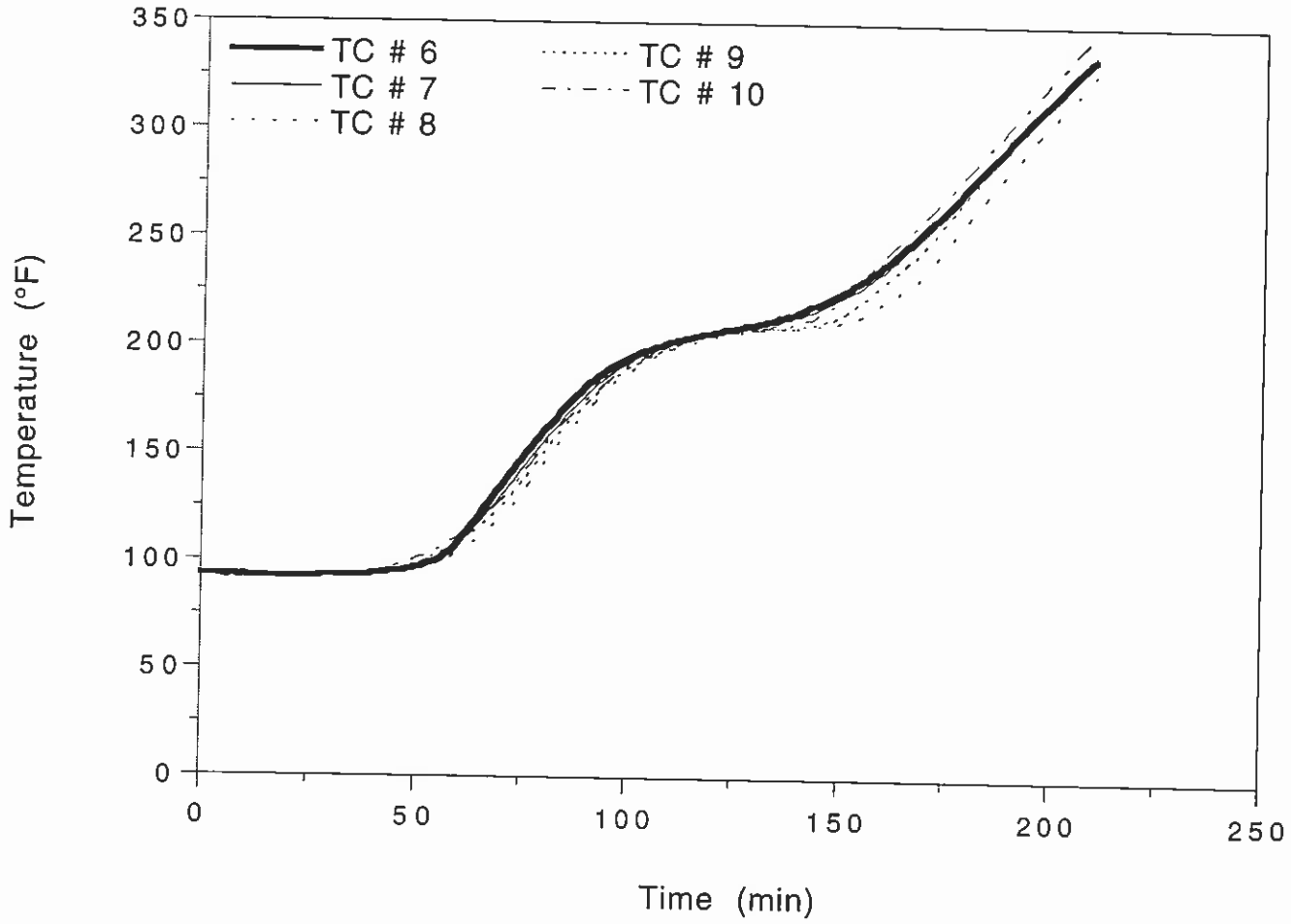
OMEGA POINT LABORATORIES

Peak Seals
Project No. 14840-99417
6" Tray Front Rail Temperatures



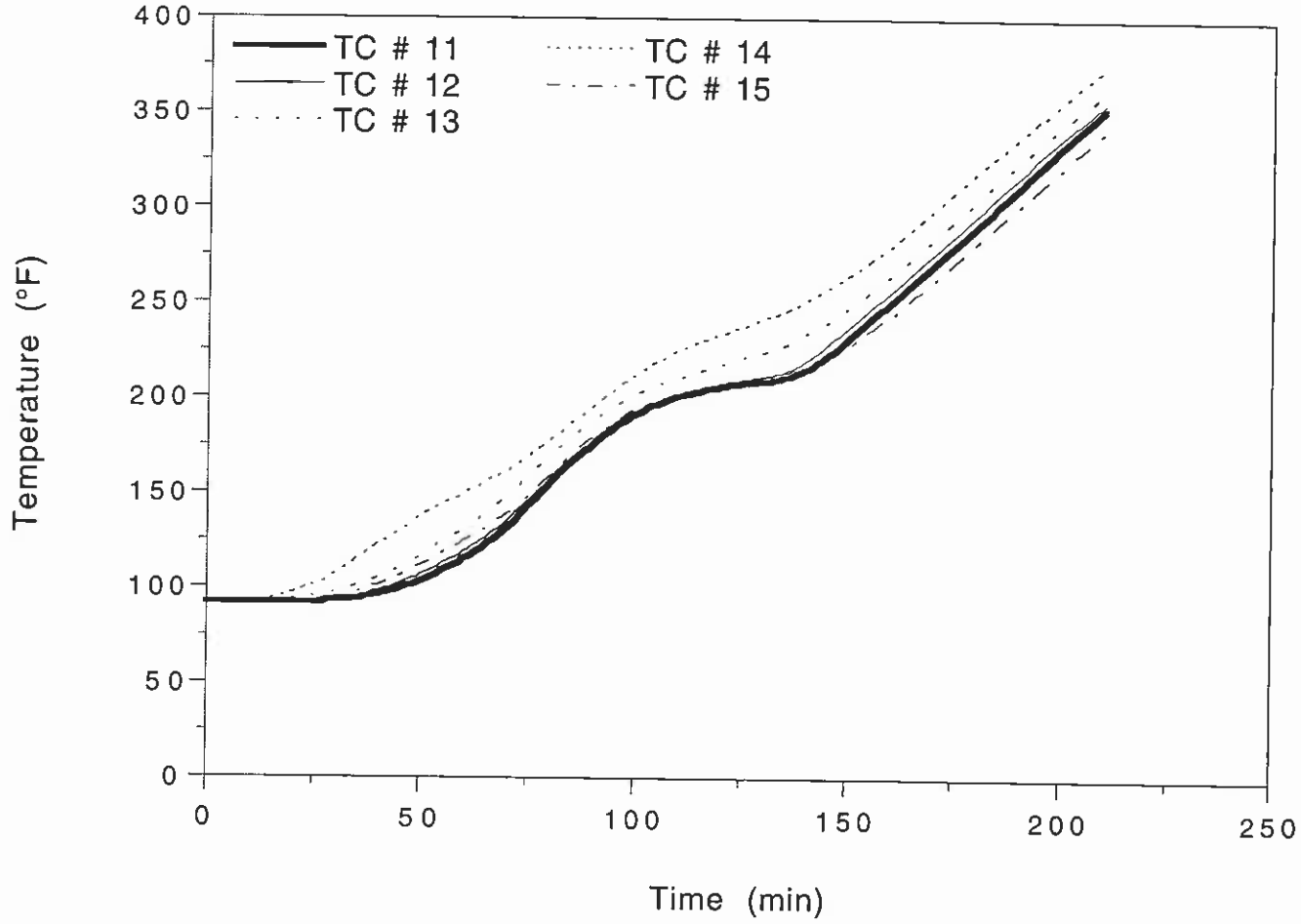
OMEGA POINT LABORATORIES

Peak Seals
Project No. 14840-99417
6" Tray Front Rail Temperatures



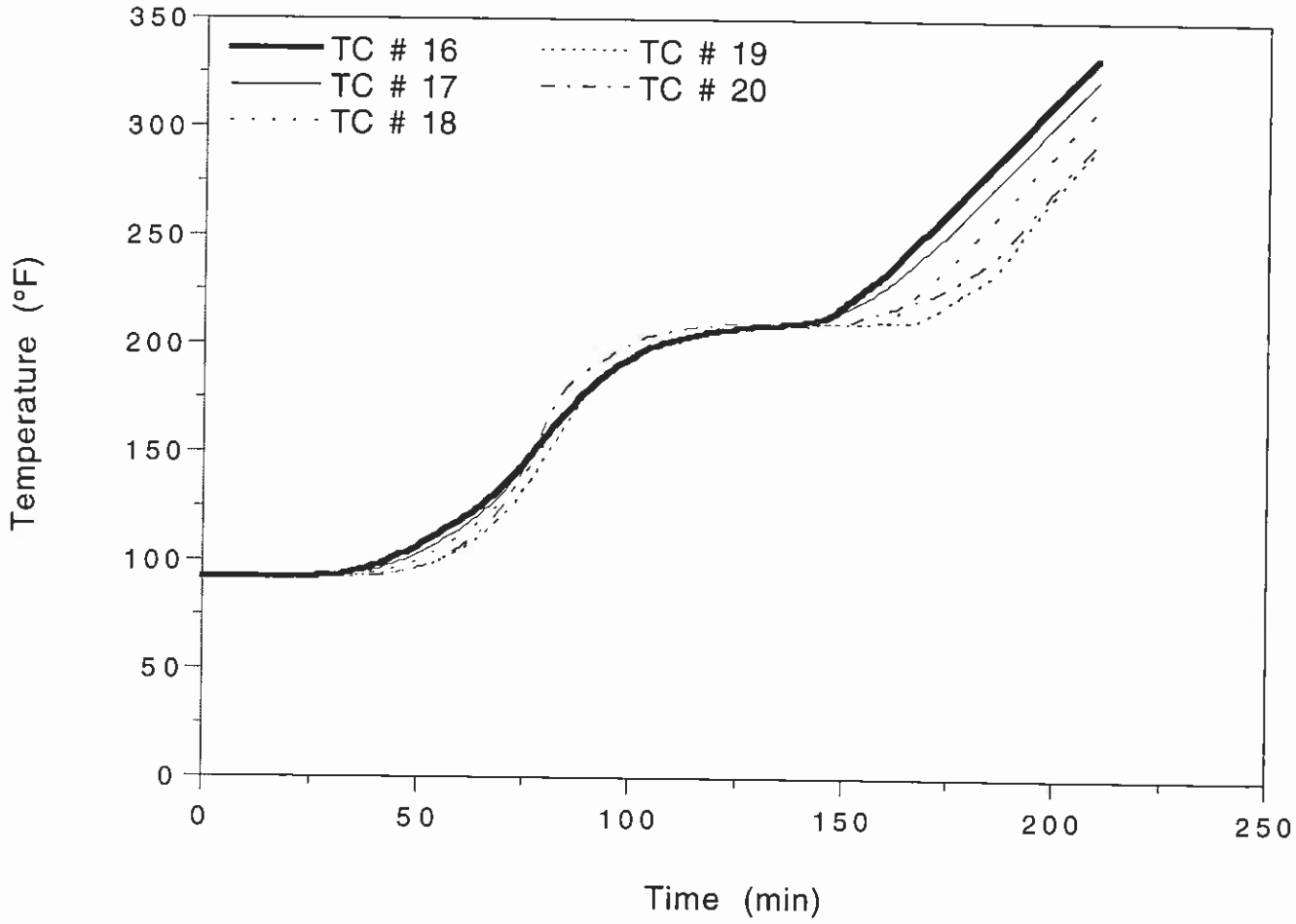
OMEGA POINT LABORATORIES

Peak Seals
Project No. 14840-99417
6" Tray Front Rail Temperatures



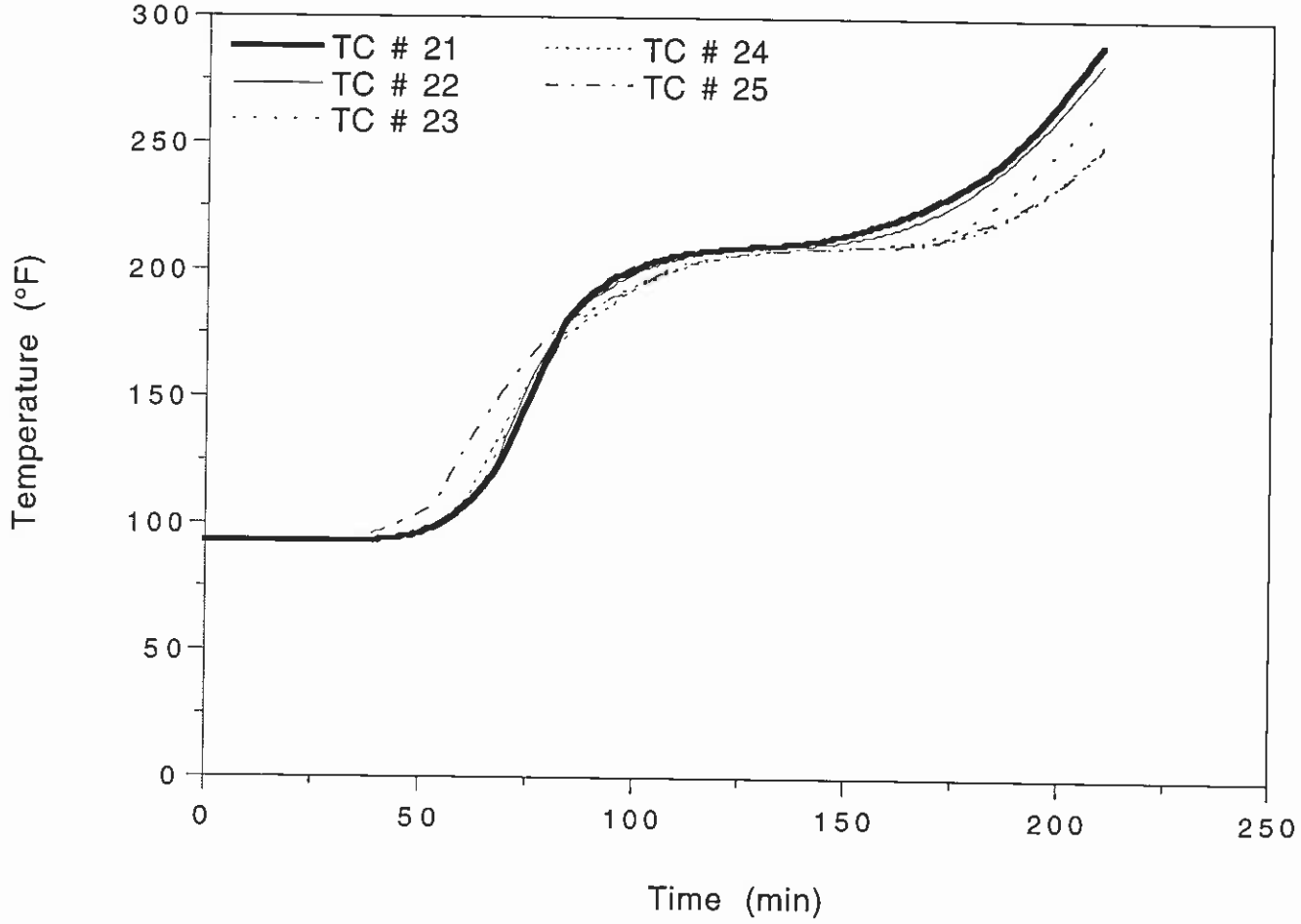
OMEGA POINT LABORATORIES

Peak Seals
Project No. 14840-99417
6" Tray Front Rail Temperatures



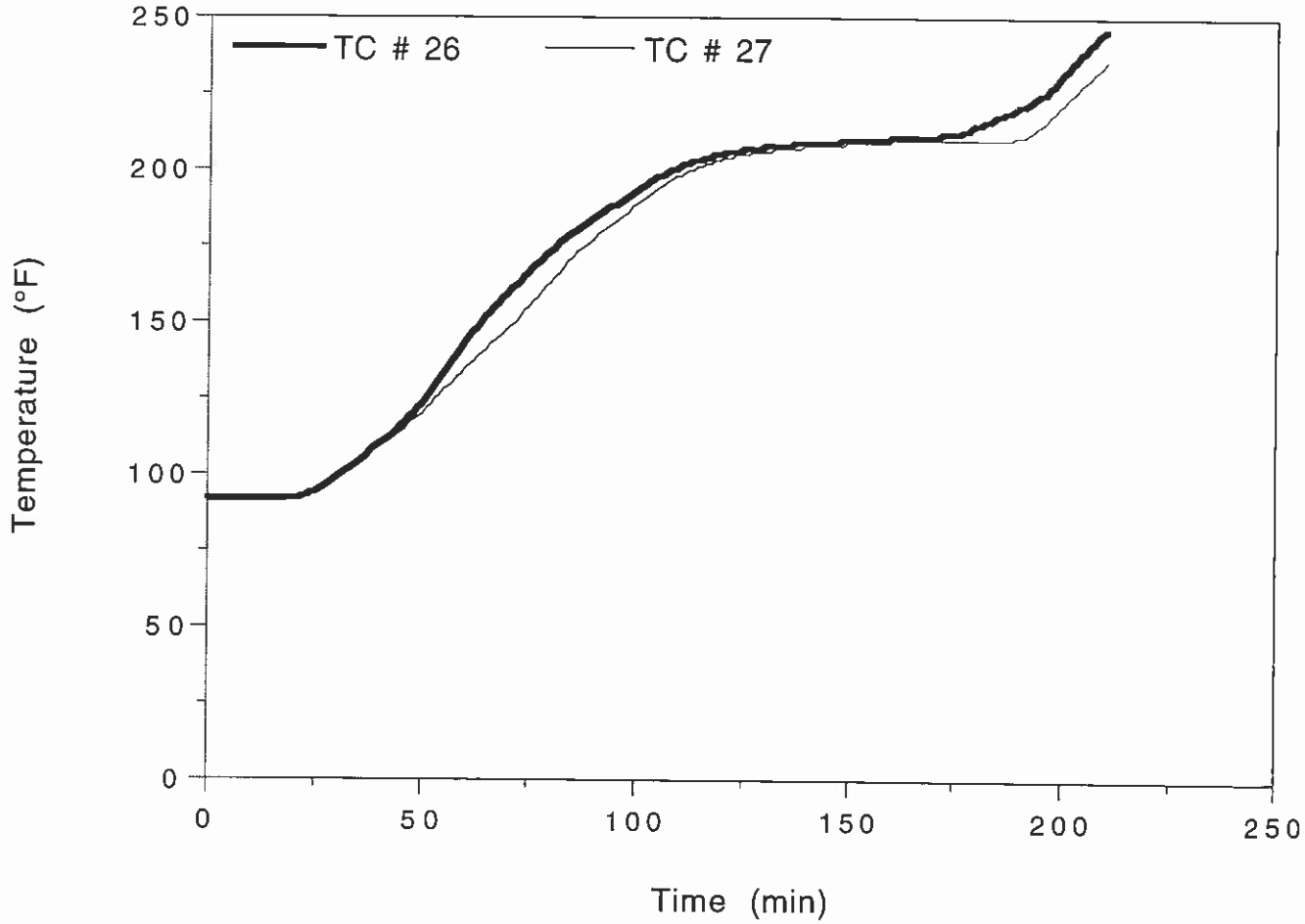
OMEGA POINT LABORATORIES

Peak Seals
Project No. 14840-99417
6" Tray Front Rail Temperatures



OMEGA POINT LABORATORIES

Peak Seals
Project No. 14840-99417
6" Tray Front Rail Temperatures



OMEGA POINT LABORATORIES

Peak Seals
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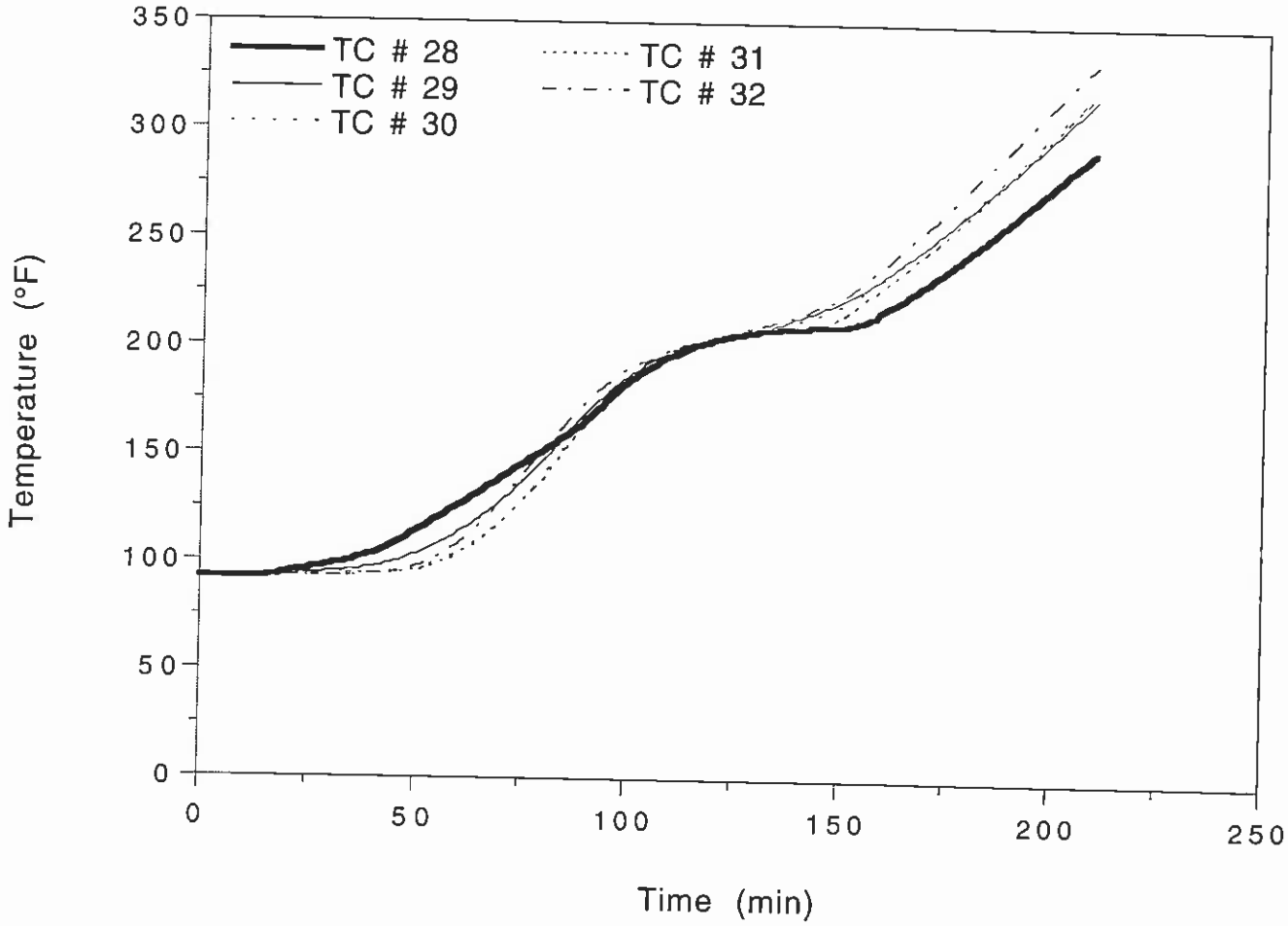
6" Tray Rear Rail Temperatures



OMEGA POINT LABORATORIES

Peak Seals
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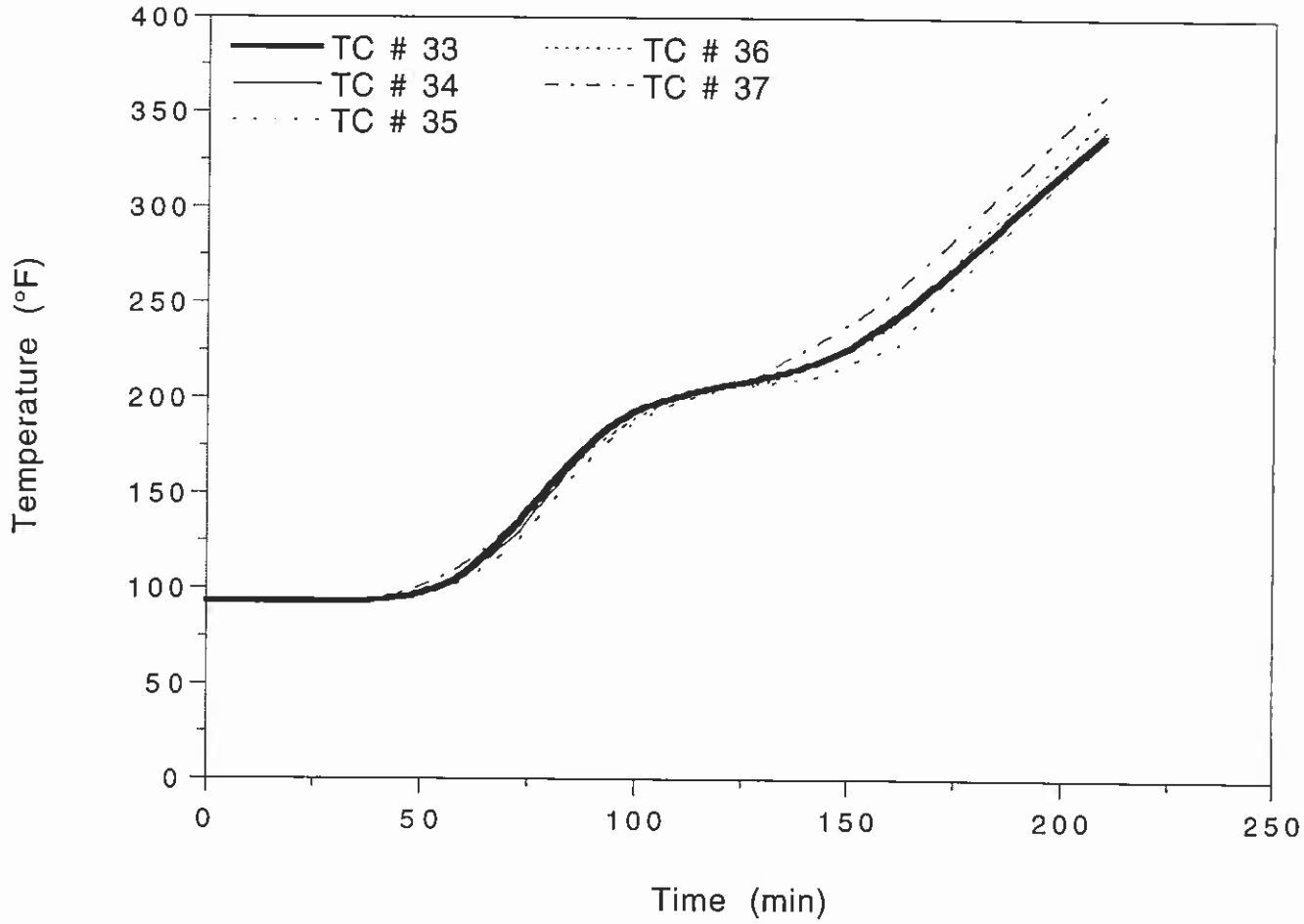
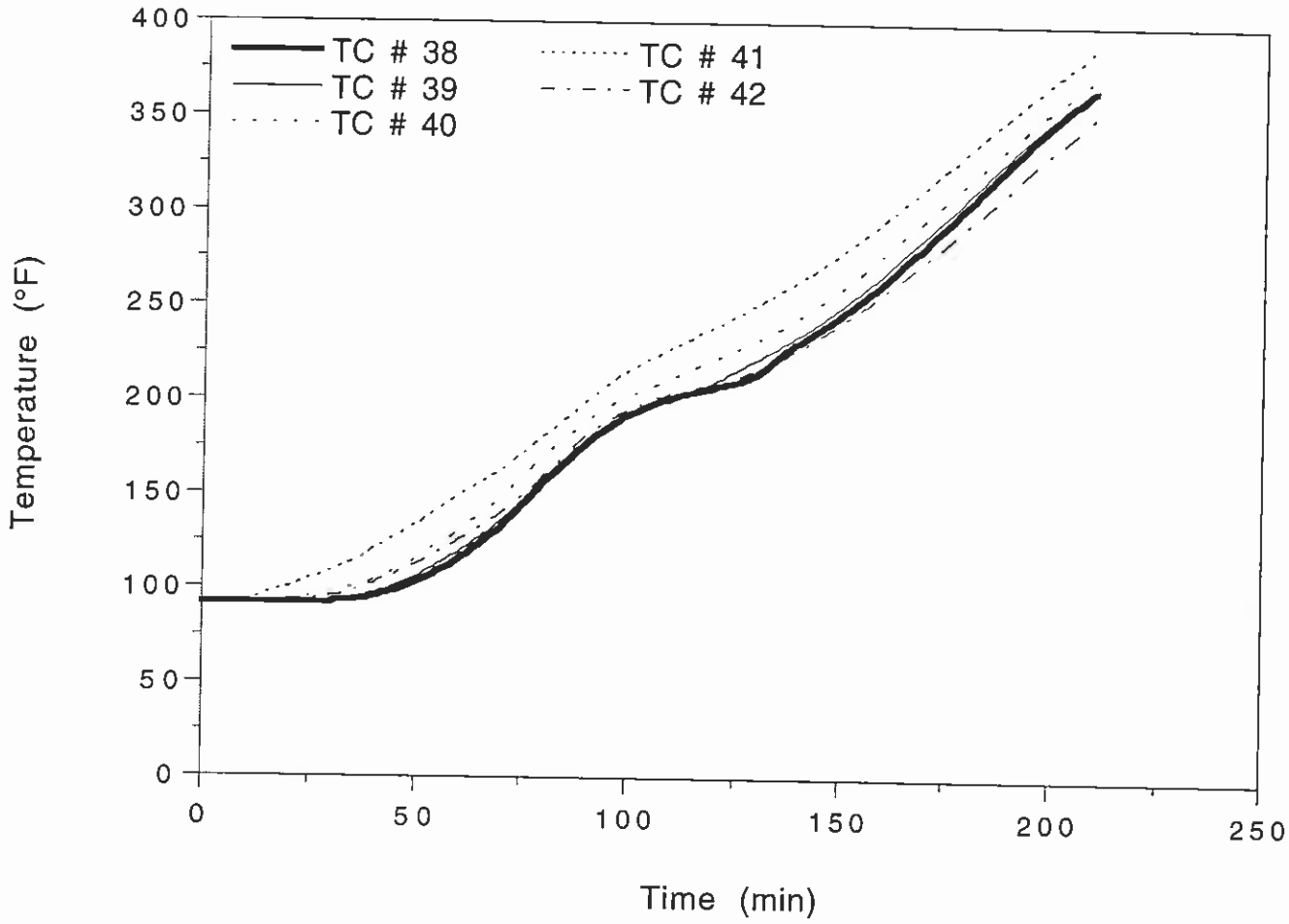
6" Tray Rear Rail Temperatures



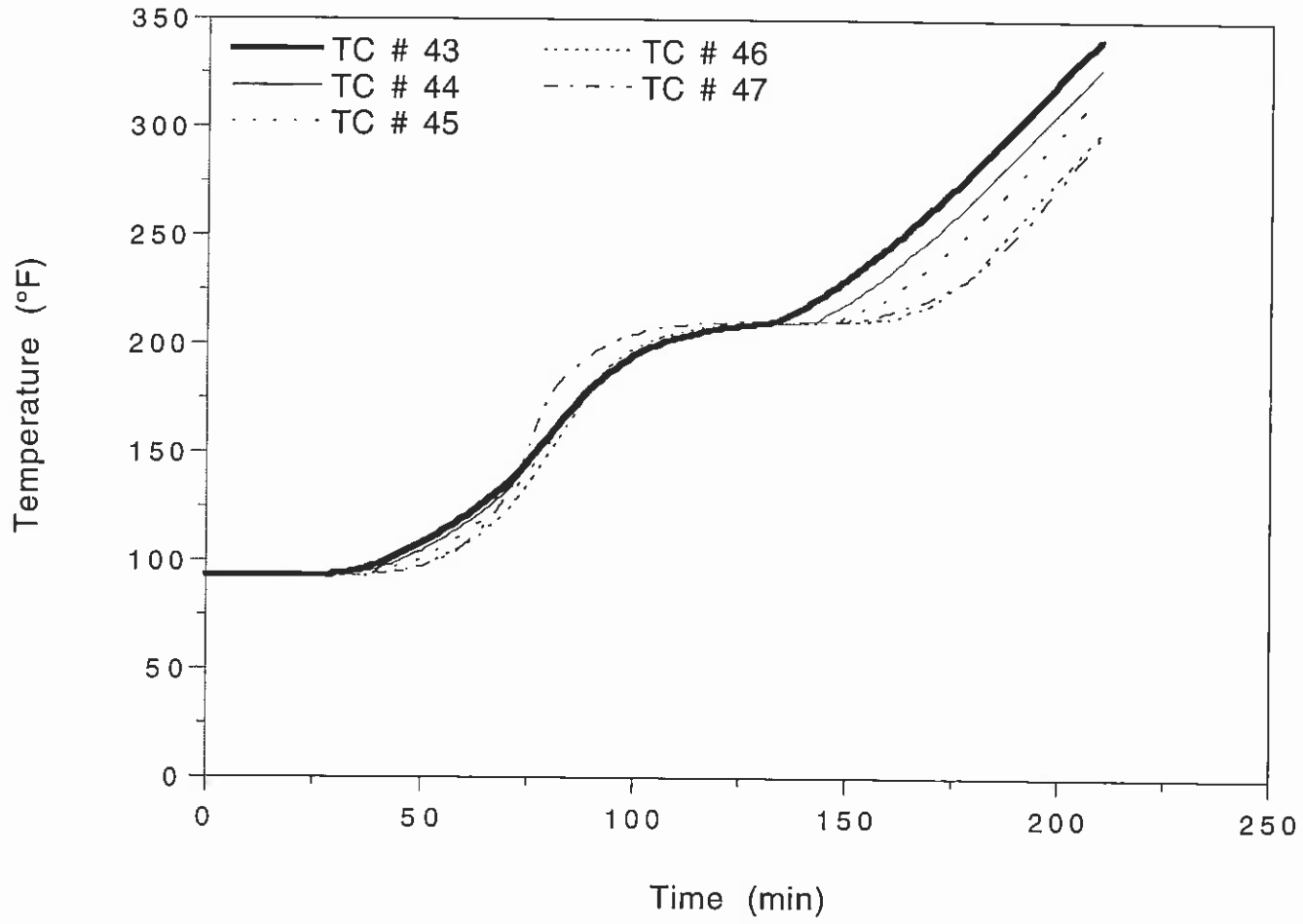
OMEGA POINT LABORATORIES

Peak Seals
Project No. 14840-99417
6" Tray Rear Rail Temperatures



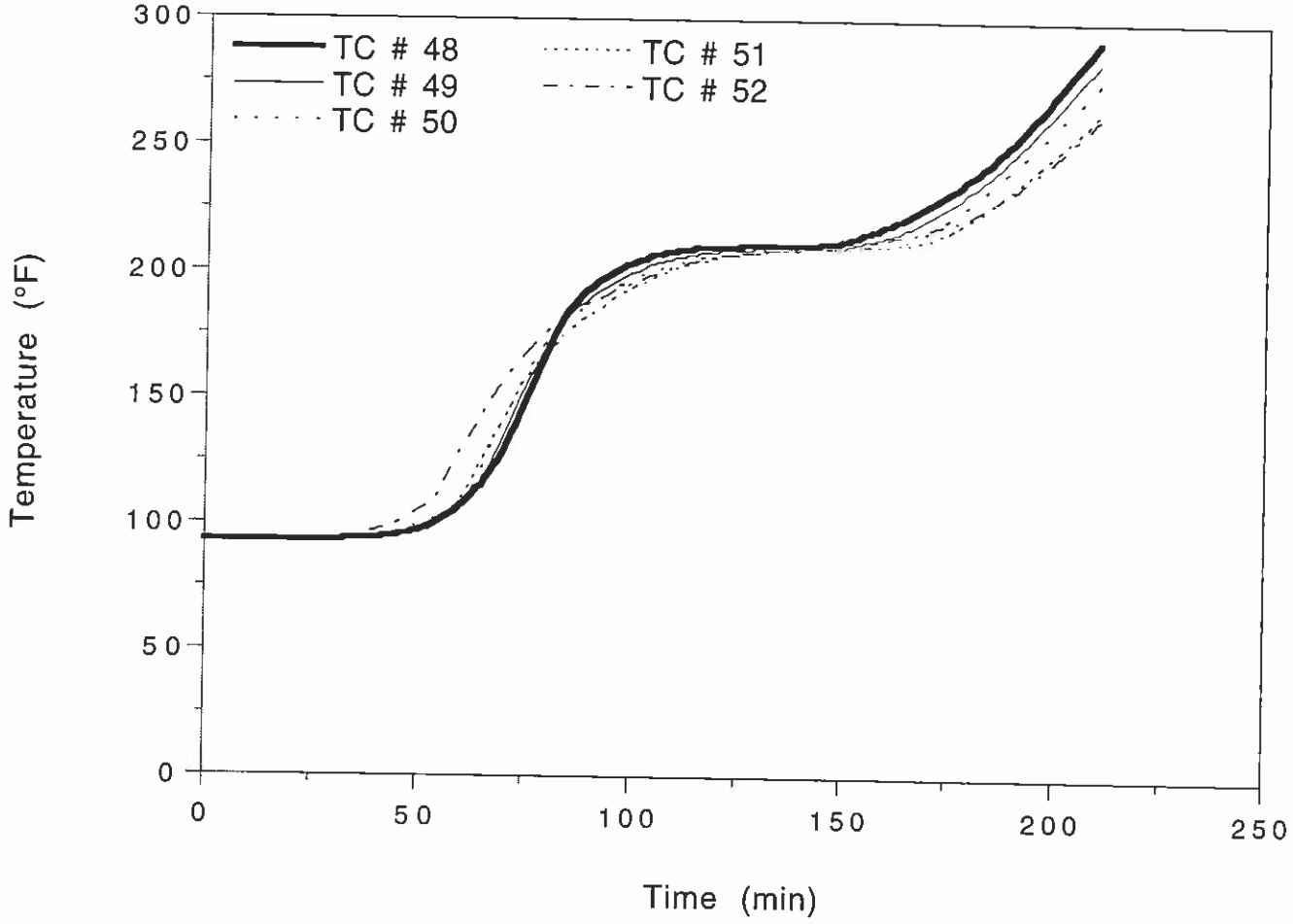
OMEGA POINT LABORATORIES

Peak Seals
Project No. 14840-99417
6" Tray Rear Rail Temperatures



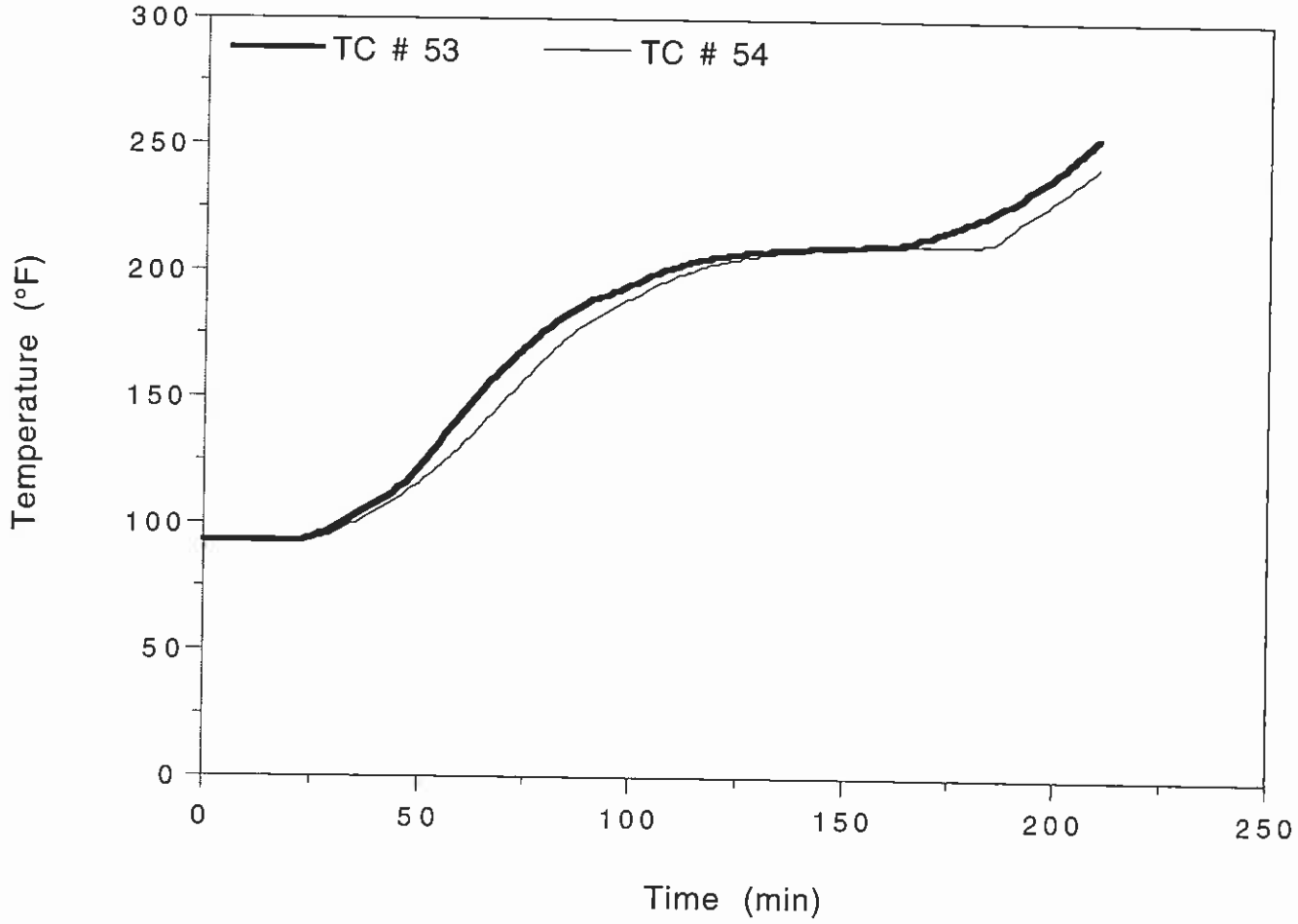
OMEGA POINT LABORATORIES

Peak Seals
Project No. 14840-99417
6" Tray Rear Rail Temperatures



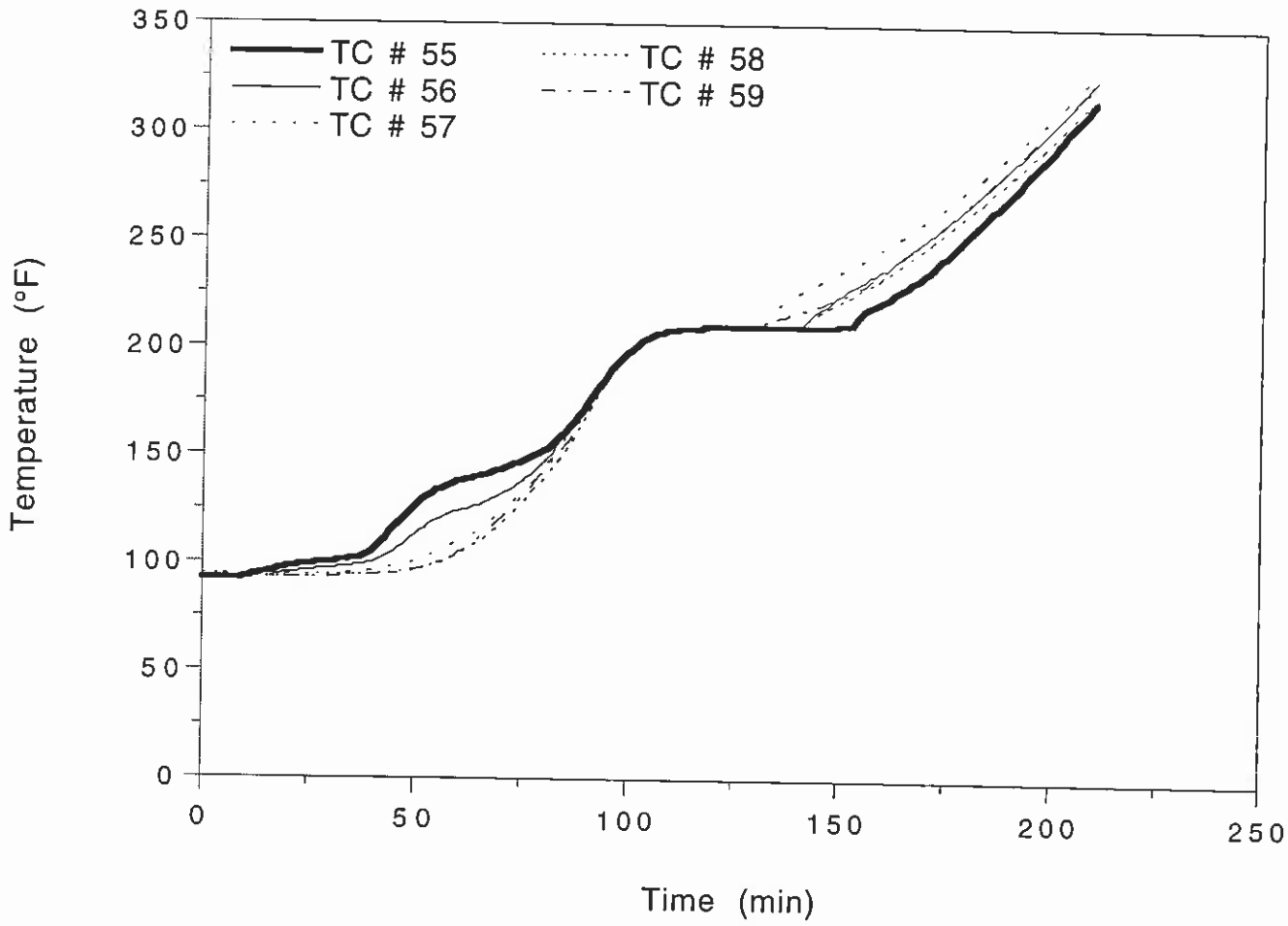
OMEGA POINT LABORATORIES

Peak Seals
Project No. 14840-99417
6" Tray Rear Rail Temperatures



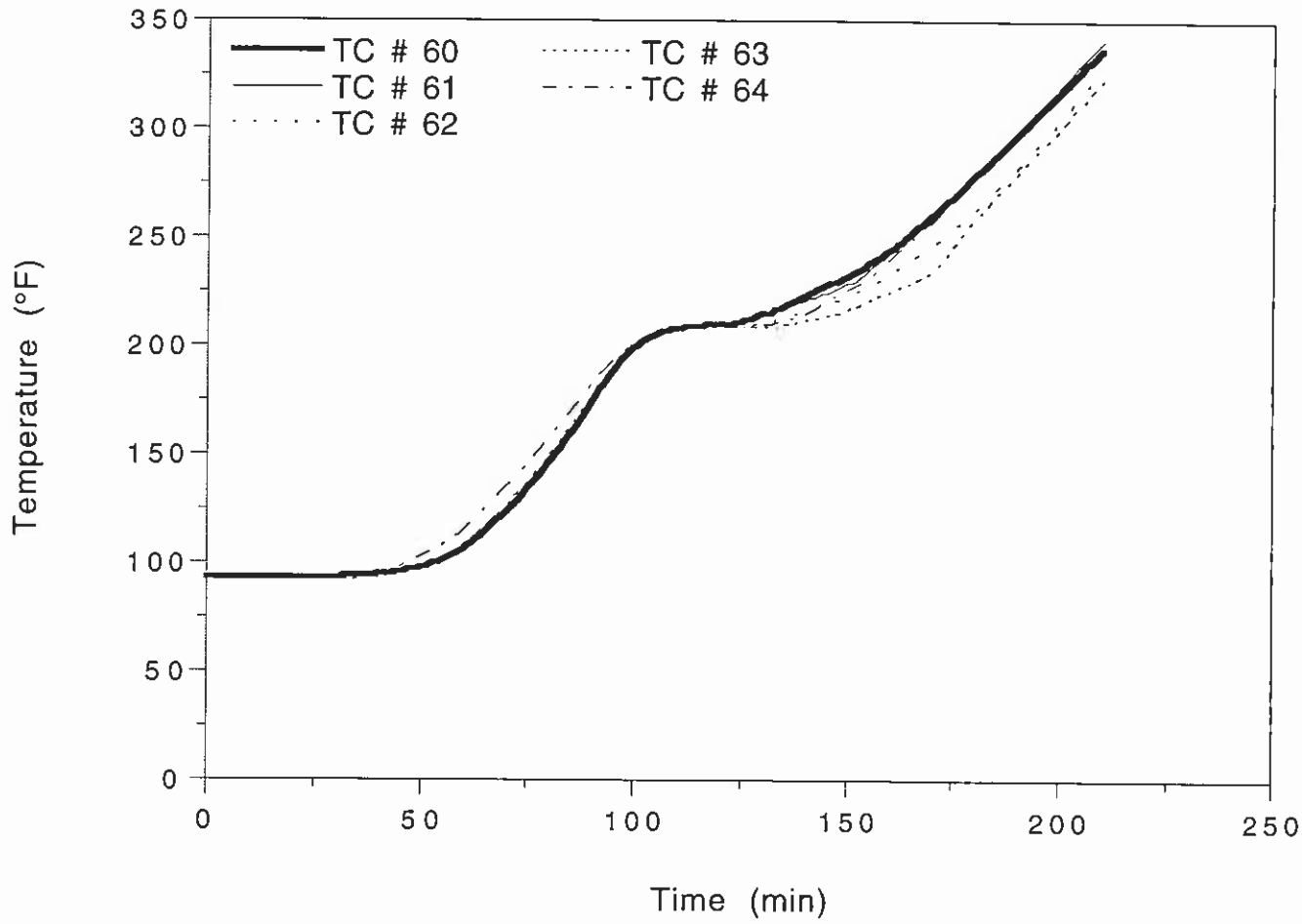
OMEGA POINT LABORATORIES

Peak Seals
Project No. 14840-99417
24" Tray Front Rail Temperatures



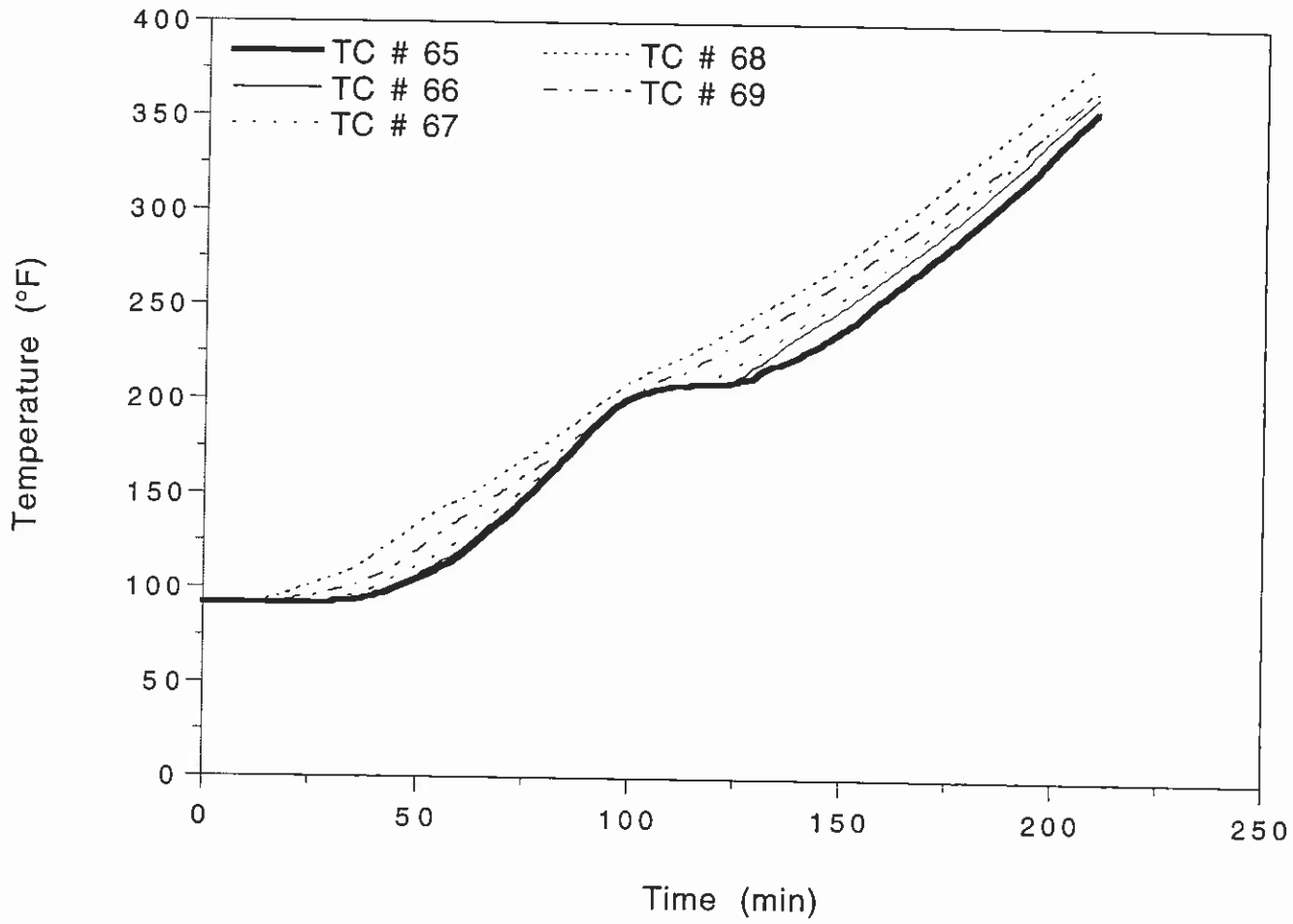
OMEGA POINT LABORATORIES

Peak Seals
Project No. 14840-99417
24" Tray Front Rail Temperatures



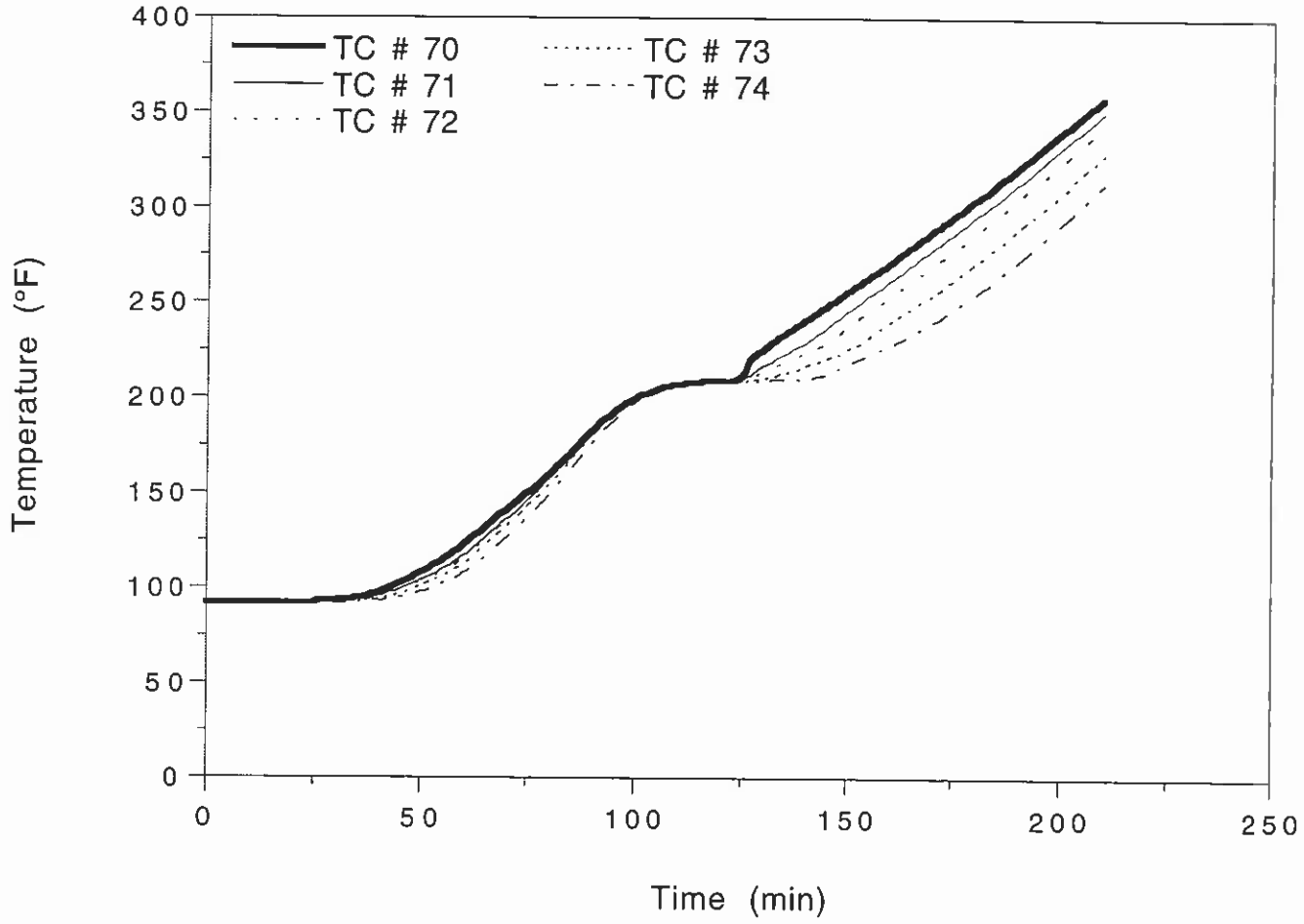
OMEGA POINT LABORATORIES

Peak Seals
Project No. 14840-99417
24" Tray Front Rail Temperatures



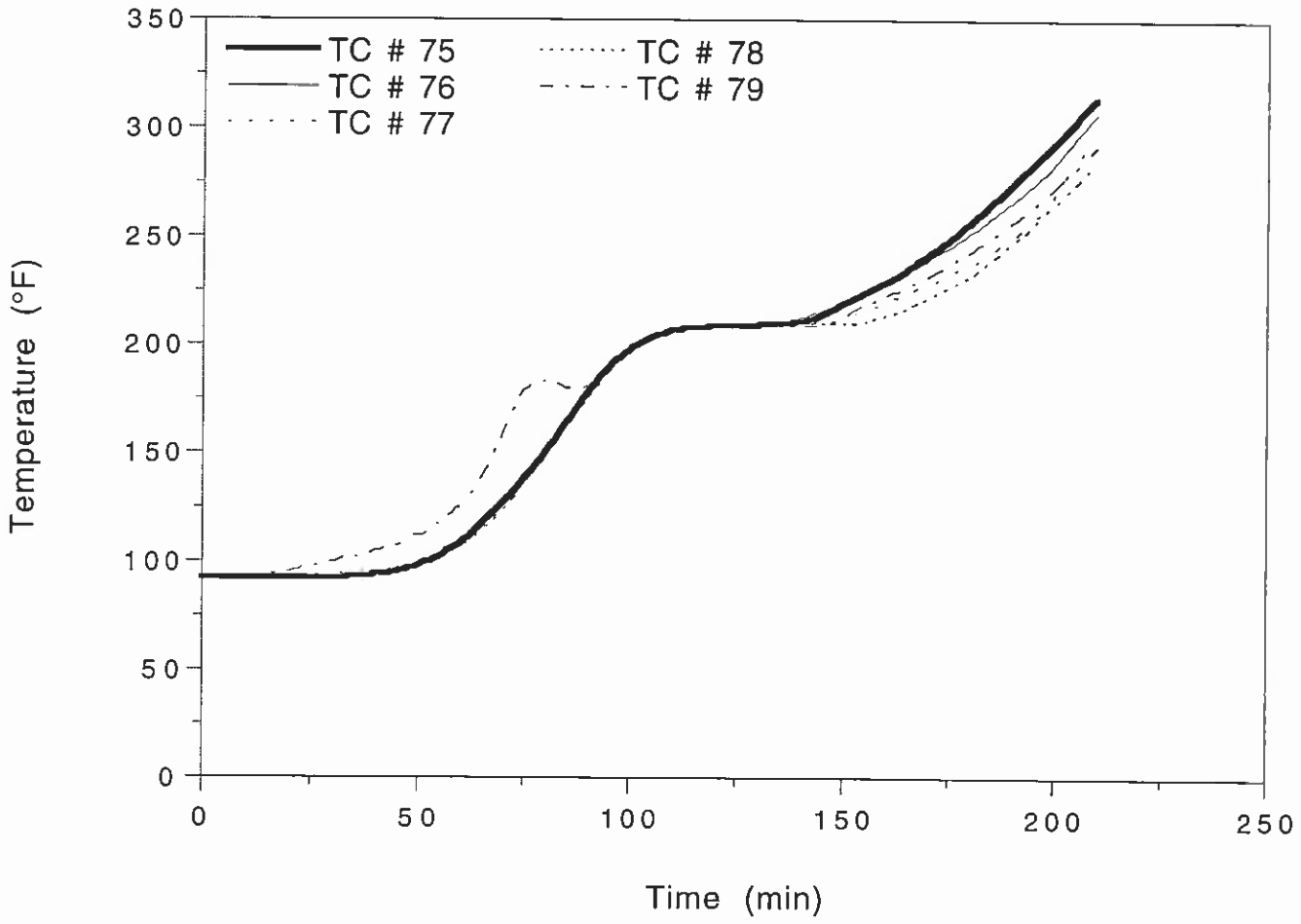
OMEGA POINT LABORATORIES

Peak Seals
Project No. 14840-99417
24" Tray Front Rail Temperatures



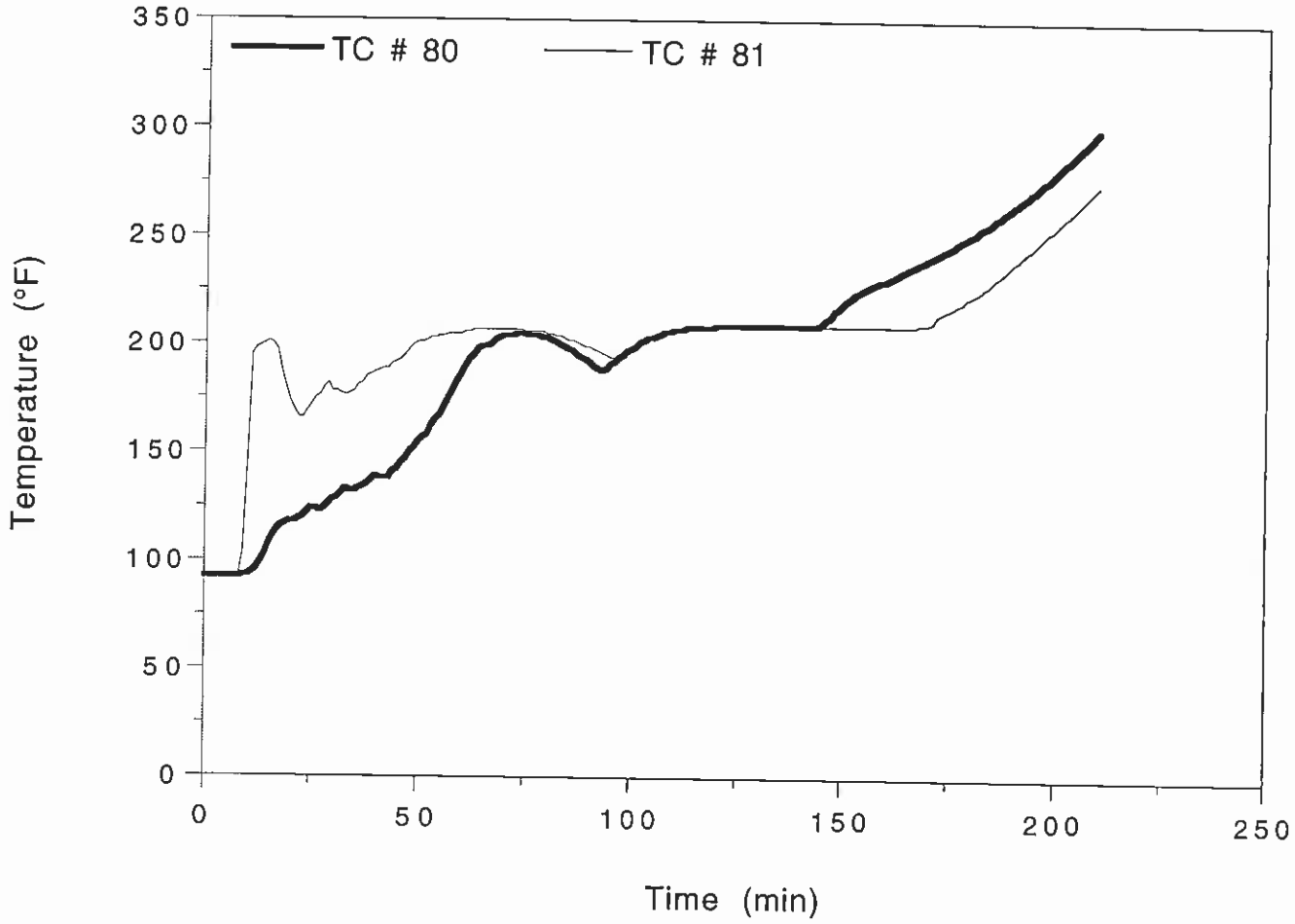
OMEGA POINT LABORATORIES

Peak Seals
Project No. 14840-99417
24" Tray Front Rail Temperatures



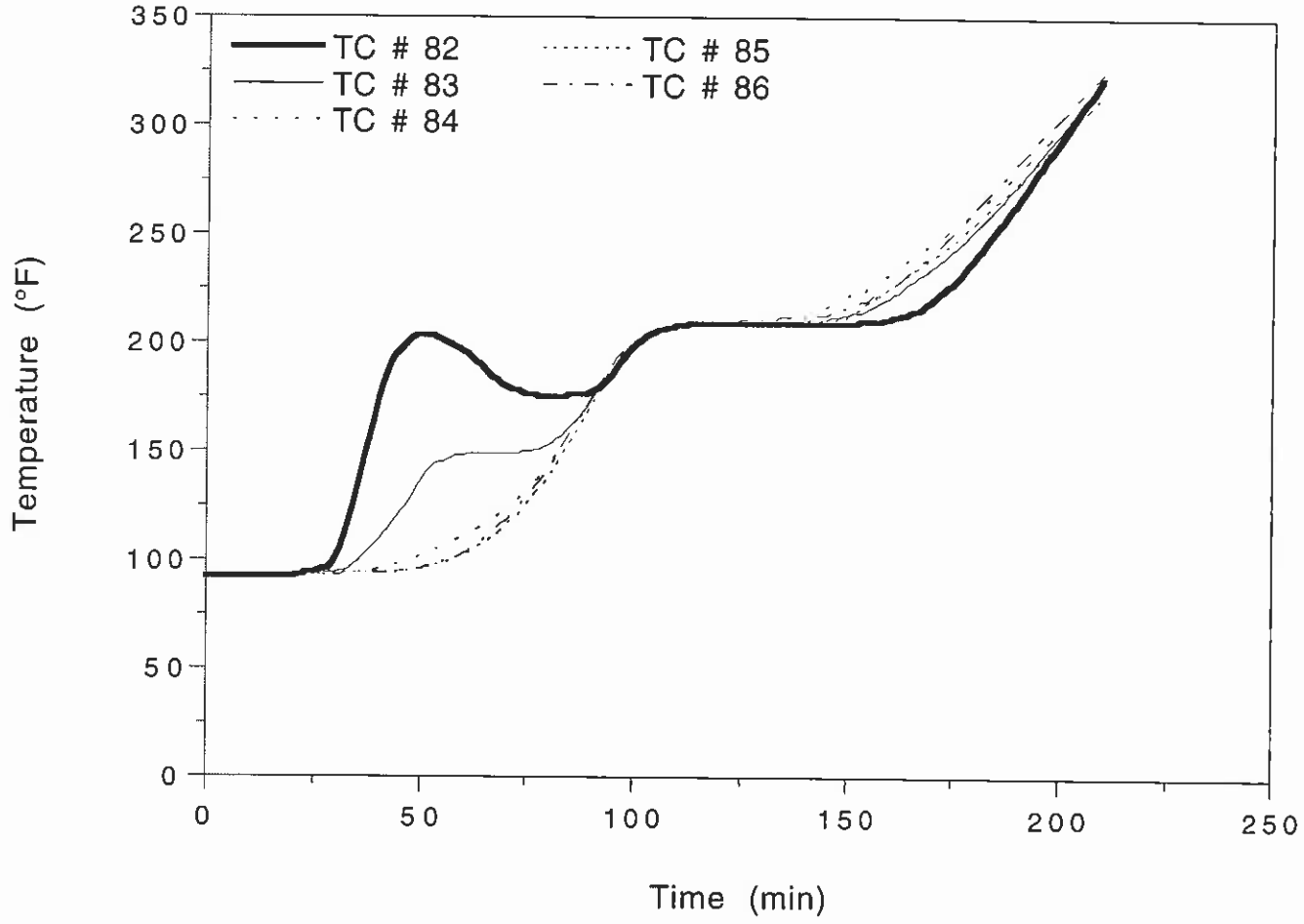
OMEGA POINT LABORATORIES

Peak Seals
Project No. 14840-99417
24" Tray Front Rail Temperatures



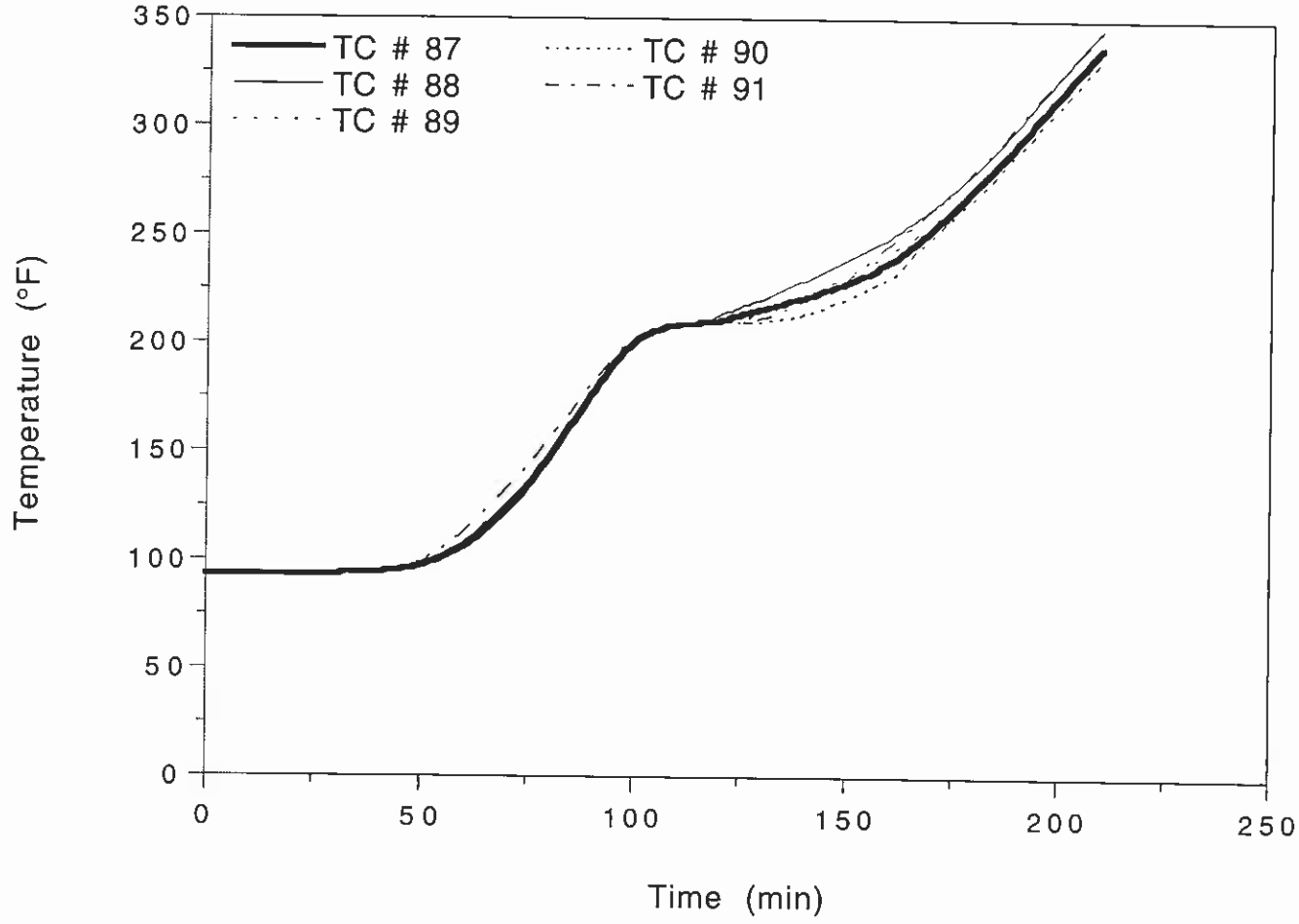
OMEGA POINT LABORATORIES

Peak Seals
Project No. 14840-99417
24" Tray Rear Rail Temperatures



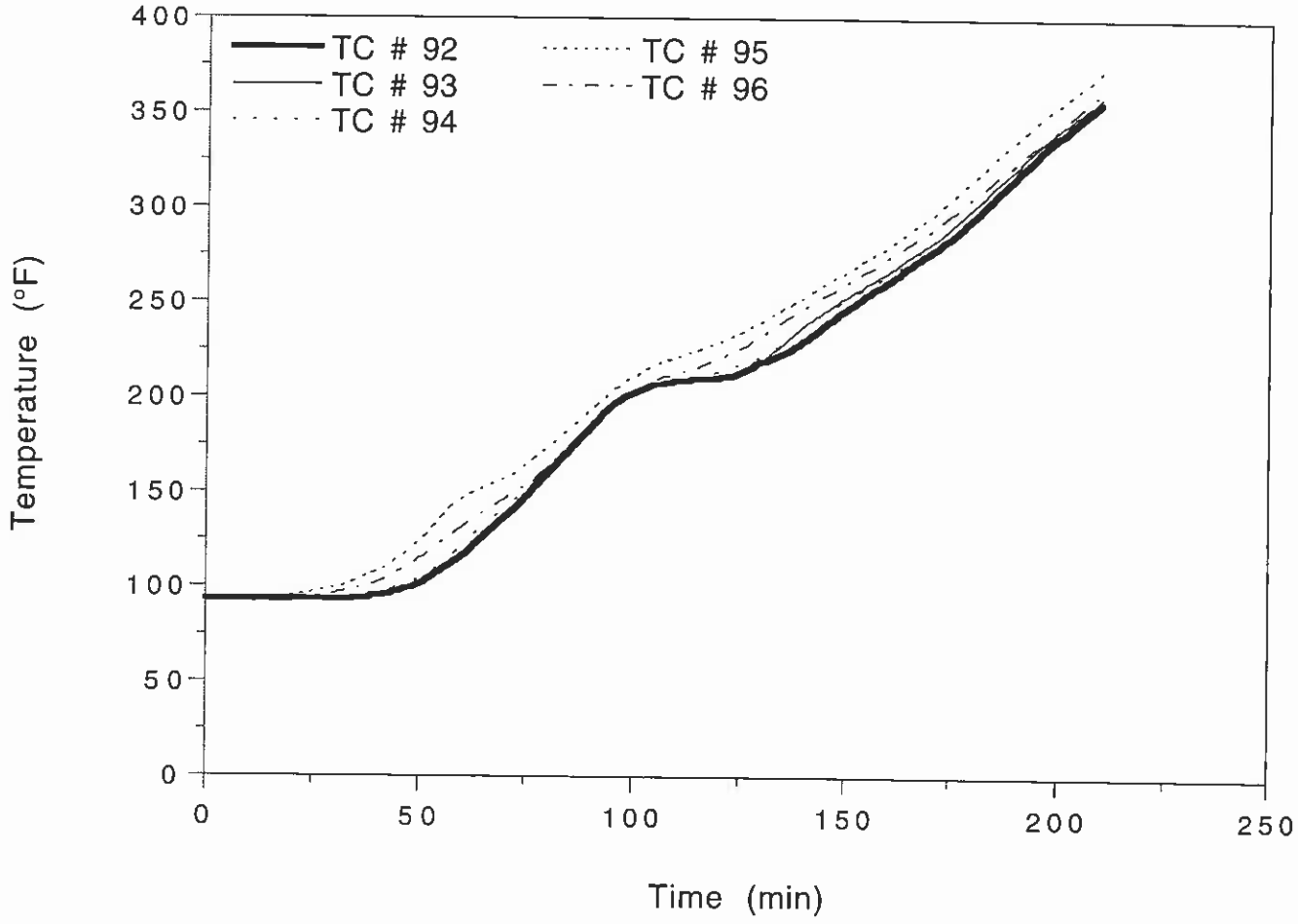
OMEGA POINT LABORATORIES

Peak Seals
Project No. 14840-99417
24" Tray Rear Rail Temperatures



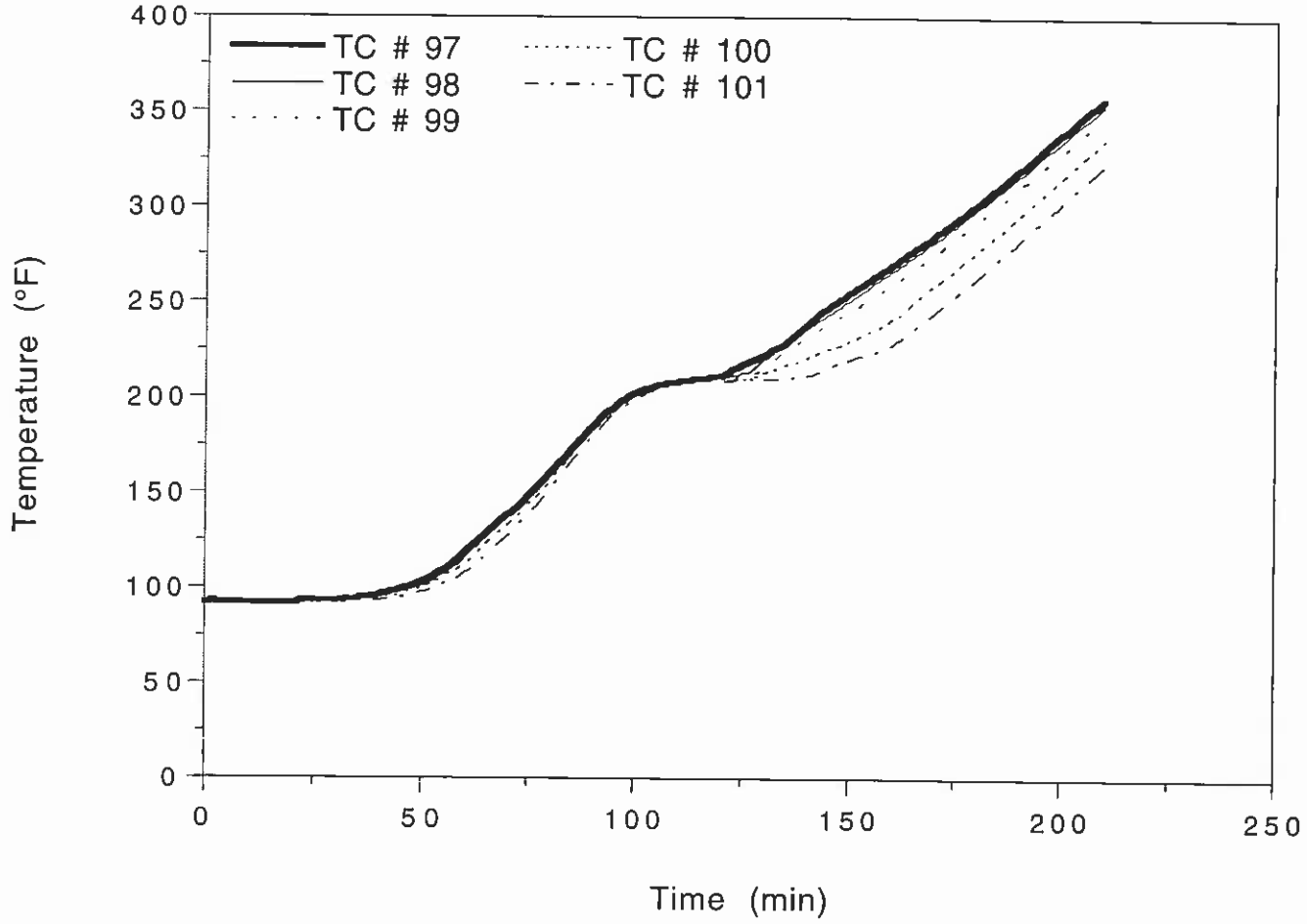
OMEGA POINT LABORATORIES

Peak Seals
Project No. 14840-99417
24" Tray Rear Rail Temperatures



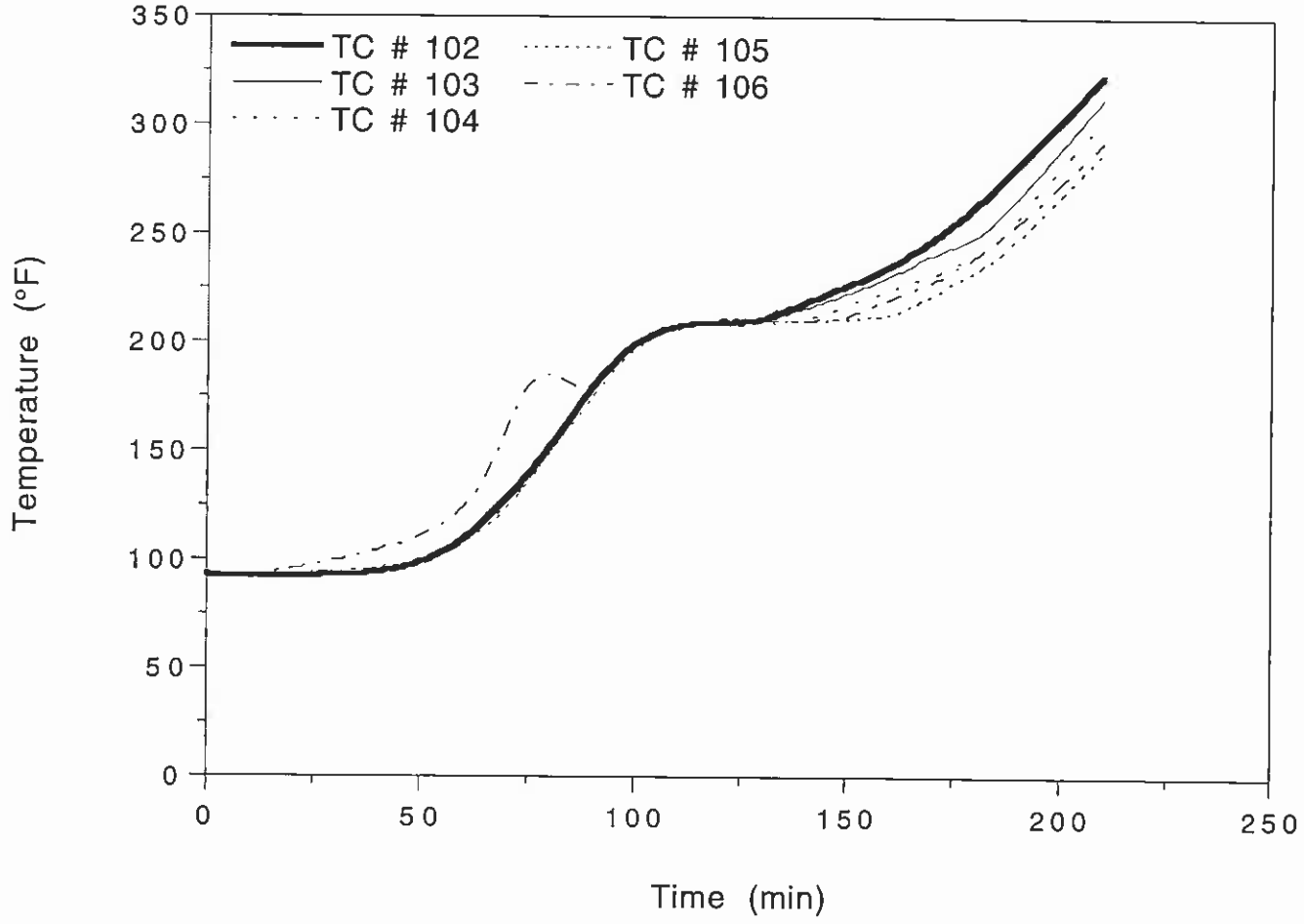
OMEGA POINT LABORATORIES

Peak Seals
Project No. 14840-99417
24" Tray Rear Rail Temperatures



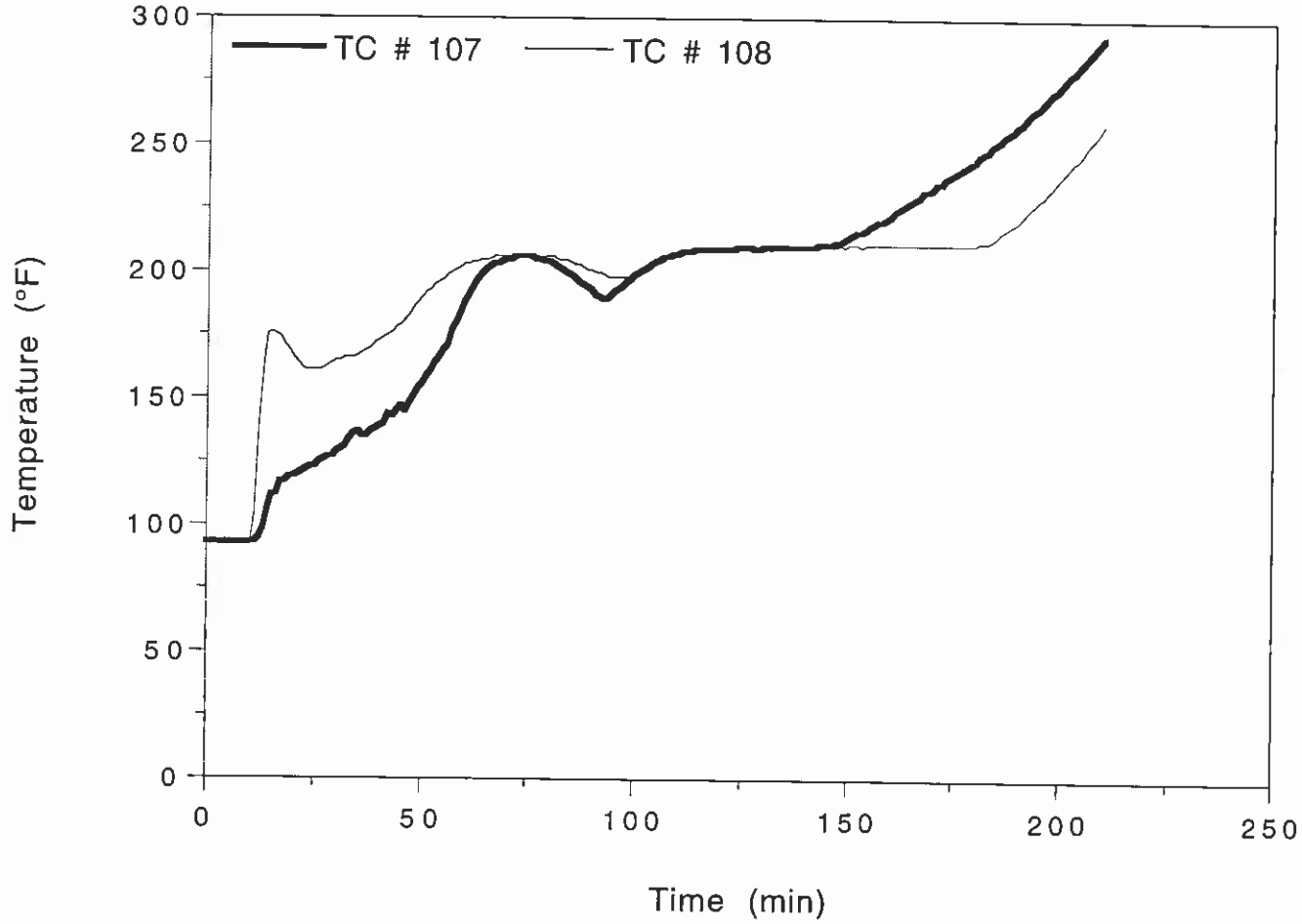
OMEGA POINT LABORATORIES

Peak Seals
Project No. 14840-99417
24" Tray Rear Rail Temperatures



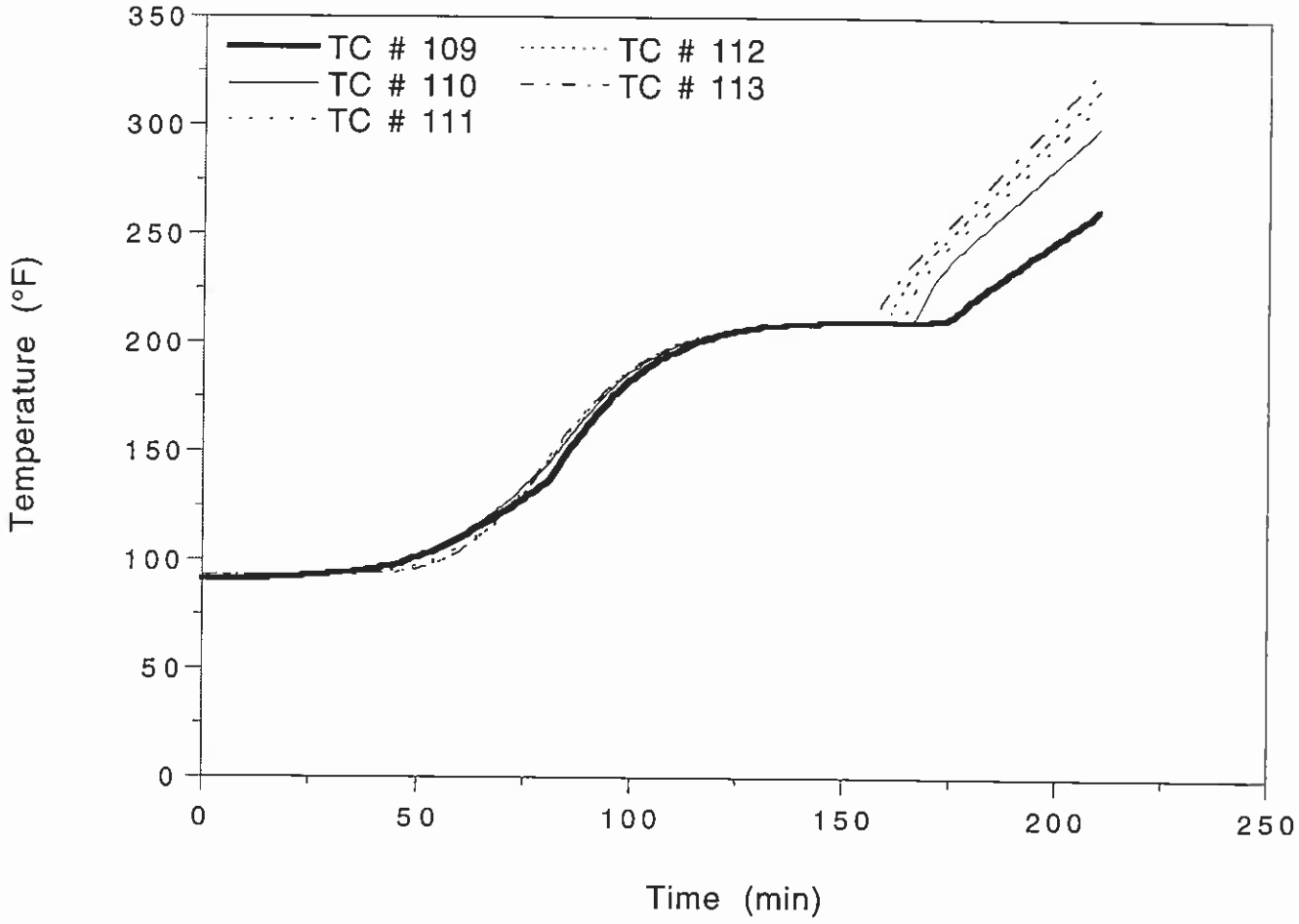
OMEGA POINT LABORATORIES

Peak Seals
Project No. 14840-99417
24" Tray Rear Rail Temperatures



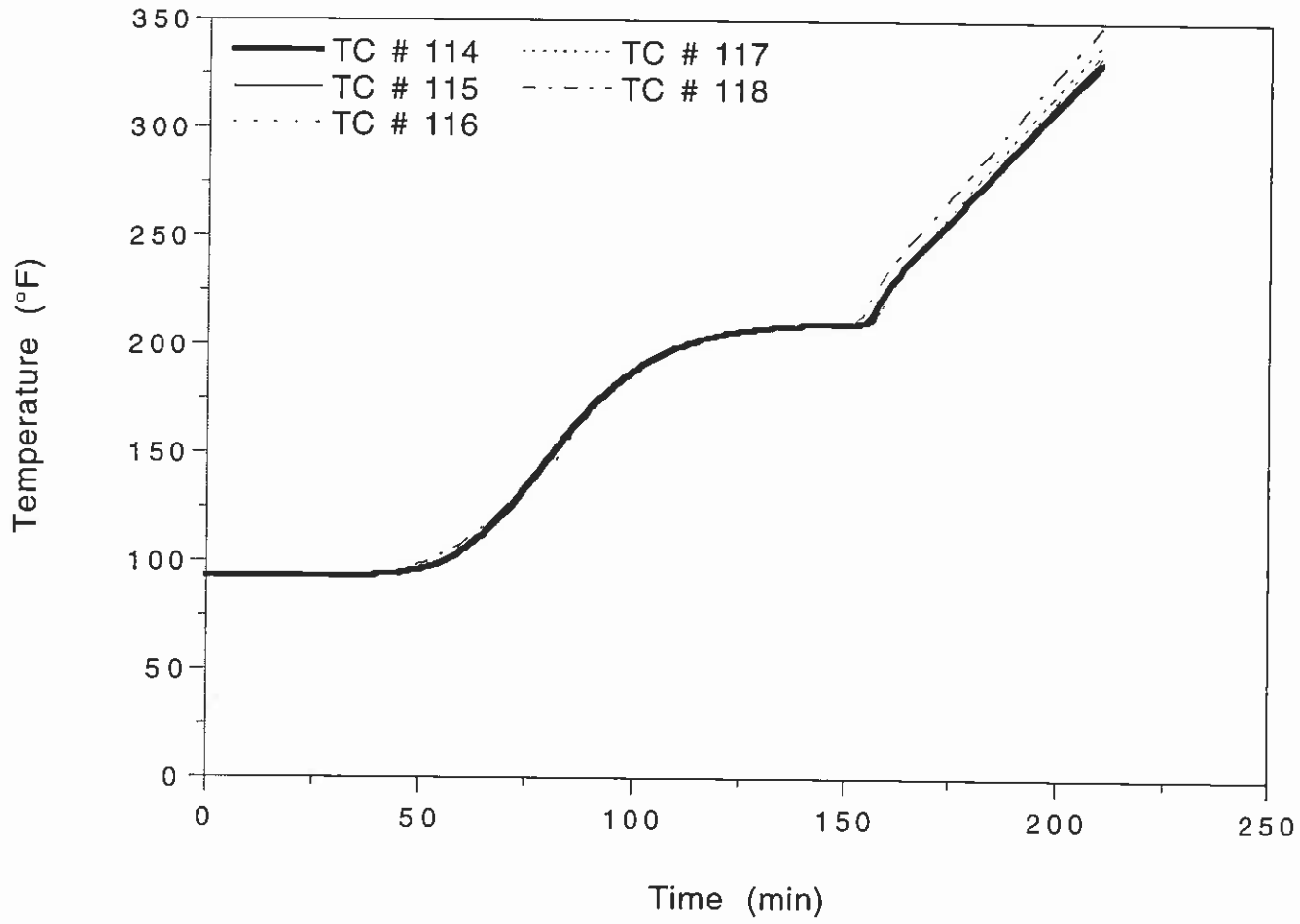
OMEGA POINT LABORATORIES

Peak Seals
Project No. 14840-99417
6" Tray Bare #8 Temperatures



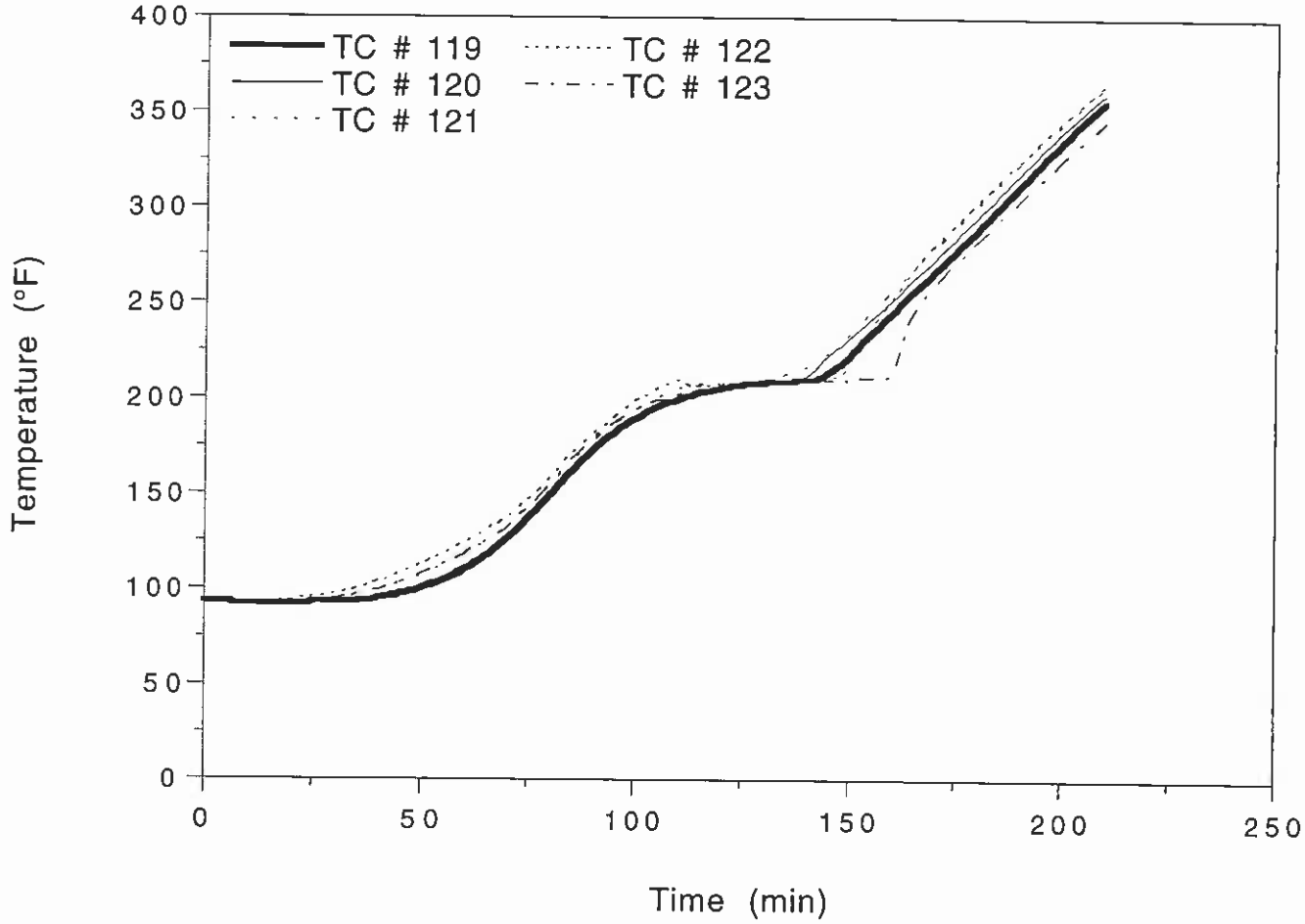
OMEGA POINT LABORATORIES

Peak Seals
Project No. 14840-99417
6" Tray Bare #8 Temperatures



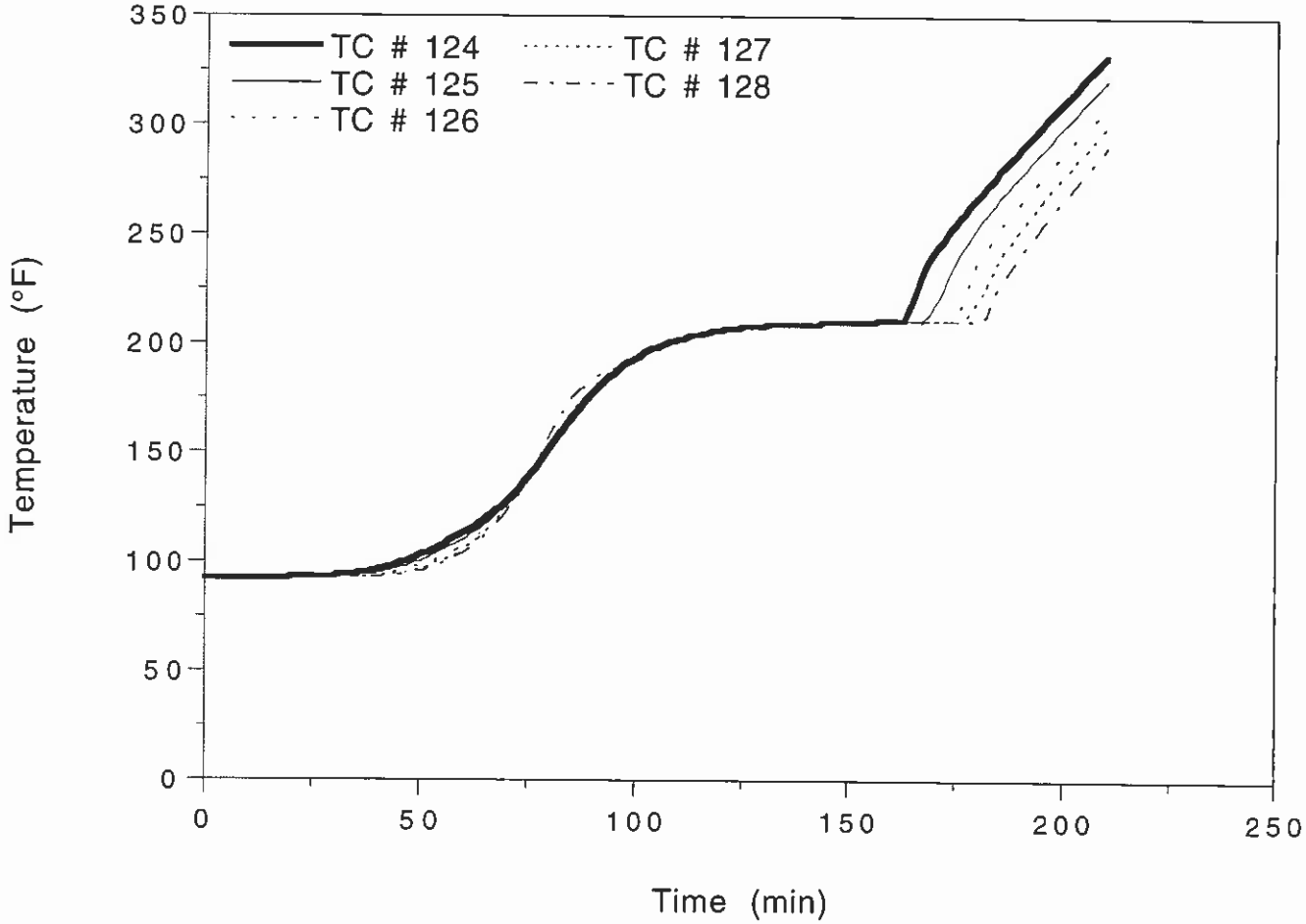
OMEGA POINT LABORATORIES

Peak Seals
Project No. 14840-99417
6" Tray Bare #8 Temperatures



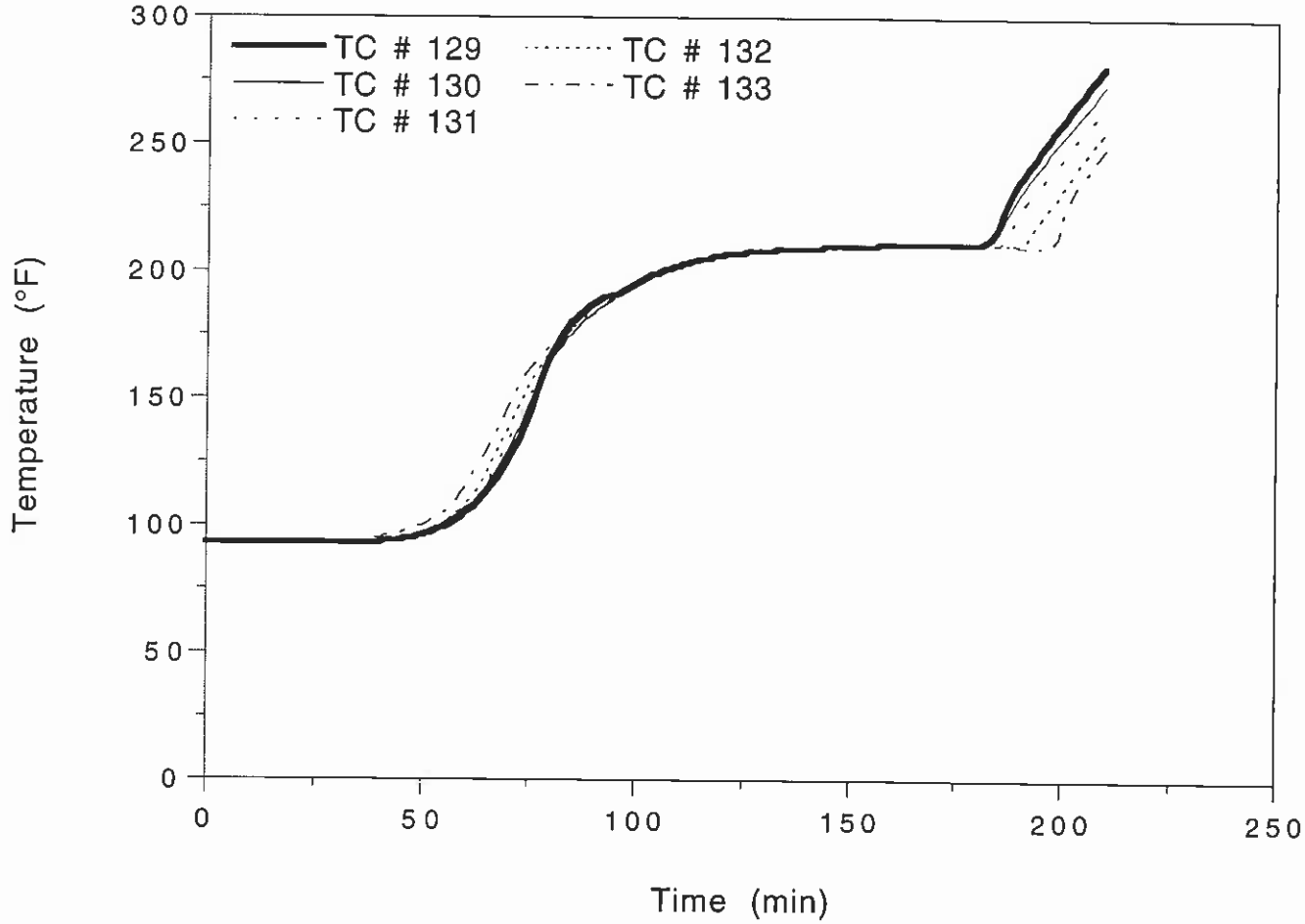
OMEGA POINT LABORATORIES

Peak Seals
Project No. 14840-99417
6" Tray Bare #8 Temperatures



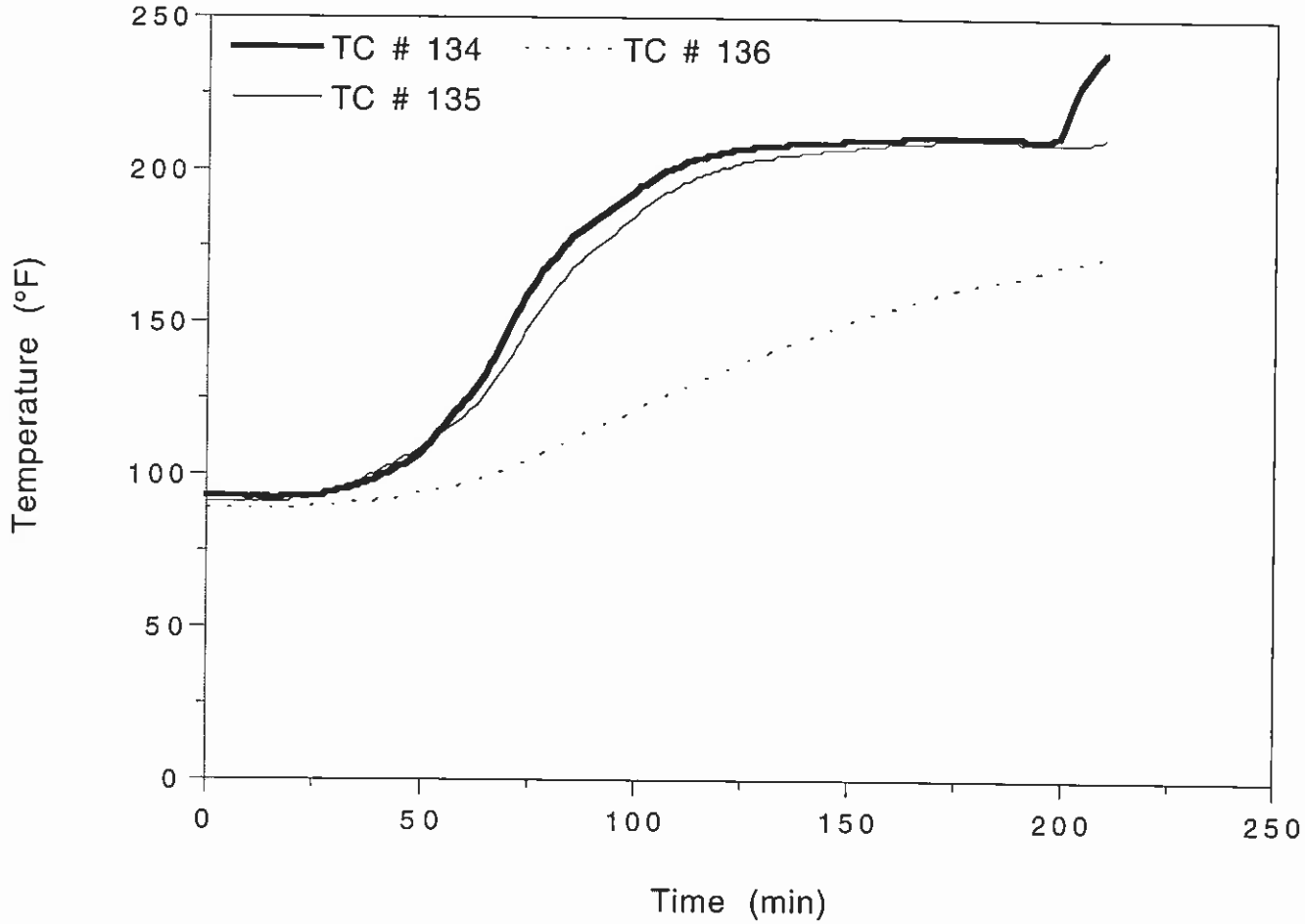
OMEGA POINT LABORATORIES

Peak Seals
Project No. 14840-99417
6" Tray Bare #8 Temperatures



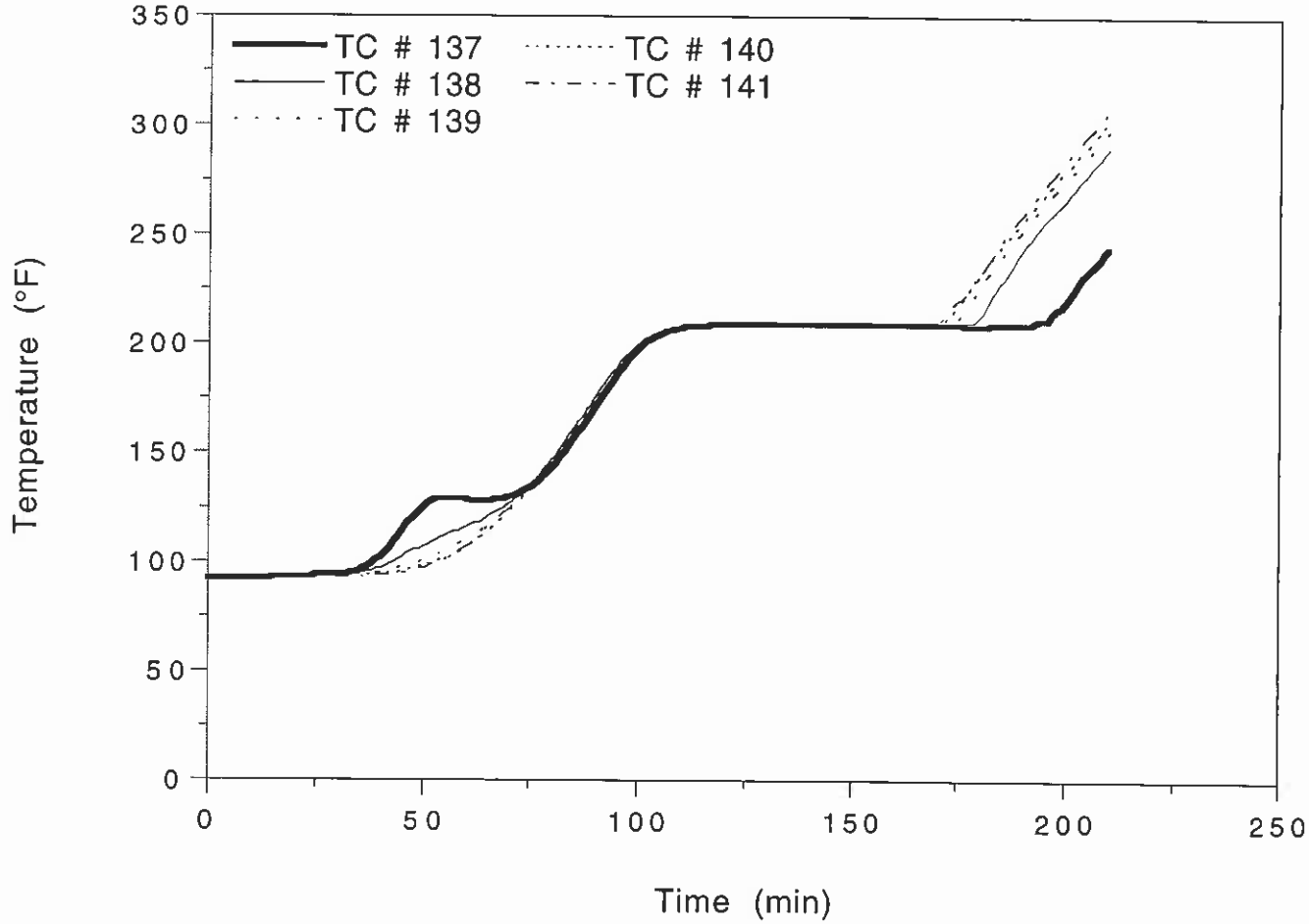
OMEGA POINT LABORATORIES

Peak Seals
Project No. 14840-99417
6" Tray Bare #8 Temperatures



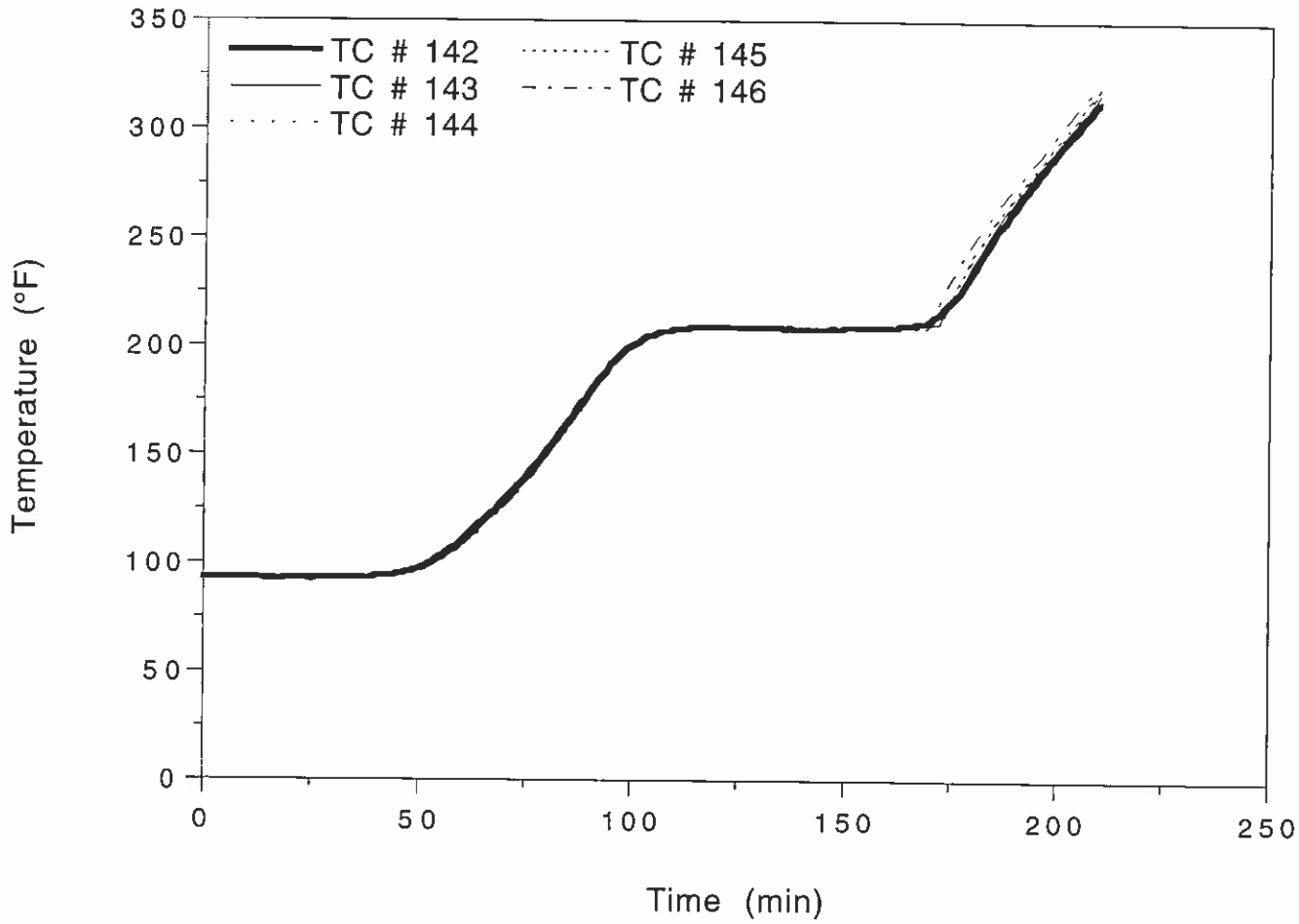
OMEGA POINT LABORATORIES

Peak Seals
Project No. 14840-99417
24" Tray Bare #8 Temperatures



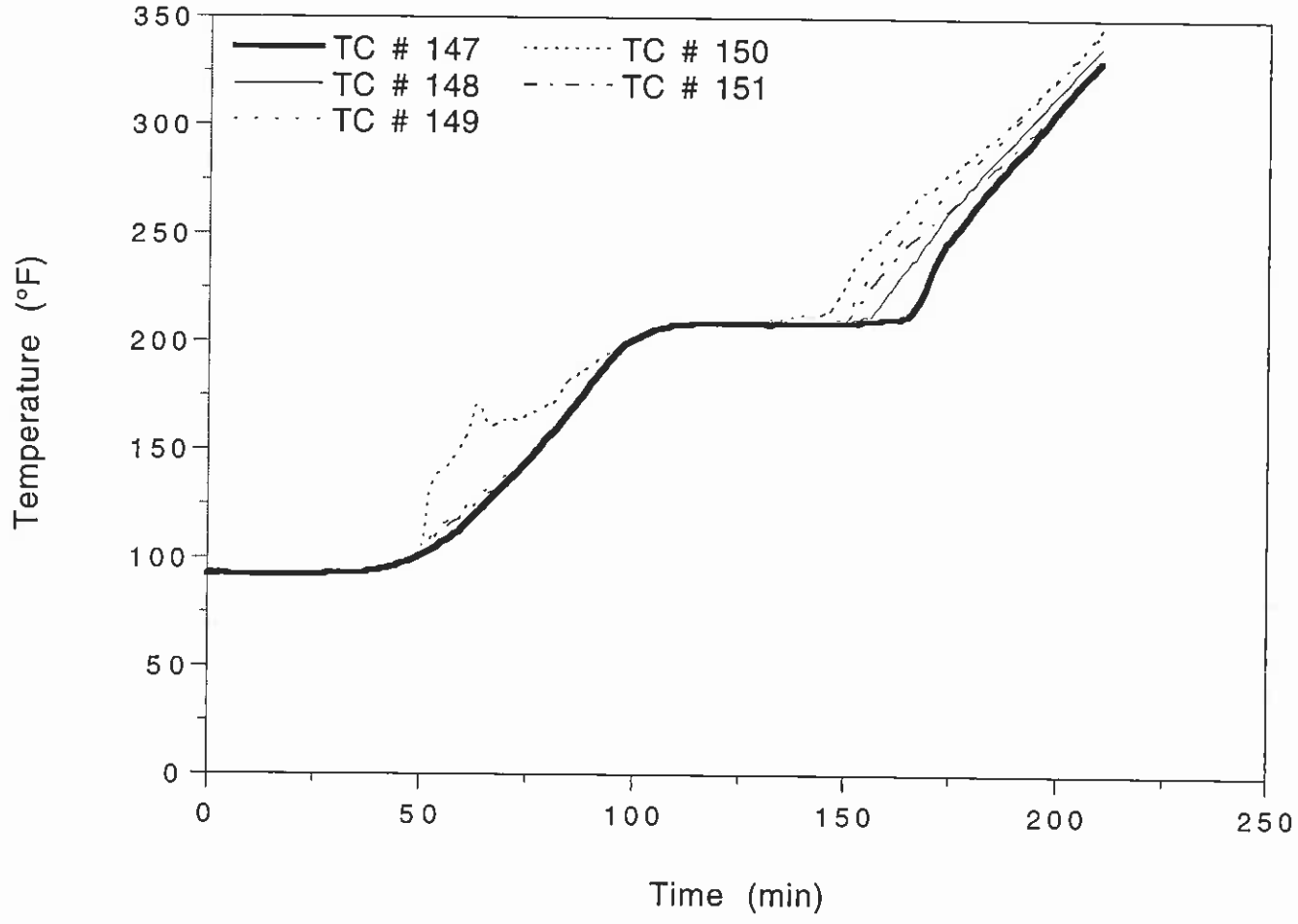
OMEGA POINT LABORATORIES

Peak Seals
Project No. 14840-99417
24" Tray Bare #8 Temperatures



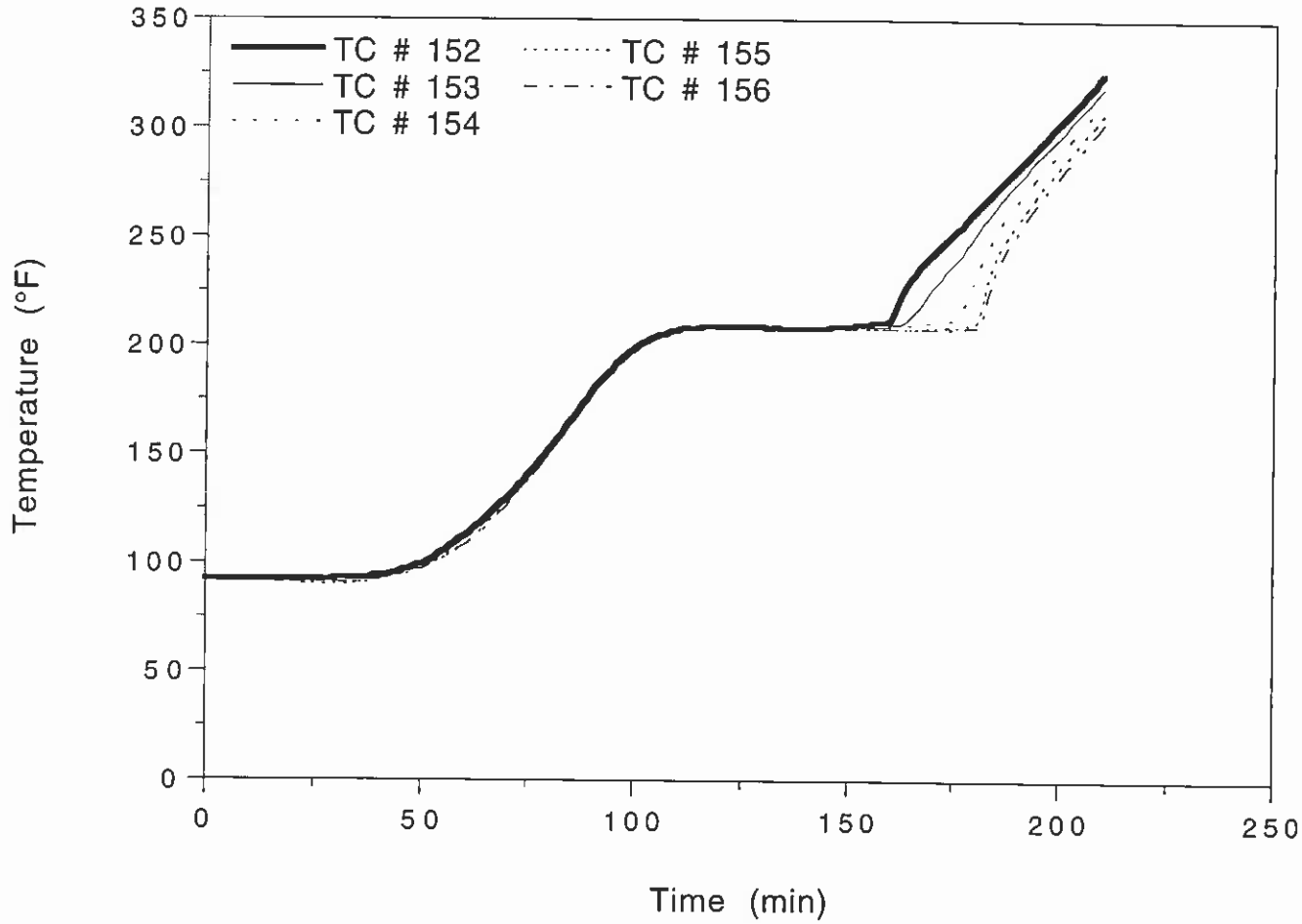
OMEGA POINT LABORATORIES

Peak Seals
Project No. 14840-99417
24" Tray Bare #8 Temperatures



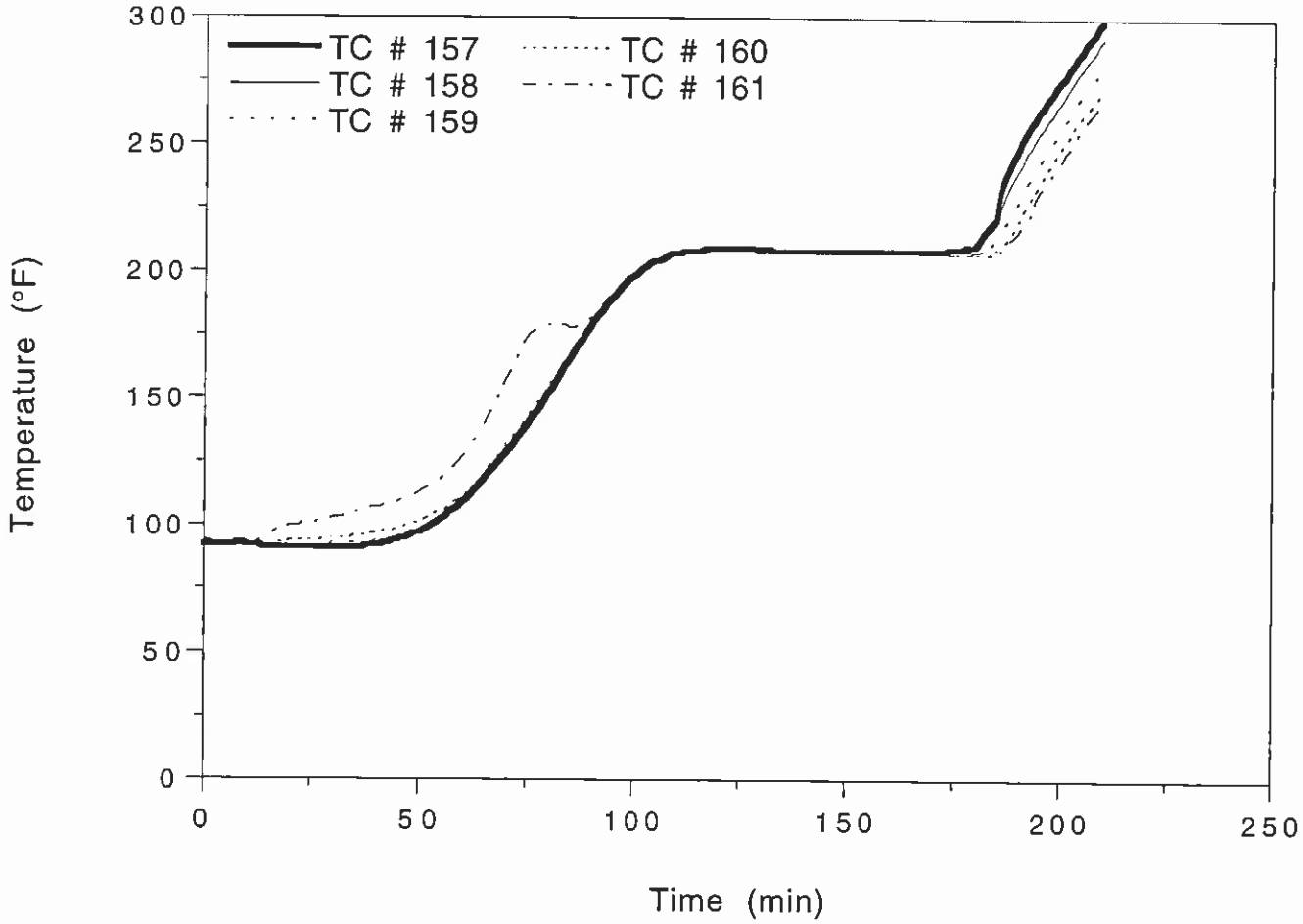
OMEGA POINT LABORATORIES

Peak Seals
Project No. 14840-99417
24" Tray Bare #8 Temperatures



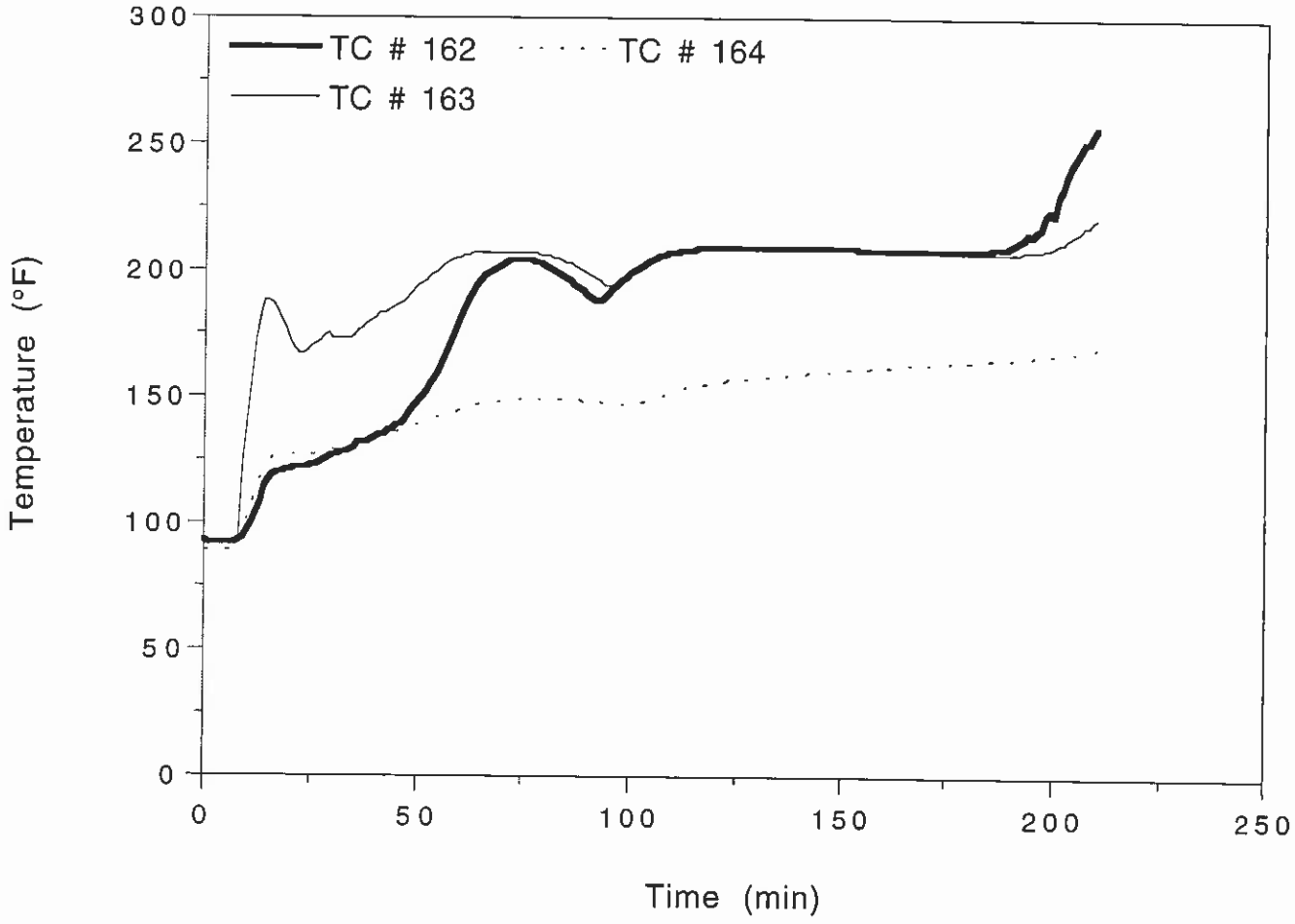
OMEGA POINT LABORATORIES

Peak Seals
Project No. 14840-99417
24" Tray Bare #8 Temperatures



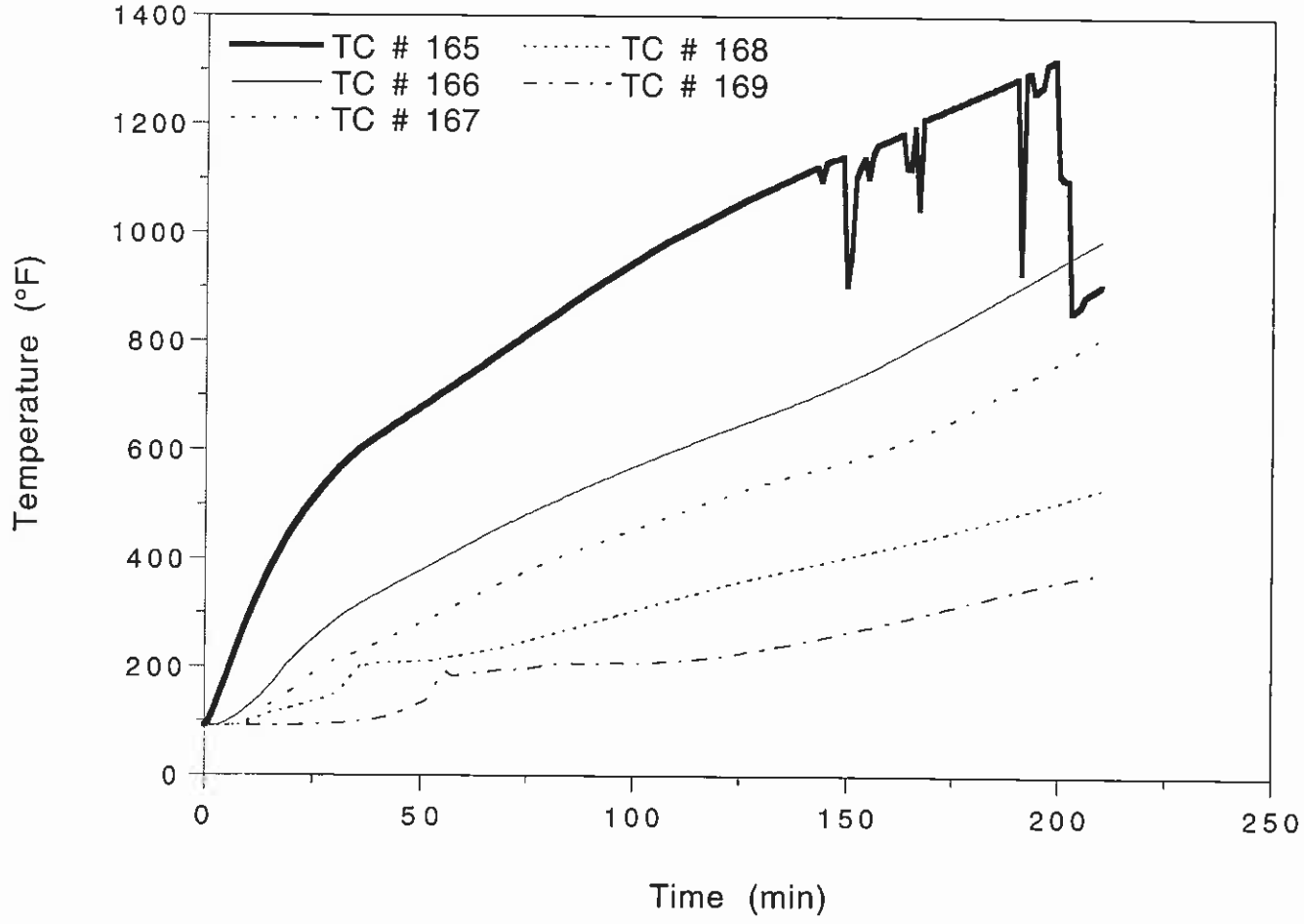
OMEGA POINT LABORATORIES

Peak Seals
Project No. 14840-99417
24" Tray Bare #8 Temperatures



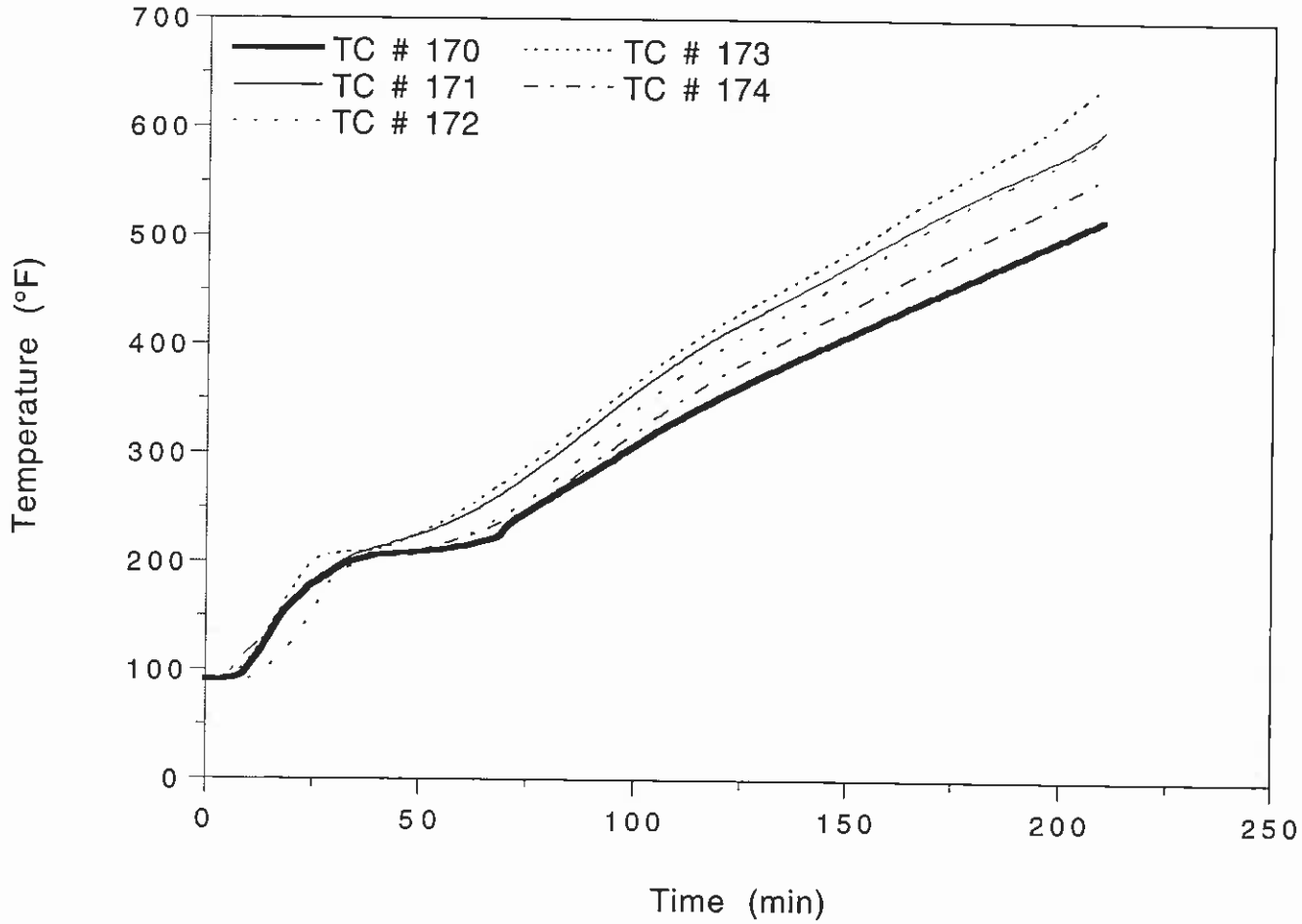
OMEGA POINT LABORATORIES

Peak Seals
Project No. 14840-99417
Support Temperatures 24" Tray Side



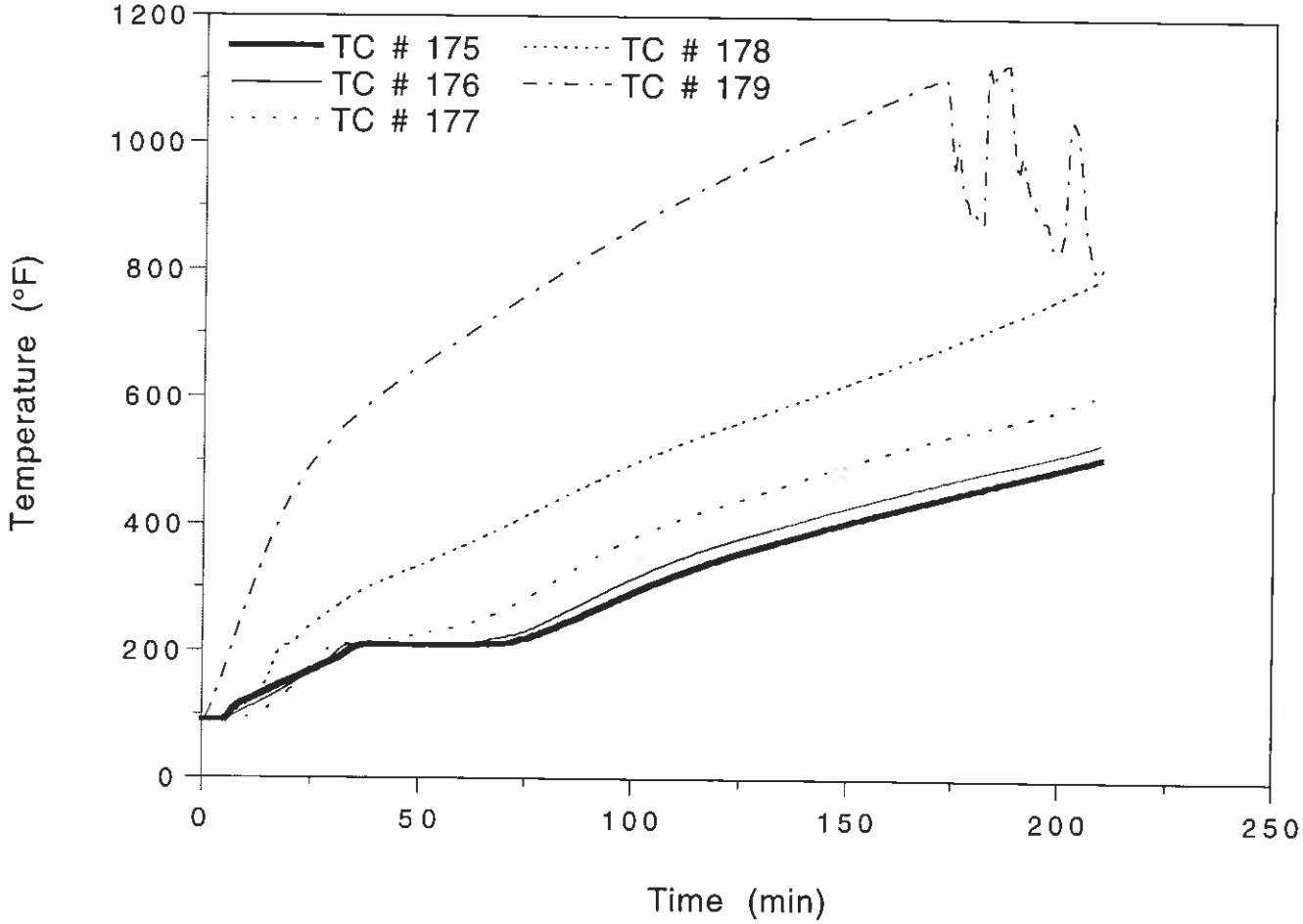
OMEGA POINT LABORATORIES

Peak Seals
Project No. 14840-99417
Support Temperatures Center Section



OMEGA POINT LABORATORIES

Peak Seals
Project No. 14840-99417
Support Temperatures 6" Tray Side



OMEGA POINT LABORATORIES

Time (min)	E119 Std (°F)	Furnace Avg (°F)	6" Tray Front Rail Avg (°F)	6" Tray Front Rail Max (°F)	6" Tray Rear Rail Avg (°F)	6" Tray Rear Rail Max (°F)	6" Tray #8 Avg (°F)
0	68	87	92	93	93	94	93
1	254	235	92	93	93	94	93
2	441	492	92	93	93	94	93
3	627	736	92	93	93	94	93
4	814	806	92	93	93	94	93
5	1000	887	92	93	93	94	93
6	1060	1018	92	93	93	94	93
7	1120	1120	92	93	93	94	92
8	1180	1153	92	93	93	94	92
9	1240	1195	92	93	93	94	92
10	1300	1255	92	93	93	94	92
11	1320	1299	92	93	93	94	92
12	1340	1318	92	93	93	94	93
13	1359	1361	92	93	93	95	93
14	1379	1388	92	94	93	96	93
15	1399	1388	92	94	93	97	93
16	1412	1436	92	95	93	97	93
17	1424	1439	92	95	93	98	93
18	1437	1463	93	96	93	99	93
19	1449	1462	93	97	93	100	93
20	1462	1442	93	97	93	100	93
21	1472	1444	93	98	93	101	93
22	1481	1473	93	99	93	102	93
23	1491	1510	93	100	93	103	93
24	1500	1512	93	101	94	104	93
25	1510	1506	93	101	94	105	93
26	1518	1507	93	102	94	106	93
27	1526	1524	94	103	94	106	93
28	1534	1541	94	104	94	107	93
29	1542	1554	94	106	94	108	93
30	1550	1555	94	107	94	109	93
31	1557	1553	94	108	95	110	94
32	1564	1551	95	110	95	111	94
33	1570	1564	95	112	95	112	94
34	1577	1582	95	113	95	113	94
35	1584	1584	96	115	96	114	94
36	1590	1587	96	117	96	115	94
37	1596	1595	96	118	96	116	95
38	1601	1604	97	120	97	118	95
39	1607	1612	97	121	97	119	95
40	1613	1615	98	123	98	121	95
41	1618	1615	98	124	98	122	96
42	1623	1626	99	125	99	123	96
43	1628	1637	99	127	99	125	96
44	1633	1634	100	128	100	126	97
45	1638	1632	100	130	100	127	97
46	1643	1645	101	131	101	128	98
47	1647	1648	102	132	102	130	98
48	1652	1651	102	134	103	131	99
49	1656	1654	103	136	103	133	99
50	1661	1658	104	137	104	134	100
51	1665	1662	105	139	105	135	101
52	1669	1666	106	140	106	137	101
53	1673	1674	107	141	107	138	102
54	1677	1677	108	143	108	140	103
55	1681	1678	109	144	109	142	104
56	1685	1681	110	145	111	143	105
57	1689	1684	111	146	112	145	106
58	1692	1689	112	147	113	146	107
59	1696	1696	114	148	115	148	108
60	1700	1703	115	150	116	149	110
61	1704	1702	117	151	118	151	111
62	1707	1704	118	152	119	152	112
63	1711	1707	120	153	121	153	114
64	1714	1710	122	154	123	155	115
65	1718	1716	124	155	125	156	117
66	1721	1719	126	157	126	157	119
67	1725	1729	128	158	128	158	121
68	1728	1737	130	159	130	160	123
69	1732	1737	132	160	133	161	125
70	1735	1736	134	161	135	163	127

OMEGA POINT LABORATORIES

Time (min)	E119 Std (°F)	Furnace Avg (°F)	6" Tray Front Rail Avg (°F)	6" Tray Front Rail Max (°F)	6" Tray Rear Rail Avg (°F)	6" Tray Rear Rail Max (°F)	6" Tray #8 Avg (°F)
71	1738	1736	136	163	137	164	129
72	1741	1738	139	164	139	166	132
73	1744	1741	141	166	142	168	134
74	1747	1744	143	167	144	170	136
75	1750	1747	146	169	147	172	139
76	1753	1751	148	171	149	173	141
77	1756	1753	151	173	152	175	144
78	1759	1755	153	174	154	177	147
79	1762	1759	156	176	157	179	149
80	1765	1762	158	178	159	181	152
81	1768	1764	161	180	161	182	154
82	1771	1772	163	181	164	184	156
83	1773	1775	165	183	166	186	159
84	1776	1776	167	185	168	188	161
85	1779	1779	169	187	170	190	164
86	1782	1780	171	188	172	191	166
87	1784	1781	173	190	174	193	168
88	1787	1784	175	192	176	195	170
89	1789	1789	177	194	178	197	172
90	1792	1792	179	195	180	199	173
91	1794	1793	180	197	182	201	175
92	1797	1794	182	199	183	203	177
93	1799	1796	184	201	185	204	179
94	1802	1798	185	203	186	206	180
95	1804	1802	187	204	188	208	182
96	1806	1809	188	206	189	210	183
97	1808	1813	189	208	191	211	185
98	1811	1805	191	209	192	213	186
99	1813	1811	192	211	193	214	187
100	1815	1822	193	212	194	216	189
101	1817	1820	194	214	195	217	190
102	1819	1819	195	215	196	218	191
103	1822	1821	196	216	197	220	192
104	1824	1825	197	218	198	221	193
105	1826	1830	198	219	199	222	194
106	1828	1835	199	220	200	223	195
107	1830	1826	200	221	201	224	196
108	1831	1825	201	222	201	226	197
109	1833	1827	201	224	202	227	197
110	1835	1827	202	225	203	228	198
111	1837	1834	203	226	204	229	199
112	1838	1838	203	227	204	230	199
113	1840	1835	204	228	205	231	200
114	1841	1837	205	229	205	232	200
115	1843	1839	205	230	206	233	201
116	1844	1842	206	231	206	235	201
117	1846	1842	206	231	207	236	202
118	1847	1844	206	232	207	237	202
119	1849	1846	207	233	208	238	203
120	1850	1851	207	234	208	239	203
121	1851	1850	208	234	209	240	203
122	1853	1851	208	235	209	241	204
123	1854	1854	208	236	210	242	204
124	1855	1853	209	237	210	244	204
125	1856	1855	209	238	210	245	205
126	1858	1854	209	238	211	246	205
127	1859	1857	210	239	211	247	205
128	1860	1857	210	240	212	249	205
129	1861	1861	210	241	212	250	205
130	1863	1865	210	242	213	251	206
131	1864	1865	211	243	213	252	206
132	1865	1864	211	243	213	254	206
133	1866	1867	211	244	214	255	206
134	1868	1865	211	245	214	256	206
135	1869	1867	212	246	215	258	206
136	1870	1870	212	247	216	259	207
137	1871	1871	212	248	216	260	207
138	1873	1873	213	249	217	261	207
139	1874	1875	213	250	217	263	207
140	1875	1876	213	252	218	264	207
141	1876	1877	214	253	218	266	208

OMEGA POINT LABORATORIES

Time (min)	E119 Std (°F)	Furnace Avg (°F)	6" Tray Front Rail Avg (°F)	6" Tray Front Rail Max (°F)	6" Tray Rear Rail Avg (°F)	6" Tray Rear Rail Max (°F)	6" Tray #8 Avg (°F)
142	1878	1877	214	254	219	267	208
143	1879	1880	215	255	219	268	208
144	1880	1882	215	257	220	270	208
145	1881	1882	216	258	221	271	209
146	1883	1883	216	259	221	273	209
147	1884	1885	217	260	222	274	209
148	1885	1886	218	262	223	276	209
149	1886	1887	218	263	224	277	210
150	1888	1889	219	265	225	279	210
151	1889	1891	220	266	225	281	211
152	1890	1890	221	268	226	282	211
153	1891	1891	222	269	227	284	212
154	1893	1893	222	271	228	286	212
155	1894	1895	223	272	229	287	213
156	1895	1896	224	274	230	289	213
157	1896	1896	225	275	231	291	214
158	1898	1896	226	277	232	292	215
159	1899	1897	227	279	234	294	217
160	1900	1899	228	280	235	296	218
161	1901	1902	230	282	236	298	219
162	1903	1903	231	284	237	300	221
163	1904	1904	232	286	238	301	222
164	1905	1905	233	288	240	303	223
165	1906	1907	234	289	241	305	225
166	1908	1907	236	291	242	307	226
167	1909	1909	237	293	244	309	228
168	1910	1910	238	295	245	310	229
169	1911	1911	239	297	247	312	231
170	1913	1911	241	299	248	314	232
171	1914	1911	242	301	249	316	233
172	1915	1912	244	303	251	318	235
173	1916	1912	245	305	253	320	236
174	1918	1914	247	307	254	322	238
175	1919	1917	248	309	256	324	239
176	1920	1918	250	311	257	325	240
177	1921	1919	251	313	259	327	242
178	1923	1920	253	315	260	329	244
179	1924	1920	255	317	262	331	245
180	1925	1920	256	319	264	333	247
181	1926	1922	258	321	265	335	248
182	1928	1924	259	323	267	337	250
183	1929	1925	261	325	269	339	252
184	1930	1924	263	327	271	341	254
185	1931	1924	264	328	272	343	255
186	1933	1925	266	330	274	345	257
187	1934	1939	268	332	276	347	259
188	1935	1947	270	334	278	348	261
189	1936	1938	271	336	280	350	263
190	1938	1925	273	338	282	352	265
191	1939	1929	275	340	283	354	267
192	1940	1942	277	342	285	356	269
193	1941	1949	279	344	287	358	271
194	1943	1954	281	346	289	360	272
195	1944	1947	282	348	291	362	274
196	1945	1940	284	349	293	363	276
197	1946	1938	286	351	295	365	278
198	1948	1944	288	353	297	367	280
199	1949	1949	290	355	298	369	282
200	1950	1953	292	357	300	371	284
201	1951	1956	294	359	302	373	286
202	1953	1959	296	361	304	374	288
203	1954	1960	298	363	306	376	290
204	1955	1958	300	365	308	378	292
205	1956	1955	302	366	310	380	294
206	1958	1956	304	368	312	381	296
207	1959	1956	305	370	313	383	298
208	1960	1957	307	372	315	385	300
209	1961	1957	309	373	317	387	302
210	1963	1962	311	375	319	388	304
Max Temp:			311	375	319	388	304
Max Allowed:			342	417	343	418	343

OMEGA POINT LABORATORIES

Time (min)	6" Tray #8 Max (°F)	24" Tray Front Rail Avg (°F)	24" Tray Front Rail Max (°F)	24" Tray Rear Rail Avg (°F)	24" Tray Rear Rail Max (°F)	24" Tray #8 Avg (°F)
0	93	92	94	93	93	92
1	93	92	94	93	93	92
2	93	92	94	93	93	92
3	93	92	94	93	93	92
4	93	92	94	93	93	92
5	93	92	94	93	93	92
6	93	92	94	93	93	92
7	93	92	94	93	93	92
8	93	92	93	93	93	93
9	93	93	104	93	93	94
10	93	94	146	93	93	95
11	93	96	195	93	104	96
12	93	96	198	95	141	96
13	93	97	199	96	163	97
14	93	97	200	96	175	98
15	93	97	201	97	176	98
16	93	97	200	97	175	98
17	94	97	197	97	174	98
18	94	97	187	97	171	98
19	94	97	180	97	169	98
20	94	97	173	97	166	98
21	94	97	169	97	164	98
22	95	97	166	97	162	98
23	95	97	166	97	161	98
24	95	97	169	97	161	98
25	96	98	172	97	161	98
26	96	98	175	97	161	98
27	96	98	176	97	162	98
28	97	98	180	97	163	98
29	97	99	182	98	164	98
30	97	99	178	98	165	98
31	98	99	178	98	165	98
32	98	99	177	99	166	99
33	99	99	176	99	166	99
34	99	99	177	100	166	99
35	100	100	178	100	167	99
36	100	100	181	101	168	99
37	101	101	182	102	169	100
38	102	101	185	102	170	100
39	103	102	186	103	172	100
40	104	102	187	104	173	101
41	104	103	188	105	180	101
42	105	103	189	105	186	102
43	106	104	189	106	191	102
44	107	105	191	107	194	103
45	108	106	192	108	196	103
46	109	106	193	108	198	104
47	110	107	195	109	200	105
48	111	108	198	110	202	106
49	112	109	200	111	203	107
50	113	110	201	112	203	107
51	114	111	201	113	203	108
52	115	112	202	114	203	110
53	116	113	203	115	203	112
54	117	114	203	116	202	113
55	118	116	204	118	201	114
56	119	117	204	119	200	115
57	121	118	205	120	200	117
58	122	119	205	121	201	118
59	123	121	205	123	202	119
60	124	122	205	124	203	121
61	125	123	206	126	203	122
62	127	125	206	127	204	124
63	129	127	207	129	204	126
64	131	128	207	130	205	128
65	133	130	207	132	205	129
66	136	132	207	133	205	131
67	138	133	207	135	206	132
68	141	135	207	137	206	134
69	144	137	207	138	206	136
70	147	139	207	140	206	137

OMEGA POINT LABORATORIES

Time (min)	6" Tray #8 Max (°F)	24" Tray Front Rail Avg (°F)	24" Tray Front Rail Max (°F)	24" Tray Rear Rail Avg (°F)	24" Tray Rear Rail Max (°F)	24" Tray #8 Avg (°F)
71	150	140	207	142	206	139
72	153	142	207	144	206	141
73	156	144	207	145	206	143
74	159	146	207	147	206	144
75	161	148	206	149	206	146
76	163	150	206	151	206	148
77	165	152	206	153	206	150
78	168	154	206	155	206	152
79	169	156	206	157	206	154
80	171	158	205	159	206	156
81	173	160	205	161	206	158
82	174	162	204	164	205	161
83	176	164	204	166	205	163
84	177	166	203	168	205	165
85	180	168	202	170	204	167
86	181	170	202	172	203	169
87	183	173	201	174	203	172
88	184	175	200	176	202	174
89	186	177	199	179	201	176
90	187	180	199	181	201	178
91	188	182	198	183	200	180
92	189	184	197	185	200	183
93	190	186	199	187	199	185
94	190	188	200	190	201	187
95	191	191	202	192	203	189
96	192	193	204	194	205	191
97	193	194	205	196	206	193
98	195	196	207	197	208	194
99	197	198	209	199	210	196
100	199	199	210	201	211	197
101	200	201	211	202	212	199
102	201	202	212	203	214	200
103	202	203	214	204	215	201
104	203	204	215	205	216	202
105	205	205	216	206	217	203
106	206	206	217	207	218	203
107	207	206	218	207	219	204
108	208	207	219	208	220	205
109	209	208	220	208	220	205
110	210	208	221	209	221	206
111	210	208	222	209	222	206
112	208	209	223	209	223	206
113	207	209	224	210	224	206
114	207	209	225	210	224	206
115	208	210	226	210	225	207
116	208	210	228	210	226	207
117	208	210	229	211	227	207
118	208	210	230	211	228	207
119	208	210	231	211	228	207
120	208	211	233	211	229	207
121	208	211	234	211	230	207
122	208	211	235	212	231	207
123	208	211	237	212	232	207
124	209	212	238	212	233	207
125	209	212	240	213	234	207
126	209	212	241	213	235	207
127	209	213	242	213	236	207
128	209	213	244	214	238	207
129	210	214	245	214	239	207
130	210	214	247	215	240	207
131	210	215	248	216	241	207
132	210	216	249	216	243	207
133	211	216	250	217	244	207
134	212	217	252	217	245	207
135	213	217	253	218	247	207
136	213	218	254	219	248	207
137	214	219	256	219	249	207
138	215	219	257	220	251	207
139	216	220	259	221	252	207
140	217	221	260	222	253	207
141	218	222	261	223	255	207

OMEGA POINT LABORATORIES

Time (min)	6" Tray #8 Max (°F)	24" Tray Front Rail Avg (°F)	24" Tray Front Rail Max (°F)	24" Tray Rear Rail Avg (°F)	24" Tray Rear Rail Max (°F)	24" Tray #8 Avg (°F)
142	219	222	263	223	256	207
143	221	223	264	224	257	207
144	223	224	265	225	259	207
145	224	225	267	226	260	207
146	226	226	268	227	261	207
147	228	227	270	228	263	207
148	230	228	271	228	264	207
149	232	229	273	229	265	208
150	234	230	274	230	266	208
151	237	231	276	231	268	208
152	239	232	277	232	269	208
153	241	233	279	233	270	209
154	244	235	280	234	272	209
155	246	236	282	235	273	210
156	248	237	284	236	274	210
157	251	238	285	237	276	210
158	253	239	287	238	277	210
159	255	241	289	239	278	211
160	257	242	290	240	280	211
161	260	243	292	242	281	212
162	262	244	293	243	283	212
163	264	246	295	244	284	213
164	266	247	297	245	286	213
165	269	248	298	247	287	214
166	271	250	300	248	289	214
167	274	251	301	249	291	215
168	276	252	303	251	292	216
169	279	254	305	252	294	216
170	281	255	307	254	296	217
171	283	257	309	255	297	218
172	286	258	311	257	299	219
173	288	260	312	258	301	220
174	290	261	314	260	303	222
175	292	263	316	261	305	223
176	294	265	318	263	307	224
177	297	266	320	264	309	226
178	299	268	322	266	311	228
179	301	269	323	268	313	229
180	303	271	325	269	315	231
181	306	273	327	271	317	233
182	308	275	329	273	319	235
183	310	276	330	275	321	238
184	312	278	332	277	324	240
185	314	280	334	279	326	242
186	317	282	336	280	328	245
187	319	283	338	282	330	247
188	321	285	340	284	332	250
189	323	287	342	286	334	252
190	325	289	344	288	336	254
191	327	291	345	291	338	256
192	329	293	347	293	340	258
193	332	294	349	295	342	261
194	334	296	351	297	344	263
195	336	298	353	299	346	265
196	338	300	355	301	348	267
197	340	302	357	303	350	269
198	342	304	359	305	352	271
199	344	306	361	307	354	274
200	346	308	362	309	355	276
201	348	311	364	311	357	278
202	350	313	366	313	359	280
203	352	315	368	315	360	283
204	354	317	370	317	362	285
205	356	319	372	319	364	287
206	358	321	374	322	366	289
207	360	323	375	323	367	292
208	362	325	377	326	369	294
209	364	327	379	328	371	296
210	366	329	381	330	373	298
Max Temp:	366	329	381	330	373	298
Max Allowed:	418	342	417	343	418	342

OMEGA POINT LABORATORIES

Time 24" (min)	Tray #8 Max (°F)	TC # 1 (°F)	TC # 2 (°F)	TC # 3 (°F)	TC # 4 (°F)	TC # 5 (°F)	TC # 6 (°F)	TC # 7 (°F)	TC # 8 (°F)	TC # 9 (°F)	TC # 10 (°F)
0	93	91	93	93	93	93	93	92	92	92	92
1	93	91	92	93	93	93	93	92	92	92	92
2	93	91	92	93	93	93	93	92	92	92	92
3	93	91	93	93	93	93	93	92	92	92	92
4	93	91	92	93	93	93	93	92	92	92	92
5	93	91	92	93	93	93	93	92	92	92	92
6	93	91	92	93	93	93	92	92	92	92	92
7	93	91	92	93	93	93	93	92	92	92	92
8	93	91	92	93	93	93	93	92	92	92	92
9	124	91	92	93	93	93	92	92	92	92	92
10	141	91	92	93	93	93	93	92	92	92	92
11	157	91	92	93	93	93	92	92	92	92	92
12	173	91	92	93	93	93	92	92	92	92	92
13	182	91	92	93	93	93	92	92	92	92	92
14	188	92	92	93	93	93	92	92	92	92	92
15	188	92	93	93	93	93	92	92	92	92	92
16	187	92	92	93	93	93	92	92	92	92	92
17	184	92	93	93	93	93	92	92	92	92	92
18	180	93	93	93	93	93	92	92	92	92	92
19	177	93	93	93	93	93	92	92	92	92	92
20	172	94	93	93	93	93	92	92	92	92	92
21	169	94	93	93	93	93	92	92	92	92	92
22	167	94	93	93	93	93	92	92	92	92	92
23	167	95	93	93	93	93	92	92	92	92	92
24	168	95	93	93	93	93	92	92	92	92	92
25	170	96	94	93	93	93	92	92	92	92	92
26	171	96	94	93	93	93	92	92	92	92	92
27	172	97	94	93	93	93	92	92	92	92	92
28	174	97	94	93	93	93	93	92	92	92	92
29	175	98	94	93	93	93	93	92	92	92	92
30	173	98	94	93	93	93	93	92	92	92	92
31	173	98	95	93	93	93	93	92	92	92	92
32	173	99	95	93	93	93	93	93	92	93	93
33	173	100	95	93	93	93	93	93	92	93	93
34	173	100	95	93	93	93	93	93	92	93	93
35	174	101	96	93	93	93	93	93	93	93	93
36	176	101	96	93	93	93	93	93	93	93	93
37	177	102	96	94	93	93	93	93	93	93	94
38	179	102	96	94	93	93	93	93	93	93	94
39	180	103	97	94	93	93	93	93	93	94	94
40	181	104	97	94	93	93	94	93	93	94	95
41	183	104	97	94	93	94	94	94	93	94	95
42	183	105	98	94	94	94	94	94	93	95	96
43	184	106	98	94	94	94	94	94	94	95	96
44	185	107	99	95	94	94	95	94	94	95	97
45	186	108	99	95	94	95	95	95	94	96	97
46	187	109	100	95	94	95	95	95	94	96	98
47	188	110	100	95	94	95	95	95	95	97	98
48	190	111	101	95	95	96	96	96	95	97	99
49	192	112	102	96	95	96	96	96	95	98	100
50	194	113	103	96	95	97	97	97	96	99	101
51	195	115	103	96	95	97	97	97	96	99	102
52	196	116	104	97	96	98	98	98	97	100	102
53	198	117	105	97	96	99	99	99	98	101	103
54	199	118	106	98	97	100	99	99	98	102	104
55	200	120	107	98	97	101	100	100	99	103	105
56	202	121	108	99	98	102	101	101	100	104	106
57	203	122	109	99	98	104	103	103	101	105	108
58	204	123	110	100	99	105	104	104	101	106	109
59	205	125	112	101	100	107	106	106	103	107	110
60	205	126	113	102	101	108	108	107	104	108	111
61	206	127	114	103	102	110	111	109	105	110	113
62	206	129	115	104	103	112	113	111	106	111	114
63	207	130	117	105	105	114	116	113	108	112	115
64	207	131	118	106	106	117	118	116	109	114	117
65	207	132	120	108	107	119	121	118	111	115	119
66	207	134	121	109	109	121	124	120	113	117	120
67	207	135	123	111	111	124	126	123	114	119	122
68	207	136	125	113	112	126	129	125	116	121	124
69	207	138	126	114	114	129	132	127	118	123	126
70	207	139	128	116	116	131	134	130	120	125	128

OMEGA POINT LABORATORIES

Time 24" (min)	Tray #8 Max (°F)	TC # 1 (°F)	TC # 2 (°F)	TC # 3 (°F)	TC # 4 (°F)	TC # 5 (°F)	TC # 6 (°F)	TC # 7 (°F)	TC # 8 (°F)	TC # 9 (°F)	TC # 10 (°F)
71	207	141	130	118	118	134	137	132	122	127	130
72	207	142	132	120	120	136	140	135	124	129	133
73	207	143	134	122	122	139	142	137	126	132	135
74	207	145	136	124	124	141	145	140	129	134	137
75	207	146	138	126	126	144	147	143	131	137	140
76	207	147	140	128	128	146	150	145	134	139	143
77	207	149	142	130	130	149	152	148	137	142	145
78	207	150	144	133	132	151	155	150	139	145	148
79	206	152	146	135	135	154	157	153	142	147	151
80	206	153	148	138	137	156	160	155	145	150	153
81	206	154	150	141	140	158	162	158	148	153	156
82	205	156	153	143	142	161	164	160	150	156	158
83	205	157	155	146	145	163	166	162	153	158	160
84	204	158	157	149	148	165	169	164	156	160	163
85	203	160	159	152	151	167	171	167	158	163	165
86	203	161	161	155	154	169	173	169	160	165	167
87	202	162	163	157	156	171	175	171	163	167	169
88	201	163	165	160	159	173	177	173	165	169	171
89	200	165	167	163	162	175	179	175	167	171	173
90	199	166	169	165	164	177	181	177	170	173	175
91	198	167	171	168	167	179	183	179	172	175	177
92	197	169	173	170	169	181	184	181	174	177	179
93	196	170	175	173	172	182	186	183	176	179	180
94	195	172	176	175	174	182	187	184	178	181	182
95	196	174	178	177	176	184	189	186	180	183	184
96	196	176	180	179	178	186	190	187	182	184	185
97	198	177	181	180	180	186	191	189	184	186	187
98	199	179	183	182	182	188	192	190	185	187	188
99	200	181	185	184	184	189	193	191	187	188	189
100	201	182	186	185	185	190	194	192	188	190	191
101	202	184	188	187	187	191	195	193	189	191	192
102	203	185	189	189	188	192	196	195	191	192	193
103	204	187	190	190	190	193	197	196	192	193	194
104	205	188	191	191	191	194	198	196	193	194	195
105	206	189	192	192	192	195	198	197	194	195	196
106	207	191	194	193	193	196	199	198	195	196	197
107	207	192	195	194	194	197	200	199	196	197	198
108	208	193	196	195	195	198	200	200	197	198	199
109	208	194	197	196	196	199	201	200	198	199	200
110	208	195	197	197	197	199	202	201	199	199	200
111	208	196	198	198	198	200	202	202	199	200	201
112	209	197	199	199	199	200	203	202	200	201	202
113	209	198	200	200	200	201	203	203	201	201	202
114	209	199	201	200	200	202	204	203	201	202	203
115	209	199	201	201	201	202	204	204	202	203	203
116	209	200	202	202	202	203	205	204	202	203	204
117	209	200	202	202	202	203	205	205	203	204	204
118	209	201	203	203	203	204	206	205	203	204	205
119	209	202	204	203	203	204	206	206	204	205	205
120	209	202	204	204	204	205	206	206	204	205	206
121	209	203	205	204	204	205	207	206	205	206	206
122	209	203	205	205	205	206	207	207	205	206	207
123	209	204	205	205	205	206	208	207	206	206	207
124	210	204	206	206	206	207	208	207	206	207	207
125	210	205	206	206	206	207	208	208	207	207	208
126	210	205	207	206	206	207	209	208	207	207	208
127	210	206	207	207	207	208	209	208	207	207	208
128	210	206	207	207	207	208	210	209	207	208	208
129	210	206	207	207	207	208	210	209	208	208	209
130	210	207	208	207	208	209	210	209	208	208	209
131	210	207	208	208	208	209	211	210	208	208	209
132	211	207	208	208	208	210	211	210	208	208	209
133	211	207	208	208	208	210	212	211	208	209	209
134	211	208	209	208	209	211	212	211	209	209	210
135	211	208	209	209	209	211	213	211	209	209	210
136	211	208	209	209	209	212	214	212	209	209	210
137	212	208	209	209	209	212	214	213	209	209	210
138	212	208	209	209	209	213	215	213	209	209	210
139	213	208	210	209	209	214	215	214	209	209	211
140	213	208	210	209	209	214	216	214	209	210	211
141	213	209	210	210	209	215	217	215	210	210	212

OMEGA POINT LABORATORIES

Time 24" (min)	Tray #8 Max (°F)	TC # 1 (°F)	TC # 2 (°F)	TC # 3 (°F)	TC # 4 (°F)	TC # 5 (°F)	TC # 6 (°F)	TC # 7 (°F)	TC # 8 (°F)	TC # 9 (°F)	TC # 10 (°F)
142	213	209	210	210	210	216	218	216	210	210	213
143	214	209	210	210	210	217	219	216	210	210	213
144	213	209	211	211	210	218	219	217	210	211	214
145	214	209	211	211	210	218	220	218	210	211	216
146	214	209	211	212	210	219	221	219	210	212	217
147	217	209	212	212	210	220	222	220	210	213	218
148	220	209	212	213	210	221	223	221	211	213	219
149	223	209	213	214	210	222	224	222	211	214	221
150	227	209	214	215	211	223	225	223	212	215	222
151	231	209	215	215	211	225	226	224	212	216	224
152	235	209	217	216	211	226	227	225	213	218	226
153	238	209	218	217	212	227	229	226	213	219	228
154	240	209	219	218	212	228	230	227	214	221	230
155	243	209	220	219	213	229	231	228	215	222	232
156	244	209	221	221	215	230	232	230	216	223	234
157	246	210	222	222	216	232	234	231	217	225	236
158	247	210	223	223	219	233	235	233	219	227	238
159	250	210	225	224	221	235	236	234	220	228	240
160	252	210	226	226	223	236	238	235	221	230	242
161	254	210	227	227	224	238	239	237	222	232	244
162	256	210	228	228	226	239	241	239	223	233	246
163	258	211	230	230	228	241	243	240	224	235	248
164	260	211	231	231	230	242	244	242	226	236	249
165	262	212	232	233	232	244	246	244	227	238	251
166	264	213	234	235	234	246	248	246	228	240	253
167	267	214	235	236	235	247	249	247	230	241	255
168	269	215	237	238	237	249	251	249	231	243	257
169	270	215	239	239	239	251	253	251	234	245	259
170	271	216	240	241	241	253	255	253	236	248	261
171	272	217	242	242	242	254	257	255	238	250	263
172	274	219	243	244	244	256	259	257	240	252	265
173	276	220	245	246	246	258	260	259	243	255	267
174	278	222	246	247	248	260	262	261	245	257	269
175	279	223	248	249	249	262	264	263	248	259	271
176	280	225	249	251	251	264	266	265	250	262	273
177	282	227	251	252	253	265	268	267	253	264	276
178	284	229	253	254	255	267	270	269	255	267	278
179	285	230	254	256	257	269	273	272	258	269	280
180	287	232	256	258	258	271	275	274	260	272	282
181	289	234	258	259	260	273	277	276	263	274	284
182	290	235	259	261	262	275	279	278	265	276	286
183	292	237	261	263	264	277	281	280	267	279	289
184	293	239	263	265	266	279	283	282	270	281	291
185	295	240	264	266	268	281	285	285	272	283	293
186	296	242	266	268	269	283	287	287	275	285	295
187	298	243	268	270	271	285	289	289	277	288	297
188	300	245	270	272	273	287	291	291	279	290	299
189	302	246	271	274	275	289	293	293	282	292	302
190	304	248	273	275	277	291	296	295	284	295	304
191	306	249	275	277	279	293	298	298	286	297	306
192	308	251	277	279	281	295	300	300	288	299	308
193	310	253	278	281	283	297	302	302	291	301	310
194	312	254	280	283	284	299	304	304	293	303	313
195	314	256	282	285	286	301	306	306	295	306	315
196	316	258	284	286	288	303	308	308	298	308	317
197	318	259	285	288	290	305	310	310	300	310	319
198	321	261	287	290	292	307	312	312	302	312	321
199	322	262	289	292	294	309	314	314	304	315	324
200	324	264	291	294	296	311	316	316	306	317	326
201	326	266	292	296	298	313	318	319	309	319	328
202	327	267	294	298	300	315	320	321	311	321	330
203	330	269	296	300	302	317	322	323	313	323	332
204	332	271	298	302	304	319	324	325	315	325	335
205	334	272	300	303	306	321	326	327	317	328	337
206	336	274	302	305	308	323	328	329	319	330	339
207	339	276	303	307	310	324	330	331	322	332	341
208	341	278	305	309	312	326	332	333	324	334	343
209	343	279	307	311	313	328	334	335	326	336	345
210	346	281	309	313	315	330	335	337	328	338	347
Max Temp:	346	281	309	313	315	330	335	337	328	338	347
Max Allowed:	417	416	418	418	418	418	418	417	417	417	417

OMEGA POINT LABORATORIES

Time (min)	TC # 11 (°F)	TC # 12 (°F)	TC # 13 (°F)	TC # 14 (°F)	TC # 15 (°F)	TC # 16 (°F)	TC # 17 (°F)	TC # 18 (°F)	TC # 19 (°F)	TC # 20 (°F)
0	92	92	92	92	92	92	92	92	92	93
1	92	92	92	92	92	92	92	92	92	93
2	92	92	92	92	92	92	92	92	92	93
3	92	92	92	92	92	92	92	92	92	93
4	92	92	92	92	92	92	92	92	92	93
5	92	92	92	92	92	92	92	92	92	93
6	92	92	92	92	92	92	92	92	92	92
7	92	92	92	92	92	92	92	92	92	93
8	92	92	92	92	92	92	92	92	92	92
9	92	92	92	92	92	92	92	92	92	92
10	92	92	92	92	92	92	92	92	92	92
11	92	92	92	93	92	92	92	92	92	92
12	92	92	92	93	92	92	92	92	92	92
13	92	92	92	93	92	92	92	92	92	92
14	92	92	92	94	92	92	92	92	92	92
15	92	92	93	94	92	92	92	92	92	92
16	92	92	93	95	92	92	92	92	92	92
17	92	92	93	95	92	92	92	92	92	92
18	92	92	93	96	92	92	92	92	92	92
19	92	92	93	97	92	92	92	92	92	92
20	92	92	94	97	93	92	92	92	92	92
21	92	92	94	98	93	92	92	92	92	92
22	92	92	94	99	93	92	92	92	92	92
23	92	93	94	100	93	92	92	92	92	92
24	92	93	95	101	93	92	92	92	92	92
25	92	93	95	101	93	92	92	92	92	92
26	92	93	95	102	94	92	92	92	92	92
27	92	93	96	103	94	93	92	92	92	92
28	93	93	96	104	94	93	92	92	92	92
29	93	93	97	106	94	93	93	92	92	92
30	93	93	97	107	95	93	93	92	92	92
31	93	94	98	108	95	93	93	92	92	92
32	93	94	98	110	95	93	93	92	92	92
33	93	94	99	112	96	94	93	93	92	92
34	94	95	100	113	96	94	93	93	92	93
35	94	95	101	115	97	95	94	93	92	93
36	94	96	101	117	98	95	94	93	92	93
37	95	96	102	118	99	96	94	93	93	93
38	95	97	103	120	100	96	95	94	93	93
39	96	98	104	121	101	97	95	94	93	93
40	96	98	105	123	101	98	96	94	93	93
41	97	99	106	124	102	98	96	95	93	93
42	97	100	107	125	103	99	97	95	93	94
43	98	100	108	127	104	100	98	96	94	94
44	98	101	109	128	105	101	98	96	94	94
45	99	102	110	130	106	102	99	97	94	94
46	100	103	111	131	107	103	100	97	95	95
47	101	104	113	132	108	103	100	98	95	95
48	101	105	114	134	109	104	101	99	95	96
49	102	105	115	136	111	105	102	99	96	96
50	103	107	116	137	112	106	103	100	96	97
51	104	108	118	139	113	108	104	101	97	97
52	105	109	120	140	114	109	105	102	98	98
53	106	110	121	141	116	110	106	103	98	99
54	107	111	123	143	117	111	107	104	99	99
55	109	113	124	144	118	112	108	105	100	100
56	110	114	125	145	120	114	110	106	101	101
57	111	115	127	146	121	115	111	107	102	102
58	112	116	128	147	122	116	112	109	103	104
59	113	117	129	148	123	117	113	110	104	105
60	115	119	131	150	125	118	114	111	105	106
61	116	120	132	151	126	120	116	112	106	108
62	117	122	134	152	127	121	117	114	108	109
63	119	123	135	153	129	122	119	115	109	111
64	120	125	137	154	130	124	120	117	110	112
65	122	126	139	155	131	125	122	118	112	114
66	124	128	140	157	133	127	124	120	113	116
67	125	130	142	158	134	129	125	122	115	118
68	127	131	144	159	136	130	127	124	117	120
69	129	133	146	160	137	132	129	125	119	123
70	131	135	148	161	139	134	131	127	121	125

OMEGA POINT LABORATORIES

Time (min)	TC # 11 (°F)	TC # 12 (°F)	TC # 13 (°F)	TC # 14 (°F)	TC # 15 (°F)	TC # 16 (°F)	TC # 17 (°F)	TC # 18 (°F)	TC # 19 (°F)	TC # 20 (°F)
71	133	137	150	163	140	136	133	130	123	128
72	135	140	152	164	142	138	136	132	125	131
73	138	142	154	166	144	140	138	134	127	135
74	140	144	157	167	146	142	140	137	130	138
75	143	146	159	169	148	144	143	140	133	142
76	145	148	161	171	151	147	145	142	135	145
77	147	151	163	173	153	149	148	145	138	149
78	150	153	165	174	155	152	150	148	141	154
79	152	155	168	176	157	154	153	151	145	158
80	155	157	170	178	159	157	156	154	148	163
81	157	159	172	180	161	159	158	157	151	167
82	160	162	174	181	164	162	161	160	154	171
83	162	164	175	183	166	164	163	162	157	174
84	164	166	177	185	168	166	166	165	160	177
85	166	168	179	187	170	168	168	168	164	180
86	168	170	181	188	172	170	171	170	166	182
87	170	172	183	190	174	172	173	172	169	184
88	172	174	185	192	176	175	175	174	172	186
89	173	175	186	194	178	177	177	176	175	187
90	175	177	188	195	179	178	179	178	177	188
91	177	179	190	197	181	180	181	180	180	190
92	179	181	191	199	183	182	183	182	183	191
93	181	183	193	201	184	184	184	185	185	192
94	182	185	194	203	186	185	186	187	186	193
95	184	186	196	204	188	187	188	189	188	194
96	186	188	197	206	189	188	190	190	189	196
97	187	189	198	208	190	190	191	191	190	197
98	188	190	199	209	192	191	192	193	192	198
99	190	192	201	211	193	192	193	194	193	199
100	191	193	202	212	194	193	194	195	194	200
101	192	194	203	214	195	194	196	196	195	201
102	193	195	204	215	196	196	197	197	196	202
103	195	196	205	216	197	197	197	197	197	203
104	196	197	206	218	198	198	198	198	198	204
105	196	198	207	219	199	199	199	199	199	204
106	197	199	208	220	200	199	200	200	200	205
107	198	200	208	221	200	200	200	200	201	205
108	199	201	209	222	201	201	201	201	202	206
109	200	202	210	224	202	201	202	202	202	206
110	201	202	211	225	202	202	202	202	203	207
111	201	203	211	226	203	202	203	203	203	207
112	202	204	212	227	203	203	203	203	204	207
113	202	204	213	228	204	203	204	204	204	208
114	203	205	213	229	205	204	204	204	205	208
115	203	205	214	230	205	204	205	205	205	208
116	204	206	215	231	206	205	205	205	206	209
117	205	206	215	231	206	205	206	206	206	209
118	205	207	216	232	207	206	206	206	206	209
119	205	207	217	233	207	206	206	206	207	209
120	206	208	218	234	207	206	207	206	207	209
121	206	208	218	234	208	207	207	207	207	209
122	207	209	219	235	208	207	207	207	207	210
123	207	209	220	236	208	207	207	207	208	210
124	207	209	220	237	209	207	208	207	208	210
125	208	210	221	238	209	208	208	208	208	210
126	208	210	222	238	210	208	208	208	208	210
127	208	210	222	239	210	208	208	208	208	210
128	208	211	223	240	210	208	208	208	208	210
129	209	211	224	241	211	209	209	208	209	210
130	209	211	224	242	211	209	209	208	209	210
131	209	212	225	243	212	209	209	209	209	210
132	209	212	226	243	212	209	209	209	209	210
133	210	213	227	244	213	209	209	209	209	210
134	210	213	227	245	213	209	209	209	209	210
135	211	214	228	246	214	209	209	209	209	210
136	211	215	229	247	214	210	210	209	209	210
137	212	216	230	248	215	210	210	209	209	210
138	213	217	231	249	215	210	210	209	209	210
139	214	218	232	250	216	210	210	209	209	210
140	215	220	234	252	217	210	210	209	209	210
141	216	221	235	253	218	211	210	209	209	210

OMEGA POINT LABORATORIES

Time (min)	TC # 11 (°F)	TC # 12 (°F)	TC # 13 (°F)	TC # 14 (°F)	TC # 15 (°F)	TC # 16 (°F)	TC # 17 (°F)	TC # 18 (°F)	TC # 19 (°F)	TC # 20 (°F)
142	217	223	236	254	218	211	211	210	209	210
143	219	224	237	255	219	211	211	210	209	210
144	220	226	239	257	220	212	211	210	210	210
145	222	228	240	258	221	212	212	210	210	210
146	224	230	241	259	222	213	212	210	210	210
147	225	232	243	260	223	214	213	210	210	210
148	227	233	245	262	225	215	214	210	210	210
149	229	235	246	263	226	217	215	210	210	210
150	231	237	248	265	228	218	216	210	210	211
151	233	239	249	266	229	220	217	210	210	211
152	235	241	251	268	231	221	218	210	210	211
153	237	243	253	269	232	223	219	210	210	212
154	239	245	254	271	234	224	220	210	210	213
155	241	247	256	272	236	226	221	211	210	213
156	243	249	258	274	237	227	222	211	210	214
157	245	251	259	275	239	229	223	211	210	215
158	247	252	261	277	241	230	225	211	211	215
159	248	254	263	279	242	232	226	211	211	216
160	250	256	265	280	244	233	227	212	211	216
161	252	258	266	282	245	235	229	212	211	217
162	254	260	268	284	247	237	230	213	211	217
163	256	262	270	286	249	239	232	216	211	218
164	258	264	272	288	251	241	233	218	211	219
165	260	266	274	289	253	243	235	219	211	219
166	262	268	276	291	255	245	236	221	211	220
167	264	270	278	293	256	247	238	223	211	221
168	266	272	280	295	258	249	240	225	212	221
169	268	274	282	297	260	251	242	227	213	222
170	270	276	284	299	262	252	243	228	214	223
171	272	278	286	301	264	254	245	230	215	223
172	274	280	288	303	266	256	247	232	216	224
173	276	282	290	305	268	258	249	234	217	225
174	278	284	292	307	270	260	250	236	218	226
175	280	286	294	309	272	262	252	237	220	227
176	282	288	296	311	274	264	254	239	221	228
177	284	290	298	313	276	266	256	241	222	229
178	286	292	300	315	278	268	258	243	224	231
179	288	294	302	317	280	270	260	245	225	232
180	290	296	304	319	282	272	262	247	226	233
181	292	298	306	321	284	274	264	249	227	234
182	294	300	309	323	286	276	266	251	228	235
183	296	303	311	325	288	278	268	253	230	237
184	298	305	313	327	290	280	270	255	231	238
185	301	307	315	328	292	282	272	257	232	240
186	303	309	317	330	294	284	274	259	234	241
187	305	311	319	332	296	286	276	261	236	243
188	307	313	321	334	298	288	278	263	239	245
189	309	315	323	336	300	290	280	266	241	248
190	311	317	325	338	302	292	282	268	244	250
191	313	319	327	340	304	294	284	270	247	252
192	316	321	329	342	306	296	286	272	250	254
193	318	324	331	344	308	298	288	274	253	257
194	320	326	333	346	310	300	290	277	255	259
195	322	328	335	348	312	302	292	279	258	261
196	324	330	337	349	314	305	294	281	260	264
197	326	332	339	351	316	307	297	283	263	266
198	328	334	341	353	318	309	299	285	265	268
199	331	336	343	355	320	311	301	287	268	271
200	333	338	345	357	322	313	303	289	270	273
201	335	340	346	359	324	315	305	292	272	275
202	337	342	348	361	327	317	307	294	275	277
203	339	344	350	363	329	319	309	296	277	280
204	341	345	352	365	330	321	311	298	279	282
205	343	347	354	366	332	323	313	300	281	284
206	345	349	356	368	334	325	315	302	284	286
207	347	351	357	370	336	327	317	304	286	289
208	349	353	359	372	338	329	319	306	288	291
209	351	354	361	373	340	331	321	308	290	293
210	353	356	362	375	342	333	323	311	292	295
Max Temp:	353	356	362	375	342	333	323	311	292	295
Max Allowed:	417	417	417	417	417	417	417	417	417	418

OMEGA POINT LABORATORIES

Time (min)	TC # 21 (°F)	TC # 22 (°F)	TC # 23 (°F)	TC # 24 (°F)	TC # 25 (°F)	TC # 26 (°F)	TC # 27 (°F)	TC # 28 (°F)	TC # 29 (°F)	TC # 30 (°F)
0	93	93	93	93	93	92	91	92	93	93
1	93	93	93	93	93	92	91	92	93	93
2	93	93	93	93	93	92	91	92	93	93
3	93	93	93	93	93	92	91	92	93	93
4	93	93	93	93	93	92	91	92	93	93
5	93	93	93	93	93	92	91	92	93	93
6	93	93	93	93	93	92	91	92	93	93
7	93	93	93	93	93	92	91	92	93	93
8	93	93	93	93	93	92	91	92	93	93
9	93	93	93	93	93	92	91	92	93	93
10	93	93	93	93	93	92	91	92	93	93
11	93	93	93	93	93	92	91	92	93	93
12	93	93	93	93	93	92	91	92	93	93
13	93	93	93	93	93	92	91	92	93	93
14	93	93	93	93	93	92	91	92	93	93
15	93	93	93	93	93	92	91	92	93	93
16	93	93	93	93	93	92	91	93	93	93
17	93	93	93	93	93	92	91	93	93	93
18	93	93	93	93	93	92	91	93	93	93
19	93	93	93	93	93	92	92	94	93	93
20	93	93	93	93	93	92	92	94	93	93
21	93	93	93	93	93	92	92	95	93	93
22	93	93	93	93	93	93	92	95	93	93
23	93	93	93	93	93	93	93	96	94	93
24	93	93	93	93	93	94	93	96	94	93
25	93	93	93	93	93	94	94	96	94	93
26	93	93	93	93	93	95	95	97	94	93
27	93	93	93	93	93	96	96	97	94	93
28	93	93	93	93	93	97	97	97	94	93
29	93	93	93	93	93	98	97	98	95	93
30	93	93	93	93	94	99	98	98	95	93
31	93	93	93	93	94	100	99	99	95	93
32	93	93	93	93	94	101	101	99	95	94
33	93	93	93	93	94	102	102	99	95	94
34	93	93	93	93	95	103	103	100	96	94
35	93	93	93	93	95	104	104	100	96	94
36	93	93	93	93	95	105	105	101	96	94
37	93	93	93	94	96	106	106	102	96	94
38	93	93	94	94	96	108	107	102	97	94
39	93	93	94	94	96	109	108	103	97	94
40	93	94	94	94	97	110	109	103	97	94
41	94	94	94	94	97	111	110	104	98	95
42	94	94	94	94	98	112	111	105	98	95
43	94	94	94	95	99	113	112	106	99	95
44	94	94	95	95	99	114	113	107	99	95
45	94	94	95	95	100	116	114	108	100	95
46	95	95	95	95	101	117	115	109	100	96
47	95	95	96	96	101	119	117	110	101	96
48	95	95	96	96	102	120	118	111	102	96
49	96	96	96	97	103	122	119	113	103	97
50	96	96	97	97	104	123	120	114	103	97
51	97	97	97	98	105	125	122	115	104	97
52	98	97	98	98	106	127	123	116	105	98
53	98	98	98	99	108	129	125	117	106	98
54	99	99	99	99	110	131	126	119	107	99
55	100	99	100	100	112	133	128	120	108	100
56	101	100	101	101	115	135	129	121	109	100
57	102	101	101	102	119	137	130	122	110	101
58	103	102	102	103	122	139	132	124	111	102
59	105	104	103	105	125	141	133	125	112	103
60	106	105	105	107	128	143	135	126	114	104
61	108	106	106	110	131	145	136	127	115	105
62	109	108	108	113	134	147	137	128	116	106
63	111	110	110	117	137	148	139	130	117	107
64	113	112	113	120	139	150	140	131	119	109
65	115	114	117	123	142	152	141	132	120	110
66	117	118	121	127	144	153	143	133	122	111
67	119	121	125	130	147	155	144	135	123	113
68	122	125	129	133	149	156	145	136	125	115
69	125	129	132	136	152	158	146	137	126	116
70	128	134	136	140	154	159	148	139	128	118

OMEGA POINT LABORATORIES

Time (min)	TC # 21 (°F)	TC # 22 (°F)	TC # 23 (°F)	TC # 24 (°F)	TC # 25 (°F)	TC # 26 (°F)	TC # 27 (°F)	TC # 28 (°F)	TC # 29 (°F)	TC # 30 (°F)
71	132	138	140	143	157	161	149	140	130	120
72	136	142	143	146	159	162	150	141	131	122
73	140	146	147	149	161	163	152	143	133	124
74	144	150	150	152	163	165	154	144	135	126
75	147	154	153	155	165	166	155	145	137	128
76	151	158	157	157	167	168	157	146	139	130
77	155	161	159	160	169	169	158	148	141	132
78	159	164	162	162	171	170	160	149	143	135
79	163	167	165	164	172	172	162	150	145	137
80	166	170	168	166	174	173	163	151	147	140
81	169	173	170	168	176	174	165	153	149	143
82	173	175	172	170	177	176	166	154	151	145
83	177	178	174	172	178	177	168	155	154	148
84	180	180	176	174	180	178	170	157	156	151
85	182	182	177	175	181	179	171	158	158	153
86	184	183	179	177	182	180	173	159	160	156
87	186	185	180	178	183	181	174	161	163	159
88	188	186	182	180	184	182	175	162	165	161
89	189	188	183	181	184	183	176	163	167	164
90	191	189	184	182	185	184	177	165	169	166
91	192	190	185	183	186	185	179	167	171	169
92	193	191	187	185	187	186	180	169	173	171
93	194	192	188	185	188	187	181	171	175	173
94	196	193	189	186	189	188	182	172	176	176
95	197	194	190	187	190	188	183	175	178	178
96	198	196	191	189	190	189	184	176	180	180
97	198	196	192	190	191	190	185	178	182	181
98	199	197	192	191	192	191	186	180	183	183
99	200	198	194	192	193	192	188	182	185	185
100	201	199	194	193	194	193	189	183	186	187
101	201	200	195	194	195	194	190	185	188	188
102	202	201	196	195	195	195	191	186	189	189
103	203	201	197	196	196	196	192	188	190	191
104	203	202	198	196	197	197	193	189	192	192
105	204	202	199	197	198	198	194	190	193	193
106	204	203	199	198	199	198	195	191	194	194
107	205	203	200	199	199	199	196	192	195	195
108	205	204	201	200	200	200	197	194	196	196
109	206	204	202	200	201	200	198	195	196	197
110	206	205	202	201	201	201	198	196	197	198
111	206	205	203	201	202	202	199	196	198	199
112	207	206	203	202	202	202	200	197	199	199
113	207	206	204	203	203	203	200	198	200	200
114	207	206	204	203	203	203	201	199	200	201
115	207	207	204	203	204	203	201	200	201	201
116	208	207	205	204	204	204	202	201	202	202
117	208	207	205	204	204	204	202	201	202	203
118	208	207	205	205	205	205	203	202	203	203
119	208	208	206	205	205	205	203	202	203	204
120	208	208	206	205	205	205	204	203	204	204
121	209	208	206	206	206	206	204	204	205	205
122	209	208	206	206	206	206	204	204	205	205
123	209	208	206	206	206	206	205	205	205	206
124	209	209	207	206	206	206	205	205	206	206
125	209	209	207	207	207	207	205	206	206	207
126	209	209	207	207	207	207	205	206	207	207
127	209	209	207	207	207	207	206	206	207	207
128	210	209	207	207	207	207	206	207	208	208
129	210	209	207	207	207	207	206	207	208	208
130	210	209	208	208	208	208	206	207	208	208
131	210	209	208	208	208	208	206	208	209	208
132	210	209	208	208	208	208	207	208	209	209
133	210	210	208	208	208	208	207	208	209	209
134	210	210	208	208	208	208	207	208	210	209
135	210	210	208	208	208	208	207	208	211	210
136	211	210	208	208	208	208	207	209	211	210
137	211	210	208	209	208	209	207	209	212	210
138	211	210	208	209	209	209	207	209	213	211
139	211	210	209	209	209	209	208	209	214	212
140	211	210	209	209	209	209	208	209	214	213
141	212	210	209	209	209	209	208	209	215	213

OMEGA POINT LABORATORIES

Time (min)	TC # 21 (°F)	TC # 22 (°F)	TC # 23 (°F)	TC # 24 (°F)	TC # 25 (°F)	TC # 26 (°F)	TC # 27 (°F)	TC # 28 (°F)	TC # 29 (°F)	TC # 30 (°F)
142	212	210	209	209	209	209	208	209	216	214
143	212	211	209	209	209	209	208	210	216	214
144	212	211	209	209	209	209	208	210	217	215
145	213	211	209	209	209	209	208	210	218	216
146	213	211	209	209	209	209	208	210	219	217
147	214	211	209	209	209	209	208	210	219	218
148	214	212	209	209	209	210	208	210	220	218
149	214	212	209	210	209	210	209	210	221	219
150	215	212	209	210	209	210	209	210	222	220
151	215	213	210	210	210	210	209	210	223	221
152	216	213	210	210	210	210	209	211	224	223
153	216	213	210	210	210	210	209	211	225	224
154	217	214	210	210	210	210	209	212	226	225
155	217	214	210	210	210	210	209	212	227	226
156	218	214	210	210	210	210	209	213	228	228
157	218	215	210	210	210	210	209	214	230	229
158	219	215	210	210	210	210	209	214	231	230
159	219	216	210	210	210	210	209	217	232	232
160	220	216	211	211	210	211	210	218	234	233
161	220	217	211	211	210	211	210	219	235	234
162	221	217	211	211	210	211	210	220	236	236
163	222	218	211	211	211	211	210	221	238	237
164	222	218	211	211	211	211	210	222	239	239
165	223	219	212	211	211	211	210	223	241	240
166	224	220	212	211	211	211	210	225	242	242
167	224	220	213	212	211	211	210	226	243	243
168	225	221	213	212	211	211	210	227	245	245
169	226	222	214	212	212	211	210	229	246	246
170	227	223	214	212	212	211	210	230	248	248
171	228	223	215	213	212	211	210	231	249	249
172	229	224	215	213	213	212	210	233	251	251
173	229	225	216	213	214	212	210	234	253	253
174	230	226	217	213	214	212	210	235	254	254
175	231	227	217	214	215	212	210	237	256	256
176	232	228	218	214	216	212	210	238	257	258
177	233	229	219	215	216	213	210	240	259	259
178	234	230	219	215	217	213	210	241	261	261
179	235	231	220	216	217	214	210	243	262	263
180	236	232	221	216	218	215	210	244	264	265
181	237	234	222	217	218	215	210	246	265	266
182	238	235	223	217	219	216	210	247	267	268
183	239	236	225	218	219	216	210	249	269	270
184	241	237	226	219	220	217	210	250	271	272
185	242	239	227	219	221	218	210	252	272	274
186	243	240	228	220	222	218	210	253	274	275
187	245	241	230	221	222	219	210	255	276	277
188	246	243	231	222	223	219	210	257	277	279
189	248	244	232	223	224	220	211	258	279	281
190	250	246	234	224	225	221	211	260	281	283
191	251	248	235	225	226	221	211	261	282	285
192	253	249	237	226	227	222	212	263	284	287
193	255	251	238	227	228	223	213	265	286	288
194	256	252	240	228	229	224	214	266	288	290
195	258	254	241	229	230	225	215	268	290	292
196	260	256	243	230	231	225	216	269	291	294
197	262	257	244	232	232	227	218	271	293	296
198	264	259	246	233	233	228	219	273	295	298
199	266	261	247	234	234	230	221	274	297	300
200	268	263	249	236	235	232	222	276	299	302
201	271	265	251	237	236	233	224	278	300	304
202	273	267	252	238	238	235	225	279	302	306
203	275	269	254	240	239	236	226	281	304	308
204	277	271	256	241	241	238	228	283	306	310
205	279	273	258	243	242	239	229	284	308	311
206	281	275	259	244	244	241	230	286	309	313
207	284	277	261	246	245	242	232	287	311	315
208	286	279	263	247	247	244	233	289	313	317
209	288	281	265	249	248	245	234	291	315	319
210	290	283	267	251	250	246	236	292	317	321
Max Temp:	290	283	267	251	250	246	236	292	317	321
Max Allowed:	418	418	418	418	418	417	416	417	418	418

OMEGA POINT LABORATORIES

Time (min)	TC # 31 (°F)	TC # 32 (°F)	TC # 33 (°F)	TC # 34 (°F)	TC # 35 (°F)	TC # 36 (°F)	TC # 37 (°F)	TC # 38 (°F)	TC # 39 (°F)	TC # 40 (°F)
0	93	93	93	93	92	92	92	92	92	92
1	93	93	93	93	92	92	92	92	92	92
2	93	93	93	92	92	92	92	92	92	92
3	93	93	93	92	92	92	92	92	92	92
4	93	93	93	92	92	92	92	92	92	92
5	93	93	93	92	92	92	92	92	92	92
6	93	93	93	92	92	92	92	92	92	92
7	93	93	93	92	92	92	92	92	92	92
8	93	93	93	92	92	92	92	92	92	92
9	93	93	93	92	92	92	92	92	92	92
10	93	93	93	92	92	92	92	92	92	92
11	93	93	93	92	92	92	92	92	92	92
12	93	93	93	92	92	92	92	92	92	92
13	93	93	93	92	92	92	92	92	92	92
14	93	93	93	92	92	92	92	92	92	92
15	93	93	93	92	92	92	92	92	92	93
16	93	93	93	92	92	92	92	92	92	93
17	93	93	93	92	92	92	92	92	92	93
18	93	93	93	92	92	92	92	92	92	93
19	93	93	93	92	92	92	92	92	92	93
20	93	93	93	92	92	92	92	92	92	94
21	93	93	93	92	92	92	92	92	92	94
22	93	93	93	92	92	92	92	92	92	94
23	93	93	93	92	92	92	92	92	92	95
24	93	93	93	92	92	92	92	92	92	95
25	93	93	93	92	92	92	92	92	92	95
26	93	93	93	92	92	92	92	92	92	96
27	93	93	93	92	92	92	92	92	93	96
28	93	93	93	92	92	92	92	92	93	96
29	93	93	93	92	92	92	92	92	93	97
30	93	93	93	92	92	92	92	92	93	97
31	93	93	93	92	92	92	92	93	93	98
32	93	93	93	93	92	92	92	93	93	98
33	93	93	93	93	92	93	93	93	94	99
34	93	93	93	93	92	93	93	93	94	100
35	93	93	93	93	92	93	93	93	95	100
36	93	93	93	93	93	93	93	94	95	101
37	94	94	93	93	93	93	93	94	96	102
38	94	94	93	93	93	93	94	94	96	103
39	94	94	94	93	93	94	94	95	97	103
40	94	94	94	93	93	94	95	95	97	104
41	94	94	94	94	93	94	95	96	98	105
42	94	94	94	94	93	95	95	97	99	106
43	94	95	95	94	94	95	96	97	99	107
44	94	95	95	94	94	95	96	98	100	108
45	95	95	95	95	94	96	97	98	101	109
46	95	95	95	95	94	96	98	99	102	110
47	95	96	96	95	95	97	98	100	103	112
48	95	96	96	96	95	97	99	101	104	113
49	96	97	97	96	96	98	100	102	105	114
50	96	98	97	97	96	99	101	103	106	116
51	96	98	98	97	97	100	102	104	107	117
52	97	99	99	98	97	101	103	105	109	118
53	97	100	99	99	98	101	104	106	110	120
54	98	101	100	99	99	102	105	107	111	122
55	99	102	101	100	99	103	106	109	113	123
56	100	103	102	101	100	104	107	110	114	124
57	100	104	103	102	101	106	109	111	115	126
58	101	106	104	104	102	107	110	112	117	127
59	102	107	106	105	103	108	111	114	118	129
60	103	108	107	106	104	109	113	115	119	131
61	105	110	109	108	106	111	114	117	121	132
62	106	111	111	110	107	112	116	118	122	134
63	107	113	113	111	108	114	117	120	124	136
64	108	115	115	113	110	115	119	122	126	137
65	110	117	117	115	111	117	121	123	127	139
66	111	119	119	116	113	119	123	125	129	141
67	113	121	121	118	115	121	125	127	130	142
68	115	123	123	120	116	123	127	129	132	144
69	116	126	126	122	118	125	129	130	134	146
70	118	128	128	124	120	127	131	132	136	148

OMEGA POINT LABORATORIES

Time (min)	TC # 31 (°F)	TC # 32 (°F)	TC # 33 (°F)	TC # 34 (°F)	TC # 35 (°F)	TC # 36 (°F)	TC # 37 (°F)	TC # 38 (°F)	TC # 39 (°F)	TC # 40 (°F)
71	120	130	130	126	122	129	133	135	138	150
72	122	133	133	128	124	132	135	137	140	152
73	124	135	135	130	126	134	138	139	142	155
74	126	137	138	133	129	136	140	141	144	157
75	128	140	141	136	131	139	142	144	146	159
76	130	142	143	139	134	142	145	146	149	161
77	132	145	146	142	136	144	148	148	151	163
78	134	147	148	144	139	147	150	151	153	166
79	136	149	151	147	142	149	153	153	155	168
80	138	152	154	150	145	151	155	156	157	170
81	141	154	156	152	147	154	158	158	159	172
82	144	156	159	155	150	156	160	160	161	174
83	146	159	161	158	153	158	163	162	163	176
84	149	161	164	161	155	161	165	164	165	178
85	152	163	166	163	158	163	167	166	168	180
86	154	166	168	166	160	165	169	168	169	182
87	157	168	171	168	163	167	172	170	171	183
88	160	170	173	171	165	170	174	173	173	185
89	162	172	175	173	167	172	175	174	175	187
90	165	174	177	175	170	174	177	176	177	189
91	167	176	179	178	172	176	179	178	179	190
92	170	178	181	180	174	177	181	180	181	192
93	172	180	183	181	176	179	183	182	182	193
94	174	181	185	183	178	181	184	183	184	195
95	176	183	186	185	180	182	186	185	185	196
96	178	184	188	186	181	184	187	186	187	197
97	180	186	189	188	183	185	188	188	188	199
98	181	187	190	189	185	187	190	189	190	200
99	183	189	192	191	186	188	191	191	191	201
100	185	190	193	192	187	190	192	192	192	202
101	187	191	194	193	189	191	193	193	193	203
102	188	192	195	194	190	192	194	194	195	204
103	190	193	196	195	191	193	195	195	196	205
104	191	193	196	196	192	194	196	196	197	206
105	192	194	197	197	194	195	197	197	198	207
106	193	195	198	198	195	196	198	198	199	208
107	194	196	199	199	196	197	199	199	199	209
108	195	197	199	199	196	198	200	200	200	210
109	196	198	200	200	197	199	201	200	201	211
110	197	199	201	201	198	200	201	201	202	212
111	198	200	201	202	199	200	202	202	203	213
112	199	200	202	202	200	201	203	203	203	214
113	200	201	203	203	200	202	203	203	204	215
114	200	201	203	203	201	202	204	204	205	216
115	201	202	204	204	202	203	204	204	205	217
116	202	203	204	204	202	203	205	205	206	218
117	202	203	205	205	203	204	205	205	207	219
118	203	204	205	205	203	204	206	206	208	220
119	203	204	206	206	204	205	206	206	209	221
120	204	205	206	206	204	205	207	207	210	222
121	205	205	207	207	205	206	207	208	211	223
122	205	206	207	207	205	206	208	208	212	224
123	205	206	208	207	206	206	208	209	214	225
124	206	207	208	208	206	207	209	209	215	226
125	206	207	208	208	206	207	209	210	216	227
126	207	208	209	209	207	207	210	210	217	228
127	207	208	209	209	207	208	210	211	218	229
128	207	209	210	210	207	208	211	212	220	230
129	208	209	210	210	208	208	212	213	221	231
130	208	210	211	210	208	209	213	214	222	232
131	208	210	211	211	208	209	214	216	223	233
132	208	211	212	211	208	210	216	217	225	234
133	208	211	212	212	209	210	217	219	226	236
134	209	212	213	212	209	211	218	221	227	237
135	209	212	213	213	209	212	220	223	228	238
136	209	213	214	214	209	213	221	225	230	239
137	209	214	215	214	210	214	222	227	231	241
138	209	214	215	215	210	215	223	228	232	242
139	209	215	216	215	210	216	224	230	234	243
140	210	216	217	216	210	217	226	231	235	245
141	210	216	218	217	211	218	227	232	236	246

OMEGA POINT LABORATORIES

Time (min)	TC # 31 (°F)	TC # 32 (°F)	TC # 33 (°F)	TC # 34 (°F)	TC # 35 (°F)	TC # 36 (°F)	TC # 37 (°F)	TC # 38 (°F)	TC # 39 (°F)	TC # 40 (°F)
142	210	217	218	218	211	219	228	234	238	248
143	210	218	219	218	212	219	229	235	239	249
144	210	219	220	219	212	220	231	237	241	251
145	211	219	221	220	213	221	232	238	242	252
146	211	220	222	221	214	222	233	240	244	254
147	212	221	223	222	215	223	235	241	246	255
148	213	222	224	223	216	224	236	243	247	257
149	214	223	225	224	217	225	237	244	249	259
150	215	224	226	225	218	226	239	246	250	260
151	216	225	227	227	219	227	240	248	252	262
152	218	226	229	228	220	228	241	249	254	264
153	219	228	230	229	221	229	243	251	256	266
154	221	229	232	231	221	230	245	253	257	267
155	222	231	233	232	222	231	246	254	259	269
156	224	232	235	233	223	232	248	256	261	271
157	225	234	236	235	224	233	250	258	263	273
158	226	236	238	236	225	235	251	259	264	275
159	228	237	239	237	225	236	253	261	266	277
160	229	239	241	239	226	238	255	263	268	278
161	231	240	243	240	227	241	257	265	270	280
162	232	242	244	242	229	243	258	267	272	282
163	234	244	246	244	230	245	260	269	274	284
164	235	245	248	245	233	247	262	271	276	286
165	237	247	249	247	236	249	264	273	278	288
166	238	249	251	249	239	251	266	275	280	290
167	240	251	253	251	241	254	268	277	282	292
168	242	252	255	253	244	256	270	279	284	294
169	243	254	257	255	246	258	272	280	286	295
170	245	256	259	257	249	260	274	282	288	297
171	247	258	260	259	251	262	276	285	290	299
172	248	259	262	261	253	264	278	287	292	301
173	250	261	264	264	256	267	280	289	294	303
174	252	263	266	266	258	269	282	291	296	305
175	253	265	268	268	260	271	285	293	298	307
176	255	267	270	270	262	273	287	295	300	309
177	257	269	272	272	265	276	289	297	302	311
178	259	271	274	274	267	278	291	300	304	313
179	261	273	276	276	269	280	293	302	306	315
180	262	275	278	278	271	282	296	304	309	317
181	264	277	280	281	274	285	298	306	311	319
182	266	279	282	283	276	287	300	308	313	321
183	268	281	284	285	278	289	302	311	315	323
184	270	283	286	287	280	291	305	313	317	325
185	272	285	288	289	283	294	307	315	320	327
186	273	286	290	291	285	296	309	317	322	329
187	275	288	293	293	287	298	311	320	324	331
188	277	290	295	296	289	300	313	322	326	333
189	279	292	297	298	292	303	316	324	328	335
190	281	294	299	300	294	305	318	327	330	337
191	283	296	301	302	296	307	320	329	333	339
192	285	298	303	304	298	309	322	331	335	341
193	287	300	305	306	300	311	325	333	337	343
194	289	302	307	308	303	314	327	335	339	345
195	290	304	309	310	305	316	329	338	341	347
196	292	306	311	313	307	318	331	340	343	349
197	294	308	313	315	309	320	333	342	345	351
198	296	310	315	317	311	323	336	344	347	353
199	298	312	317	319	313	325	338	346	349	354
200	300	314	319	321	315	327	340	348	351	356
201	302	316	321	323	318	329	342	350	352	358
202	304	318	323	325	320	331	344	352	354	360
203	306	320	325	327	322	333	346	354	356	361
204	308	322	327	329	324	336	348	356	358	363
205	310	324	329	331	326	338	350	358	359	365
206	312	326	330	333	328	340	352	359	361	366
207	314	328	332	335	330	342	354	361	363	368
208	316	330	334	337	332	344	356	363	364	370
209	318	331	336	339	334	346	358	365	366	371
210	320	333	338	341	336	348	360	366	367	373
Max Temp:	320	333	338	341	336	348	360	366	367	373
Max Allowed:	418	418	418	418	417	417	417	417	417	417

OMEGA POINT LABORATORIES

Time (min)	TC # 41 (°F)	TC # 42 (°F)	TC # 43 (°F)	TC # 44 (°F)	TC # 45 (°F)	TC # 46 (°F)	TC # 47 (°F)	TC # 48 (°F)	TC # 49 (°F)	TC # 50 (°F)
0	92	93	93	93	93	93	93	93	94	94
1	92	93	93	93	93	93	93	93	94	94
2	92	93	93	93	93	93	93	93	94	94
3	92	93	93	93	93	93	93	93	94	94
4	92	93	93	93	93	93	93	93	94	94
5	92	93	93	93	93	93	93	93	94	94
6	92	92	93	93	93	93	93	93	94	94
7	92	93	93	93	93	93	93	93	94	94
8	93	92	93	93	93	93	93	93	94	94
9	93	93	93	93	93	93	93	93	94	94
10	93	92	93	93	93	93	93	93	94	94
11	94	93	93	93	93	93	93	93	94	94
12	94	93	93	93	93	93	93	93	94	94
13	95	93	93	93	93	93	93	93	94	94
14	96	93	93	93	93	93	93	93	94	94
15	97	93	93	93	93	93	93	93	94	94
16	97	93	93	93	93	93	93	93	94	94
17	98	93	93	93	93	93	93	93	94	94
18	99	93	93	93	93	93	93	93	94	94
19	100	93	93	93	93	93	93	93	94	94
20	100	93	93	93	93	93	93	93	94	94
21	101	94	93	93	93	93	93	93	94	94
22	102	94	93	93	93	93	93	93	94	94
23	103	94	93	93	93	93	93	93	94	94
24	104	94	93	93	93	93	93	93	94	94
25	105	94	93	93	93	93	93	93	94	94
26	106	94	93	93	93	93	93	93	94	94
27	106	95	93	93	93	93	93	93	94	94
28	107	95	93	93	93	93	93	93	94	94
29	108	95	93	93	93	93	93	93	94	94
30	109	96	94	93	93	93	93	93	94	94
31	110	96	94	93	93	93	93	93	94	94
32	111	96	94	93	93	93	93	93	94	94
33	112	97	94	94	93	93	93	94	94	94
34	113	97	95	94	93	93	93	94	94	94
35	114	98	95	94	93	93	93	94	94	94
36	115	99	96	94	94	93	93	94	94	94
37	116	100	96	95	94	93	93	94	94	95
38	118	101	97	95	94	93	94	94	94	95
39	119	102	98	96	94	94	94	94	94	95
40	121	102	98	96	95	94	94	94	94	95
41	122	104	99	97	95	94	94	94	95	95
42	123	105	100	98	96	94	94	95	95	96
43	125	106	101	98	96	95	94	95	95	96
44	126	106	102	99	97	95	95	95	95	96
45	127	107	103	100	98	95	95	95	95	97
46	128	109	104	101	98	96	95	96	96	97
47	130	110	105	102	99	96	96	96	96	98
48	131	111	106	103	100	97	96	96	97	98
49	133	112	107	104	100	97	97	97	97	99
50	134	113	108	104	101	98	97	97	98	99
51	135	114	109	106	102	98	98	98	98	100
52	137	115	110	107	103	99	99	98	99	101
53	138	116	111	108	104	100	99	99	100	101
54	140	118	112	109	105	101	100	100	101	102
55	142	119	114	110	106	102	101	101	102	103
56	143	120	115	111	108	103	102	102	103	104
57	145	122	116	113	109	104	103	103	104	105
58	146	123	117	114	110	105	104	104	105	106
59	148	124	119	115	111	106	106	105	107	107
60	149	126	120	117	113	107	107	107	108	108
61	151	127	121	118	114	108	109	108	109	110
62	152	128	123	119	115	110	111	110	111	112
63	153	130	124	121	117	111	112	112	113	115
64	155	131	126	122	118	112	114	114	115	118
65	156	133	127	124	120	114	117	115	117	122
66	157	134	129	125	121	116	119	118	120	126
67	158	135	130	127	123	117	121	120	123	130
68	160	137	132	129	125	119	124	123	127	134
69	161	138	133	130	127	121	127	125	130	137
70	163	140	135	132	129	123	130	128	134	141

OMEGA POINT LABORATORIES

Time (min)	TC # 41 (°F)	TC # 42 (°F)	TC # 43 (°F)	TC # 44 (°F)	TC # 45 (°F)	TC # 46 (°F)	TC # 47 (°F)	TC # 48 (°F)	TC # 49 (°F)	TC # 50 (°F)
71	164	142	137	134	131	125	133	132	138	144
72	166	143	139	137	133	128	137	136	142	148
73	168	145	141	139	136	130	141	139	146	152
74	170	147	143	141	138	132	146	143	150	155
75	172	149	145	144	141	135	151	147	153	158
76	173	151	148	146	143	138	156	151	157	161
77	175	153	150	149	146	141	162	155	160	164
78	177	155	153	151	149	144	167	159	163	167
79	179	157	155	154	152	147	172	163	167	170
80	181	160	157	156	154	150	176	167	170	172
81	182	162	160	159	157	153	179	171	173	174
82	184	164	162	161	160	156	182	175	176	177
83	186	166	165	164	163	159	184	178	178	178
84	188	168	167	166	165	162	186	181	180	180
85	190	170	169	169	167	165	187	184	182	181
86	191	173	171	171	170	168	189	186	184	183
87	193	175	174	173	172	171	191	188	186	184
88	195	177	176	175	174	174	192	190	187	185
89	197	179	178	177	177	176	194	192	188	186
90	199	181	180	179	179	179	195	193	189	187
91	201	182	182	181	181	182	197	194	191	188
92	203	184	183	183	183	185	198	196	192	189
93	204	186	185	184	184	188	199	197	193	190
94	206	187	187	186	187	190	200	198	194	191
95	208	189	188	188	189	191	201	199	195	192
96	210	190	189	190	191	193	202	200	196	194
97	211	191	191	191	192	194	203	201	197	195
98	213	193	192	193	193	196	203	202	198	195
99	214	194	193	194	194	197	204	203	199	197
100	216	195	195	195	195	198	205	203	200	197
101	217	196	196	196	196	199	205	204	200	198
102	218	197	197	197	197	200	206	205	201	199
103	220	198	198	198	198	201	207	205	202	199
104	221	199	199	199	199	202	207	206	203	200
105	222	200	199	199	200	202	207	207	203	200
106	223	201	200	200	201	203	208	207	204	201
107	224	202	201	201	201	204	208	207	204	202
108	226	202	202	201	202	204	208	208	205	202
109	227	203	202	202	203	205	209	208	205	203
110	228	204	203	203	203	205	209	208	206	203
111	229	204	203	203	204	206	209	209	206	204
112	230	205	204	204	204	206	209	209	206	204
113	231	205	204	204	205	207	210	209	207	205
114	232	206	205	205	205	207	210	209	207	205
115	233	207	205	205	206	207	210	210	207	205
116	235	207	206	205	206	208	210	210	208	206
117	236	208	206	206	206	208	210	210	208	206
118	237	208	207	206	207	208	210	210	208	206
119	238	209	207	207	207	209	210	210	208	207
120	239	209	207	207	207	209	210	210	208	207
121	240	210	208	207	208	209	210	210	209	207
122	241	210	208	207	208	209	210	210	209	207
123	242	211	208	208	208	209	211	210	209	207
124	244	212	208	208	208	209	210	210	209	208
125	245	213	209	208	209	210	211	210	209	208
126	246	213	209	208	209	210	211	211	209	208
127	247	214	209	209	209	210	210	211	209	208
128	249	215	209	209	209	210	211	211	209	208
129	250	216	210	209	210	210	210	211	210	208
130	251	217	210	209	210	210	210	211	210	209
131	252	218	210	209	210	210	210	211	210	209
132	254	219	210	209	210	210	210	211	210	209
133	255	220	211	210	210	210	210	211	210	209
134	256	221	211	210	210	210	210	211	210	209
135	258	222	212	210	210	210	210	211	210	209
136	259	223	213	210	210	210	210	211	210	209
137	260	224	214	210	210	210	210	211	210	209
138	261	226	215	210	211	210	210	211	210	209
139	263	227	216	210	211	210	210	211	210	210
140	264	228	217	211	211	210	211	211	211	210
141	266	229	218	211	211	210	211	211	211	210

OMEGA POINT LABORATORIES

Time (min)	TC # 41 (°F)	TC # 42 (°F)	TC # 43 (°F)	TC # 44 (°F)	TC # 45 (°F)	TC # 46 (°F)	TC # 47 (°F)	TC # 48 (°F)	TC # 49 (°F)	TC # 50 (°F)
142	267	231	220	211	211	210	211	211	211	210
143	268	232	221	211	211	210	211	211	211	210
144	270	233	222	212	211	211	211	211	211	210
145	271	235	223	214	211	211	211	212	211	210
146	273	236	225	215	211	211	211	212	211	210
147	274	238	226	216	212	211	211	212	211	210
148	276	239	227	217	212	211	211	212	211	210
149	277	241	229	218	212	211	211	212	211	210
150	279	242	230	219	214	211	211	213	212	210
151	281	244	232	220	215	211	212	213	212	211
152	282	245	233	222	215	211	212	214	212	211
153	284	247	235	223	216	211	212	214	212	211
154	286	248	236	225	217	211	212	215	212	211
155	287	250	238	226	217	211	212	216	213	211
156	289	251	239	227	218	212	213	216	213	211
157	291	253	241	229	219	212	213	217	213	211
158	292	255	242	230	220	212	214	217	214	211
159	294	256	244	232	221	212	215	218	214	211
160	296	258	245	233	222	212	215	219	215	211
161	298	260	247	235	224	213	216	219	215	211
162	300	261	249	237	225	213	216	220	216	212
163	301	263	250	238	227	214	217	221	216	212
164	303	265	252	240	228	215	218	221	217	212
165	305	266	254	242	229	216	218	222	218	213
166	307	268	256	243	231	216	219	223	218	213
167	309	270	257	245	232	217	220	224	219	214
168	310	271	259	246	234	217	220	225	220	215
169	312	273	261	248	235	218	221	226	221	216
170	314	275	263	250	237	219	222	227	222	217
171	316	277	264	251	239	221	223	228	223	218
172	318	279	266	253	240	222	224	229	224	219
173	320	281	268	255	242	224	225	230	225	220
174	322	282	270	257	244	225	226	231	226	221
175	324	284	272	259	246	227	227	232	227	222
176	325	286	273	260	248	228	228	233	228	223
177	327	288	275	262	249	229	229	234	229	224
178	329	290	277	264	251	230	230	235	230	225
179	331	292	279	266	253	232	232	237	232	227
180	333	294	281	268	255	233	233	238	233	228
181	335	295	283	270	257	235	235	239	234	229
182	337	297	285	272	259	237	236	240	235	231
183	339	299	287	274	261	240	238	242	237	232
184	341	301	289	276	263	242	240	243	238	234
185	343	303	291	278	265	245	241	244	239	235
186	345	305	293	280	267	247	243	246	241	237
187	347	307	295	282	269	249	245	248	242	238
188	348	309	297	284	272	252	247	249	244	240
189	350	311	299	286	274	254	249	251	246	241
190	352	313	301	288	276	256	251	252	247	243
191	354	316	303	290	278	258	253	254	249	244
192	356	318	305	292	280	260	255	256	251	246
193	358	320	307	294	282	263	257	258	252	247
194	360	322	309	296	284	265	259	260	254	249
195	362	324	311	298	286	267	262	262	256	251
196	363	326	313	300	288	269	264	263	258	252
197	365	328	315	302	290	271	267	265	260	254
198	367	330	317	304	292	273	269	267	261	255
199	369	332	319	306	295	276	272	270	263	257
200	371	334	322	308	297	278	274	272	265	259
201	373	336	324	310	299	280	276	274	267	261
202	374	337	326	312	301	282	279	276	269	262
203	376	339	328	314	303	284	281	278	271	264
204	378	341	330	316	305	286	284	280	273	266
205	380	343	332	318	307	289	286	282	275	267
206	381	345	334	320	309	291	288	284	277	269
207	383	347	336	322	311	293	291	286	279	271
208	385	349	337	324	313	295	293	288	280	273
209	387	351	339	326	315	297	295	290	282	274
210	388	353	341	328	317	299	298	292	284	276
Max Temp:	388	353	341	328	317	299	298	292	284	276
Max Allowed:	417	418	418	418	418	418	418	418	419	419

OMEGA POINT LABORATORIES

Time (min)	TC # 51 (°F)	TC # 52 (°F)	TC # 53 (°F)	TC # 54 (°F)	TC # 55 (°F)	TC # 56 (°F)	TC # 57 (°F)	TC # 58 (°F)	TC # 59 (°F)	TC # 60 (°F)
0	94	94	93	92	92	93	93	94	93	93
1	94	94	93	92	92	93	93	94	93	93
2	94	94	93	92	92	93	93	94	93	93
3	94	94	93	92	92	93	93	94	93	93
4	94	94	93	92	92	93	93	94	93	93
5	94	94	93	92	92	93	93	94	93	93
6	94	94	93	92	92	93	93	94	93	93
7	94	94	93	92	92	93	93	94	93	93
8	94	93	93	92	92	93	93	93	93	93
9	94	93	93	92	92	93	93	93	93	93
10	94	94	93	92	93	93	93	93	93	93
11	94	94	93	92	93	93	93	94	93	93
12	94	93	93	92	94	93	93	93	93	93
13	94	93	93	92	94	93	93	93	93	93
14	94	93	93	92	95	94	93	93	93	93
15	94	93	93	92	95	94	93	93	93	93
16	94	93	93	92	96	94	93	93	93	93
17	94	93	93	92	96	94	94	93	93	93
18	94	93	93	92	97	94	94	93	93	93
19	94	93	93	92	97	95	94	93	93	93
20	94	93	93	92	98	95	94	93	93	93
21	94	93	93	92	98	95	94	93	93	93
22	94	93	93	92	98	95	94	93	93	93
23	94	93	93	92	99	96	94	93	93	93
24	94	94	94	93	99	96	94	93	93	93
25	94	94	94	93	99	96	94	93	93	93
26	94	94	95	94	99	96	94	94	93	93
27	94	94	96	94	100	97	94	94	93	93
28	94	94	96	95	100	97	94	94	93	93
29	94	94	97	95	100	97	94	94	93	93
30	94	94	98	96	100	97	94	94	93	93
31	94	94	99	97	100	97	95	94	93	93
32	94	94	100	98	101	98	95	94	93	94
33	94	95	101	99	101	98	95	94	94	94
34	94	95	102	100	101	98	95	94	94	94
35	94	95	103	100	102	98	95	94	94	94
36	94	95	104	101	102	99	95	94	94	94
37	95	96	105	102	102	99	96	94	94	94
38	95	96	106	103	103	99	96	94	94	94
39	95	97	107	104	104	100	96	94	94	94
40	95	97	108	105	105	100	96	94	94	95
41	95	98	109	106	107	101	97	95	94	95
42	96	98	110	107	109	102	97	95	95	95
43	96	99	111	108	111	103	97	95	95	95
44	96	100	112	109	114	104	98	95	95	96
45	97	100	114	110	116	105	98	95	95	96
46	97	101	115	111	118	107	99	96	95	96
47	97	102	116	113	120	108	99	96	96	97
48	98	103	118	114	122	110	100	96	96	97
49	98	104	120	115	124	112	100	97	96	97
50	99	105	122	116	126	113	101	97	97	98
51	99	106	124	118	128	115	102	97	97	98
52	100	107	126	119	130	116	102	98	98	99
53	101	108	128	120	131	118	103	98	98	100
54	101	110	130	122	132	119	104	99	99	100
55	102	112	132	123	134	120	105	100	100	101
56	103	116	135	125	134	121	106	100	101	102
57	104	119	137	126	135	122	107	101	102	103
58	105	123	139	128	136	123	108	102	102	104
59	107	126	141	129	137	124	109	103	103	105
60	109	129	143	131	138	124	110	104	105	106
61	112	132	145	133	138	125	111	105	106	108
62	115	134	147	134	139	125	112	106	107	109
63	118	137	149	136	139	126	113	107	109	111
64	122	140	151	138	140	127	114	109	110	112
65	125	143	153	140	140	127	115	110	112	114
66	128	146	155	142	141	128	117	111	114	116
67	132	149	157	143	141	129	119	113	115	118
68	135	151	158	145	142	130	120	115	117	120
69	138	154	160	147	143	131	122	116	119	121
70	141	156	162	149	143	132	123	118	121	123

OMEGA POINT LABORATORIES

Time (min)	TC # 51 (°F)	TC # 52 (°F)	TC # 53 (°F)	TC # 54 (°F)	TC # 55 (°F)	TC # 56 (°F)	TC # 57 (°F)	TC # 58 (°F)	TC # 59 (°F)	TC # 60 (°F)
71	144	159	163	151	144	133	125	120	123	125
72	147	161	165	152	145	134	127	122	125	127
73	151	163	167	154	146	135	129	124	127	129
74	154	165	168	156	146	137	131	126	129	131
75	157	167	170	158	147	138	133	128	131	134
76	159	169	171	159	148	140	135	130	133	136
77	162	171	173	161	149	141	137	133	135	138
78	164	173	174	163	150	143	139	135	138	140
79	166	175	176	165	151	145	141	137	141	143
80	168	176	177	166	152	147	144	139	142	146
81	170	178	178	168	153	149	147	142	145	148
82	171	179	180	170	155	151	149	144	148	151
83	173	180	181	171	157	155	152	147	149	153
84	175	181	182	173	159	157	155	149	152	156
85	176	183	183	174	160	160	158	152	155	159
86	178	184	184	175	163	163	161	155	157	161
87	179	185	185	177	165	166	164	158	161	164
88	181	186	186	178	168	168	167	162	165	167
89	182	187	187	179	170	171	170	165	167	170
90	183	188	188	180	173	174	173	169	171	173
91	184	189	189	181	176	177	176	172	175	176
92	185	190	189	182	179	180	180	175	177	180
93	186	190	190	183	182	183	182	179	181	182
94	188	191	190	184	184	186	185	182	183	185
95	189	192	191	185	187	189	188	185	186	188
96	190	193	192	186	190	192	191	188	189	190
97	191	193	192	187	192	194	193	190	192	193
98	192	194	193	188	194	196	195	193	194	195
99	193	195	194	189	196	198	197	195	196	197
100	194	196	195	189	198	199	199	197	198	199
101	195	197	195	190	199	201	201	199	199	200
102	196	197	196	191	201	202	202	201	201	202
103	196	198	197	192	203	203	203	202	203	203
104	197	199	198	193	204	204	204	204	204	204
105	198	199	199	194	205	205	205	205	205	205
106	199	200	199	195	206	206	206	206	206	206
107	200	201	200	196	207	207	207	207	207	207
108	200	201	201	196	207	207	207	207	207	207
109	201	202	201	197	208	208	208	208	207	208
110	202	202	202	198	208	208	208	208	208	208
111	202	203	202	199	208	209	209	208	208	208
112	203	203	203	199	209	209	209	209	208	209
113	203	204	203	200	209	209	209	209	209	209
114	204	204	204	200	209	209	209	209	209	209
115	204	205	204	201	209	209	209	209	209	209
116	205	205	205	202	209	210	210	209	209	209
117	205	205	205	202	209	210	210	209	209	210
118	205	206	205	203	210	210	210	210	209	210
119	206	206	206	203	210	210	210	210	209	210
120	206	206	206	203	210	210	210	210	209	210
121	206	207	206	204	210	210	210	210	210	210
122	207	207	206	204	210	210	210	210	210	210
123	207	207	207	205	210	210	210	210	210	210
124	207	207	207	205	210	210	210	210	210	211
125	207	207	207	205	210	210	210	210	210	211
126	208	208	207	206	210	210	210	210	210	212
127	208	208	208	206	210	210	210	210	210	212
128	208	208	208	206	210	210	210	210	210	213
129	208	208	208	206	210	210	210	210	210	214
130	208	208	208	207	210	210	211	210	211	215
131	208	209	208	207	210	210	211	210	211	215
132	209	209	208	207	210	211	212	210	211	215
133	209	209	209	207	210	211	213	210	212	217
134	209	209	209	208	210	211	217	210	213	217
135	209	209	209	208	210	210	219	210	214	218
136	209	209	209	208	210	210	221	210	215	219
137	209	209	209	208	210	211	222	210	215	220
138	209	209	209	208	210	211	223	210	216	221
139	209	210	209	208	210	211	225	211	216	222
140	210	210	209	208	210	211	226	211	217	223
141	210	210	209	209	210	211	227	211	218	224

OMEGA POINT LABORATORIES

Time (min)	TC # 51 (°F)	TC # 52 (°F)	TC # 53 (°F)	TC # 54 (°F)	TC # 55 (°F)	TC # 56 (°F)	TC # 57 (°F)	TC # 58 (°F)	TC # 59 (°F)	TC # 60 (°F)
142	210	210	210	209	210	213	228	213	218	225
143	210	210	210	209	210	215	229	214	219	226
144	210	210	210	209	210	217	230	215	220	227
145	210	210	210	209	210	218	231	217	220	228
146	210	210	210	209	210	219	232	218	221	229
147	210	210	210	209	210	220	233	219	222	229
148	210	210	210	209	210	222	234	220	223	230
149	210	210	210	209	210	224	235	221	224	231
150	210	211	210	209	211	225	236	222	224	232
151	210	211	210	210	211	226	237	223	225	233
152	210	211	210	210	211	228	238	224	226	234
153	211	212	210	210	211	229	239	225	227	235
154	211	212	210	210	214	230	240	226	228	236
155	211	212	211	210	216	231	241	228	229	238
156	211	213	211	210	218	232	242	229	230	239
157	211	213	211	210	219	234	243	230	232	240
158	211	213	211	210	220	234	245	231	233	241
159	211	214	211	210	221	236	246	232	235	243
160	211	214	211	210	222	237	247	234	236	244
161	211	214	211	210	223	237	248	235	237	245
162	212	215	211	210	224	239	249	236	239	247
163	212	215	211	210	226	241	250	238	240	248
164	212	215	212	210	227	242	252	239	242	250
165	212	216	212	211	228	244	253	240	243	251
166	212	216	212	211	229	245	254	242	245	253
167	212	216	213	211	231	247	256	243	246	255
168	213	217	214	211	232	248	257	245	248	256
169	213	217	214	211	233	250	259	246	250	258
170	214	218	214	211	235	251	260	248	251	260
171	214	218	215	211	236	253	262	249	253	261
172	215	219	216	211	238	254	263	251	254	263
173	216	219	216	211	240	256	264	252	256	265
174	216	220	217	211	242	257	266	254	258	267
175	217	220	217	211	243	259	267	255	259	268
176	218	221	218	211	245	261	269	257	261	270
177	219	221	218	211	247	262	271	259	263	272
178	220	222	219	211	249	264	272	260	265	274
179	221	223	220	211	251	266	274	262	266	276
180	222	223	220	211	253	267	275	263	268	278
181	223	224	221	211	255	269	277	265	270	280
182	224	225	222	211	257	271	279	267	272	281
183	225	226	222	212	259	273	280	268	273	283
184	227	227	223	212	261	275	282	270	275	285
185	228	228	224	212	263	276	284	272	277	287
186	229	229	225	213	265	278	285	274	279	289
187	230	230	226	214	266	280	287	275	281	291
188	232	231	227	216	268	282	289	277	283	293
189	233	232	227	217	270	284	291	279	284	295
190	234	233	228	218	272	286	292	281	286	297
191	236	234	229	220	274	288	294	282	288	299
192	237	236	230	221	276	289	296	284	290	301
193	238	237	232	222	279	291	298	286	292	303
194	240	238	233	223	281	293	299	288	294	305
195	241	240	234	224	283	295	301	290	296	307
196	243	241	235	225	285	297	303	291	298	309
197	244	242	236	226	287	299	305	293	299	311
198	246	244	237	227	289	301	306	295	301	313
199	247	245	238	229	291	303	308	297	303	315
200	249	247	240	230	293	305	310	299	305	317
201	250	248	241	231	296	307	312	301	307	319
202	252	250	242	232	298	309	314	303	309	321
203	253	251	244	233	301	311	316	305	311	323
204	255	253	245	235	303	313	318	307	313	325
205	256	254	247	236	305	316	320	309	315	327
206	258	256	248	237	307	318	322	311	318	330
207	259	257	250	239	309	320	324	313	319	331
208	261	259	251	240	311	322	326	314	321	333
209	263	261	253	241	314	324	328	316	323	335
210	264	262	254	243	316	326	330	318	325	337
Max Temp:	264	262	254	243	316	326	330	318	325	337
Max Allowed:	419	419	418	417	417	418	418	419	418	418

OMEGA POINT LABORATORIES

Time (min)	TC # 61 (°F)	TC # 62 (°F)	TC # 63 (°F)	TC # 64 (°F)	TC # 65 (°F)	TC # 66 (°F)	TC # 67 (°F)	TC # 68 (°F)	TC # 69 (°F)	TC # 70 (°F)
0	92	92	92	92	92	92	92	92	92	92
1	92	92	92	92	92	92	92	92	92	92
2	92	92	92	92	92	92	92	92	92	92
3	92	92	92	92	92	92	92	92	92	92
4	92	92	92	92	92	92	92	92	92	92
5	92	92	92	92	92	92	92	92	92	92
6	92	92	92	92	92	92	92	92	92	92
7	92	92	92	92	92	92	92	92	92	92
8	92	92	92	92	92	92	92	92	92	92
9	92	92	92	92	92	92	92	92	92	92
10	92	92	92	92	92	92	92	92	92	92
11	92	92	92	92	92	92	92	92	92	92
12	92	92	92	92	92	92	92	92	92	92
13	92	92	92	92	92	92	92	93	92	92
14	92	92	92	92	92	92	92	93	92	92
15	92	92	92	92	92	92	92	94	92	92
16	92	92	92	92	92	92	92	95	93	92
17	92	92	92	92	92	92	92	95	93	92
18	92	92	92	92	92	92	92	96	93	92
19	92	92	92	92	92	92	92	97	94	92
20	92	92	92	92	92	92	92	97	94	92
21	92	92	92	92	92	92	93	98	94	92
22	92	92	92	92	92	92	93	99	95	92
23	92	92	92	92	92	92	93	100	95	92
24	92	92	92	92	92	92	93	101	96	92
25	92	92	92	92	92	92	93	101	96	92
26	92	92	92	92	92	92	93	102	96	93
27	92	92	92	92	92	92	94	103	97	93
28	92	92	92	92	92	93	94	104	97	93
29	92	92	92	92	92	93	94	105	98	93
30	92	92	92	92	92	93	94	105	98	93
31	93	92	92	92	93	93	95	106	99	94
32	93	92	92	92	93	93	95	107	99	94
33	93	92	92	93	93	93	95	108	100	94
34	93	92	92	93	93	94	96	109	101	94
35	93	93	92	93	93	94	96	110	101	95
36	93	93	92	93	94	94	97	111	102	95
37	93	93	93	93	94	95	98	113	103	95
38	93	93	93	94	95	96	98	114	104	96
39	94	93	93	94	95	96	99	116	105	97
40	94	93	93	95	96	97	100	118	106	97
41	94	94	93	95	97	98	102	120	107	98
42	94	94	94	96	97	99	103	121	108	99
43	95	94	94	96	98	100	104	123	110	100
44	95	94	94	97	99	101	105	124	111	101
45	95	95	95	98	100	102	106	126	112	102
46	96	95	95	99	101	103	107	127	114	103
47	96	96	96	100	102	104	108	129	116	104
48	97	96	96	101	103	105	109	130	117	105
49	97	97	97	102	104	106	111	133	119	107
50	98	98	98	103	105	107	112	134	120	108
51	98	98	98	104	106	109	113	136	122	109
52	99	99	99	105	107	110	115	137	124	110
53	100	100	100	106	108	111	116	138	125	112
54	101	101	101	107	109	112	117	140	127	113
55	102	102	102	108	111	114	119	141	129	114
56	103	103	103	110	112	115	120	143	130	116
57	104	104	104	111	113	116	122	144	132	117
58	105	105	105	112	114	117	123	145	134	119
59	106	106	106	113	116	119	124	146	135	120
60	107	108	108	115	117	120	126	147	137	122
61	109	109	109	117	119	122	127	148	138	124
62	110	111	111	119	121	124	129	149	140	126
63	112	113	112	121	123	126	131	151	142	128
64	114	115	114	123	125	128	133	152	143	129
65	116	116	116	125	127	130	135	154	144	131
66	117	118	118	127	129	132	136	155	146	133
67	119	120	120	129	131	134	138	157	147	135
68	121	122	122	131	133	135	140	158	149	137
69	123	124	124	133	135	137	142	160	150	139
70	125	126	126	135	136	139	143	161	152	140

OMEGA POINT LABORATORIES

Time (min)	TC # 61 (°F)	TC # 62 (°F)	TC # 63 (°F)	TC # 64 (°F)	TC # 65 (°F)	TC # 66 (°F)	TC # 67 (°F)	TC # 68 (°F)	TC # 69 (°F)	TC # 70 (°F)
71	127	128	128	137	138	141	145	163	153	142
72	129	131	130	139	140	143	147	164	155	144
73	131	133	132	141	142	145	149	166	157	146
74	133	135	134	143	145	147	151	167	158	148
75	136	137	137	145	147	149	152	169	160	150
76	138	139	139	147	149	151	155	170	161	151
77	140	142	141	150	151	153	156	172	163	153
78	143	144	144	152	153	155	158	173	164	155
79	145	147	146	155	156	157	160	175	166	157
80	148	149	149	157	158	160	162	177	167	159
81	150	152	152	160	161	162	164	178	169	161
82	153	155	154	162	163	164	166	180	171	164
83	155	157	157	164	165	166	168	182	172	166
84	158	160	159	167	168	169	170	183	174	168
85	161	162	162	169	170	171	172	185	176	170
86	163	165	165	172	172	173	174	186	178	173
87	166	168	168	174	175	176	176	188	180	175
88	169	171	170	177	177	178	179	190	182	178
89	172	173	173	179	180	181	181	192	183	180
90	175	176	176	182	182	183	183	193	185	182
91	178	179	179	184	185	185	185	195	187	184
92	181	182	181	187	187	187	187	197	189	187
93	183	184	184	189	189	190	189	199	191	189
94	186	187	187	191	191	192	191	200	193	190
95	189	189	189	193	193	194	194	202	195	192
96	191	192	191	195	195	195	195	204	197	194
97	193	194	194	197	197	197	197	205	198	195
98	195	196	195	198	198	198	199	207	200	197
99	197	198	197	200	200	200	200	209	201	198
100	199	199	199	201	201	201	201	210	203	199
101	200	200	200	202	202	202	202	211	204	201
102	201	202	201	203	203	203	203	212	205	202
103	203	203	202	203	204	204	204	214	206	202
104	204	204	203	204	204	204	205	215	207	203
105	204	205	204	205	205	205	205	216	209	204
106	205	205	205	206	206	206	206	217	210	205
107	206	206	206	206	206	206	206	218	211	206
108	207	206	206	207	207	207	207	219	212	206
109	207	207	207	207	207	207	207	220	213	207
110	207	207	207	207	208	208	208	221	213	207
111	208	208	207	208	208	208	208	222	214	207
112	208	208	208	208	208	208	208	223	215	208
113	208	208	208	208	208	208	208	224	216	208
114	208	208	208	208	208	208	209	225	217	208
115	209	208	208	208	209	209	209	226	218	208
116	209	208	208	208	209	209	209	228	219	209
117	209	209	208	209	209	209	210	229	221	209
118	209	209	209	209	209	209	211	230	222	209
119	209	209	209	209	209	209	212	231	223	209
120	210	209	209	209	209	209	213	233	224	209
121	210	209	209	209	209	210	214	234	225	209
122	210	209	209	209	209	210	215	235	227	209
123	211	209	209	209	209	210	216	237	228	209
124	211	209	209	209	210	211	217	238	229	210
125	212	209	209	209	210	211	219	240	231	211
126	213	209	209	209	211	213	220	241	232	214
127	213	209	209	209	211	214	221	242	233	220
128	214	210	209	209	212	216	222	244	235	222
129	214	210	209	209	212	218	223	245	236	224
130	215	210	209	210	214	219	225	247	237	225
131	216	211	209	210	216	220	226	248	239	227
132	216	211	209	210	217	222	228	249	240	229
133	217	212	209	211	218	224	229	250	241	230
134	217	213	209	211	219	225	231	252	243	232
135	218	213	210	212	219	227	232	253	244	233
136	219	214	210	212	220	229	234	254	245	235
137	219	214	210	213	221	231	236	256	247	236
138	220	215	211	214	222	232	237	257	248	238
139	220	215	211	214	223	234	239	259	249	239
140	221	216	212	215	224	235	240	260	251	241
141	222	216	212	216	226	237	242	261	252	242

OMEGA POINT LABORATORIES

Time (min)	TC # 61 (°F)	TC # 62 (°F)	TC # 63 (°F)	TC # 64 (°F)	TC # 65 (°F)	TC # 66 (°F)	TC # 67 (°F)	TC # 68 (°F)	TC # 69 (°F)	TC # 70 (°F)
142	222	217	212	217	227	238	243	263	253	244
143	223	218	213	218	228	240	245	264	255	245
144	224	218	213	220	229	241	246	265	256	247
145	224	219	214	221	230	243	247	267	258	248
146	225	220	214	222	232	244	249	268	259	250
147	226	221	215	223	233	245	250	270	261	251
148	227	221	215	224	235	247	252	271	262	253
149	228	222	216	225	236	248	253	273	264	254
150	229	223	217	226	238	250	255	274	265	256
151	229	224	218	227	239	251	256	276	267	257
152	230	225	218	228	241	253	258	277	268	259
153	232	226	219	229	242	255	260	279	269	260
154	233	227	220	230	244	256	261	280	271	262
155	235	228	221	232	246	258	263	282	272	263
156	237	229	222	233	248	259	264	284	274	265
157	238	230	223	235	250	261	266	285	276	266
158	240	231	224	237	252	263	268	287	277	268
159	241	232	224	239	254	265	270	289	279	269
160	243	234	225	240	255	266	271	290	280	271
161	244	235	226	242	257	268	273	292	282	272
162	246	236	227	244	259	270	274	293	283	274
163	248	237	228	245	261	271	276	295	285	276
164	249	238	228	247	262	273	278	297	286	277
165	251	239	229	249	264	274	279	298	288	279
166	253	241	230	250	266	276	281	300	289	280
167	255	242	231	252	268	278	283	301	291	282
168	257	243	232	254	269	279	284	303	293	284
169	258	245	233	256	271	281	286	305	294	285
170	260	246	234	257	273	283	288	307	296	287
171	262	248	236	259	275	285	290	309	298	289
172	264	249	238	261	277	286	292	311	299	290
173	266	251	240	263	278	288	293	312	301	292
174	268	252	243	265	280	290	295	314	302	293
175	270	254	246	267	282	292	297	316	304	295
176	272	256	248	269	284	294	299	318	306	297
177	274	257	251	270	285	295	301	320	308	298
178	275	259	253	272	287	297	303	322	309	300
179	277	261	256	274	289	299	305	323	311	302
180	279	262	258	277	291	301	307	325	312	304
181	281	264	260	279	293	303	309	327	314	305
182	283	266	262	281	295	305	311	329	316	307
183	285	268	264	283	297	307	312	330	317	308
184	287	270	267	285	299	309	314	332	319	310
185	289	272	269	287	301	311	316	334	321	312
186	291	274	271	289	303	313	319	336	322	314
187	293	276	273	291	305	315	321	338	324	316
188	295	278	275	293	307	317	323	340	326	317
189	297	280	277	295	309	319	325	342	328	319
190	299	282	279	297	311	321	327	344	330	321
191	301	284	282	300	313	323	329	345	331	323
192	303	286	284	302	315	325	331	347	333	325
193	305	288	286	304	317	327	334	349	335	326
194	307	291	288	306	319	329	336	351	337	328
195	309	293	290	308	321	332	338	353	339	330
196	311	295	292	310	323	334	340	355	341	332
197	313	297	294	312	326	336	343	357	342	334
198	315	299	296	314	328	339	345	359	344	336
199	317	302	298	317	331	341	347	361	346	338
200	320	304	301	319	333	343	349	362	348	340
201	322	307	303	322	336	345	351	364	349	342
202	324	309	305	324	338	347	353	366	351	343
203	326	312	308	326	340	349	355	368	353	345
204	329	314	310	328	342	351	357	370	355	347
205	331	317	312	331	345	353	359	372	357	349
206	333	319	314	333	347	355	361	374	359	351
207	335	322	317	335	349	357	363	375	361	353
208	337	324	319	337	351	359	365	377	363	354
209	339	326	321	339	353	361	366	379	365	356
210	341	328	323	341	355	363	368	381	366	358
Max Temp:	341	328	323	341	355	363	368	381	366	358
Max Allowed:	417	417	417	417	417	417	417	417	417	417

OMEGA POINT LABORATORIES

Time (min)	TC # 71 (°F)	TC # 72 (°F)	TC # 73 (°F)	TC # 74 (°F)	TC # 75 (°F)	TC # 76 (°F)	TC # 77 (°F)	TC # 78 (°F)	TC # 79 (°F)	TC # 80 (°F)
0	92	92	92	92	92	92	93	93	93	92
1	92	92	92	92	92	92	93	93	93	92
2	92	92	92	92	92	92	93	93	93	92
3	92	92	92	92	92	92	93	93	93	92
4	92	92	92	92	92	92	93	93	93	92
5	92	92	92	92	92	92	93	93	93	92
6	92	92	92	92	92	92	93	93	93	92
7	92	92	92	92	92	92	93	93	93	92
8	92	92	92	92	92	92	93	93	93	92
9	92	92	92	92	92	92	93	93	93	93
10	92	92	92	92	92	92	93	93	93	93
11	92	92	92	92	92	92	92	93	93	94
12	92	92	92	92	92	92	92	93	93	96
13	92	92	92	92	92	92	92	93	93	99
14	92	92	92	92	92	92	92	93	93	102
15	92	92	92	92	92	92	92	93	94	107
16	92	92	92	92	92	92	92	93	94	111
17	92	92	92	92	92	92	92	92	94	114
18	92	92	92	92	92	92	92	93	95	116
19	92	92	92	92	92	92	92	93	95	117
20	92	92	92	92	92	92	92	93	95	118
21	92	92	92	92	92	92	92	93	96	118
22	92	92	92	92	92	92	92	93	96	119
23	92	92	92	92	92	92	92	93	97	120
24	92	92	92	92	92	92	92	93	97	122
25	92	92	92	92	92	92	92	93	97	124
26	92	92	92	92	92	92	92	93	98	124
27	92	92	92	92	92	92	92	93	98	123
28	92	92	92	92	92	92	92	93	99	124
29	93	92	92	92	92	92	92	93	99	126
30	93	92	92	92	92	92	92	93	100	128
31	93	93	92	92	92	92	92	94	100	129
32	93	93	92	92	92	92	93	94	101	131
33	93	93	93	92	92	93	93	94	102	133
34	93	93	93	92	93	93	93	94	102	132
35	94	93	93	92	93	93	93	94	102	132
36	94	94	93	93	93	93	93	94	102	133
37	94	94	93	93	93	93	93	95	103	134
38	94	94	93	93	93	93	93	95	104	135
39	95	95	94	93	93	93	93	95	104	137
40	96	95	94	93	94	94	94	95	105	139
41	96	96	94	93	94	94	94	96	105	138
42	97	96	95	94	94	94	94	96	106	138
43	98	97	95	94	94	94	94	96	106	138
44	98	98	96	94	95	95	95	96	107	141
45	99	98	97	95	95	95	95	97	107	142
46	100	99	97	95	96	95	96	97	108	145
47	101	100	98	96	96	96	96	98	109	147
48	102	101	99	96	97	97	97	98	110	150
49	103	102	100	97	97	97	97	98	112	152
50	104	103	101	98	98	98	98	99	112	155
51	105	104	102	98	99	98	98	100	112	157
52	106	105	103	99	100	99	99	100	113	158
53	107	106	104	100	100	100	100	101	114	162
54	108	107	105	101	101	101	101	101	117	165
55	110	108	106	102	102	102	101	102	117	167
56	111	110	107	103	103	103	102	103	118	171
57	112	111	108	104	105	104	103	104	121	175
58	114	112	110	105	106	105	105	105	122	179
59	115	114	111	106	107	106	106	106	125	183
60	117	116	113	108	108	107	107	107	125	186
61	118	117	114	109	110	109	108	108	128	190
62	120	119	116	111	111	110	110	109	130	193
63	122	121	118	112	113	112	111	111	132	195
64	124	123	120	114	115	114	113	112	135	198
65	126	125	122	116	117	116	115	114	139	199
66	128	127	124	118	119	118	117	116	142	199
67	130	129	126	120	121	120	118	117	145	200
68	132	131	128	122	123	122	120	119	150	202
69	134	133	130	124	125	124	122	121	154	203
70	136	135	132	126	127	126	124	123	159	204

OMEGA POINT LABORATORIES

Time (min)	TC # 71 (°F)	TC # 72 (°F)	TC # 73 (°F)	TC # 74 (°F)	TC # 75 (°F)	TC # 76 (°F)	TC # 77 (°F)	TC # 78 (°F)	TC # 79 (°F)	TC # 80 (°F)
71	137	137	134	128	129	128	127	126	164	204
72	139	139	136	130	131	130	129	128	168	204
73	141	141	138	132	133	132	131	130	172	205
74	143	143	140	134	135	134	133	133	176	205
75	146	145	143	137	138	137	136	136	179	205
76	148	147	145	139	140	139	138	138	180	204
77	150	149	147	141	142	141	141	141	182	204
78	152	152	149	144	145	144	143	144	183	204
79	155	154	152	146	147	146	145	146	183	203
80	157	157	154	149	150	149	148	149	183	203
81	160	159	157	151	153	152	151	152	183	202
82	162	162	159	154	155	154	154	154	182	201
83	164	164	162	157	158	157	157	157	182	200
84	167	167	164	159	161	160	159	159	181	199
85	170	169	167	162	164	163	162	162	180	198
86	172	172	170	165	166	166	165	165	180	197
87	175	174	172	168	169	169	168	167	179	195
88	177	177	175	171	172	171	171	170	179	194
89	180	179	178	173	175	174	173	172	180	193
90	182	182	180	176	177	177	176	175	181	192
91	184	184	183	179	180	180	179	177	182	190
92	187	186	185	181	182	182	181	180	184	189
93	189	188	187	184	185	185	184	182	186	188
94	191	190	189	186	187	187	186	185	188	189
95	192	192	191	188	189	189	188	187	190	191
96	194	194	193	190	191	191	190	189	192	192
97	196	195	194	192	193	193	192	191	193	194
98	197	197	196	194	194	195	194	193	195	195
99	198	198	197	196	196	196	196	195	196	197
100	200	199	199	197	197	198	197	196	198	198
101	201	200	200	198	199	199	199	198	199	199
102	202	201	201	200	200	200	200	199	200	201
103	203	202	202	201	201	201	201	200	201	202
104	203	203	203	202	202	202	202	202	202	203
105	204	204	204	203	203	203	203	203	203	203
106	205	205	204	204	204	204	204	204	204	204
107	206	205	205	205	205	205	205	204	205	205
108	206	206	206	205	205	206	206	205	206	206
109	207	207	206	206	206	206	206	206	206	206
110	207	207	207	206	207	207	207	206	207	207
111	207	207	207	207	207	207	207	207	207	207
112	208	208	208	207	207	207	207	207	207	207
113	208	208	208	208	208	208	208	207	207	208
114	208	208	208	208	208	208	208	208	208	208
115	208	208	208	208	208	208	208	208	208	208
116	209	209	208	208	208	208	208	208	208	208
117	209	209	209	208	208	208	208	208	208	208
118	209	209	209	209	208	208	208	208	208	208
119	209	209	209	209	209	208	208	208	208	208
120	209	209	209	209	209	209	209	208	208	209
121	209	209	209	209	209	209	209	209	208	209
122	209	209	209	209	209	209	209	209	209	209
123	210	209	209	209	209	209	209	209	209	209
124	210	209	209	209	209	209	209	209	209	209
125	210	210	209	209	209	209	209	209	209	209
126	211	210	209	209	209	209	209	209	209	209
127	212	210	210	209	209	209	209	209	209	209
128	214	211	210	209	209	209	209	209	209	209
129	216	213	210	209	209	209	209	209	209	209
130	217	214	210	209	209	209	209	209	209	209
131	218	215	211	209	210	209	209	209	209	209
132	219	216	211	210	210	209	209	209	209	209
133	221	217	212	210	210	209	209	209	209	209
134	222	218	213	210	210	209	209	209	209	209
135	223	218	213	210	210	210	209	209	209	209
136	224	219	214	210	210	210	209	209	209	209
137	226	220	215	210	210	211	209	209	209	209
138	227	222	215	210	210	212	209	209	209	209
139	228	223	216	210	211	212	209	210	209	209
140	229	224	217	210	211	213	210	210	209	209
141	231	225	218	210	211	213	210	210	209	209

OMEGA POINT LABORATORIES

Time (min)	TC # 71 (°F)	TC # 72 (°F)	TC # 73 (°F)	TC # 74 (°F)	TC # 75 (°F)	TC # 76 (°F)	TC # 77 (°F)	TC # 78 (°F)	TC # 79 (°F)	TC # 80 (°F)
142	232	226	218	211	212	214	210	210	209	209
143	234	227	219	212	212	215	210	210	209	209
144	235	228	220	212	213	215	211	210	209	209
145	237	230	221	213	214	216	211	210	209	210
146	239	231	222	214	215	217	211	210	209	212
147	241	233	223	215	216	217	211	210	210	213
148	242	234	223	216	217	218	211	210	210	216
149	244	236	225	217	218	219	212	210	211	217
150	246	238	226	218	219	220	213	210	213	219
151	247	240	227	219	220	221	214	210	214	221
152	249	241	228	220	221	222	215	210	216	222
153	250	243	229	221	222	222	215	210	217	224
154	252	244	230	222	223	223	216	211	218	225
155	254	246	232	223	224	224	216	211	219	226
156	255	247	234	224	225	225	217	211	219	227
157	257	249	236	225	226	226	218	212	220	228
158	258	250	237	226	227	227	218	213	221	229
159	260	252	239	227	228	228	219	213	222	230
160	262	254	240	228	229	229	220	214	223	230
161	263	255	242	229	230	229	221	214	224	231
162	265	257	243	230	231	230	222	215	225	232
163	266	258	245	231	232	231	222	216	225	233
164	268	260	246	232	233	233	223	216	226	234
165	270	262	247	233	234	234	224	217	227	235
166	271	263	249	234	236	235	225	218	228	236
167	273	265	250	236	237	236	226	219	229	237
168	275	266	252	237	239	237	227	220	230	238
169	276	268	253	238	240	238	228	221	231	239
170	278	269	254	240	241	239	228	222	232	240
171	280	271	256	241	243	241	229	223	233	241
172	281	273	257	242	244	242	230	224	234	242
173	283	274	259	244	245	243	231	225	235	243
174	285	276	261	245	247	244	232	226	236	244
175	286	278	262	247	248	245	233	227	237	245
176	288	280	264	248	250	246	234	228	238	246
177	290	281	266	250	251	248	235	229	240	248
178	291	283	267	251	253	249	236	230	241	249
179	293	285	269	253	255	250	236	231	242	250
180	295	287	271	254	256	252	237	232	243	251
181	297	288	272	256	258	253	238	233	244	252
182	298	290	274	258	260	254	239	235	246	254
183	300	292	276	259	261	256	241	236	247	255
184	302	294	278	261	263	257	242	238	248	256
185	303	296	279	263	265	259	243	239	249	257
186	305	297	281	265	267	260	244	241	251	259
187	307	299	283	267	268	262	246	242	252	260
188	309	301	285	268	270	263	247	244	254	262
189	311	303	287	270	272	265	248	246	255	263
190	313	305	289	272	274	266	250	247	257	265
191	314	307	291	274	276	268	251	249	258	266
192	316	309	293	276	278	269	253	251	260	268
193	318	310	295	278	280	271	255	252	261	269
194	320	312	296	280	281	273	256	254	263	271
195	322	314	298	282	283	274	258	256	264	272
196	324	316	300	284	285	276	260	258	266	274
197	326	318	302	286	287	278	261	260	268	276
198	328	320	304	288	289	279	263	262	270	277
199	330	322	306	290	291	281	266	264	271	279
200	332	324	308	292	293	284	270	266	273	281
201	334	326	310	294	295	286	273	267	275	283
202	336	328	312	296	297	289	276	269	277	285
203	338	330	315	298	299	291	279	271	279	286
204	339	332	317	300	301	293	282	273	281	288
205	341	334	319	302	303	296	285	275	282	290
206	343	336	321	305	306	298	287	277	284	292
207	345	338	323	307	308	300	290	279	286	294
208	347	340	325	309	310	303	292	281	288	296
209	349	342	327	311	312	305	295	283	290	298
210	351	344	329	313	314	307	297	285	292	300
Max Temp:	351	344	329	313	314	307	297	285	292	300
Max Allowed:	417	417	417	417	417	417	418	418	418	417

OMEGA POINT LABORATORIES

Time (min)	TC # 81 (°F)	TC # 82 (°F)	TC # 83 (°F)	TC # 84 (°F)	TC # 85 (°F)	TC # 86 (°F)	TC # 87 (°F)	TC # 88 (°F)	TC # 89 (°F)	TC # 90 (°F)
0	92	92	93	93	93	93	93	93	93	93
1	92	92	93	93	93	93	93	93	93	93
2	92	92	93	93	93	93	93	93	93	93
3	92	92	93	93	93	93	93	93	93	93
4	92	92	93	93	93	93	93	93	93	93
5	92	92	93	93	93	93	93	93	93	93
6	92	92	93	93	93	93	93	93	93	93
7	92	92	93	93	93	93	93	93	93	93
8	92	92	93	93	93	93	93	93	93	93
9	104	92	93	93	93	93	93	93	93	93
10	146	92	93	93	93	93	93	93	93	93
11	195	92	93	93	93	93	93	93	93	93
12	198	92	93	93	93	93	93	93	93	93
13	199	92	93	93	93	93	93	93	93	93
14	200	92	93	93	93	93	93	93	93	93
15	201	92	93	93	93	93	93	93	93	93
16	200	92	93	93	93	93	93	93	93	93
17	197	92	93	93	93	93	93	93	93	93
18	187	92	93	93	93	93	93	93	93	93
19	180	92	93	93	93	93	93	93	93	93
20	173	92	93	93	93	93	93	93	93	93
21	169	93	93	93	93	93	93	93	93	93
22	166	93	93	93	93	93	93	93	93	93
23	166	94	93	93	93	93	93	93	93	93
24	169	94	94	94	93	93	93	93	93	93
25	172	94	94	94	93	93	93	93	93	93
26	175	95	94	94	93	93	93	93	93	93
27	176	96	94	94	93	93	93	93	93	93
28	180	96	94	94	93	93	93	93	93	93
29	182	98	94	94	93	93	93	93	93	93
30	178	101	94	94	94	93	93	93	93	93
31	178	105	95	94	94	93	93	93	93	93
32	177	111	95	94	94	94	94	94	93	93
33	176	118	96	94	94	94	94	94	93	93
34	177	125	98	94	94	94	94	94	93	93
35	178	133	99	94	94	94	94	94	93	93
36	181	140	101	94	94	94	94	94	94	93
37	182	149	103	95	94	94	94	94	94	93
38	185	156	105	95	94	94	94	94	94	93
39	186	164	107	95	94	94	94	95	94	94
40	187	173	109	96	94	94	94	95	94	94
41	188	180	112	96	94	94	94	95	94	94
42	189	186	114	97	94	94	95	95	95	94
43	189	191	117	97	94	94	95	96	95	94
44	191	194	119	98	94	94	95	96	95	95
45	192	196	122	98	95	95	95	96	96	95
46	193	198	124	99	95	95	96	97	96	95
47	195	200	127	100	95	95	96	97	96	96
48	198	202	130	100	95	96	96	98	97	96
49	200	203	134	101	96	96	97	98	97	96
50	201	203	137	102	96	96	97	99	98	97
51	201	203	140	103	97	97	98	99	98	98
52	202	203	142	103	97	97	99	100	99	98
53	203	203	144	105	98	98	99	101	100	99
54	203	202	145	105	98	98	100	102	101	100
55	204	201	145	106	99	99	101	102	102	101
56	204	200	146	107	99	100	102	104	103	102
57	205	199	147	108	100	101	103	105	104	103
58	205	198	148	109	101	101	104	106	105	104
59	205	197	148	110	102	102	105	107	106	106
60	205	196	148	111	103	103	106	108	108	107
61	206	195	149	112	103	104	107	110	109	108
62	206	193	149	113	104	106	109	111	111	110
63	207	191	149	114	106	107	110	113	113	112
64	207	190	149	115	107	108	112	115	115	113
65	207	188	149	116	108	110	114	117	116	115
66	207	186	149	117	109	112	115	118	118	117
67	207	184	149	119	111	114	117	120	120	119
68	207	183	149	120	112	115	119	122	122	121
69	207	181	149	122	114	117	121	124	124	123
70	207	180	149	123	116	118	123	126	126	125

OMEGA POINT LABORATORIES

Time (min)	TC # 81 (°F)	TC # 82 (°F)	TC # 83 (°F)	TC # 84 (°F)	TC # 85 (°F)	TC # 86 (°F)	TC # 87 (°F)	TC # 88 (°F)	TC # 89 (°F)	TC # 90 (°F)
71	207	179	149	125	118	120	125	128	128	128
72	207	178	149	126	119	122	127	130	130	130
73	207	178	149	128	121	124	129	132	132	132
74	207	177	150	130	124	127	131	134	135	134
75	206	176	150	132	126	129	134	136	137	136
76	206	176	150	134	128	131	136	139	139	139
77	206	176	151	136	131	134	139	141	142	141
78	206	175	151	138	133	136	142	144	144	144
79	206	175	152	141	135	139	144	146	147	147
80	205	175	153	143	138	142	147	149	149	149
81	205	175	154	146	141	145	150	152	152	152
82	204	175	156	149	144	148	153	154	155	155
83	204	175	157	152	148	152	156	157	157	158
84	203	175	159	155	151	155	159	160	160	160
85	202	176	161	158	154	158	162	163	163	163
86	202	176	163	161	157	162	164	165	165	166
87	201	176	165	164	161	165	167	168	168	169
88	200	176	168	167	164	168	170	171	171	172
89	199	176	170	170	167	171	173	173	174	174
90	199	177	173	173	171	174	176	176	177	177
91	198	178	176	177	174	178	178	179	179	180
92	197	179	179	180	178	181	182	182	182	183
93	196	181	181	183	181	184	184	185	185	185
94	195	183	184	186	184	187	187	187	187	188
95	194	185	187	189	188	190	190	190	190	190
96	194	188	190	192	191	193	192	192	192	193
97	195	191	192	194	193	195	194	195	195	195
98	195	193	195	196	196	197	197	197	197	197
99	196	196	197	198	198	199	198	198	198	199
100	198	198	199	200	200	200	200	200	200	200
101	199	200	200	201	201	202	202	201	201	202
102	200	201	202	202	203	203	203	203	202	203
103	201	203	203	204	204	204	204	204	204	204
104	202	204	204	205	205	205	205	205	205	205
105	203	205	205	206	206	206	206	206	206	206
106	204	206	206	206	206	206	206	207	206	206
107	205	206	207	207	207	207	207	207	207	207
108	206	207	207	208	208	207	208	208	207	207
109	206	207	208	208	208	208	208	208	208	208
110	207	208	208	208	208	208	208	209	208	208
111	207	208	208	209	209	209	209	209	209	208
112	208	208	209	209	209	209	209	209	209	209
113	208	209	209	209	209	209	209	209	209	209
114	208	209	209	209	209	209	209	210	209	209
115	208	209	209	209	209	209	209	210	209	209
116	209	209	209	209	209	210	210	210	209	209
117	209	209	209	209	209	210	210	211	209	209
118	209	209	209	209	209	210	210	211	210	209
119	209	209	209	209	209	210	210	212	210	210
120	209	209	209	209	209	210	210	213	210	210
121	209	209	209	209	210	210	211	214	210	210
122	209	209	209	209	209	210	211	215	210	210
123	209	209	209	209	209	210	212	215	211	210
124	209	209	209	209	210	210	213	216	211	210
125	209	209	209	209	210	211	213	217	212	210
126	209	209	209	209	210	211	214	218	212	210
127	209	209	209	209	209	211	214	218	212	210
128	209	209	209	209	209	211	215	219	213	210
129	209	209	209	209	209	211	215	220	214	210
130	209	209	209	209	209	211	216	220	214	210
131	209	209	209	209	210	211	216	221	215	210
132	209	209	209	210	209	212	217	222	216	211
133	209	209	209	209	209	211	217	223	216	211
134	209	209	209	210	210	212	218	224	217	211
135	209	209	209	209	209	212	218	225	218	212
136	209	209	209	210	209	212	219	226	219	212
137	209	209	209	210	210	212	220	227	220	212
138	209	209	209	210	210	212	220	228	220	213
139	209	209	210	210	210	212	221	229	221	213
140	209	209	210	210	210	212	221	229	222	214
141	209	209	210	211	210	212	222	230	223	214

OMEGA POINT LABORATORIES

Time (min)	TC # 81 (°F)	TC # 82 (°F)	TC # 83 (°F)	TC # 84 (°F)	TC # 85 (°F)	TC # 86 (°F)	TC # 87 (°F)	TC # 88 (°F)	TC # 89 (°F)	TC # 90 (°F)
142	209	209	210	214	210	213	222	231	224	215
143	209	209	210	215	210	213	223	232	225	215
144	209	209	211	216	210	213	224	233	226	216
145	209	209	211	217	210	213	225	234	227	217
146	209	209	212	218	211	214	225	235	228	218
147	209	209	212	219	211	214	226	236	229	219
148	209	209	212	220	212	215	227	237	229	219
149	209	209	213	221	212	216	227	238	231	220
150	209	209	213	222	212	216	228	239	232	221
151	209	209	214	223	214	217	229	240	233	222
152	209	209	214	222	215	218	230	241	234	223
153	209	210	214	225	216	219	231	242	235	224
154	209	210	215	224	218	219	232	243	236	225
155	209	210	216	227	219	220	232	244	237	226
156	209	210	217	227	220	222	233	245	238	227
157	209	210	218	217	222	222	234	246	239	228
158	209	210	219	229	223	223	236	247	240	229
159	209	211	220	231	224	224	237	248	241	230
160	209	211	221	232	226	226	238	249	243	231
161	209	212	223	234	227	227	239	251	244	232
162	209	212	223	235	228	228	240	252	245	234
163	209	213	225	237	230	230	242	253	246	236
164	209	213	227	238	231	232	243	255	248	238
165	209	214	228	239	232	233	245	256	249	240
166	209	215	229	241	234	235	246	257	250	243
167	209	215	231	242	235	236	248	259	252	245
168	210	216	232	243	237	238	250	260	253	246
169	210	218	233	245	238	239	251	262	254	248
170	210	219	235	246	239	241	253	263	256	250
171	211	221	236	247	241	243	255	265	258	252
172	214	223	238	249	242	245	257	266	259	254
173	215	224	239	250	244	247	258	268	261	256
174	216	226	241	252	245	249	260	270	263	257
175	217	227	243	253	247	251	262	271	264	259
176	218	229	244	255	248	253	264	273	266	261
177	219	231	246	256	250	255	266	275	268	263
178	220	234	248	258	252	257	268	277	270	265
179	222	236	250	259	254	259	270	278	272	266
180	223	238	252	261	255	262	272	280	273	268
181	224	241	254	263	257	264	274	282	276	270
182	225	243	256	264	259	266	276	284	277	272
183	227	246	258	266	261	268	278	286	280	274
184	228	249	260	268	263	270	280	288	282	276
185	230	251	262	270	265	272	282	290	284	278
186	232	254	264	272	266	274	284	292	286	280
187	233	256	266	273	268	276	286	294	288	283
188	235	259	269	275	270	278	288	297	290	285
189	237	262	271	277	272	281	290	299	293	287
190	239	264	273	279	274	283	293	301	295	289
191	240	267	275	281	276	285	295	303	297	291
192	242	270	278	283	278	287	297	306	299	293
193	244	273	280	285	280	289	299	308	302	295
194	245	276	282	287	282	291	302	310	304	297
195	247	279	285	289	284	294	304	313	306	300
196	249	281	287	291	286	296	306	315	308	302
197	251	285	290	293	288	298	308	317	310	304
198	253	287	292	295	290	300	311	319	313	306
199	254	290	295	297	293	302	313	322	315	308
200	256	293	297	299	295	304	315	324	317	310
201	258	296	300	301	297	306	317	326	319	313
202	260	299	302	303	299	308	320	328	321	315
203	261	302	304	305	301	311	322	331	324	317
204	263	305	307	307	303	313	324	333	326	319
205	265	308	309	309	305	315	326	335	328	321
206	267	311	312	311	307	317	328	338	330	324
207	269	313	314	313	309	319	331	340	333	326
208	271	316	317	315	311	321	333	342	335	328
209	273	319	319	318	313	323	335	344	337	330
210	275	322	321	320	315	325	337	346	339	332
Max Temp:	275	322	321	320	315	325	337	346	339	332
Max Allowed:	417	417	418	418	418	418	418	418	418	418

OMEGA POINT LABORATORIES

Time (min)	TC # 91 (°F)	TC # 92 (°F)	TC # 93 (°F)	TC # 94 (°F)	TC # 95 (°F)	TC # 96 (°F)	TC # 97 (°F)	TC # 98 (°F)	TC # 99 (°F)	TC # 100 (°F)
0	93	93	93	93	92	92	92	92	92	92
1	93	93	93	93	92	92	92	92	92	92
2	93	93	93	93	92	92	93	92	92	93
3	93	93	93	93	92	92	92	92	92	92
4	93	93	93	93	92	92	92	92	92	92
5	93	93	93	92	92	92	92	92	92	92
6	93	93	93	93	92	92	92	92	92	92
7	93	93	92	92	92	92	92	92	92	92
8	93	93	93	92	92	92	92	92	92	92
9	93	93	93	93	92	92	92	92	92	92
10	93	93	93	93	92	92	92	92	92	92
11	93	93	93	93	92	92	92	92	92	92
12	93	93	93	92	93	92	92	92	92	92
13	93	93	93	93	93	93	92	92	92	92
14	93	93	92	92	93	93	92	92	92	92
15	93	93	93	92	93	93	92	92	92	92
16	93	93	92	92	93	93	92	92	92	92
17	93	93	92	93	94	93	92	92	92	92
18	93	93	92	93	94	93	92	92	92	92
19	93	93	92	93	94	93	92	92	92	92
20	93	93	92	93	95	93	92	92	92	92
21	93	93	93	93	95	94	92	92	92	92
22	93	93	93	93	96	94	93	92	92	92
23	93	93	93	93	96	94	93	92	92	92
24	93	93	93	93	96	94	93	93	92	92
25	93	93	93	93	97	95	93	93	93	92
26	93	93	93	93	97	95	93	93	93	93
27	93	93	93	93	98	95	93	93	93	93
28	93	93	93	93	98	96	93	93	93	93
29	93	93	93	93	99	96	93	93	93	93
30	93	93	93	94	99	96	93	93	93	93
31	93	93	93	94	100	97	93	93	93	93
32	93	93	93	94	100	97	94	93	93	93
33	93	93	93	94	101	98	94	93	93	93
34	93	93	94	94	102	98	94	94	93	93
35	93	94	94	95	103	99	94	94	94	93
36	93	94	94	95	104	99	95	94	94	93
37	94	94	94	95	105	100	95	94	94	94
38	94	94	95	96	106	101	95	95	94	94
39	94	95	95	96	107	101	96	95	95	94
40	94	95	95	96	108	102	96	95	95	94
41	95	95	96	97	109	103	97	96	95	95
42	95	96	96	97	110	104	97	96	96	95
43	95	96	97	98	112	105	98	97	96	95
44	96	97	97	99	113	107	98	97	97	96
45	96	97	98	100	115	108	99	98	97	96
46	97	98	99	100	116	109	100	98	98	97
47	97	99	99	101	118	110	100	99	99	98
48	98	99	100	102	120	112	101	100	100	98
49	99	100	101	103	122	113	102	100	100	99
50	99	101	102	104	124	115	103	101	101	100
51	100	102	103	106	126	116	104	102	102	101
52	102	104	105	107	128	118	105	103	103	102
53	103	105	107	108	131	120	106	104	105	103
54	104	107	109	110	133	121	108	106	106	104
55	105	108	110	112	136	123	109	107	107	106
56	107	110	112	113	138	125	110	108	108	107
57	108	111	113	115	141	126	112	110	110	108
58	110	113	115	117	143	128	114	112	111	109
59	111	114	116	119	145	130	116	113	113	111
60	113	116	118	121	146	131	118	115	115	112
61	115	117	119	124	148	133	120	118	117	114
62	117	119	122	126	149	135	122	120	119	116
63	119	122	124	128	150	136	124	122	121	118
64	121	124	126	130	151	138	126	125	124	121
65	123	126	128	132	152	139	128	127	126	123
66	125	128	130	133	153	141	130	129	128	125
67	127	130	132	135	154	142	132	131	130	127
68	129	132	134	137	155	143	134	133	132	129
69	131	134	136	139	156	145	136	135	134	131
70	133	136	138	141	157	146	138	137	136	133

OMEGA POINT LABORATORIES

Time (min)	TC # 91 (°F)	TC # 92 (°F)	TC # 93 (°F)	TC # 94 (°F)	TC # 95 (°F)	TC # 96 (°F)	TC # 97 (°F)	TC # 98 (°F)	TC # 99 (°F)	TC # 100 (°F)
71	135	138	140	143	158	148	139	139	138	135
72	137	140	142	145	159	149	141	141	140	137
73	139	142	145	147	161	150	143	143	142	139
74	141	144	147	149	163	152	145	145	144	141
75	144	147	149	151	164	153	148	147	147	144
76	146	149	152	154	166	155	150	149	149	146
77	148	152	154	156	168	157	152	152	151	148
78	151	154	157	158	170	159	155	154	154	151
79	154	157	159	160	172	161	157	157	156	153
80	156	159	162	163	173	163	160	160	159	156
81	159	162	164	165	175	165	162	162	161	159
82	161	164	167	168	177	167	165	165	164	161
83	163	167	169	170	179	170	167	167	166	164
84	166	169	171	173	181	172	169	169	168	166
85	168	171	173	175	183	174	172	172	171	169
86	171	174	175	177	185	177	174	175	173	172
87	174	176	178	179	187	179	177	177	176	174
88	176	179	180	181	189	181	179	180	178	177
89	179	181	182	183	191	183	182	182	180	179
90	181	183	185	186	193	186	184	184	183	182
91	184	186	187	188	195	188	186	187	185	184
92	186	188	189	190	197	190	189	189	187	186
93	189	191	191	192	199	192	191	191	189	188
94	191	193	193	194	201	194	193	193	191	190
95	194	195	195	196	203	195	194	195	193	192
96	196	197	197	197	205	197	196	196	195	194
97	198	198	199	199	206	199	198	198	197	196
98	199	200	200	200	208	200	199	199	198	198
99	201	201	201	202	210	202	201	200	199	199
100	202	202	203	203	211	203	202	202	201	200
101	203	203	204	204	212	204	203	203	202	201
102	204	204	204	205	214	205	204	204	203	202
103	205	205	205	206	215	207	205	205	204	204
104	206	206	206	206	216	208	205	205	205	204
105	206	207	207	207	217	209	206	206	205	205
106	207	207	207	207	218	210	207	207	206	206
107	207	207	207	208	219	211	207	207	207	207
108	208	208	208	208	220	211	208	208	207	207
109	208	208	208	209	220	212	208	208	208	208
110	208	209	209	209	221	213	208	209	208	208
111	209	209	209	210	222	214	209	209	208	208
112	209	209	209	210	223	214	209	209	209	209
113	209	209	210	211	224	215	209	210	209	209
114	209	210	210	211	224	216	210	210	209	209
115	209	210	210	211	225	216	210	210	209	209
116	209	210	211	212	226	217	210	211	210	209
117	209	210	211	212	227	218	210	210	210	209
118	210	210	211	213	228	219	211	211	210	210
119	210	210	212	213	228	220	211	211	210	210
120	210	210	212	214	229	220	211	211	210	210
121	210	211	212	214	230	221	212	211	210	210
122	210	211	213	215	231	223	213	211	210	210
123	210	211	213	216	232	224	215	212	210	210
124	210	212	213	217	233	225	216	212	211	210
125	210	213	213	217	234	226	217	213	212	210
126	210	214	215	218	235	227	218	213	212	210
127	210	215	216	219	236	228	219	214	212	211
128	211	216	217	220	238	230	220	216	213	211
129	211	218	218	221	239	231	221	218	214	212
130	212	219	220	221	240	233	222	220	216	213
131	212	219	221	222	241	234	223	221	218	214
132	213	220	223	224	243	236	225	223	220	215
133	213	221	225	226	244	238	226	225	221	215
134	214	222	226	227	245	239	227	226	223	216
135	216	223	228	229	247	240	228	228	224	217
136	216	224	230	230	248	242	230	230	226	218
137	217	225	232	232	249	243	232	232	227	218
138	218	227	234	234	251	245	234	233	229	219
139	219	228	236	236	252	246	236	235	231	220
140	220	230	238	238	253	247	238	236	232	221
141	221	231	240	239	255	249	240	238	234	222

OMEGA POINT LABORATORIES

Time (min)	TC # 91 (°F)	TC # 92 (°F)	TC # 93 (°F)	TC # 94 (°F)	TC # 95 (°F)	TC # 96 (°F)	TC # 97 (°F)	TC # 98 (°F)	TC # 99 (°F)	TC # 100 (°F)
142	222	233	241	241	256	250	242	239	235	223
143	222	234	243	242	257	251	244	241	236	224
144	223	236	244	244	259	253	246	242	238	225
145	224	238	246	245	260	254	247	244	239	226
146	225	240	247	247	261	255	249	245	240	226
147	226	241	249	248	263	256	250	247	242	227
148	227	243	250	249	264	258	252	248	243	228
149	229	245	252	251	265	259	253	250	244	229
150	230	246	253	252	266	260	255	251	246	230
151	232	248	254	253	268	262	256	253	247	230
152	233	249	256	255	269	263	258	254	248	232
153	235	251	257	256	270	264	259	256	250	233
154	236	252	258	257	272	266	261	257	251	234
155	238	254	260	259	273	267	262	259	252	235
156	239	255	261	260	274	268	264	261	254	236
157	241	257	262	261	276	269	265	262	255	237
158	243	258	264	262	277	271	267	264	257	239
159	245	259	265	264	278	272	268	265	258	240
160	246	261	266	265	280	274	270	267	260	242
161	248	262	268	266	281	275	271	268	261	243
162	250	264	269	268	283	276	273	270	263	244
163	251	265	271	269	284	278	274	271	265	246
164	253	267	272	271	286	279	276	273	266	248
165	254	269	274	272	287	281	277	274	268	250
166	256	270	275	274	289	282	279	276	269	252
167	258	272	277	276	291	284	280	277	271	254
168	259	273	278	277	292	285	282	279	272	256
169	261	275	280	279	294	287	283	281	274	258
170	263	276	281	281	296	288	285	282	276	259
171	264	278	283	283	297	290	287	284	277	261
172	266	279	284	284	299	292	288	285	279	263
173	268	281	286	286	301	293	290	287	281	265
174	269	283	288	288	303	295	291	289	283	266
175	271	284	290	290	305	297	293	290	284	268
176	273	286	292	292	307	298	295	292	286	270
177	275	288	294	294	309	300	296	294	288	272
178	277	290	296	296	311	302	298	296	289	274
179	279	292	298	298	313	304	300	297	291	275
180	281	294	300	300	315	306	301	299	293	277
181	283	296	302	302	317	307	303	301	295	279
182	285	298	304	304	319	309	305	302	296	281
183	287	301	306	307	321	311	307	304	298	283
184	289	303	309	309	324	313	309	306	300	285
185	291	305	311	311	326	315	310	308	302	287
186	293	308	313	313	328	317	312	309	304	288
187	295	310	315	315	330	319	314	311	305	290
188	298	312	317	317	332	321	316	313	307	292
189	300	314	319	319	334	322	318	315	309	294
190	302	316	321	321	336	324	320	317	311	296
191	305	319	323	324	338	326	321	318	313	298
192	307	321	326	326	340	328	323	320	314	300
193	309	323	328	328	342	330	325	322	316	302
194	311	325	330	330	344	332	327	324	318	304
195	314	327	332	332	346	333	329	326	320	306
196	316	330	334	334	348	335	331	328	322	308
197	318	332	336	336	350	337	333	330	324	310
198	320	334	338	338	352	339	335	331	326	312
199	322	336	340	340	354	341	337	333	328	314
200	324	338	342	342	355	343	339	335	329	316
201	326	339	344	344	357	345	340	337	331	318
202	328	341	345	345	359	347	342	339	333	320
203	330	343	347	347	360	349	344	341	335	322
204	333	345	349	349	362	351	346	343	337	324
205	335	347	350	350	364	353	348	345	339	326
206	337	349	352	352	366	355	350	346	341	328
207	339	351	354	354	367	357	352	348	343	330
208	341	352	355	355	369	359	353	350	345	332
209	343	354	357	357	371	360	355	352	347	334
210	346	356	359	359	373	362	357	354	349	336
Max Temp:	346	356	359	359	373	362	357	354	349	336
Max Allowed:	418	418	418	418	417	417	417	417	417	417

OMEGA POINT LABORATORIES

Time (min)	TC # 101 (°F)	TC # 102 (°F)	TC # 103 (°F)	TC # 104 (°F)	TC # 105 (°F)	TC # 106 (°F)	TC # 107 (°F)	TC # 108 (°F)	TC # 109 (°F)
0	92	93	93	93	93	93	93	92	91
1	92	92	93	93	93	93	93	92	91
2	92	92	93	93	93	93	93	92	91
3	92	92	93	93	93	93	93	92	91
4	92	92	93	93	93	93	93	92	91
5	92	92	93	93	93	93	93	92	91
6	92	92	93	93	93	93	93	92	91
7	92	92	93	93	93	93	93	92	91
8	92	92	93	93	93	93	93	92	91
9	92	92	93	93	93	93	93	92	91
10	92	92	92	93	93	93	93	92	91
11	92	92	92	93	93	93	93	104	91
12	92	92	92	93	93	93	95	141	91
13	92	92	93	93	93	93	99	163	91
14	92	92	93	93	93	94	106	175	92
15	92	92	92	93	93	94	112	176	91
16	92	92	92	93	93	94	112	175	92
17	92	92	93	93	93	95	117	174	92
18	92	92	92	93	93	95	117	171	92
19	92	92	93	93	93	95	119	169	92
20	92	92	92	93	93	96	119	166	92
21	92	92	92	93	93	96	120	164	92
22	92	92	92	93	93	96	121	162	92
23	92	92	93	93	93	97	122	161	92
24	92	92	93	93	93	97	123	161	93
25	92	92	92	93	94	97	123	161	93
26	92	92	93	93	94	98	125	161	93
27	92	93	93	93	94	98	126	162	93
28	92	93	93	93	94	99	127	163	93
29	92	93	93	93	94	99	127	164	93
30	92	93	93	93	94	100	129	165	94
31	93	93	93	93	94	100	130	165	94
32	92	93	93	93	94	100	131	166	94
33	92	93	93	93	94	101	134	166	94
34	93	93	93	93	95	102	136	166	94
35	93	93	93	94	95	102	137	167	94
36	93	93	93	94	95	102	135	168	95
37	93	93	94	94	95	103	135	169	95
38	93	94	94	94	96	103	137	170	95
39	93	94	94	94	96	104	138	172	96
40	93	94	94	94	96	104	139	173	96
41	94	94	94	95	96	105	140	174	96
42	94	95	95	95	97	106	144	175	97
43	94	95	95	95	97	106	143	176	97
44	95	95	95	95	97	107	145	178	97
45	95	96	96	96	97	107	147	179	98
46	95	96	96	96	98	107	145	181	98
47	96	97	97	97	98	108	148	183	99
48	96	97	97	97	99	109	151	186	100
49	97	98	98	98	99	110	154	188	101
50	98	99	98	98	100	111	156	190	101
51	98	99	99	99	100	112	159	192	102
52	99	100	100	99	101	113	161	193	103
53	100	101	100	100	101	114	164	195	103
54	101	102	101	101	102	115	166	196	104
55	102	103	102	102	103	116	169	197	105
56	103	104	103	103	103	117	171	199	106
57	104	105	104	104	104	119	177	200	107
58	105	106	105	105	105	120	180	201	108
59	106	108	106	106	106	123	184	202	109
60	108	109	108	107	107	124	188	203	110
61	109	111	109	108	109	127	191	203	111
62	111	112	111	110	110	128	194	204	112
63	112	114	113	112	111	131	197	204	114
64	115	116	114	113	113	135	199	205	115
65	116	118	116	115	114	138	201	205	116
66	118	120	118	117	116	142	202	205	117
67	121	122	120	119	118	147	203	206	118
68	123	124	122	121	119	150	203	206	119
69	125	126	124	123	122	155	204	206	121
70	127	128	126	125	124	160	205	206	122

OMEGA POINT LABORATORIES

Time (min)	TC # 101 (°F)	TC # 102 (°F)	TC # 103 (°F)	TC # 104 (°F)	TC # 105 (°F)	TC # 106 (°F)	TC # 107 (°F)	TC # 108 (°F)	TC # 109 (°F)
71	129	130	128	127	126	165	205	206	123
72	131	132	130	129	128	169	206	206	124
73	134	134	132	131	131	174	206	206	126
74	136	137	135	134	133	177	206	206	127
75	138	139	137	136	136	180	206	206	128
76	141	141	140	138	139	182	206	206	130
77	143	144	142	141	141	183	205	206	131
78	146	146	145	143	144	184	205	206	132
79	149	149	147	146	146	185	204	206	134
80	152	152	150	149	149	185	204	206	135
81	155	154	153	152	152	184	203	206	137
82	157	157	156	154	154	184	202	205	140
83	160	160	159	157	157	183	201	205	143
84	163	162	162	160	160	182	200	205	146
85	166	165	164	163	162	181	199	204	149
86	169	168	167	166	164	180	198	203	152
87	171	171	170	169	167	179	196	203	154
88	174	174	173	172	170	179	195	202	157
89	177	176	175	174	172	180	194	201	159
90	180	179	178	177	175	181	193	201	162
91	182	181	181	180	177	183	191	200	164
92	184	184	183	183	180	185	190	200	167
93	187	186	186	185	182	187	189	199	169
94	189	188	188	188	185	188	190	198	171
95	191	190	190	190	187	190	192	198	173
96	193	192	192	192	189	193	193	198	176
97	194	194	194	193	191	194	194	198	177
98	196	196	196	195	193	196	196	198	179
99	198	197	197	197	195	197	197	199	181
100	199	199	199	198	196	199	199	199	183
101	200	200	200	200	198	200	200	200	184
102	201	201	201	201	199	201	201	201	186
103	203	202	202	202	201	203	202	202	187
104	203	203	203	203	202	203	203	203	189
105	205	204	204	204	203	204	204	204	190
106	205	205	205	205	204	205	205	205	191
107	206	206	206	206	205	206	206	206	193
108	206	206	206	206	206	206	206	206	193
109	207	207	207	207	206	207	207	207	195
110	207	207	207	207	207	207	207	207	195
111	208	208	208	208	207	208	208	207	196
112	208	208	208	208	208	208	208	208	197
113	209	208	208	208	208	209	208	208	198
114	209	209	209	208	208	209	209	208	199
115	209	209	209	209	209	209	209	208	200
116	209	209	209	209	209	209	209	209	201
117	209	209	209	209	209	209	209	209	201
118	209	209	209	209	209	209	209	209	202
119	210	209	209	209	209	209	209	209	202
120	209	209	209	209	209	209	209	209	203
121	209	210	209	209	209	209	209	209	204
122	209	209	209	209	209	209	209	209	204
123	209	209	209	209	209	209	209	209	205
124	210	210	209	210	210	210	210	209	205
125	209	209	209	209	210	210	210	209	206
126	210	210	209	210	210	210	210	209	206
127	210	210	210	210	210	210	210	209	206
128	210	210	210	209	210	210	209	209	207
129	210	210	210	209	209	210	209	209	207
130	210	211	210	209	210	210	210	209	207
131	210	211	210	209	210	210	210	209	208
132	210	212	211	210	210	210	210	209	208
133	210	213	211	209	210	210	210	209	208
134	210	214	212	210	210	210	210	210	208
135	210	214	213	209	210	210	210	209	208
136	210	215	213	210	210	210	210	210	208
137	211	216	214	210	210	210	210	210	209
138	211	216	215	210	210	210	210	210	209
139	211	217	215	210	210	210	210	210	209
140	212	218	216	211	210	210	210	210	209
141	212	219	216	211	210	210	210	210	209

OMEGA POINT LABORATORIES

Time (min)	TC # 101 (°F)	TC # 102 (°F)	TC # 103 (°F)	TC # 104 (°F)	TC # 105 (°F)	TC # 106 (°F)	TC # 107 (°F)	TC # 108 (°F)	TC # 109 (°F)
142	213	220	217	212	210	210	210	210	209
143	214	220	218	212	210	211	211	210	209
144	215	221	218	213	210	211	211	210	209
145	216	222	219	214	210	211	211	210	210
146	217	223	220	215	211	211	211	210	210
147	218	224	220	215	211	211	212	210	210
148	219	225	221	216	211	212	212	211	210
149	219	225	222	217	211	212	213	210	210
150	220	226	223	218	211	212	214	211	210
151	221	227	223	218	211	213	215	211	210
152	222	228	224	219	212	214	216	211	210
153	222	228	225	219	211	214	216	210	210
154	223	229	226	220	212	215	217	211	210
155	224	230	226	221	212	216	218	211	210
156	224	231	227	222	212	217	219	211	210
157	225	232	228	222	212	218	220	211	210
158	225	233	229	223	212	218	220	211	210
159	227	234	230	224	213	219	221	211	210
160	228	235	231	224	213	220	222	211	210
161	230	236	232	225	214	221	224	211	210
162	231	237	233	226	214	222	225	211	210
163	233	238	233	226	215	222	226	211	210
164	234	239	234	227	216	223	227	211	210
165	236	241	235	228	217	224	228	211	210
166	238	242	236	229	217	225	229	211	210
167	240	243	238	229	219	226	230	211	210
168	242	244	239	230	220	227	232	211	210
169	243	246	240	231	221	228	232	211	210
170	245	247	240	231	222	228	233	211	210
171	247	249	241	232	223	230	235	211	211
172	249	250	242	233	224	230	235	211	211
173	251	252	243	234	225	231	237	211	211
174	253	253	244	235	227	233	238	211	211
175	254	255	244	236	228	234	239	211	212
176	256	256	245	237	229	235	240	211	213
177	258	258	246	237	230	236	241	211	215
178	259	259	247	238	231	237	242	211	216
179	261	261	248	239	232	238	243	211	218
180	263	263	249	240	233	240	244	211	220
181	265	265	250	241	234	241	246	212	221
182	267	266	252	243	236	243	247	212	223
183	269	268	253	244	237	244	248	212	224
184	271	270	255	245	238	246	250	213	226
185	273	272	257	247	240	247	251	214	227
186	275	274	259	249	241	249	252	216	228
187	277	276	261	251	243	251	254	217	230
188	279	278	263	253	245	252	255	218	231
189	280	280	265	256	247	254	256	219	233
190	283	282	267	258	248	256	258	220	234
191	285	284	269	260	250	257	259	222	235
192	287	286	272	263	252	259	261	224	237
193	289	288	274	265	254	261	263	226	238
194	291	290	276	268	256	262	264	227	240
195	292	292	278	270	258	264	265	229	241
196	295	294	280	272	260	266	267	230	242
197	296	296	283	274	262	268	269	232	243
198	299	298	285	277	264	270	271	234	245
199	300	300	287	279	266	272	272	236	246
200	303	302	290	281	268	274	274	238	248
201	305	304	292	284	270	276	276	240	249
202	307	306	294	286	272	277	278	242	250
203	309	308	297	288	274	279	279	244	252
204	311	310	299	290	276	281	281	245	253
205	313	312	301	292	278	283	283	247	254
206	315	315	304	295	281	285	285	250	256
207	317	317	306	297	282	287	287	252	257
208	319	319	308	299	285	289	289	254	258
209	321	321	310	301	286	291	291	256	260
210	323	323	313	303	289	293	293	259	262
Max Temp:	323	323	313	303	289	293	293	259	262
Max Allowed:	417	418	418	418	418	418	418	417	416

OMEGA POINT LABORATORIES

Time (min)	TC # 110 (°F)	TC # 111 (°F)	TC # 112 (°F)	TC # 113 (°F)	TC # 114 (°F)	TC # 115 (°F)	TC # 116 (°F)	TC # 117 (°F)	TC # 118 (°F)
0	93	93	93	93	93	93	93	93	93
1	93	93	93	93	93	93	93	93	93
2	92	93	93	93	93	93	93	93	93
3	92	93	93	93	93	93	93	93	93
4	92	93	93	93	93	93	93	93	93
5	92	93	93	93	93	93	93	93	93
6	93	93	93	93	93	93	93	93	93
7	92	93	93	93	93	93	93	93	93
8	92	93	93	93	93	93	93	93	92
9	92	93	93	93	93	93	93	93	93
10	92	93	93	93	93	93	93	93	92
11	92	93	93	93	93	93	93	93	92
12	92	93	93	93	93	93	93	93	92
13	93	93	93	93	93	93	93	93	92
14	93	93	93	93	93	93	93	93	92
15	92	93	93	93	93	93	93	93	92
16	93	93	93	93	93	93	93	93	92
17	93	93	93	93	93	93	93	93	92
18	93	93	93	93	93	93	93	93	92
19	93	93	93	93	93	93	93	92	92
20	93	93	93	93	93	93	93	92	92
21	93	93	93	93	93	93	93	92	92
22	93	93	93	93	93	93	93	92	92
23	93	93	93	93	93	93	93	93	92
24	93	93	93	93	93	93	93	92	92
25	93	93	93	93	93	93	93	92	92
26	93	93	93	93	93	93	93	92	92
27	94	93	93	93	93	93	93	92	92
28	94	93	93	93	93	93	93	92	92
29	94	94	93	93	93	93	93	93	93
30	94	94	93	93	93	93	93	93	93
31	94	94	93	93	93	93	93	93	93
32	94	94	93	93	93	93	93	93	93
33	95	94	93	93	93	93	93	93	93
34	95	94	94	93	93	93	93	93	93
35	95	94	94	93	93	93	93	93	93
36	95	94	94	93	93	93	93	93	93
37	95	94	94	93	93	93	93	93	93
38	96	95	94	93	93	93	93	93	94
39	96	95	94	94	93	93	93	93	94
40	96	95	94	94	94	93	93	94	94
41	97	95	94	94	94	94	94	94	94
42	97	95	94	94	94	94	94	94	95
43	97	95	95	94	94	94	94	94	95
44	98	96	95	94	94	94	94	95	96
45	98	96	95	94	94	95	95	95	96
46	99	96	95	95	95	95	95	95	96
47	99	97	95	95	95	95	95	96	97
48	100	97	96	95	96	96	96	96	97
49	101	97	96	96	96	96	96	97	98
50	101	98	96	96	96	96	96	97	99
51	102	98	97	97	97	97	97	98	99
52	103	99	97	97	97	97	97	98	100
53	104	100	98	98	98	98	98	99	101
54	104	100	99	98	98	98	98	100	102
55	106	101	99	99	99	99	99	100	103
56	106	102	100	100	100	100	100	101	104
57	108	103	101	101	101	101	101	102	105
58	109	104	102	102	102	102	102	103	106
59	110	105	103	103	103	104	103	104	107
60	111	106	104	104	105	105	105	106	108
61	112	107	106	106	106	106	106	107	110
62	114	109	107	107	108	108	108	109	111
63	115	110	108	108	109	110	109	110	113
64	116	111	110	110	111	111	111	112	114
65	118	113	111	112	112	113	113	113	116
66	119	114	113	113	114	115	114	115	118
67	121	116	115	115	116	116	116	117	119
68	122	118	116	117	118	118	118	119	121
69	124	119	118	119	120	120	120	121	123
70	125	121	120	121	122	122	122	123	125

OMEGA POINT LABORATORIES

Time (min)	TC # 110 (°F)	TC # 111 (°F)	TC # 112 (°F)	TC # 113 (°F)	TC # 114 (°F)	TC # 115 (°F)	TC # 116 (°F)	TC # 117 (°F)	TC # 118 (°F)
71	127	123	122	123	124	123	124	125	127
72	128	125	124	126	126	125	126	127	130
73	130	127	126	128	129	128	128	129	132
74	132	129	129	130	131	130	130	131	134
75	134	131	131	133	134	133	132	133	136
76	136	133	133	135	136	135	134	135	138
77	137	135	136	138	139	137	136	137	140
78	139	138	138	140	141	140	139	140	143
79	141	140	141	143	144	143	141	142	145
80	143	143	144	146	147	145	143	144	148
81	145	145	147	148	149	148	145	147	150
82	148	148	149	151	152	150	147	149	152
83	150	151	152	153	154	153	150	152	155
84	153	153	155	156	157	155	153	155	158
85	155	156	158	159	159	158	156	157	160
86	158	159	160	161	162	161	158	160	163
87	160	161	163	163	164	163	161	162	165
88	163	164	165	166	166	166	164	165	167
89	165	166	167	168	168	168	166	167	169
90	167	169	169	170	171	170	168	169	171
91	169	171	172	172	173	173	171	171	173
92	172	173	174	174	175	175	173	173	175
93	174	175	176	176	176	177	175	175	177
94	176	177	178	178	178	179	177	177	179
95	178	179	180	180	180	180	179	179	181
96	180	181	182	182	182	182	181	181	182
97	182	183	183	183	183	184	182	183	184
98	184	184	185	185	185	185	184	184	186
99	185	186	186	186	186	186	185	186	187
100	187	188	188	188	188	188	187	187	189
101	188	189	189	189	189	189	188	189	190
102	189	190	191	191	191	190	190	190	191
103	191	192	192	192	192	192	191	191	192
104	192	193	193	193	193	193	192	192	193
105	193	194	194	194	194	194	193	194	194
106	194	195	195	195	195	195	194	195	196
107	195	196	196	196	196	196	195	196	196
108	196	197	197	197	197	197	196	197	197
109	197	198	198	198	198	198	197	198	198
110	198	199	199	199	199	199	198	198	199
111	199	199	200	200	199	199	199	199	200
112	199	200	200	200	200	200	200	200	201
113	200	201	201	201	201	201	200	201	201
114	201	202	201	201	201	201	201	201	202
115	202	202	202	202	202	202	202	202	202
116	202	203	203	203	203	203	202	202	203
117	203	203	203	203	203	203	203	203	204
118	203	204	204	204	204	204	203	204	204
119	204	204	204	204	204	204	204	204	205
120	204	205	205	205	205	205	204	205	205
121	205	205	205	205	205	205	205	205	206
122	205	206	206	206	206	206	205	205	206
123	205	206	206	206	206	206	206	206	206
124	206	206	206	206	206	206	206	206	207
125	206	207	207	207	207	207	206	207	207
126	207	207	207	207	207	207	207	207	207
127	207	207	207	207	207	207	207	207	208
128	207	208	207	208	207	208	207	208	208
129	207	208	208	208	208	208	208	208	208
130	208	208	208	208	208	208	208	208	208
131	208	208	208	208	208	208	208	208	208
132	208	208	208	208	208	208	208	208	209
133	208	208	208	209	209	209	209	209	209
134	209	209	209	209	209	209	209	209	209
135	209	209	209	209	209	209	209	209	209
136	209	209	209	209	209	209	209	209	209
137	209	209	209	209	209	209	209	209	209
138	209	209	209	209	209	209	209	209	209
139	209	209	209	209	209	209	209	209	209
140	209	210	209	210	210	210	210	209	209
141	209	210	210	210	210	210	210	209	210

OMEGA POINT LABORATORIES

Time (min)	TC # 110 (°F)	TC # 111 (°F)	TC # 112 (°F)	TC # 113 (°F)	TC # 114 (°F)	TC # 115 (°F)	TC # 116 (°F)	TC # 117 (°F)	TC # 118 (°F)
142	209	210	210	210	210	210	210	210	210
143	210	210	210	210	210	210	210	210	210
144	210	210	210	210	210	210	210	210	210
145	210	210	210	210	210	210	210	210	210
146	210	210	210	210	210	210	210	210	210
147	210	210	210	210	210	210	210	210	210
148	210	210	210	210	210	210	210	210	210
149	210	210	210	210	210	210	210	210	210
150	210	210	210	210	210	210	210	210	210
151	210	210	210	210	210	210	210	210	210
152	210	210	210	210	210	210	210	210	211
153	210	210	210	210	210	210	210	210	213
154	210	210	210	210	211	210	210	210	214
155	210	210	210	211	211	211	210	210	218
156	210	210	210	211	213	211	211	211	222
157	210	210	210	212	216	212	211	212	226
158	210	210	210	215	220	218	215	216	229
159	210	210	211	219	223	222	219	221	232
160	210	210	211	222	226	225	223	225	235
161	210	211	214	225	229	228	226	229	238
162	210	211	219	228	231	231	229	232	240
163	210	211	222	230	233	233	232	234	242
164	210	213	225	233	236	236	234	237	245
165	211	216	228	235	238	238	237	239	247
166	211	221	231	237	240	240	239	241	249
167	212	226	233	239	242	242	241	243	251
168	216	229	236	241	244	244	243	246	253
169	220	232	238	244	246	246	246	248	255
170	224	235	240	245	248	248	248	250	258
171	228	237	242	247	250	251	250	252	260
172	231	239	244	249	252	253	252	255	262
173	233	242	246	251	254	255	254	257	264
174	235	244	248	253	256	257	257	259	266
175	238	246	250	255	258	259	259	261	269
176	240	247	252	257	260	261	261	264	271
177	242	249	254	259	262	264	264	266	273
178	243	251	256	261	264	266	266	268	275
179	245	253	258	263	267	268	268	271	278
180	247	255	259	265	269	270	270	273	280
181	249	257	261	267	271	272	273	275	282
182	251	259	263	269	273	275	275	278	285
183	252	260	265	271	275	277	277	280	287
184	254	262	267	273	277	279	279	282	289
185	256	264	269	275	279	281	282	284	291
186	258	266	271	277	281	283	284	287	294
187	259	268	273	279	283	286	286	289	296
188	261	270	275	281	286	288	289	291	298
189	263	271	277	283	288	290	291	294	301
190	265	273	278	285	290	292	293	296	303
191	266	275	280	287	292	294	295	298	305
192	268	277	282	289	294	297	297	300	308
193	270	279	284	291	296	299	300	303	310
194	272	281	286	293	298	301	302	305	312
195	273	283	288	295	300	303	304	307	315
196	275	285	290	297	303	305	306	309	317
197	277	287	292	299	305	307	309	312	319
198	279	289	294	301	307	310	311	314	321
199	280	290	296	303	309	312	313	316	324
200	282	293	298	306	311	314	315	318	326
201	284	294	300	308	313	316	317	321	328
202	286	296	302	310	315	318	319	323	330
203	287	298	304	312	317	320	322	325	333
204	289	300	306	314	319	322	324	327	335
205	291	302	308	316	321	324	326	329	337
206	293	304	310	318	323	326	328	332	339
207	294	306	312	320	325	328	330	334	341
208	296	308	314	322	327	330	332	336	344
209	298	310	316	324	329	332	334	338	346
210	300	312	318	325	331	334	336	340	348
Max Temp:	300	312	318	325	331	334	336	340	348
Max Allowed:	418	418	418	418	418	418	418	418	418

OMEGA POINT LABORATORIES

Time (min)	TC # 119 (°F)	TC # 120 (°F)	TC # 121 (°F)	TC # 122 (°F)	TC # 123 (°F)	TC # 124 (°F)	TC # 125 (°F)	TC # 126 (°F)	TC # 127 (°F)
0	93	93	92	92	92	92	93	93	93
1	93	93	92	92	92	92	93	93	93
2	93	93	92	92	92	92	93	93	93
3	93	93	92	92	92	92	92	93	93
4	93	93	92	92	92	92	92	93	93
5	93	93	92	92	92	92	92	93	93
6	93	93	92	92	92	92	92	93	93
7	92	92	92	92	92	92	92	93	93
8	92	92	92	92	92	92	92	93	93
9	92	92	92	92	92	92	92	93	93
10	92	92	92	92	92	92	92	93	93
11	92	92	92	92	92	92	92	93	93
12	92	92	92	93	92	92	92	93	93
13	92	92	92	93	92	92	92	93	93
14	92	92	93	93	92	92	92	93	93
15	92	92	93	93	93	92	92	93	93
16	92	93	93	93	93	92	92	93	93
17	92	93	93	94	93	92	92	93	93
18	92	93	93	94	93	92	92	93	93
19	92	93	93	94	93	92	92	93	93
20	92	93	93	94	93	93	92	93	93
21	92	93	93	94	93	93	92	93	93
22	92	93	93	95	93	93	92	93	93
23	92	93	94	95	93	93	92	93	93
24	92	93	94	95	94	93	92	93	93
25	93	93	94	96	94	93	93	93	93
26	93	93	94	96	94	93	93	93	93
27	93	93	94	96	94	93	93	93	93
28	93	93	95	97	94	93	93	93	93
29	93	93	95	97	95	93	93	93	93
30	93	94	95	97	95	93	93	93	93
31	93	94	95	98	95	94	93	93	93
32	93	94	96	98	96	94	93	93	93
33	93	94	96	99	96	94	93	93	93
34	93	94	96	99	96	94	93	93	93
35	93	94	97	100	97	94	93	93	93
36	94	95	97	100	97	95	94	93	93
37	94	95	98	101	98	95	94	93	93
38	94	95	98	102	98	95	94	94	93
39	94	96	99	103	99	96	94	94	93
40	95	96	99	104	99	96	95	94	93
41	95	97	100	104	100	97	95	94	94
42	96	97	100	105	101	97	96	94	94
43	96	98	101	106	102	98	96	95	94
44	96	98	102	107	102	98	97	95	94
45	97	99	103	108	103	99	97	96	95
46	97	99	103	109	104	100	98	96	95
47	98	100	104	110	105	100	98	96	95
48	98	100	105	111	106	101	99	97	96
49	99	101	106	112	107	102	100	98	96
50	100	102	107	113	108	103	100	98	97
51	101	103	108	114	109	104	101	99	97
52	101	104	109	115	110	104	102	100	98
53	102	104	110	116	111	105	103	100	99
54	103	105	111	117	112	106	104	101	100
55	104	106	112	118	113	107	105	102	100
56	105	107	113	119	114	108	106	103	101
57	106	108	114	121	115	110	107	104	102
58	107	110	115	122	116	111	108	105	103
59	108	111	117	123	117	112	109	106	104
60	110	112	118	124	118	113	110	107	106
61	111	113	119	125	120	114	111	109	107
62	112	115	120	127	121	115	113	110	108
63	114	116	122	128	122	116	114	111	110
64	115	117	123	129	123	118	115	113	111
65	117	119	125	131	125	119	117	114	113
66	118	120	126	132	126	121	118	116	115
67	120	122	128	134	127	122	120	118	117
68	122	124	129	134	129	124	122	120	119
69	124	126	131	136	130	125	124	122	121
70	126	127	133	138	132	127	126	124	123

OMEGA POINT LABORATORIES

Time (min)	TC # 119 (°F)	TC # 120 (°F)	TC # 121 (°F)	TC # 122 (°F)	TC # 123 (°F)	TC # 124 (°F)	TC # 125 (°F)	TC # 126 (°F)	TC # 127 (°F)
71	128	129	135	139	134	129	128	126	126
72	130	131	137	141	135	131	130	129	129
73	132	134	139	143	138	133	132	131	132
74	134	136	141	146	140	136	135	134	135
75	137	138	143	147	143	138	138	137	138
76	139	140	145	149	144	141	141	140	141
77	141	143	147	151	147	143	143	143	144
78	144	145	150	153	150	146	146	146	147
79	146	147	152	156	152	149	149	149	150
80	149	150	155	158	155	152	152	152	154
81	151	152	157	161	158	155	155	155	157
82	154	155	159	163	160	158	158	158	160
83	156	157	162	166	163	160	161	161	163
84	159	159	164	169	165	163	163	163	166
85	161	162	166	171	168	165	166	166	168
86	163	164	169	173	170	168	168	168	171
87	166	166	171	175	172	170	171	171	173
88	168	168	173	177	174	173	173	173	175
89	170	171	175	179	177	175	175	175	177
90	172	173	177	181	179	177	177	177	179
91	174	175	179	183	181	179	179	179	182
92	176	177	181	185	182	181	181	181	184
93	178	178	183	186	184	183	183	183	186
94	180	180	184	188	186	185	185	185	187
95	181	182	186	190	187	186	187	187	189
96	183	183	188	192	189	188	189	189	190
97	185	185	189	193	190	190	190	191	191
98	186	187	191	195	191	191	192	192	193
99	188	188	192	197	192	192	193	193	194
100	189	189	194	199	194	193	194	194	195
101	190	191	195	200	195	194	195	195	196
102	191	192	197	201	196	196	196	196	197
103	193	193	198	202	197	197	197	197	197
104	194	194	199	203	198	198	198	198	198
105	195	195	200	205	199	198	199	199	199
106	196	196	201	206	199	199	200	200	200
107	197	197	202	207	200	200	200	200	201
108	198	198	203	208	201	201	201	201	201
109	198	199	204	209	202	201	201	202	202
110	199	200	205	210	202	202	202	202	202
111	200	201	206	210	203	202	203	203	203
112	201	202	207	208	203	203	203	203	203
113	201	202	207	207	204	204	204	204	204
114	202	203	207	207	204	204	204	204	204
115	203	203	208	207	205	204	205	205	205
116	203	204	208	207	205	205	205	205	205
117	204	204	208	207	205	205	205	206	206
118	204	205	208	207	206	206	206	206	206
119	205	205	208	207	206	206	206	206	206
120	205	206	208	208	206	206	206	206	206
121	206	206	208	208	207	207	207	207	207
122	206	206	208	208	207	207	207	207	207
123	207	207	208	208	207	207	207	207	207
124	207	207	208	209	208	207	207	207	207
125	207	207	208	209	208	208	208	208	208
126	208	208	209	209	208	208	208	208	208
127	208	208	209	209	208	208	208	208	208
128	208	208	209	209	208	208	208	208	208
129	208	209	209	210	209	208	208	208	208
130	208	209	210	210	209	208	208	208	208
131	209	209	210	210	209	209	209	208	208
132	209	209	210	210	209	209	209	209	209
133	209	209	211	210	209	209	209	209	209
134	209	210	212	210	209	209	209	209	209
135	209	210	213	210	209	209	209	209	209
136	209	210	213	210	209	209	209	209	209
137	209	210	214	211	209	209	209	209	209
138	210	211	215	211	209	209	209	209	209
139	210	211	216	211	209	209	209	209	209
140	210	212	217	211	210	209	209	209	209
141	210	214	218	211	210	209	209	209	209

OMEGA POINT LABORATORIES

Time (min)	TC # 119 (°F)	TC # 120 (°F)	TC # 121 (°F)	TC # 122 (°F)	TC # 123 (°F)	TC # 124 (°F)	TC # 125 (°F)	TC # 126 (°F)	TC # 127 (°F)
142	210	216	219	211	210	209	209	209	209
143	211	218	221	211	210	209	210	209	209
144	212	221	223	211	210	210	210	210	210
145	214	223	224	212	210	210	210	210	210
146	215	225	226	212	210	210	210	210	210
147	217	227	228	212	210	210	210	210	210
148	218	228	230	213	210	210	210	210	210
149	220	230	232	215	210	210	210	210	210
150	222	232	234	219	210	210	210	210	210
151	225	234	237	223	211	210	210	210	210
152	227	236	239	227	211	210	210	210	210
153	230	238	241	231	211	210	210	210	210
154	232	240	244	234	211	210	210	210	210
155	234	242	246	237	211	210	210	210	210
156	236	244	248	241	211	210	210	210	210
157	238	246	251	244	211	211	210	210	210
158	241	248	253	247	211	211	210	210	210
159	243	250	255	250	212	211	210	210	210
160	245	252	257	253	214	211	211	210	211
161	247	254	260	256	220	211	211	210	211
162	250	256	262	259	228	211	211	210	211
163	252	259	264	262	235	211	211	210	211
164	254	261	266	265	241	215	211	210	211
165	256	263	269	268	245	219	211	210	211
166	258	265	271	271	249	224	211	210	211
167	260	267	273	274	252	230	211	210	211
168	262	269	276	276	255	235	212	211	211
169	264	271	278	279	258	239	214	211	211
170	267	273	280	281	260	242	218	211	211
171	269	276	282	283	263	245	221	211	211
172	271	278	284	286	265	247	225	211	211
173	273	280	287	288	268	250	230	211	211
174	275	282	289	290	270	253	234	211	211
175	277	284	291	292	272	255	238	213	211
176	280	287	293	294	274	258	242	217	211
177	282	289	295	297	276	260	245	222	212
178	284	291	297	299	278	263	248	228	214
179	286	293	300	301	281	265	251	234	217
180	288	295	302	303	283	267	254	238	220
181	291	298	304	306	285	269	257	241	223
182	293	300	306	308	287	272	259	244	227
183	295	302	309	310	289	274	262	247	231
184	298	304	311	312	292	276	264	250	236
185	300	307	313	314	294	279	267	253	239
186	302	309	315	317	296	281	269	256	243
187	305	311	318	319	298	283	271	258	245
188	307	314	320	321	300	285	274	261	248
189	309	316	322	323	302	287	276	263	251
190	312	318	324	325	305	290	278	266	254
191	314	321	326	327	307	292	280	268	256
192	316	323	328	329	309	294	283	271	259
193	319	325	331	332	311	296	285	273	261
194	321	327	333	334	313	298	287	275	264
195	323	330	335	336	315	300	289	277	266
196	326	332	337	338	317	303	291	280	269
197	328	334	339	340	319	305	293	282	271
198	330	336	341	342	321	307	296	284	273
199	332	339	343	344	324	309	298	286	276
200	335	341	345	346	326	311	300	288	278
201	337	343	347	348	328	313	302	291	280
202	339	345	349	350	330	315	304	293	282
203	342	347	351	352	332	317	306	295	285
204	344	349	353	354	334	320	309	297	287
205	346	351	355	356	336	322	311	299	289
206	348	353	357	358	338	324	313	301	291
207	350	355	359	360	340	326	315	303	294
208	352	357	361	362	342	328	317	305	296
209	354	359	363	364	344	330	319	308	298
210	356	360	365	366	346	332	321	310	300
Max Temp:	356	360	365	366	346	332	321	310	300
Max Allowed:	418	418	417	417	417	417	418	418	418

OMEGA POINT LABORATORIES

Time (min)	TC # 128 (°F)	TC # 129 (°F)	TC # 130 (°F)	TC # 131 (°F)	TC # 132 (°F)	TC # 133 (°F)	TC # 134 (°F)	TC # 135 (°F)	TC # 136 (°F)
0	93	93	93	93	93	93	93	91	89
1	93	93	93	93	93	93	93	91	89
2	93	93	93	93	93	93	93	91	89
3	93	93	93	93	93	93	93	91	89
4	93	93	93	93	93	93	93	91	89
5	93	93	93	93	93	93	93	91	89
6	93	93	93	93	93	93	93	91	89
7	93	93	93	93	93	93	93	91	89
8	93	93	93	93	93	93	93	91	89
9	93	93	93	93	93	93	93	91	89
10	93	93	93	93	93	93	92	91	89
11	93	93	93	93	93	93	93	91	89
12	93	93	93	93	93	93	93	91	89
13	93	93	93	93	93	93	92	91	89
14	93	93	93	93	93	93	93	91	89
15	93	93	93	93	93	93	92	91	89
16	93	93	93	93	93	93	92	91	89
17	93	93	93	93	93	93	92	91	89
18	93	93	93	93	93	93	93	91	89
19	93	93	93	93	93	93	93	91	89
20	93	93	93	93	93	93	93	92	89
21	93	93	93	93	93	93	93	92	89
22	93	93	93	93	93	93	93	92	89
23	93	93	93	93	93	93	93	92	89
24	93	93	93	93	93	93	93	92	89
25	93	93	93	93	93	93	93	93	90
26	93	93	93	93	93	93	93	93	90
27	93	93	93	93	93	93	93	93	90
28	93	93	93	93	93	93	94	94	90
29	93	93	93	93	93	93	94	94	90
30	93	93	93	93	93	93	94	95	90
31	93	93	93	93	93	94	95	95	90
32	93	93	93	93	93	94	95	96	90
33	93	93	93	93	93	94	95	97	90
34	93	93	93	94	93	94	96	97	91
35	93	93	93	94	94	94	96	98	91
36	93	93	93	94	94	94	97	98	91
37	93	93	93	94	94	95	97	99	91
38	93	93	93	94	94	95	98	100	91
39	93	93	94	94	94	95	98	100	91
40	93	93	94	94	94	95	99	101	92
41	93	94	94	94	94	96	100	102	92
42	94	94	94	94	95	96	100	103	92
43	94	94	94	94	95	97	101	103	92
44	94	94	94	95	95	97	102	104	92
45	94	94	95	95	96	97	103	105	93
46	94	95	95	95	96	98	103	106	93
47	95	95	95	96	96	98	104	106	93
48	95	95	96	96	97	99	105	107	93
49	96	96	96	97	97	100	106	108	94
50	96	96	97	97	98	100	107	109	94
51	96	97	98	98	98	101	109	110	94
52	97	97	98	99	99	102	110	111	94
53	98	98	99	99	100	103	112	112	95
54	98	99	100	100	100	104	114	113	95
55	99	99	101	101	101	105	115	114	95
56	100	100	102	102	102	106	117	115	96
57	101	101	103	103	104	108	119	116	96
58	102	102	104	104	105	110	121	117	96
59	103	103	105	105	106	113	122	118	97
60	104	105	107	107	108	115	124	119	97
61	105	106	108	108	110	118	125	121	98
62	107	107	109	110	112	121	127	122	98
63	108	109	111	111	114	123	129	123	98
64	110	111	113	114	117	126	131	125	99
65	112	113	115	116	120	129	133	127	99
66	114	115	118	119	124	132	136	129	100
67	116	117	120	122	127	135	138	131	100
68	118	119	123	125	131	139	141	133	101
69	120	122	126	129	134	142	144	135	101
70	123	125	129	132	137	146	147	137	102

OMEGA POINT LABORATORIES

Time (min)	TC # 128 (°F)	TC # 129 (°F)	TC # 130 (°F)	TC # 131 (°F)	TC # 132 (°F)	TC # 133 (°F)	TC # 134 (°F)	TC # 135 (°F)	TC # 136 (°F)
71	125	128	132	136	141	150	150	139	102
72	128	131	136	139	145	153	153	142	103
73	131	134	139	143	148	156	155	144	104
74	134	138	143	146	151	159	158	147	104
75	138	142	147	150	155	161	160	149	105
76	141	146	151	153	158	163	162	151	106
77	145	152	154	157	161	165	164	153	106
78	150	157	158	160	163	168	167	155	107
79	154	162	161	163	166	169	168	157	108
80	158	166	164	166	168	171	170	159	108
81	162	169	167	168	170	173	171	161	109
82	165	172	169	170	172	174	173	163	110
83	169	175	171	173	174	176	175	164	110
84	172	177	174	175	176	177	176	166	111
85	175	180	175	177	177	179	178	168	112
86	177	181	177	178	179	180	179	169	112
87	179	183	179	180	180	181	180	170	113
88	180	184	181	181	181	182	181	172	114
89	182	186	182	182	182	183	182	173	114
90	184	187	183	184	183	184	183	174	115
91	185	188	185	185	184	185	184	175	116
92	186	189	186	186	186	186	185	176	116
93	187	190	187	187	187	187	186	177	117
94	188	190	189	189	188	188	187	178	118
95	189	191	190	190	189	189	188	179	118
96	190	191	191	191	190	190	189	181	119
97	192	192	192	192	191	191	190	182	119
98	193	193	193	193	192	192	191	183	120
99	194	194	194	194	193	193	192	184	121
100	195	195	195	195	194	194	193	185	122
101	196	196	196	196	195	195	195	187	122
102	197	197	197	197	196	196	195	188	123
103	197	198	198	198	197	197	196	189	124
104	198	199	198	199	198	198	197	190	124
105	199	199	199	199	199	199	198	191	125
106	200	200	200	200	200	200	199	192	126
107	200	201	200	201	200	200	200	193	126
108	201	201	201	201	201	201	200	193	127
109	202	202	202	202	202	202	201	194	128
110	202	202	202	202	202	202	201	195	128
111	203	203	203	203	203	203	202	196	129
112	203	203	203	203	203	203	203	196	129
113	204	204	204	204	204	204	203	197	130
114	204	204	204	204	204	204	204	198	131
115	205	205	205	205	204	204	204	198	131
116	205	205	205	205	205	205	204	199	132
117	205	205	205	206	205	205	205	199	132
118	206	206	206	206	205	205	205	200	133
119	206	206	206	206	206	206	205	200	134
120	206	206	206	206	206	206	206	201	134
121	207	207	206	207	206	206	206	201	135
122	207	207	207	207	207	207	206	201	135
123	207	207	207	207	207	207	207	202	136
124	207	207	207	207	207	207	207	202	137
125	207	207	207	207	207	207	207	203	137
126	208	208	208	208	207	207	207	203	138
127	208	208	208	208	208	208	207	203	138
128	208	208	208	208	208	208	208	204	139
129	208	208	208	208	208	208	208	204	139
130	208	208	208	208	208	208	208	204	140
131	208	208	208	208	208	208	208	204	140
132	208	208	208	208	208	208	208	204	141
133	209	209	208	208	208	208	208	205	141
134	209	209	209	209	208	208	208	205	142
135	209	209	209	209	209	208	208	205	142
136	209	209	209	209	209	209	209	205	143
137	209	209	209	209	209	209	209	205	143
138	209	209	209	209	209	209	209	205	144
139	209	209	209	209	209	209	209	206	144
140	209	209	209	209	209	209	209	206	145
141	209	209	209	209	209	209	209	206	145

OMEGA POINT LABORATORIES

Time (min)	TC # 128 (°F)	TC # 129 (°F)	TC # 130 (°F)	TC # 131 (°F)	TC # 132 (°F)	TC # 133 (°F)	TC # 134 (°F)	TC # 135 (°F)	TC # 136 (°F)
142	209	209	209	209	209	209	209	206	146
143	209	209	209	209	209	209	209	206	146
144	210	210	209	210	209	209	209	207	147
145	210	210	210	210	209	209	209	207	148
146	210	210	210	210	209	209	209	207	148
147	210	210	210	210	209	209	209	207	148
148	210	210	210	210	209	210	209	207	149
149	210	210	210	210	210	210	210	207	149
150	210	210	210	210	210	210	210	207	150
151	210	210	210	210	210	210	210	207	151
152	210	210	210	210	210	210	210	208	151
153	210	210	210	210	210	210	210	208	151
154	210	210	210	210	210	210	210	208	152
155	210	210	210	210	210	210	210	208	153
156	210	210	210	210	210	210	210	208	153
157	211	211	210	210	210	210	210	208	153
158	211	211	210	210	210	210	210	208	154
159	211	211	210	211	210	210	210	209	154
160	211	211	211	211	210	210	210	209	155
161	211	211	211	211	210	210	210	209	155
162	211	211	211	211	210	210	210	209	156
163	211	211	211	211	211	211	211	209	156
164	211	211	211	211	211	211	211	209	157
165	211	211	211	211	211	211	211	209	157
166	211	211	211	211	211	211	211	209	157
167	211	211	211	211	211	211	211	209	158
168	211	211	211	211	211	211	211	209	158
169	211	211	211	211	211	211	211	209	159
170	211	211	211	211	211	211	211	210	159
171	211	211	211	211	211	211	211	210	160
172	211	211	211	211	211	211	211	210	160
173	211	211	211	211	211	211	211	210	160
174	211	211	211	211	211	211	211	210	161
175	211	211	211	211	211	211	211	210	161
176	211	211	211	211	211	211	211	210	162
177	211	211	211	211	211	211	211	210	162
178	211	211	211	211	211	211	211	210	162
179	211	211	211	211	211	211	211	210	162
180	211	211	211	211	211	211	211	210	163
181	212	211	211	211	211	211	211	210	163
182	213	212	211	211	211	211	211	210	163
183	219	213	212	211	211	211	211	210	164
184	224	215	213	211	211	211	211	210	164
185	227	217	216	211	211	211	211	210	164
186	230	222	218	212	211	211	211	210	164
187	233	226	222	215	211	211	211	210	165
188	236	230	225	217	211	211	211	210	165
189	239	233	228	222	211	211	211	210	165
190	242	236	231	225	211	210	211	209	165
191	245	238	233	227	212	210	210	209	166
192	247	241	236	229	214	210	210	209	166
193	250	243	238	231	217	210	210	209	166
194	252	245	240	233	219	210	210	209	167
195	255	248	242	235	221	210	210	209	167
196	257	250	244	237	224	211	210	209	167
197	260	252	247	239	226	211	210	209	168
198	262	255	249	241	228	212	211	209	168
199	265	257	251	243	230	214	211	209	169
200	267	259	253	245	233	222	214	209	169
201	269	261	255	248	235	226	218	209	169
202	272	264	257	250	238	230	222	209	170
203	274	266	259	252	241	233	225	209	170
204	277	268	261	254	243	236	228	209	170
205	279	270	263	256	245	238	230	209	170
206	281	273	265	258	248	240	232	209	171
207	284	275	267	260	250	243	234	210	171
208	286	277	270	262	252	245	236	210	171
209	288	279	272	264	254	247	237	210	172
210	291	281	274	266	256	249	239	211	172
Max Temp:	291	281	274	266	256	249	239	211	172
Max Allowed:	418	418	418	418	418	418	418	416	414

OMEGA POINT LABORATORIES

Time (min)	TC # 137 (°F)	TC # 138 (°F)	TC # 139 (°F)	TC # 140 (°F)	TC # 141 (°F)	TC # 142 (°F)	TC # 143 (°F)	TC # 144 (°F)	TC # 145 (°F)
0	92	93	93	93	93	93	93	93	93
1	92	93	93	93	93	93	93	93	93
2	92	93	93	93	93	93	93	93	92
3	92	93	93	93	93	93	93	93	93
4	92	93	93	93	93	93	93	93	93
5	92	93	93	93	93	93	93	93	92
6	92	93	93	93	93	93	93	93	93
7	92	93	93	93	93	93	93	93	93
8	92	93	93	93	93	93	93	93	93
9	92	93	93	93	93	93	93	93	93
10	92	93	93	93	93	93	93	93	92
11	92	93	93	93	93	93	93	93	92
12	92	93	93	93	93	93	93	93	92
13	92	93	93	93	93	93	93	93	92
14	92	93	93	93	93	93	93	93	93
15	93	93	93	93	93	92	92	92	92
16	93	93	93	93	93	93	92	92	92
17	93	93	93	93	93	92	92	92	92
18	93	94	94	93	93	92	92	92	92
19	93	94	94	93	93	93	93	92	92
20	93	94	94	93	93	93	92	92	92
21	93	94	94	93	93	93	92	92	92
22	93	94	94	93	93	93	92	92	92
23	93	94	94	93	93	93	92	92	92
24	93	94	94	93	93	93	92	92	92
25	94	94	94	93	93	92	92	92	92
26	94	94	94	93	93	93	92	92	92
27	94	94	94	93	93	93	93	93	93
28	94	94	94	94	93	93	93	93	93
29	94	94	94	94	93	93	93	93	93
30	94	94	94	94	93	93	93	93	93
31	94	95	94	94	93	93	93	93	93
32	94	95	94	94	93	93	93	93	93
33	95	95	94	94	93	93	93	93	93
34	95	95	94	94	93	93	93	93	93
35	96	95	94	94	93	93	93	93	93
36	97	95	94	94	93	93	93	93	93
37	98	96	95	94	93	93	93	93	93
38	99	96	95	94	93	93	93	93	93
39	101	97	95	94	94	93	93	93	93
40	102	97	95	94	94	94	93	93	93
41	104	98	96	95	94	94	94	94	94
42	106	99	96	95	94	94	94	94	94
43	109	100	97	95	94	94	94	94	94
44	111	101	97	95	95	94	94	94	95
45	114	102	98	96	95	95	95	95	95
46	117	104	98	96	95	95	95	95	95
47	119	105	99	97	96	96	95	95	96
48	121	106	100	97	96	96	96	96	96
49	123	106	100	98	97	97	96	96	97
50	125	107	101	98	97	97	97	97	98
51	127	108	102	99	98	98	98	98	98
52	128	109	102	99	99	99	98	98	99
53	129	110	103	100	100	100	99	99	100
54	129	111	104	101	100	102	100	100	101
55	129	112	105	102	101	103	101	101	102
56	129	113	106	102	102	104	102	102	103
57	129	114	107	103	103	106	104	103	104
58	129	114	108	104	105	107	105	105	106
59	129	115	109	105	106	108	106	106	107
60	129	116	110	107	107	110	108	107	108
61	128	117	111	108	108	112	109	109	110
62	128	118	112	109	110	114	111	111	112
63	128	118	113	111	112	116	113	113	113
64	128	119	115	112	114	118	115	114	115
65	128	121	116	114	116	119	117	116	117
66	128	122	118	115	117	121	119	118	119
67	129	123	119	117	119	123	121	120	121
68	129	124	121	119	121	124	123	122	123
69	129	125	123	121	123	127	125	124	125
70	130	127	124	123	124	129	126	126	127

OMEGA POINT LABORATORIES

Time (min)	TC # 137 (°F)	TC # 138 (°F)	TC # 139 (°F)	TC # 140 (°F)	TC # 141 (°F)	TC # 142 (°F)	TC # 143 (°F)	TC # 144 (°F)	TC # 145 (°F)
71	130	128	126	125	126	131	128	128	129
72	131	130	128	127	129	133	130	130	131
73	132	132	130	129	130	135	133	132	133
74	133	133	132	131	133	137	135	134	135
75	134	135	134	133	135	139	137	137	137
76	135	137	137	135	137	142	139	139	140
77	137	139	139	138	139	144	141	141	142
78	139	141	141	141	142	146	144	144	144
79	141	144	144	144	145	149	147	146	147
80	143	147	146	146	147	152	149	149	150
81	145	149	149	149	149	154	152	152	152
82	148	152	152	152	153	157	155	154	155
83	150	155	155	155	156	160	157	157	157
84	153	158	158	156	158	162	160	159	160
85	156	161	160	159	160	165	163	162	163
86	159	164	164	162	163	167	165	165	165
87	161	166	166	166	166	171	168	168	168
88	164	169	169	168	170	174	171	170	171
89	167	172	172	171	172	175	173	173	173
90	170	175	175	175	175	178	176	176	176
91	173	178	178	177	178	181	179	179	179
92	176	181	181	181	181	184	182	182	182
93	179	184	184	182	183	186	185	184	185
94	182	187	186	185	186	188	187	187	187
95	185	189	189	188	189	192	190	190	190
96	188	192	191	191	193	193	192	192	192
97	190	194	193	193	194	195	194	194	195
98	193	196	196	196	196	197	197	196	197
99	195	198	198	197	198	199	198	198	199
100	197	199	199	199	200	200	200	200	200
101	199	201	201	201	201	201	201	201	201
102	201	203	203	203	203	202	202	203	203
103	202	203	203	204	204	204	204	204	204
104	203	204	204	205	205	205	204	205	205
105	204	205	205	205	206	205	205	205	206
106	205	206	206	206	207	206	206	206	206
107	206	207	207	207	207	207	207	207	207
108	206	207	207	207	208	207	207	207	207
109	207	208	208	208	208	207	207	207	208
110	207	208	208	208	208	208	208	208	208
111	208	208	208	208	208	208	208	208	208
112	208	208	208	209	209	208	208	208	209
113	208	209	209	209	209	208	208	208	209
114	208	209	209	209	209	209	209	209	209
115	208	209	209	209	209	209	209	209	209
116	208	209	209	209	209	209	209	209	209
117	209	209	209	209	209	209	209	209	209
118	209	209	209	209	209	209	209	209	209
119	209	209	209	209	209	209	209	209	209
120	209	209	209	209	209	209	209	209	209
121	209	209	209	209	209	209	209	209	209
122	209	209	209	209	209	209	209	209	209
123	209	209	209	209	209	209	209	209	209
124	209	209	209	209	209	209	209	209	209
125	209	209	209	209	209	209	209	209	209
126	209	209	209	209	209	209	209	209	209
127	209	209	209	209	209	209	209	209	209
128	209	209	209	209	209	209	209	209	209
129	209	209	209	209	209	209	209	209	209
130	209	209	209	209	209	209	209	208	209
131	209	209	209	209	209	209	209	209	209
132	209	209	209	209	209	209	208	208	209
133	209	209	209	209	209	209	208	208	209
134	209	209	209	209	209	209	208	209	209
135	209	209	209	209	209	209	208	209	209
136	209	209	209	209	209	208	208	208	209
137	209	209	209	209	209	209	208	209	209
138	209	209	209	209	209	208	208	208	209
139	209	209	209	209	209	208	208	208	209
140	209	209	209	209	209	208	208	209	209
141	209	209	209	209	209	208	208	209	209

OMEGA POINT LABORATORIES

Time (min)	TC # 137 (°F)	TC # 138 (°F)	TC # 139 (°F)	TC # 140 (°F)	TC # 141 (°F)	TC # 142 (°F)	TC # 143 (°F)	TC # 144 (°F)	TC # 145 (°F)
142	209	209	209	209	209	208	208	209	209
143	209	209	209	209	209	208	208	209	209
144	209	209	209	209	209	208	208	209	209
145	209	209	209	209	209	208	209	209	209
146	209	209	209	209	209	208	209	209	209
147	209	209	209	209	209	209	209	209	209
148	209	209	209	209	209	208	208	209	209
149	209	209	209	209	209	208	208	209	209
150	209	209	209	209	209	209	209	209	209
151	209	209	209	209	209	209	209	209	209
152	209	209	209	209	209	209	208	209	209
153	209	209	209	209	209	209	209	209	209
154	209	209	209	209	209	209	209	209	209
155	209	209	209	209	209	209	209	209	209
156	209	209	209	209	209	209	209	209	209
157	209	209	209	209	209	209	209	209	209
158	209	209	209	209	209	209	209	209	209
159	209	209	209	209	209	209	209	209	209
160	209	209	209	209	209	209	209	209	209
161	209	209	209	209	209	209	209	209	209
162	209	209	209	209	209	209	209	209	209
163	209	209	209	210	209	210	209	209	209
164	209	209	209	210	209	210	209	210	209
165	209	209	209	210	210	210	210	210	209
166	209	209	209	210	210	210	210	209	209
167	209	209	209	210	210	211	210	210	209
168	209	209	209	210	210	211	210	210	210
169	209	209	209	210	210	211	210	209	209
170	209	209	210	210	211	212	210	210	210
171	209	209	209	210	211	214	211	211	210
172	209	209	209	211	213	215	211	211	211
173	209	209	209	213	216	217	214	212	212
174	209	209	210	215	218	219	217	217	218
175	209	209	211	218	220	221	220	222	223
176	209	209	214	220	221	223	223	227	227
177	208	210	217	222	223	225	226	230	231
178	208	210	219	226	226	228	230	234	234
179	208	210	222	228	229	231	234	237	238
180	208	212	226	231	232	234	238	240	242
181	208	214	229	234	234	237	241	243	245
182	208	218	232	236	237	241	244	247	248
183	209	222	234	239	240	244	248	251	251
184	209	225	237	242	243	247	251	254	254
185	209	228	239	244	246	250	254	257	257
186	209	230	242	247	249	254	257	259	260
187	209	233	245	249	252	256	260	262	262
188	209	236	247	252	254	258	263	265	265
189	209	240	250	254	257	262	265	267	268
190	209	243	252	256	259	264	268	270	270
191	209	246	255	259	262	267	271	272	273
192	209	248	257	261	265	270	273	275	275
193	210	251	260	264	267	272	276	277	278
194	211	253	262	266	269	275	278	279	280
195	211	256	264	268	272	277	281	282	282
196	211	258	266	271	275	280	283	284	284
197	214	260	269	273	277	282	285	286	287
198	216	262	271	276	279	285	288	288	289
199	217	264	273	278	282	287	290	291	293
200	219	266	275	280	284	290	293	294	295
201	222	269	278	282	287	293	295	296	297
202	225	271	280	284	289	295	298	298	299
203	228	274	282	287	291	297	300	301	302
204	231	276	284	289	294	299	302	303	304
205	233	278	287	291	296	301	305	306	307
206	235	281	289	293	298	304	307	309	310
207	237	283	291	296	300	306	309	311	313
208	239	285	294	298	303	308	312	314	315
209	242	288	296	301	305	311	314	316	317
210	244	290	298	303	308	313	317	318	320
Max Temp:	244	290	298	303	308	313	317	318	320
Max Allowed:	417	418	418	418	418	418	418	418	418

OMEGA POINT LABORATORIES

Time (min)	TC # 146 (°F)	TC # 147 (°F)	TC # 148 (°F)	TC # 149 (°F)	TC # 150 (°F)	TC # 151 (°F)	TC # 152 (°F)	TC # 153 (°F)	TC # 154 (°F)
0	93	92	92	92	92	92	92	92	92
1	93	93	93	93	93	92	92	92	92
2	92	92	92	92	92	92	92	92	92
3	93	93	93	92	92	92	92	92	92
4	93	93	93	92	92	92	92	92	92
5	92	92	92	92	92	92	92	92	92
6	93	92	92	92	92	92	92	92	92
7	93	92	92	92	92	92	92	92	92
8	93	92	92	92	92	92	92	92	92
9	92	92	92	92	92	92	92	92	92
10	92	92	92	92	92	92	92	92	92
11	92	92	92	92	92	92	92	92	92
12	92	92	92	92	92	92	92	92	92
13	92	92	92	92	92	92	92	92	92
14	92	92	92	92	92	92	92	92	92
15	92	92	92	92	92	92	92	92	92
16	92	92	92	92	92	92	92	92	92
17	92	92	92	92	92	92	92	92	92
18	92	92	92	92	92	92	92	92	92
19	92	92	92	92	92	92	92	92	92
20	92	92	92	92	92	93	92	92	92
21	92	92	92	92	92	92	92	92	91
22	92	92	92	92	92	92	92	92	91
23	92	92	93	93	93	92	92	92	91
24	92	92	93	93	93	92	92	92	91
25	92	92	92	92	93	92	92	92	91
26	92	92	93	93	93	92	92	92	91
27	92	92	93	93	93	93	92	92	91
28	92	93	93	93	93	93	92	92	91
29	92	93	93	93	93	93	92	92	91
30	93	93	93	93	93	93	93	92	91
31	93	93	93	93	93	93	93	92	91
32	93	93	93	93	93	93	93	92	91
33	93	93	93	93	93	93	93	92	91
34	93	93	93	93	94	93	93	92	91
35	93	93	93	94	94	93	93	92	91
36	93	93	94	94	94	94	93	93	92
37	93	93	94	94	94	94	93	93	92
38	93	94	94	94	95	94	93	93	92
39	93	94	94	95	95	94	94	93	92
40	94	94	95	95	95	95	94	93	93
41	94	95	95	95	96	95	94	94	93
42	94	95	95	96	96	95	94	94	94
43	95	96	96	96	97	96	95	95	94
44	95	96	96	97	98	96	95	95	95
45	96	97	97	98	98	97	96	96	95
46	96	98	98	98	99	98	97	97	96
47	97	98	98	99	100	98	97	97	97
48	98	99	99	100	101	99	98	98	97
49	98	100	100	101	102	100	99	99	98
50	99	101	101	101	103	101	99	100	99
51	100	102	102	103	111	102	100	100	100
52	101	103	103	107	130	105	101	101	101
53	102	104	105	111	135	108	102	102	102
54	103	105	107	114	139	111	104	104	103
55	104	107	108	116	140	113	105	105	104
56	105	108	109	116	141	114	106	106	105
57	107	109	111	118	144	116	108	107	107
58	108	111	112	119	147	117	109	109	108
59	109	112	113	120	150	118	111	110	109
60	111	114	115	122	153	120	112	112	111
61	112	116	117	124	157	122	113	113	112
62	114	118	119	125	163	123	115	115	114
63	116	120	120	128	171	125	117	117	116
64	118	122	122	130	171	128	118	118	118
65	120	124	124	131	165	129	120	120	120
66	122	126	126	132	162	130	122	122	122
67	124	128	128	133	161	131	124	124	124
68	126	130	130	135	162	132	126	126	126
69	128	132	132	136	164	134	128	128	128
70	130	134	134	138	164	135	129	130	130

OMEGA POINT LABORATORIES

Time (min)	TC # 146 (°F)	TC # 147 (°F)	TC # 148 (°F)	TC # 149 (°F)	TC # 150 (°F)	TC # 151 (°F)	TC # 152 (°F)	TC # 153 (°F)	TC # 154 (°F)
71	132	136	136	140	166	137	131	132	132
72	134	138	138	141	164	139	133	134	134
73	136	140	140	143	164	140	136	136	136
74	138	142	141	144	164	142	137	138	138
75	140	144	144	146	167	144	140	141	140
76	143	146	146	148	167	146	142	143	143
77	145	149	148	150	168	148	144	145	145
78	147	151	151	152	170	150	147	148	147
79	150	154	153	154	170	152	149	150	150
80	152	156	155	156	172	155	152	153	153
81	155	158	158	158	172	157	154	155	155
82	157	160	160	160	174	159	157	158	158
83	160	163	162	162	178	162	159	160	160
84	162	165	165	165	181	165	162	163	163
85	165	168	167	167	183	167	165	166	166
86	167	170	170	169	183	170	167	168	168
87	170	173	172	172	186	173	170	171	171
88	173	175	175	174	187	175	173	174	174
89	175	178	177	177	188	178	175	176	177
90	178	181	180	180	190	180	178	179	179
91	181	183	183	183	191	183	181	182	182
92	184	186	186	186	193	185	183	184	184
93	186	188	188	188	194	187	185	186	186
94	189	191	190	191	195	189	187	188	188
95	191	193	193	193	196	191	189	190	190
96	193	195	195	195	196	193	192	192	192
97	195	197	196	197	198	195	193	194	194
98	197	199	198	199	199	197	195	196	196
99	199	200	200	200	200	198	197	197	197
100	201	201	201	201	201	200	198	199	199
101	202	202	202	202	202	201	200	200	200
102	203	203	203	203	203	202	201	201	201
103	204	204	204	204	204	203	202	202	202
104	205	205	205	205	204	204	203	204	203
105	206	206	206	206	205	205	204	204	204
106	206	206	206	206	206	206	205	205	205
107	207	207	207	207	206	206	205	206	206
108	207	207	207	207	207	207	206	206	206
109	208	208	208	208	207	207	207	207	207
110	208	208	208	208	208	208	207	207	207
111	208	208	208	208	208	208	208	208	208
112	208	208	208	208	208	208	208	208	208
113	208	208	209	208	208	208	208	208	208
114	209	209	209	209	209	208	208	208	208
115	209	209	209	209	209	209	208	208	208
116	209	209	209	209	209	208	209	209	208
117	209	209	209	209	209	209	209	209	209
118	209	209	209	209	209	209	209	209	209
119	209	209	209	209	209	209	209	209	209
120	209	209	209	209	209	209	209	209	209
121	209	209	209	209	209	209	209	209	209
122	209	209	209	209	209	209	209	209	209
123	209	209	209	209	209	209	209	209	209
124	209	209	209	209	210	209	209	209	209
125	209	209	209	209	210	209	209	209	209
126	209	209	209	209	210	209	209	209	209
127	209	209	209	209	210	209	209	209	209
128	209	209	209	209	210	209	209	209	209
129	209	209	209	210	210	209	209	209	209
130	209	209	209	209	210	209	209	209	208
131	209	209	209	209	210	209	208	209	208
132	208	208	209	209	211	209	208	209	208
133	209	209	209	210	211	209	209	209	208
134	209	209	209	210	211	209	208	208	208
135	209	209	209	210	211	209	208	208	208
136	208	209	209	210	211	209	206	208	208
137	209	209	209	210	212	209	208	208	208
138	209	209	209	210	212	209	208	208	208
139	209	209	209	210	213	209	208	208	208
140	209	209	209	210	213	209	208	208	208
141	209	209	209	210	213	210	208	208	208

OMEGA POINT LABORATORIES

Time (min)	TC # 146 (°F)	TC # 147 (°F)	TC # 148 (°F)	TC # 149 (°F)	TC # 150 (°F)	TC # 151 (°F)	TC # 152 (°F)	TC # 153 (°F)	TC # 154 (°F)
142	209	209	209	210	213	210	208	208	208
143	209	209	209	210	214	210	208	208	208
144	209	209	209	210	213	210	208	208	208
145	209	209	209	210	214	210	208	208	208
146	209	209	210	210	214	210	209	208	208
147	209	209	210	211	217	211	209	208	208
148	209	209	209	211	220	210	209	209	208
149	209	209	210	211	223	210	209	209	208
150	209	209	210	212	227	210	209	209	208
151	209	209	210	215	231	212	209	209	208
152	209	209	211	219	235	215	210	209	208
153	209	209	211	223	238	218	210	209	208
154	209	210	212	226	240	220	210	209	208
155	209	210	212	229	243	223	210	209	209
156	209	210	212	231	244	226	211	209	209
157	209	210	215	234	246	228	211	209	209
158	209	210	217	236	247	231	211	209	209
159	210	211	220	239	250	233	211	209	209
160	210	211	223	241	252	235	212	210	209
161	210	211	225	243	254	237	216	210	209
162	210	211	228	245	256	240	221	210	209
163	211	211	231	247	258	242	225	211	209
164	211	212	233	249	260	244	228	212	210
165	211	212	235	251	262	246	231	214	210
166	211	214	238	253	264	248	233	216	210
167	211	217	239	255	267	249	236	218	210
168	211	220	243	257	269	251	238	221	211
169	212	224	246	259	270	253	240	224	211
170	212	230	248	261	271	255	242	227	211
171	216	235	251	263	272	256	244	229	211
172	220	239	254	266	274	258	246	231	211
173	224	242	257	268	276	260	248	234	212
174	228	246	260	270	278	261	250	236	212
175	232	248	262	272	279	263	252	238	212
176	235	251	264	274	280	265	254	240	214
177	239	253	266	276	282	266	255	242	218
178	242	256	268	278	284	268	258	246	221
179	245	258	271	280	285	270	260	248	225
180	248	261	273	282	287	272	262	251	231
181	251	264	275	284	289	274	264	254	236
182	254	266	278	286	290	275	266	257	241
183	257	269	280	288	292	277	268	259	245
184	259	271	282	289	293	279	270	262	249
185	262	273	284	291	295	281	272	264	252
186	265	276	286	293	296	282	274	267	256
187	267	278	288	295	298	284	276	269	259
188	270	280	290	298	300	286	278	272	262
189	272	283	292	300	302	288	280	274	265
190	275	285	294	302	304	290	282	276	267
191	277	287	297	304	306	292	284	278	270
192	279	289	299	306	308	294	286	280	272
193	281	291	301	308	310	296	288	283	274
194	284	293	303	310	312	297	290	285	277
195	286	296	305	313	314	299	292	287	279
196	288	298	307	315	316	302	294	289	281
197	291	300	309	317	318	304	296	291	284
198	293	303	312	319	321	306	299	293	286
199	296	306	314	321	322	308	301	295	288
200	299	308	316	323	324	310	303	297	290
201	302	311	318	325	326	312	305	299	293
202	304	313	320	327	327	314	307	302	295
203	306	315	322	329	330	316	309	304	297
204	309	318	325	331	332	318	311	306	299
205	311	320	327	333	334	320	313	308	302
206	313	322	329	335	336	323	316	310	304
207	316	324	331	338	339	325	318	312	306
208	318	326	333	340	341	327	320	315	308
209	320	328	335	342	343	330	323	317	310
210	322	330	337	344	346	332	325	319	313
Max Temp:	322	330	337	344	346	332	325	319	313
Max Allowed:	418	417	417	417	417	417	417	417	417

OMEGA POINT LABORATORIES

Time (min)	TC # 155 (°F)	TC # 156 (°F)	TC # 157 (°F)	TC # 158 (°F)	TC # 159 (°F)	TC # 160 (°F)	TC # 161 (°F)	TC # 162 (°F)	TC # 163 (°F)
0	92	92	92	93	93	93	93	93	92
1	92	92	93	93	93	93	93	92	91
2	92	92	92	93	93	93	93	92	92
3	92	92	92	93	93	93	93	92	92
4	92	92	92	93	93	93	93	92	92
5	92	92	92	93	93	93	93	92	92
6	92	92	92	93	93	93	93	92	91
7	92	92	92	92	93	93	93	92	92
8	92	93	93	93	93	93	93	93	93
9	92	92	93	93	93	93	93	94	124
10	92	92	92	93	93	93	93	97	141
11	92	92	92	92	92	92	93	100	157
12	92	92	92	92	92	92	93	104	173
13	92	92	92	92	92	92	94	108	182
14	92	92	91	92	92	92	95	114	188
15	92	91	91	92	92	92	96	117	188
16	91	91	91	91	92	93	97	119	187
17	91	91	91	91	92	93	98	120	184
18	91	91	91	91	92	93	99	120	180
19	91	91	91	91	92	93	99	121	177
20	91	91	91	91	92	94	100	121	172
21	91	91	91	91	92	94	100	122	169
22	90	91	91	91	92	94	100	122	167
23	90	91	91	91	92	94	101	122	167
24	90	91	91	91	92	94	101	122	168
25	90	91	91	91	92	94	101	123	170
26	90	91	91	91	92	94	101	123	171
27	90	91	91	91	92	94	102	124	172
28	90	91	91	91	92	95	102	125	174
29	90	91	91	91	92	95	102	126	175
30	90	91	91	91	93	95	103	127	173
31	90	91	91	91	93	95	103	127	173
32	90	91	91	91	93	95	103	128	173
33	90	91	91	92	93	95	104	128	173
34	90	91	91	91	93	95	104	129	173
35	91	91	91	92	93	96	105	130	174
36	91	91	91	92	93	96	105	132	176
37	91	91	91	92	93	96	106	132	177
38	91	92	92	92	93	96	106	132	179
39	92	92	92	92	93	97	107	133	180
40	92	92	92	92	94	97	107	134	181
41	92	93	92	93	94	97	107	135	183
42	93	93	93	93	94	98	108	135	183
43	93	93	93	94	95	98	108	137	184
44	94	94	94	94	95	98	109	137	185
45	94	94	94	95	95	99	109	139	186
46	95	95	95	95	96	99	110	139	187
47	95	95	95	96	96	100	110	141	188
48	96	96	96	96	97	100	111	144	190
49	97	97	97	97	98	101	112	146	192
50	97	97	97	98	98	101	113	148	194
51	98	98	98	99	99	102	114	150	195
52	99	99	99	100	100	103	115	152	196
53	100	100	100	101	101	104	116	155	198
54	101	101	101	102	102	105	117	157	199
55	102	102	102	103	102	105	118	160	200
56	103	103	103	104	104	106	120	164	202
57	105	104	105	106	105	108	121	168	203
58	106	105	106	107	106	109	123	172	204
59	107	107	107	108	107	110	125	176	205
60	108	108	109	110	108	111	127	180	205
61	110	109	110	111	110	113	129	184	206
62	111	111	112	113	112	115	132	188	206
63	113	113	114	115	113	116	134	191	207
64	115	114	116	117	116	119	137	194	207
65	117	116	118	119	117	120	140	196	207
66	119	118	120	121	120	123	143	198	207
67	121	120	122	123	122	125	146	199	207
68	123	122	124	125	124	127	149	200	207
69	125	124	126	127	126	129	153	201	207
70	127	126	128	129	128	131	157	202	207

OMEGA POINT LABORATORIES

Time (min)	TC # 155 (°F)	TC # 156 (°F)	TC # 157 (°F)	TC # 158 (°F)	TC # 159 (°F)	TC # 160 (°F)	TC # 161 (°F)	TC # 162 (°F)	TC # 163 (°F)
71	129	128	130	131	130	134	160	203	207
72	131	131	132	133	132	136	164	204	207
73	133	133	135	136	134	138	168	204	207
74	135	135	137	138	136	140	171	204	207
75	137	137	139	140	139	143	174	204	207
76	140	139	142	142	141	145	176	204	207
77	142	142	144	144	144	147	177	204	207
78	145	144	146	147	146	150	178	203	207
79	147	147	149	149	149	152	179	203	206
80	150	149	152	152	152	155	179	202	206
81	152	152	154	154	154	158	179	201	206
82	155	155	157	157	157	160	179	200	205
83	158	157	160	160	160	163	179	199	205
84	161	160	163	163	163	165	179	198	204
85	163	163	165	165	165	168	178	197	203
86	166	166	168	168	168	170	178	196	203
87	169	168	171	171	171	173	179	194	202
88	171	171	173	174	174	175	179	193	201
89	174	174	176	177	176	178	180	192	200
90	177	177	178	180	179	180	182	190	199
91	179	179	181	182	181	182	184	189	198
92	182	182	183	185	184	184	186	188	197
93	184	184	185	187	186	186	188	188	196
94	186	186	188	189	188	188	190	189	194
95	188	188	189	191	190	190	191	191	194
96	190	190	191	193	192	192	193	193	193
97	192	192	193	195	194	194	195	194	194
98	194	194	195	196	196	195	196	196	195
99	196	196	197	197	197	197	198	197	197
100	197	197	198	199	198	198	199	199	198
101	199	199	199	200	200	199	200	200	199
102	200	200	201	201	201	201	201	201	200
103	201	201	202	202	202	202	202	202	202
104	202	202	203	203	203	203	203	203	203
105	203	204	204	204	204	204	204	204	204
106	204	204	204	205	205	205	205	205	205
107	205	205	205	205	205	205	206	206	205
108	206	206	206	206	206	206	206	206	206
109	207	207	207	207	207	206	207	207	207
110	207	207	207	207	207	207	207	207	207
111	207	207	207	207	208	207	208	207	207
112	208	208	208	208	208	208	208	208	208
113	208	208	208	208	208	208	208	208	208
114	208	208	208	208	208	208	208	208	208
115	208	208	208	208	208	208	209	208	208
116	208	209	208	208	208	208	209	209	209
117	209	209	209	208	208	208	209	209	209
118	209	209	209	208	208	208	209	209	209
119	209	209	209	209	209	209	209	209	209
120	209	209	209	208	208	208	209	209	209
121	209	209	209	209	209	209	209	209	209
122	209	209	209	209	209	209	209	209	209
123	209	209	209	209	209	209	209	209	209
124	209	209	209	209	209	209	209	209	209
125	209	209	209	209	209	209	209	209	209
126	209	209	209	209	209	209	209	209	209
127	209	209	209	209	209	209	209	209	209
128	209	209	209	209	209	209	209	209	209
129	209	209	209	209	209	209	209	209	209
130	208	208	208	208	208	208	209	209	209
131	208	209	209	208	208	208	209	209	209
132	208	209	209	208	208	208	209	209	209
133	208	208	208	208	208	208	209	209	209
134	208	208	208	208	208	208	209	209	209
135	208	208	208	208	208	208	209	209	209
136	208	208	208	208	208	208	209	209	209
137	208	208	208	208	208	208	209	209	209
138	208	208	208	208	208	208	209	209	209
139	208	208	208	208	208	208	209	209	209
140	208	208	208	208	208	208	209	209	209
141	208	208	208	208	208	208	209	209	209

OMEGA POINT LABORATORIES

Time (min)	TC # 155 (°F)	TC # 156 (°F)	TC # 157 (°F)	TC # 158 (°F)	TC # 159 (°F)	TC # 160 (°F)	TC # 161 (°F)	TC # 162 (°F)	TC # 163 (°F)
142	208	208	208	208	208	208	209	209	209
143	208	208	208	208	208	208	209	209	209
144	208	208	208	208	208	208	209	209	209
145	208	208	208	208	208	208	209	209	209
146	208	208	208	208	208	208	209	209	209
147	208	208	208	208	208	208	209	209	209
148	208	208	208	208	208	208	209	209	209
149	208	208	208	208	208	208	209	209	209
150	208	208	208	208	208	208	209	209	209
151	208	208	208	208	208	208	209	209	209
152	208	208	208	208	208	208	209	209	209
153	208	208	208	208	208	208	209	209	209
154	208	208	208	208	208	208	209	208	208
155	208	208	208	208	208	208	209	208	208
156	208	208	208	208	208	208	209	208	208
157	208	208	208	208	208	208	209	208	208
158	208	208	208	208	208	208	209	208	208
159	208	208	208	208	208	208	209	208	208
160	208	208	208	208	208	208	209	208	208
161	208	208	208	208	208	208	209	208	208
162	208	208	208	208	208	208	209	208	208
163	208	208	208	208	208	208	209	208	208
164	208	208	208	208	208	208	209	208	208
165	208	208	208	208	208	208	209	208	208
166	208	208	208	208	208	208	208	208	208
167	208	208	208	208	208	208	208	208	208
168	208	208	208	208	208	208	208	208	208
169	209	208	208	208	208	208	208	208	208
170	209	208	208	208	207	207	208	208	208
171	209	208	208	208	207	207	208	208	208
172	209	208	208	208	207	207	208	208	208
173	209	208	208	208	207	207	208	208	208
174	209	208	209	208	207	207	208	208	207
175	209	208	209	208	207	207	208	208	207
176	209	208	209	208	207	207	208	208	207
177	209	208	209	208	207	207	208	208	207
178	210	209	210	208	207	207	208	208	207
179	210	209	210	209	207	207	208	208	207
180	210	209	210	209	208	207	208	208	207
181	213	209	212	210	208	207	208	208	207
182	221	214	215	213	208	207	209	208	207
183	230	223	217	216	210	207	209	208	207
184	236	230	219	218	212	207	209	208	207
185	241	235	221	221	214	208	209	208	207
186	245	239	232	225	216	209	210	209	207
187	248	243	237	230	219	212	211	209	207
188	252	247	241	234	221	214	213	209	207
189	255	250	245	237	224	217	214	209	207
190	258	253	248	240	228	220	216	210	207
191	260	256	252	243	231	224	219	211	207
192	263	259	255	247	235	227	220	212	207
193	266	262	258	249	238	230	224	213	208
194	268	264	260	252	240	232	229	215	208
195	271	267	263	255	243	235	232	214	208
196	274	269	265	257	246	238	234	216	208
197	276	272	268	260	248	241	235	217	208
198	278	274	270	262	251	243	239	222	209
199	281	277	273	265	254	247	242	224	209
200	283	279	275	267	257	249	244	222	210
201	286	282	277	270	260	252	247	230	211
202	288	284	280	273	262	254	249	233	211
203	290	286	282	275	265	257	252	238	213
204	293	289	285	278	268	260	255	242	214
205	295	291	287	280	270	262	257	245	215
206	298	293	290	283	273	264	260	248	216
207	300	296	292	285	275	266	262	251	218
208	302	298	294	287	277	268	264	251	218
209	305	300	297	290	279	270	266	254	220
210	307	303	299	292	282	272	268	257	221
Max Temp:	307	303	299	292	282	272	268	257	221
Max Allowed:	417	417	417	418	418	418	418	418	417

OMEGA POINT LABORATORIES

Time (min)	TC # 164 (°F)	TC # 165 (°F)	TC # 166 (°F)	TC # 167 (°F)	TC # 168 (°F)	TC # 169 (°F)	TC # 170 (°F)	TC # 171 (°F)	TC # 172 (°F)
0	89	91	91	91	91	92	91	91	91
1	89	99	91	91	91	92	91	91	91
2	89	116	91	91	91	92	91	91	91
3	89	138	92	91	91	92	91	91	91
4	89	160	94	92	91	92	91	92	91
5	89	179	98	92	91	92	92	92	91
6	89	200	102	93	91	92	92	92	91
7	89	223	107	94	92	92	93	93	91
8	89	245	112	96	92	92	94	95	91
9	94	266	118	97	92	92	97	97	91
10	102	287	125	100	95	92	102	102	92
11	107	307	131	105	100	92	108	108	93
12	113	326	139	110	104	92	113	115	95
13	118	343	146	117	108	92	119	121	97
14	121	361	154	123	111	92	126	128	100
15	124	377	163	129	114	92	132	135	104
16	126	393	172	134	116	92	139	141	108
17	127	408	183	140	118	92	146	147	112
18	128	423	193	145	120	92	152	153	116
19	128	438	204	151	122	92	157	159	121
20	127	451	212	156	124	92	161	163	125
21	127	464	221	162	126	92	165	168	130
22	126	475	229	168	129	93	168	172	136
23	126	487	236	174	131	93	172	176	141
24	126	497	244	180	133	93	176	179	148
25	127	508	251	187	136	94	179	182	154
26	127	518	258	193	138	94	181	185	161
27	128	528	265	200	141	94	184	188	168
28	129	538	271	205	143	95	186	190	175
29	129	547	278	208	147	95	189	193	182
30	129	556	284	211	150	96	192	196	187
31	129	565	290	214	155	96	194	198	192
32	129	573	296	217	164	97	197	201	196
33	129	581	302	220	175	98	199	203	199
34	129	588	307	223	184	98	200	205	202
35	130	595	312	227	189	99	201	207	204
36	130	601	317	230	202	100	202	208	206
37	131	607	321	233	201	101	203	209	207
38	132	613	326	237	203	102	204	210	208
39	132	618	331	241	206	103	205	212	208
40	133	624	335	244	207	105	206	213	209
41	134	629	339	248	207	107	206	214	209
42	135	635	344	252	208	108	207	215	209
43	135	640	348	255	208	111	207	216	209
44	136	646	352	259	209	113	207	218	210
45	136	651	357	262	208	116	208	219	210
46	137	656	361	266	209	120	208	220	210
47	137	662	365	270	209	124	208	221	210
48	138	667	370	274	209	127	208	223	211
49	139	672	374	277	209	130	209	224	211
50	139	678	378	281	210	133	209	225	212
51	140	683	382	285	210	137	209	226	212
52	141	688	387	289	211	146	210	228	213
53	141	693	391	292	212	162	210	229	214
54	142	699	395	296	214	173	210	231	215
55	142	704	400	300	215	185	211	233	216
56	143	709	404	304	217	192	212	234	217
57	143	715	409	308	218	185	212	236	218
58	144	720	413	313	220	183	213	238	219
59	144	726	417	317	221	185	214	240	221
60	145	731	422	320	222	187	214	242	223
61	145	736	426	324	224	188	215	244	224
62	146	741	430	328	225	190	216	246	226
63	146	747	434	332	227	190	217	248	228
64	147	752	439	336	229	190	218	250	230
65	147	758	443	340	230	190	219	253	232
66	147	763	447	344	231	192	220	255	234
67	147	769	451	348	232	193	221	257	237
68	147	774	455	351	234	194	222	260	239
69	148	780	459	355	236	195	225	262	241
70	148	785	463	359	237	194	231	265	244

OMEGA POINT LABORATORIES

Time (min)	TC # 164 (°F)	TC # 165 (°F)	TC # 166 (°F)	TC # 167 (°F)	TC # 168 (°F)	TC # 169 (°F)	TC # 170 (°F)	TC # 171 (°F)	TC # 172 (°F)
71	148	791	467	362	240	195	235	268	246
72	148	796	470	366	242	195	238	270	249
73	149	801	474	370	244	196	241	273	251
74	149	807	478	373	246	197	243	276	254
75	149	812	482	377	248	198	246	279	257
76	149	818	485	381	251	199	248	282	259
77	149	823	489	384	253	200	251	285	262
78	149	829	493	388	255	201	253	288	265
79	149	834	497	391	257	205	256	291	268
80	150	840	500	394	259	205	258	294	271
81	150	845	504	398	261	206	261	297	275
82	150	851	507	401	264	206	263	300	278
83	149	856	511	404	266	207	266	303	281
84	149	862	515	407	268	207	268	306	285
85	149	867	518	410	270	207	270	309	288
86	149	873	522	413	272	207	273	312	292
87	149	878	525	416	275	207	275	316	295
88	149	884	529	419	277	207	277	319	299
89	148	889	532	422	279	207	280	322	302
90	148	894	535	425	281	207	282	325	306
91	148	899	539	428	283	207	285	328	309
92	148	904	542	430	286	207	287	331	313
93	148	910	546	433	288	208	290	335	316
94	147	915	549	436	290	208	292	338	319
95	147	919	552	439	292	208	294	341	323
96	147	924	556	442	295	208	297	344	326
97	146	929	559	445	297	208	300	347	330
98	147	934	562	448	299	208	302	350	333
99	147	939	566	451	302	208	305	353	336
100	147	944	569	454	304	208	307	356	339
101	147	949	572	457	306	208	310	359	343
102	148	954	575	459	309	208	312	362	346
103	148	959	579	462	311	209	315	365	349
104	149	964	582	465	313	209	317	368	352
105	149	968	585	468	315	209	320	370	355
106	150	973	588	471	318	210	322	373	358
107	150	978	592	474	320	210	324	376	361
108	151	983	595	477	322	211	327	379	364
109	152	987	598	480	324	211	329	382	367
110	152	991	601	483	326	212	331	384	370
111	153	995	604	486	329	213	333	387	373
112	153	1000	607	488	331	213	336	390	376
113	154	1004	610	491	333	214	338	392	379
114	154	1008	614	494	335	215	340	395	381
115	154	1012	617	497	337	216	342	397	384
116	155	1016	620	500	339	216	344	400	387
117	155	1020	623	503	341	217	346	402	389
118	155	1025	626	505	343	218	348	405	392
119	156	1029	629	508	346	219	350	407	394
120	156	1033	632	511	348	220	352	409	396
121	156	1037	635	513	350	221	354	412	399
122	156	1042	638	516	352	222	356	414	401
123	157	1046	641	519	354	223	358	416	403
124	157	1050	644	521	356	225	360	418	405
125	157	1054	647	524	358	227	362	420	407
126	157	1058	650	527	360	229	364	422	409
127	157	1062	653	529	362	230	366	424	411
128	157	1066	656	532	364	232	368	426	413
129	158	1070	659	534	365	233	370	428	415
130	158	1074	662	537	367	234	372	430	417
131	158	1077	665	539	369	236	374	433	420
132	158	1081	668	541	371	237	376	435	422
133	158	1085	671	544	373	238	377	437	424
134	158	1089	674	546	375	240	379	439	426
135	158	1093	677	548	377	241	381	441	428
136	158	1096	680	551	379	243	383	443	430
137	159	1100	683	553	381	244	385	445	433
138	159	1104	687	555	383	246	387	447	435
139	159	1108	690	557	384	247	389	449	437
140	159	1111	693	559	386	249	390	452	439
141	159	1115	696	561	388	250	392	454	441

OMEGA POINT LABORATORIES

Time (min)	TC # 164 (°F)	TC # 165 (°F)	TC # 166 (°F)	TC # 167 (°F)	TC # 168 (°F)	TC # 169 (°F)	TC # 170 (°F)	TC # 171 (°F)	TC # 172 (°F)
142	160	1119	700	563	390	252	394	456	444
143	160	1122	703	565	392	253	396	458	446
144	160	1097	706	567	393	255	398	460	448
145	160	1129	710	569	395	257	399	462	451
146	160	1133	713	572	397	259	401	464	453
147	160	1136	717	574	399	260	403	467	455
148	160	1137	720	576	400	262	405	469	457
149	160	1140	724	578	402	264	407	471	460
150	160	904	727	580	404	265	408	473	462
151	161	960	731	582	406	267	410	475	464
152	161	1103	735	584	407	269	412	478	467
153	161	1123	739	587	409	271	414	480	469
154	161	1138	742	589	411	273	416	482	472
155	161	1103	746	592	413	274	417	484	474
156	161	1146	750	594	415	276	419	486	476
157	162	1162	754	597	417	278	421	489	479
158	162	1166	758	600	418	280	423	491	481
159	162	1169	763	603	420	282	425	493	484
160	162	1173	767	606	422	284	427	495	486
161	162	1176	771	609	424	285	428	497	488
162	162	1180	775	612	426	287	430	499	491
163	163	1184	779	615	428	289	432	502	493
164	163	1121	783	618	429	291	434	504	496
165	163	1119	788	621	431	293	436	506	498
166	163	1195	792	624	433	295	437	508	501
167	163	1046	796	627	435	297	439	510	503
168	163	1210	801	631	437	299	441	512	505
169	163	1213	805	634	439	301	443	515	508
170	163	1217	809	638	441	303	445	517	510
171	163	1220	814	642	443	305	446	519	513
172	164	1223	818	645	445	307	448	521	515
173	164	1227	822	649	447	309	450	523	517
174	164	1230	827	653	449	311	452	525	520
175	163	1234	831	657	451	313	453	527	522
176	164	1237	836	661	453	315	455	529	524
177	164	1241	840	665	456	317	457	531	526
178	164	1244	845	669	458	319	459	533	528
179	164	1248	849	673	460	321	461	535	531
180	164	1251	853	677	462	323	462	537	533
181	164	1255	858	681	464	325	464	539	535
182	164	1258	862	686	467	327	466	541	537
183	165	1262	867	690	469	329	468	543	539
184	165	1265	871	694	471	331	470	545	541
185	165	1269	876	699	473	333	472	547	543
186	165	1272	880	703	476	335	473	549	545
187	165	1276	885	707	478	337	475	551	547
188	165	1280	890	711	480	339	477	552	548
189	165	1283	894	716	482	341	479	554	550
190	165	1287	898	720	485	343	481	556	552
191	166	930	903	724	487	344	482	558	554
192	166	1294	908	729	489	346	484	560	556
193	166	1298	912	733	491	348	486	561	557
194	166	1260	917	738	494	350	488	563	559
195	166	1267	921	742	496	351	490	565	561
196	167	1273	926	747	498	353	491	567	562
197	167	1311	930	751	500	355	493	569	564
198	167	1316	935	756	503	357	495	571	566
199	167	1320	939	760	505	358	497	572	568
200	167	1110	944	765	507	360	499	574	570
201	167	1101	949	769	510	361	500	576	572
202	167	1098	953	774	512	363	502	578	574
203	167	855	958	778	514	365	504	581	576
204	168	861	962	783	516	366	506	583	579
205	168	868	967	788	519	368	508	585	581
206	168	885	971	792	521	369	510	588	584
207	169	890	976	797	523	371	511	591	587
208	169	895	980	801	526	373	513	593	591
209	169	900	984	806	528	374	515	596	594
210	170	906	989	790	530	376	517	600	598
Max Temp:	170	1320	989	806	530	376	517	600	598
Max Allowed:	414								

OMEGA POINT LABORATORIES

Time (min)	TC # 173 (°F)	TC # 174 (°F)	TC # 175 (°F)	TC # 176 (°F)	TC # 177 (°F)	TC # 178 (°F)	TC # 179 (°F)	Ambient (°F)	Furnace # 1 (°F)
0	91	91	91	91	91	91	91	84	89
1	90	91	91	91	91	91	97	84	205
2	91	91	91	91	91	91	111	84	375
3	91	91	91	91	91	91	130	84	568
4	91	91	91	91	91	93	149	84	677
5	92	93	91	91	91	95	168	84	766
6	94	99	96	92	91	98	188	84	877
7	97	104	106	97	91	101	209	84	972
8	100	109	112	101	92	105	231	85	1036
9	104	114	117	105	94	110	252	85	1087
10	109	118	121	109	95	115	272	85	1132
11	115	121	123	112	97	121	292	85	1168
12	121	125	126	115	100	127	311	85	1202
13	127	129	130	118	103	135	329	85	1234
14	134	133	133	122	106	143	347	85	1269
15	140	137	136	125	110	154	364	85	1280
16	147	142	140	129	114	174	381	85	1315
17	153	146	143	133	119	194	397	86	1333
18	160	151	147	137	125	204	413	86	1352
19	167	156	150	141	131	208	428	86	1361
20	173	160	153	145	138	210	441	86	1351
21	179	164	156	149	146	214	453	86	1348
22	186	167	159	154	154	221	463	86	1364
23	191	171	162	158	162	227	474	86	1393
24	196	174	165	162	170	234	485	86	1410
25	199	178	168	167	178	239	495	86	1411
26	203	181	171	171	184	245	504	87	1411
27	205	184	175	176	191	250	513	86	1426
28	206	186	178	181	198	256	521	86	1440
29	207	188	181	186	203	261	529	87	1453
30	207	189	184	192	206	266	537	86	1459
31	208	191	187	198	208	270	544	87	1460
32	208	193	191	204	210	275	551	86	1459
33	209	194	196	208	211	279	557	86	1467
34	209	196	201	209	211	284	563	87	1483
35	209	198	205	210	212	288	569	87	1489
36	209	201	207	210	213	292	575	87	1492
37	209	204	209	210	214	295	581	87	1500
38	210	205	209	210	214	299	587	87	1509
39	210	207	209	210	215	302	593	88	1518
40	211	208	209	210	216	305	598	87	1524
41	212	208	209	210	216	308	604	88	1526
42	213	208	209	209	217	311	609	87	1534
43	214	209	209	209	218	314	614	88	1543
44	215	209	209	209	219	317	619	87	1545
45	217	209	209	209	220	320	624	88	1545
46	219	209	209	209	221	323	629	88	1555
47	220	210	209	209	222	326	634	88	1560
48	222	210	209	209	223	329	639	88	1562
49	224	210	209	209	224	331	643	88	1567
50	226	211	208	209	225	334	648	88	1572
51	228	211	209	209	226	337	652	88	1575
52	230	212	209	209	227	340	657	89	1579
53	232	213	209	209	229	343	661	89	1586
54	234	214	209	209	230	346	666	89	1591
55	236	216	209	210	232	349	671	88	1595
56	238	217	209	210	233	352	675	89	1597
57	240	218	209	210	235	355	680	89	1601
58	243	220	209	211	236	358	684	89	1605
59	245	221	209	211	238	361	689	89	1612
60	248	222	209	212	240	364	693	89	1620
61	250	224	209	212	242	367	698	89	1620
62	253	225	209	213	244	370	702	89	1622
63	255	226	209	214	246	373	707	89	1625
64	258	228	210	215	248	376	711	89	1630
65	261	230	210	216	251	380	716	89	1635
66	263	231	210	217	253	383	720	89	1639
67	266	233	211	219	256	386	724	90	1648
68	269	235	211	220	259	389	729	90	1657
69	272	237	211	221	262	393	734	90	1658
70	274	239	212	222	265	396	738	90	1658

OMEGA POINT LABORATORIES

Time (min)	TC # 173 (°F)	TC # 174 (°F)	TC # 175 (°F)	TC # 176 (°F)	TC # 177 (°F)	TC # 178 (°F)	TC # 179 (°F)	Ambient (°F)	Furnace # 1 (°F)
71	277	241	212	224	268	399	743	90	1659
72	280	243	214	225	272	403	747	90	1660
73	283	245	216	227	275	406	751	90	1664
74	286	247	218	229	279	409	755	90	1666
75	289	249	219	231	282	413	760	91	1670
76	291	252	221	234	286	416	764	91	1675
77	294	254	224	237	290	419	768	91	1678
78	297	257	226	240	294	423	773	91	1681
79	300	259	229	243	299	426	777	91	1685
80	303	262	232	247	303	430	781	91	1688
81	306	265	234	250	307	433	786	92	1691
82	310	268	237	254	311	437	790	91	1698
83	313	270	240	257	315	440	795	91	1702
84	316	273	243	261	319	444	799	92	1705
85	319	276	246	264	323	447	804	91	1709
86	322	279	246	267	327	450	808	91	1711
87	325	282	251	271	331	454	813	91	1712
88	328	285	254	274	335	457	817	92	1715
89	331	288	258	278	339	460	821	92	1719
90	334	291	261	281	343	464	826	91	1722
91	338	294	264	284	347	467	830	92	1725
92	341	297	267	288	350	470	834	92	1727
93	344	299	270	291	354	473	838	92	1728
94	347	302	273	294	357	477	843	92	1732
95	350	305	276	298	361	480	847	92	1735
96	353	308	279	301	364	483	851	93	1741
97	356	311	282	304	368	486	855	93	1746
98	359	314	285	307	371	489	859	93	1742
99	362	317	288	311	374	492	863	93	1746
100	365	320	291	314	378	495	868	93	1755
101	368	322	294	317	381	498	872	93	1756
102	371	325	297	320	384	501	876	94	1756
103	374	328	300	323	387	504	880	94	1759
104	377	331	303	326	390	507	884	94	1762
105	380	334	306	330	393	510	888	95	1769
106	383	336	308	333	395	513	892	94	1772
107	386	339	311	335	398	515	896	94	1769
108	388	342	314	338	401	518	900	94	1769
109	391	344	317	341	403	521	903	94	1771
110	394	347	320	344	406	524	907	93	1772
111	397	350	322	346	408	527	911	93	1778
112	399	352	325	349	411	529	914	94	1781
113	402	355	327	351	413	532	918	93	1780
114	404	357	330	354	415	534	922	94	1783
115	407	360	332	357	418	537	925	94	1785
116	410	362	335	359	420	540	929	94	1788
117	412	365	337	361	422	542	932	93	1791
118	414	367	340	364	424	545	936	94	1792
119	417	369	342	366	427	547	939	94	1794
120	419	372	344	368	429	550	943	94	1799
121	422	374	346	370	431	552	946	94	1800
122	424	376	349	372	433	555	950	94	1802
123	426	378	351	375	435	557	953	94	1804
124	429	381	353	377	438	560	957	94	1804
125	431	383	355	379	440	562	960	94	1807
126	433	385	357	381	442	565	964	95	1807
127	435	387	359	383	444	567	967	95	1809
128	437	389	361	385	447	570	970	95	1810
129	439	392	363	387	449	572	973	96	1814
130	442	394	365	389	451	574	976	95	1817
131	444	396	367	391	453	577	979	95	1818
132	446	398	369	393	456	579	983	95	1819
133	448	400	371	395	458	582	986	95	1822
134	450	402	374	397	460	584	989	95	1823
135	452	404	375	399	462	586	992	95	1824
136	455	406	377	401	465	589	995	96	1826
137	457	408	379	403	467	591	999	96	1827
138	459	410	381	405	469	594	1002	97	1829
139	461	412	383	407	471	596	1005	96	1831
140	463	414	385	409	474	599	1008	96	1833
141	466	416	387	411	476	601	1011	96	1835

OMEGA POINT LABORATORIES

Time (min)	TC # 173 (°F)	TC # 174 (°F)	TC # 175 (°F)	TC # 176 (°F)	TC # 177 (°F)	TC # 178 (°F)	TC # 179 (°F)	Amblent Furnace # 1 (°F)	(°F)
142	468	418	389	413	478	603	1014	97	1835
143	470	420	391	415	480	606	1018	96	1837
144	472	422	393	417	482	608	1021	96	1840
145	475	424	395	419	485	611	1024	97	1842
146	477	426	397	421	487	613	1027	97	1842
147	479	428	399	423	489	616	1030	97	1845
148	481	430	400	424	491	618	1033	97	1846
149	484	432	402	426	493	621	1036	98	1847
150	486	433	404	428	495	623	1039	97	1849
151	488	435	406	430	497	626	1042	97	1850
152	491	437	408	432	500	628	1046	98	1851
153	493	439	409	434	502	631	1049	98	1853
154	495	441	411	435	504	633	1052	98	1855
155	498	443	413	437	506	636	1055	98	1856
156	500	445	415	439	508	638	1058	99	1858
157	503	447	417	441	510	641	1061	98	1858
158	506	449	418	443	512	643	1064	99	1858
159	508	451	420	445	514	646	1067	100	1859
160	511	453	422	446	516	648	1070	99	1862
161	513	455	423	448	518	651	1073	100	1865
162	516	457	425	450	520	653	1076	100	1867
163	519	459	427	452	521	656	1079	100	1869
164	521	461	429	453	523	659	1082	99	1869
165	524	463	430	455	525	661	1085	100	1871
166	526	465	432	457	527	664	1088	100	1871
167	529	467	434	459	529	666	1091	99	1874
168	531	469	436	460	531	669	1094	99	1875
169	534	471	437	462	532	671	1096	100	1876
170	536	473	439	464	534	674	1099	100	1877
171	539	475	441	465	536	677	1102	100	1878
172	541	477	442	467	538	679	1105	100	1878
173	544	479	444	469	539	682	1108	101	1879
174	546	481	446	470	541	685	1055	101	1881
175	549	483	448	472	543	687	957	100	1884
176	551	485	449	474	544	690	1006	101	1885
177	554	488	451	475	546	693	921	100	1888
178	556	490	453	477	547	695	914	99	1890
179	558	492	454	479	549	698	888	100	1891
180	561	494	456	480	550	701	897	100	1891
181	563	496	458	482	552	703	875	102	1893
182	565	498	459	484	553	706	878	101	1894
183	567	500	461	485	555	709	1131	101	1895
184	569	502	463	487	556	712	1093	101	1895
185	572	504	464	488	558	714	1117	101	1896
186	574	506	466	490	560	717	1119	101	1897
187	576	508	468	491	561	720	1126	101	1908
188	578	510	469	493	563	723	1126	100	1917
189	580	512	471	494	564	726	1016	100	1912
190	583	514	473	496	566	729	949	100	1901
191	585	516	474	497	567	731	984	101	1902
192	587	518	476	499	569	734	946	101	1912
193	590	520	478	501	571	737	916	102	1921
194	592	522	479	502	572	740	906	101	1927
195	595	524	481	504	574	743	890	101	1923
196	597	526	483	505	576	746	881	102	1918
197	600	529	484	507	578	749	878	101	1914
198	603	531	486	509	580	753	842	103	1918
199	606	533	488	510	582	756	833	104	1922
200	610	535	490	512	584	759	833	104	1928
201	613	538	491	514	586	762	864	105	1931
202	616	540	493	515	588	765	1012	104	1933
203	620	542	495	517	591	769	1038	102	1935
204	623	544	497	519	593	772	1022	102	1936
205	626	547	499	521	596	775	956	102	1935
206	630	549	500	523	598	779	864	103	1935
207	633	551	502	525	601	782	830	104	1935
208	636	554	504	527	604	785	802	103	1935
209	640	556	506	529	607	789	791	104	1936
210	643	559	508	531	610	792	806	104	1940
Max Temp:	643	559	508	531	610	792	1131		
Max Allowed:									

OMEGA POINT LABORATORIES

Time (min)	Furnace # 2 (°F)	Furnace # 3 (°F)	Furnace # 4 (°F)	Furnace # 5 (°F)	Furnace # 6 (°F)	Furnace # 7 (°F)	Furnace # 8 (°F)
0	89	89	89	84	89	84	84
1	217	268	184	268	320	210	190
2	424	488	398	545	606	369	348
3	634	697	654	820	825	521	523
4	707	768	750	921	855	612	627
5	767	844	816	1052	916	697	717
6	871	962	933	1232	1030	789	822
7	958	1058	1033	1352	1124	869	913
8	1007	1099	1081	1365	1161	934	976
9	1047	1138	1118	1403	1198	989	1027
10	1088	1182	1165	1486	1246	1028	1067
11	1120	1220	1207	1547	1289	1049	1094
12	1152	1250	1236	1561	1313	1086	1131
13	1180	1284	1270	1631	1346	1102	1154
14	1214	1316	1305	1650	1377	1138	1190
15	1219	1317	1308	1648	1371	1166	1216
16	1247	1354	1337	1722	1420	1169	1235
17	1267	1369	1357	1699	1426	1203	1262
18	1292	1393	1384	1720	1453	1215	1282
19	1308	1403	1397	1692	1447	1247	1310
20	1303	1390	1384	1641	1418	1266	1328
21	1302	1385	1380	1659	1407	1282	1341
22	1316	1402	1397	1713	1428	1299	1357
23	1340	1435	1428	1770	1479	1314	1368
24	1353	1452	1445	1738	1485	1326	1384
25	1359	1448	1444	1708	1475	1339	1402
26	1364	1448	1444	1707	1468	1350	1420
27	1377	1465	1464	1739	1485	1356	1430
28	1391	1480	1479	1762	1502	1371	1445
29	1404	1493	1497	1774	1516	1380	1458
30	1413	1497	1502	1760	1517	1396	1471
31	1419	1497	1500	1756	1512	1410	1480
32	1423	1498	1498	1743	1508	1419	1486
33	1429	1506	1510	1765	1519	1426	1497
34	1442	1521	1525	1790	1538	1431	1504
35	1450	1526	1529	1782	1541	1442	1513
36	1455	1530	1530	1780	1542	1453	1518
37	1463	1538	1542	1790	1551	1460	1523
38	1472	1549	1546	1792	1561	1469	1531
39	1479	1556	1550	1802	1569	1480	1541
40	1485	1558	1557	1804	1573	1487	1549
41	1489	1560	1564	1799	1573	1492	1554
42	1497	1566	1568	1813	1581	1503	1564
43	1505	1575	1577	1831	1592	1510	1572
44	1510	1577	1577	1814	1590	1516	1574
45	1512	1574	1575	1801	1586	1525	1578
46	1519	1584	1583	1822	1597	1533	1589
47	1523	1585	1588	1826	1601	1542	1597
48	1528	1589	1589	1822	1603	1549	1601
49	1532	1591	1594	1827	1607	1554	1607
50	1536	1594	1594	1830	1611	1561	1610
51	1541	1595	1593	1829	1614	1572	1615
52	1546	1599	1595	1833	1617	1580	1622
53	1550	1605	1602	1847	1626	1585	1628
54	1555	1608	1604	1852	1629	1589	1634
55	1560	1611	1608	1847	1631	1593	1639
56	1565	1612	1610	1845	1633	1600	1643
57	1569	1617	1614	1848	1635	1606	1647
58	1574	1620	1618	1851	1640	1611	1651
59	1578	1624	1625	1862	1646	1617	1659
60	1584	1632	1632	1871	1654	1622	1665
61	1588	1630	1631	1863	1652	1629	1668
62	1593	1632	1633	1864	1652	1637	1670
63	1598	1637	1638	1868	1656	1643	1671
64	1603	1640	1640	1869	1659	1649	1676
65	1608	1645	1644	1880	1665	1654	1680
66	1612	1649	1648	1876	1668	1657	1686
67	1619	1659	1659	1890	1678	1658	1694
68	1627	1667	1666	1898	1686	1664	1704
69	1630	1667	1667	1894	1687	1671	1703
70	1631	1665	1665	1891	1686	1680	1705

OMEGA POINT LABORATORIES

Time (min)	Furnace # 2 (°F)	Furnace # 3 (°F)	Furnace # 4 (°F)	Furnace # 5 (°F)	Furnace # 6 (°F)	Furnace # 7 (°F)	Furnace # 8 (°F)
71	1633	1665	1664	1888	1686	1687	1707
72	1637	1667	1667	1891	1687	1694	1711
73	1644	1671	1672	1888	1689	1701	1716
74	1647	1673	1672	1893	1692	1708	1720
75	1650	1676	1676	1895	1696	1713	1724
76	1656	1683	1684	1902	1700	1718	1729
77	1659	1686	1685	1901	1703	1720	1732
78	1663	1688	1688	1901	1706	1724	1734
79	1668	1692	1694	1902	1707	1727	1739
80	1672	1695	1697	1904	1710	1731	1742
81	1677	1699	1701	1907	1713	1736	1745
82	1683	1705	1707	1919	1721	1743	1753
83	1687	1709	1710	1920	1726	1743	1754
84	1692	1712	1713	1920	1729	1745	1756
85	1697	1714	1716	1917	1731	1752	1761
86	1698	1716	1715	1915	1733	1753	1762
87	1699	1717	1715	1916	1734	1752	1763
88	1701	1719	1718	1921	1736	1759	1766
89	1707	1725	1727	1926	1740	1769	1774
90	1709	1727	1727	1930	1744	1771	1775
91	1714	1730	1730	1927	1747	1770	1775
92	1713	1730	1727	1924	1748	1770	1776
93	1715	1732	1728	1929	1749	1771	1778
94	1720	1736	1733	1930	1752	1773	1782
95	1723	1739	1736	1935	1756	1781	1786
96	1729	1745	1744	1942	1761	1792	1793
97	1735	1750	1750	1943	1764	1802	1801
98	1730	1744	1741	1929	1758	1794	1793
99	1731	1747	1741	1945	1765	1796	1796
100	1740	1759	1755	1958	1775	1809	1807
101	1743	1758	1756	1950	1774	1812	1807
102	1742	1756	1751	1945	1773	1804	1804
103	1745	1759	1754	1949	1776	1810	1806
104	1749	1763	1759	1953	1779	1817	1813
105	1755	1772	1771	1957	1787	1820	1819
106	1759	1775	1771	1965	1789	1830	1823
107	1757	1769	1766	1945	1781	1824	1816
108	1756	1768	1764	1947	1781	1822	1814
109	1758	1770	1766	1951	1784	1821	1815
110	1758	1769	1764	1949	1783	1817	1815
111	1764	1777	1771	1966	1793	1826	1821
112	1766	1779	1772	1969	1796	1822	1823
113	1766	1778	1771	1959	1791	1824	1821
114	1768	1780	1773	1960	1793	1826	1823
115	1770	1781	1775	1963	1796	1830	1824
116	1774	1785	1780	1969	1800	1837	1828
117	1776	1788	1781	1967	1801	1832	1831
118	1778	1789	1783	1967	1802	1838	1832
119	1780	1790	1784	1970	1804	1844	1835
120	1783	1794	1787	1979	1811	1851	1839
121	1784	1795	1788	1974	1809	1849	1839
122	1786	1797	1790	1973	1810	1846	1841
123	1788	1799	1791	1979	1814	1849	1842
124	1789	1798	1790	1975	1811	1845	1842
125	1790	1802	1793	1978	1815	1847	1845
126	1791	1800	1791	1975	1813	1849	1844
127	1793	1802	1794	1978	1817	1856	1846
128	1794	1803	1794	1977	1816	1858	1847
129	1797	1807	1798	1985	1824	1862	1849
130	1799	1811	1803	1987	1829	1868	1856
131	1801	1811	1801	1987	1826	1868	1856
132	1802	1811	1802	1981	1825	1867	1854
133	1805	1815	1805	1989	1829	1861	1857
134	1805	1815	1805	1983	1828	1860	1856
135	1807	1817	1807	1988	1830	1854	1856
136	1809	1819	1809	1991	1833	1861	1857
137	1811	1819	1810	1988	1833	1868	1861
138	1812	1821	1811	1992	1835	1871	1863
139	1814	1824	1814	1996	1839	1869	1865
140	1816	1825	1815	1995	1840	1870	1864
141	1818	1827	1817	1998	1844	1872	1866

OMEGA POINT LABORATORIES

Time (min)	Furnace # 2 (°F)	Furnace # 3 (°F)	Furnace # 4 (°F)	Furnace # 5 (°F)	Furnace # 6 (°F)	Furnace # 7 (°F)	Furnace # 8 (°F)
142	1818	1826	1815	1994	1842	1876	1867
143	1820	1829	1818	2001	1844	1879	1869
144	1822	1832	1821	2002	1849	1881	1870
145	1825	1835	1825	1998	1850	1875	1869
146	1825	1833	1823	2003	1848	1883	1871
147	1828	1837	1827	2007	1853	1883	1873
148	1829	1837	1827	2010	1853	1883	1874
149	1830	1839	1828	2008	1854	1887	1877
150	1831	1841	1830	2009	1856	1885	1879
151	1833	1842	1830	2018	1857	1887	1878
152	1834	1842	1831	2008	1856	1889	1879
153	1836	1844	1833	2008	1859	1887	1880
154	1837	1847	1835	2012	1862	1889	1882
155	1839	1848	1836	2019	1864	1888	1881
156	1840	1849	1836	2022	1865	1889	1883
157	1841	1849	1837	2019	1864	1886	1883
158	1841	1848	1836	2014	1862	1892	1883
159	1842	1850	1839	2012	1865	1891	1886
160	1845	1854	1844	2016	1870	1893	1889
161	1847	1856	1844	2024	1874	1901	1889
162	1848	1857	1845	2022	1873	1899	1891
163	1850	1859	1846	2027	1876	1897	1892
164	1851	1860	1847	2029	1876	1898	1892
165	1852	1861	1848	2028	1876	1901	1894
166	1853	1861	1849	2026	1876	1900	1894
167	1855	1864	1851	2034	1880	1899	1895
168	1856	1865	1852	2033	1879	1902	1896
169	1857	1866	1854	2031	1880	1901	1897
170	1858	1867	1854	2029	1881	1901	1897
171	1859	1867	1854	2031	1881	1902	1898
172	1859	1868	1854	2034	1881	1904	1898
173	1860	1869	1855	2031	1882	1903	1897
174	1862	1871	1859	2027	1884	1905	1901
175	1865	1875	1862	2034	1890	1906	1904
176	1866	1875	1862	2033	1889	1914	1905
177	1869	1879	1866	2037	1894	1911	1903
178	1871	1882	1869	2039	1898	1908	1905
179	1871	1880	1868	2037	1894	1910	1905
180	1871	1880	1868	2034	1893	1912	1905
181	1872	1882	1869	2039	1896	1912	1909
182	1874	1884	1871	2044	1898	1912	1909
183	1875	1885	1871	2045	1898	1913	1909
184	1875	1884	1870	2040	1897	1912	1909
185	1876	1884	1871	2041	1896	1914	1909
186	1877	1886	1872	2041	1898	1916	1911
187	1886	1899	1878	2075	1917	1930	1922
188	1895	1911	1889	2082	1930	1933	1929
189	1890	1902	1887	2058	1916	1923	1920
190	1880	1889	1876	2031	1899	1911	1908
191	1881	1890	1875	2043	1902	1921	1913
192	1890	1902	1885	2070	1918	1931	1925
193	1898	1912	1894	2077	1930	1938	1932
194	1904	1919	1899	2087	1938	1943	1937
195	1901	1912	1896	2067	1927	1934	1929
196	1896	1906	1892	2054	1919	1929	1923
197	1893	1901	1888	2047	1912	1929	1924
198	1896	1906	1891	2061	1919	1934	1928
199	1900	1912	1895	2068	1926	1936	1936
200	1905	1919	1901	2069	1936	1941	1940
201	1908	1921	1904	2073	1935	1943	1942
202	1910	1923	1907	2080	1937	1945	1945
203	1912	1925	1909	2082	1940	1946	1946
204	1913	1926	1909	2077	1941	1945	1941
205	1912	1923	1907	2073	1936	1943	1939
206	1913	1925	1908	2075	1938	1940	1939
207	1913	1923	1909	2073	1934	1943	1941
208	1912	1923	1907	2074	1934	1944	1942
209	1913	1923	1907	2074	1934	1948	1944
210	1917	1929	1911	2080	1943	1955	1949
Max Temp:							
Max Allowed:							

OMEGA POINT LABORATORIES

Time (min)	Furnace # 9 (°F)	Furnace # 10 (°F)
0	84	84
1	246	245
2	611	761
3	948	1168
4	984	1158
5	1060	1236
6	1232	1429
7	1361	1562
8	1367	1509
9	1385	1556
10	1478	1674
11	1569	1722
12	1555	1699
13	1630	1784
14	1646	1780
15	1617	1734
16	1712	1844
17	1667	1810
18	1686	1856
19	1651	1801
20	1601	1735
21	1597	1741
22	1645	1809
23	1714	1864
24	1690	1833
25	1666	1809
26	1657	1798
27	1679	1821
28	1698	1847
29	1710	1856
30	1702	1835
31	1690	1808
32	1682	1797
33	1700	1819
34	1722	1864
35	1720	1852
36	1720	1848
37	1729	1849
38	1738	1869
39	1749	1873
40	1748	1861
41	1742	1847
42	1755	1875
43	1769	1892
44	1760	1874
45	1755	1868
46	1770	1893
47	1773	1886
48	1775	1892
49	1777	1887
50	1781	1894
51	1783	1903
52	1787	1903
53	1797	1913
54	1799	1912
55	1799	1904
56	1800	1909
57	1802	1907
58	1808	1917
59	1814	1918
60	1821	1927
61	1816	1922
62	1817	1923
63	1819	1920
64	1818	1919
65	1825	1923
66	1827	1929
67	1841	1942
68	1848	1953
69	1846	1951
70	1842	1941

OMEGA POINT LABORATORIES

Time (min)	Furnace # 9 (°F)	Furnace # 10 (°F)
71	1838	1937
72	1837	1934
73	1834	1929
74	1835	1932
75	1836	1931
76	1839	1928
77	1840	1931
78	1840	1931
79	1843	1931
80	1845	1932
81	1846	1928
82	1853	1937
83	1856	1942
84	1854	1935
85	1853	1935
86	1855	1941
87	1858	1944
88	1860	1944
89	1863	1942
90	1865	1948
91	1865	1948
92	1868	1954
93	1871	1953
94	1871	1953
95	1876	1957
96	1880	1958
97	1881	1957
98	1870	1944
99	1880	1960
100	1891	1970
101	1884	1961
102	1886	1967
103	1888	1967
104	1890	1966
105	1891	1963
106	1895	1969
107	1882	1954
108	1880	1952
109	1882	1955
110	1882	1957
111	1888	1963
112	1895	1975
113	1893	1968
114	1892	1967
115	1894	1969
116	1894	1969
117	1891	1965
118	1897	1967
119	1895	1968
120	1902	1966
121	1899	1967
122	1896	1966
123	1901	1973
124	1901	1971
125	1900	1972
126	1901	1973
127	1906	1970
128	1902	1968
129	1905	1971
130	1908	1970
131	1907	1973
132	1905	1972
133	1910	1977
134	1906	1970
135	1911	1973
136	1916	1976
137	1917	1977
138	1915	1979
139	1918	1979
140	1919	1979
141	1919	1979

OMEGA POINT LABORATORIES

Time (min)	Furnace # 9 (°F)	Furnace # 10 (°F)
142	1919	1982
143	1922	1981
144	1921	1979
145	1921	1977
146	1922	1978
147	1922	1978
148	1923	1979
149	1925	1980
150	1928	1983
151	1929	1985
152	1928	1984
153	1929	1984
154	1930	1984
155	1934	1987
156	1932	1988
157	1939	1987
158	1933	1989
159	1935	1985
160	1934	1987
161	1933	1989
162	1935	1989
163	1934	1991
164	1939	1993
165	1940	1993
166	1945	1992
167	1945	1995
168	1945	1996
169	1947	1997
170	1948	1996
171	1949	1997
172	1947	1998
173	1948	1997
174	1951	1997
175	1950	2000
176	1950	1999
177	1945	1997
178	1948	1996
179	1950	1996
180	1952	1996
181	1955	1998
182	1952	2000
183	1955	1999
184	1956	2000
185	1954	1999
186	1955	2001
187	1960	2016
188	1964	2020
189	1964	2010
190	1956	1995
191	1961	2002
192	1972	2014
193	1969	2017
194	1968	2021
195	1969	2010
196	1965	2002
197	1967	2002
198	1975	2013
199	1976	2017
200	1977	2017
201	1978	2019
202	1982	2024
203	1982	2022
204	1975	2017
205	1971	2015
206	1972	2014
207	1977	2014
208	1980	2015
209	1980	2016
210	1977	2017
Max Temp:		
Max Allowed:		

OMEGA POINT LABORATORIES