*** ACTION REQUEST ***

A/R TYPE : CM ECR
REQUEST ORG : OED
REQUEST DATE: 21OCT06
REQUESTED BY: TAMBURRO

A/R NUMBER : A2152754
A/R STATUS : ASIGND
STATUS DATE: 25OCT06
LAST UPDATE: 27OCT06
PRINT DATE : 27OCT06

EVALUATION NBR: 05
EVALUATING ORG: OERT
EVAL ASIGND TO: MARKOS/KESTER
EVAL REQUEST ORG: OERT
EVAL REQUESTOR: MARKOS,S
EVAL RETURNED BY:

ORIG DATE ASSIGNED:
EVAL DUE DATE: 26OCT06
DATE ASSIGNED: 25OCT06
EVAL STATUS : ASIGND

IMPORTANCE CODE: 3 OEAP: SCHEDULE CODE: DATE FIXED:

EVAL DESC: TECHNICAL BASIS FOR AWA FOR ECR 06-00879

THE CAVEATS LISTED IN THE FOLLOWING TECHNICAL EVALUATION	PRK1 25OCT06
MUST BE CAPTURED IN THE PLANNED WORK PACKAGE WITH	PRK1 25OCT06
APPROPRIATE SIGNOFFS. QV HOLD POINTS ARE REQUIRED. THE	PRK1 25OCT06
SCOPE OF THIS TECHNICAL EVALUATION IS NUCLEAR SAFETY	PRK1 25OCT06
RELATED.	PRK1 25OCT06
.	PRK1 25OCT06
THIS TECHNICAL EVALUATION IS PERFORMED IN ACCORDANCE WITH	PRK1 25OCT06
PROCEDURE CC-AA-309-101.	PRK1 25OCT06
A PRE-JOB BRIEF HAS BEEN CONDUCTED IAW HU-AA-1212. THIS	PRK1 25OCT06
TECHNICAL EVALUATION WAS SCREENED AGAINST HU-AA-1212 AND	PRK1 25OCT06
DETERMINED TO BE MEDIUM CONSEQUENCE AND RISK RANKED A 4.	PRK1 25OCT06
ACCORDINGLY, EXISTING PROCESS REVIEW IS ACCEPTABLE AND NO	PRK1 25OCT06
THIRD PARTY REVIEW IS REQUIRED.	PRK1 25OCT06
.	PRK1 25OCT06
SCOPE AND REASONS FOR EVALUATION:	PRK1 25OCT06
.	PRK1 25OCT06
THIS TECHNICAL EVALUATION PROVIDES THE TECHNICAL BASIS	PRK1 25OCT06
FOR THE ADVANCED WORK AUTHORIZATION ASSOCIATED WITH ECR	PRK1 25OCT06
06-00879 FOR CAULKING THE JOINT AT THE OUTBOARD PERIMETER	PRK1 25OCT06
OF THE ELEV. 10'-3" DRYWELL CONCRETE SLAB CURB AND THE	PRK1 25OCT06
DRYWELL STEEL SHELL. THE EVALUATION WILL EXAMINE THE	PRK1 25OCT06
IMPACT OF THE ADDITION OF THE PROPOSED CAULKING ON THE	PRK1 25OCT06
DESIGN BASIS ANALYSIS (REFERENCE 2) FOR SUCTION STRAINER	PRK1 25OCT06
DEBRIS GENERATION AND TRANSPORT. THIS SCOPE OF THIS	PRK1 25OCT06
TECHNICAL EVALUATION IS LIMITED TO PROVIDING THE	PRK1 25OCT06
TECHNICAL BASIS FOR AWA AND SHALL NOT BE USED FOR	PRK1 25OCT06
TURNOVER TO OPERATION.	PRK1 25OCT06
.	PRK1 25OCT06
DETAILED EVALUATION:	PRK1 25OCT06
.	PRK1 25OCT06
AT THE OUTBOARD PERIMETER OF THE ELEV. 10'-3" DRYWELL	PRK1 25OCT06
FLOOR, THE CONCRETE SLAB MEETS THE DRYWELL SHELL. THIS	PRK1 25OCT06
INTERFACE HAS BEEN PREPARED FOR CAULKING UNDER AWA #3.	PRK1 25OCT06
THE SCOPE OF THIS AWA IS TO APPLY THE CAULK TO THE JOINT.	PRK1 25OCT06
THE CAULK WILL LAP ONTO THE CONCRETE AND STEEL SURFACES	PRK1 25OCT06
BY 1/4" TO 1" ON EACH SURFACE. THE APPLICATION OF THE	PRK1 25OCT06
CAULK WILL MINIMIZE WATER SEEPAGE THROUGH THE SUBJECT	PRK1 25OCT06
JOINT.	PRK1 25OCT06
.	PRK1 25OCT06
THE COMPUTED AMOUNT OF THE REQUIRED CAULKING MATERIAL IS	PRK1 25OCT06
ABOUT 830 OZ, WHICH IS ABOUT 81 LBS OF THIOKOL 2235M BY	PRK1 25OCT06
POLYSPEC, QUALIFIED MATERIAL FOR INSIDE DRYWELL	PRK1 25OCT06

15

A/R TYPE : CM ECR
REQUEST ORG : OED
REQUEST DATE: 21OCT06
REQUESTED BY: TAMBURRO

A/R NUMBER : A2152754
A/R STATUS : ASIGND
STATUS DATE: 25OCT06
LAST UPDATE: 27OCT06
PRINT DATE : 27OCT06

APPLICATION (SEE ATTACHMENT 5). THE CAULKED JOINT IS	PRK1 25OCT06
LOCATED IN CLOSE PROXIMITY OF THE RECIRCULATION PIPING.	PRK1 25OCT06
IN DESIGN BASIS LOSS OF COOLANT ACCIDENT (DBLOCA) INSIDE	PRK1 25OCT06
THE DRYWELL, THE PROPOSED CAULKING MATERIAL COULD	PRK1 25OCT06
GENERATE DEBRIS THAT IS CAUSED BY A LINE BREAKAGE IN	PRK1 25OCT06
RECIRCULATION PIPING SYSTEM. SUCH DEBRIS COULD	PRK1 25OCT06
ACCUMULATE ON THE ECCS SUCTION STRAINERS. IN ORDER TO	PRK1 25OCT06
EVALUATE THE POTENTIAL IMPACT OF THE CAULKING MATERIAL	PRK1 25OCT06
DEBRIS ON THE ECCS SUCTION STRAINERS, THE METHODOLOGY AND	PRK1 25OCT06
ASSUMPTIONS USED IN REFERENCE 2 WILL NOT BE CHANGED.	PRK1 25OCT06
DURING THE SANDBED REMOVAL AND DRYWELL SHELL INSPECTION,	PRK1 25OCT06
TWO TRENCHES WERE EXCAVATED TO FACILITATE THE INSPECTION	PRK1 25OCT06
OF THE INSIDE SURFACE OF THE DRYWELL SHELL. AFTER THE	PRK1 25OCT06
INSPECTION WAS COMPLETE, THE TRENCHES WERE FILLED WITH	PRK1 25OCT06
LIGHT DENSITY 3-6548 SILICONE RTV FOAM AND COVERED WITH	PRK1 25OCT06
1-1/2" LIGHT DENSITY SILICONE AS SHOWN IN REFERENCES 3	PRK1 25OCT06
AND 4. AFTER THE RECENT INSPECTION OF THE DRYWELL SHELL	PRK1 25OCT06
IS COMPLETE DURING 1R21 REFUELING, THE INSPECTION	PRK1 25OCT06
TRENCHES WILL NOT BE REFILLED WITH THE SILICONE RTV FOAM.	PRK1 25OCT06
ACCORDINGLY, LESS DEBRIS COULD BE GENERATED DURING LOCA	PRK1 25OCT06
ACCIDENT ASSOCIATED WITH RECIRCULATION LINE BREAKAGE.	PRK1 25OCT06
.	PRK1 25OCT06
DURING DBLOCA, THE ZONE OF INFLUENCE WILL NOT EXTEND	PRK1 25OCT06
BEYOND ONE-FOURTH OF THE CAULKED JOINT PERIMETER (BASED	PRK1 25OCT06
ON THE METHODOLOGY IN REF. 2). THE GENERATED DEBRIS IS	PRK1 25OCT06
THEREFORE ESTIMATED TO BE ABOUT 20 LBS OF CURED CAULK.	PRK1 25OCT06
ONE TRENCH WILL BE AFFECTED BY THE ZONE OF INFLUENCE OF	PRK1 25OCT06
RECIRCULATION PIPING BREAKAGE DUE TO THE RELATIVE	PRK1 25OCT06
LOCATIONS OF THE INSPECTION TRENCHES. THE AMOUNT OF THE	PRK1 25OCT06
3-6548 SILICONE RTV FOAM THAT IS NOT BEING REPLACED IS	PRK1 25OCT06
ESTIMATED BASED ON THE INSTALLATION SPECIFICATION PER	PRK1 25OCT06
REFERENCE 1. THE VOLUME IS ABOUT 1/2X18"X40"X16" =5760	PRK1 25OCT06
IN 3 OR 3.333 FT 3. THE MINIMUM DENSITY OF 3-6548	PRK1 25OCT06
SILICONE RTV FOAM IS 14 LBS/FT 3. THE REMOVED WEIGHT IS	PRK1 25OCT06
ABOUT 3.333 X 14 = 46.7 LBS. THE VOLUME OF LIGHT DENSITY	PRK1 25OCT06
SILICONE THAT IS NOT BEING REPLACED IS ABOUT = 1.5" X 16"	PRK1 25OCT06
X 40" = 960 IN 3 OR 0.56 FT 3. THE DENSITY OF THE LIGHT	PRK1 25OCT06
DENSITY SILICONE IS 55 LBS/FT 3 (REF 5). THE REMOVED	PRK1 25OCT06
WEIGHT OF LIGHT DENSITY SILICONE IS 0.56X55 = 31 LBS.	PRK1 25OCT06
THE ADDED CAULKING MATERIAL IS MUCH LESS THAN THE REMOVED	PRK1 25OCT06
MATERIALS FROM ONE OF THE TWO TRENCHES. THE ADDED	PRK1 25OCT06
MATERIALS IS RELATIVELY INSIGNIFICANT FOR THE DUST AND	PRK1 25OCT06
DIRT/LOOSE CONCRETE AMOUNT OF 150 LBS THAT IS USED IN THE	PRK1 25OCT06
DESIGN BASIS ANALYSIS OF THE SUCTION STRAINER DEBRIS	PRK1 25OCT06
GENERATION AND TRANSPORT, (REF 2). IT SHOULD BE NOTED	PRK1 25OCT06
THAT ADEQUATE MARGIN EXIST FOR CAULKING THE TRENCHES	PRK1 25OCT06
JOINTS.	PRK1 25OCT06
.	PRK1 25OCT06
CONCLUSION AND FINDINGS:	PRK1 25OCT06
.	PRK1 25OCT06
THE ADDED CAULKING MATERIAL THAT COULD BE DISLODGED IS	PRK1 25OCT06
MUCH LESS THAN WHAT IS REMOVED FROM ONE OF THE INSPECTION	PRK1 25OCT06

A/R TYPE : CM ECR
REQUEST ORG : OED
REQUEST DATE: 21OCT06
REQUESTED BY: TAMBURRO

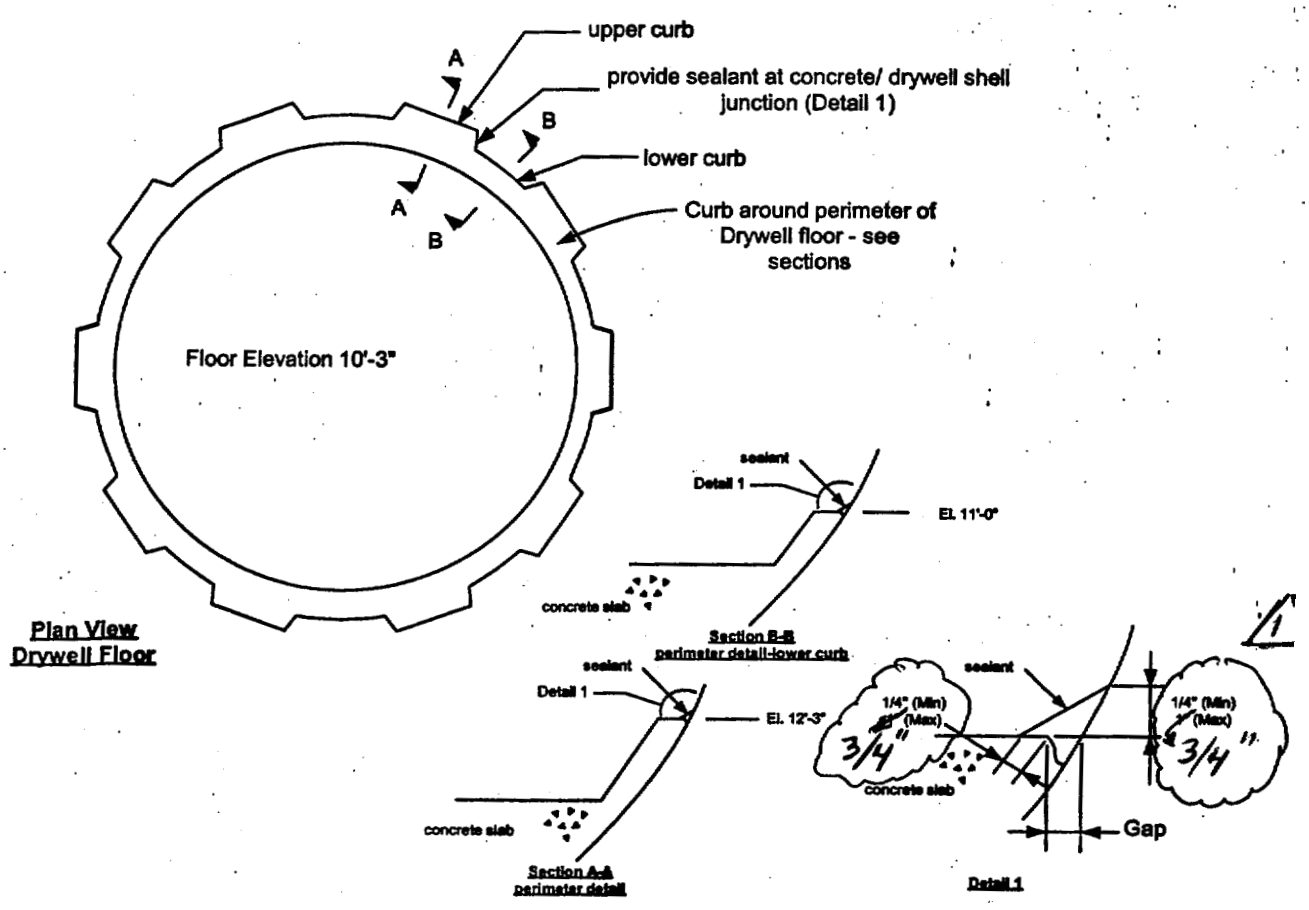
A/R NUMBER : A2152754
A/R STATUS : ASIGND
STATUS DATE: 25OCT06
LAST UPDATE: 27OCT06
PRINT DATE : 27OCT06

TRENCHES. THE ADDED MATERIAL IS BOUNDED IN THE DESIGN	PRK1	25OCT06
BASIS ANALYSIS AS DOCUMENTED IN REFERENCE 2. THE	PRK1	25OCT06
INSTALLATION OF THE CAULKING MATERIAL WILL NOT INVALIDATE	PRK1	25OCT06
THE DESIGN ANALYSIS IN REFERENCE 2. THE INSTALLATION OF	PRK1	25OCT06
THIS CAULKING MATERIAL IS ACCEPTABLE PROVIDED THAT	PRK1	25OCT06
CAULKING MATERIAL IS QUALIFIED TO BE USED INSIDE THE	PRK1	25OCT06
DRYWELL AS AUGMENTED QUALIFY, QA CLASS "A" OR BETTER. THE	PRK1	25OCT06
SURFACE PREPARATION AND INSTALLATION SHALL BE IAW THE	PRK1	25OCT06
MANUFACTURER'S INSTRUCTIONS. QV VERIFICATIONS ARE	PRK1	25OCT06
REQUIRED FOR PREPARATION AND INSTALLATION OF THE	PRK1	25OCT06
CAULK. (LOCATION AND PROFILE OF CAULK ARE SHOWN ON	PRK1	25OCT06
ATTACHMENT 1.)	PRK1	25OCT06
.	PRK1	25OCT06
REVERENCES:	PRK1	25OCT06
.	PRK1	25OCT06
1) SPECIFICATION OCIS-328227-003, REV. 0	PRK1	25OCT06
2) DESIGN BASIS CALCULATION NO. C-1302-241-E610-081, REV.	PRK1	25OCT06
0	PRK1	25OCT06
3) DRAWING NO. 3B-153-34-1000, REV, 0	PRK1	25OCT06
4) DRAWING NO. 3BM-153-34-1000, REV. 0	PRK1	25OCT06
5) PCI PASSIVE FIRE PROTECTION SOLUTIONS MATERIAL	PRK1	25OCT06
CATALOG.	PRK1	25OCT06
.	PRK1	25OCT06
ATTACHMENTS:	PRK1	25OCT06
.	PRK1	25OCT06
1) COMPUTATION OF REQUIRED CAULKING MATERIALS, 2 PAGES.	PRK1	25OCT06
2) 3-6548 SILICONE RTV FOAM DATA SHEET, 1 PAGE.	PRK1	25OCT06
3) PCI-PROMATEC LDSE DATA SHEET, 1 PAGE.	PRK1	25OCT06
4) POLYSPEC THIOKOL 2235M DENSITY INFORMATION, 1 PAGE.	PRK1	25OCT06
5) EVALUATION OF POLYSPEC/THIOKOL 2235M INDUSTRIAL	PRK1	25OCT06
POLYSULFIDE JOINT SEALANT FOR USE IN THE DRYWELL OF THE	PRK1	25OCT06
OYSTER CREEK NUCLEAR GENERATING STATION, 3 PAGES.	PRK1	25OCT06
.	PRK1	25OCT06
PREPARED BY: SAM MARKOS / PAUL KESTER	PRK1	25OCT06
INDEPENDENT REVIEWER COMMENTS: PERFORMED BY DAN FIORELLO	DJF2	27OCT06
ATTACHMENT 1 WAS REVISED TO DECREASE THE MAXIMUM SIZE OF	DJF2	27OCT06
THE CAULK JOINT TO 3/4 INCH. THIS CHANGE DECREASES THE	DJF2	27OCT06
AMOUNT OF CAULIKING MATERIAL TO 522 FLUID OUNCES OR 51.3	DJF2	27OCT06
POUNDS OF THIOKOL 2235M. DURING A DBLOCA THE GENERATED	DJF2	27OCT06
DEBRIS OF CURED CAULK WILL THEREFORE CHANGE FROM 20	DJF2	27OCT06
POUNDS TO 13 POUNDS. I HAVE REVIEWED THE EVALUATION AND	DJF2	27OCT06
ATTACHMENTS AND AM IN AGREEMENT WITH THE EXCEPTION OF THE	DJF2	27OCT06
TEMPERATURE LIMITS. THE MATERIAL IS BEING TESTED BY	DJF2	27OCT06
POWER LABS AND THESE TESTS INCLUDE TESTING OF THE CAULK	DJF2	27OCT06
TO WITHSTAND A TEMPERATURE OF 317 DEGREES FOR 600	DJF2	27OCT06
SECONDS.	DJF2	27OCT06
THIS EVALUATION SHOULD NOT BE RETURNED UNTIL THE	DJF2	27OCT06
CAULK HAS PASSED THE REQUIRED TESTING.	DJF2	27OCT06

==========END OF ACTION REQUEST==========

Oyster Creek	ECR 06-00879 AWA #5 Rev. 1	Preparer Michael S. Ader (SH) 10/25/06	A2152754 E05 ATT. 1, 1/2
		Reviewer Daniel Fiorello 10/25/06	

The following calculation is estimate for the volume and weight of caulk applied around the perimeter of the drywell at the concrete slab / steel shell interface.



$Dia := 49 \cdot ft$ approximate diameter at concrete/shell interface at upper curb level

$Length_1 := \pi \cdot Dia$ $Length_1 = 153.9\,ft$ circumference

$Length_2 := 2 \cdot 10 \cdot (12.25 \cdot ft - 11.00 \cdot ft)$ $Length_2 = 25\,ft$ summation of vertical lengths from lower curb to upper curb

$Length_{total} := Length_1 + Length_2$ $Length_{total} = 178.9\,ft$

Using a caulk bead 1" high and a gap equal to 0.3" (approximate gap due to deterioration at the corner of the concrete slab) and caulk extending 1" horizontally beyond the gap (see Detail 1).

Oyster Creek	Preparer Michael S. Ader (S&L) MSA 10/25/06	A2152754 E05 ATT.1, 2/2
	Reviewer Daniel Fiorello DJF 10/25/06	

Use two triangular areas to approximate area of caulk

$$\text{Area} := \frac{(1\cdot\text{in})\cdot(1.3\cdot\text{in})}{2} + \frac{(0.3\cdot\text{in})\cdot(0.3\cdot\text{in})}{2}$$ .75 1.05

Area = ~~0.695 in^2~~ .439

$\text{Volume} := \text{Length}_{total}\cdot\text{Area}$

Volume = ~~0.864 ft^3~~ .545

Volume = ~~6.46 gal~~ 4.1

Volume = ~~826.9 fl_oz~~ 522

$\gamma := 12.5\cdot\frac{\text{lbf}}{\text{gal}}$ density of sealant per vendor e-mail

$\text{Weight} := \text{Volume}\cdot\gamma$ Weight = ~~80.8 lbf~~ 51.25

Rev. 1 prepared: ~~Paul Keats~~ 10/26/06

Reviewed: Daniel Fiorello 10/26/06

A2152754-05, ATTACHMENT 2, 1/1

Fire stop 3-6548 silicone RTV foam

Data Sheet

RS stock numbers 779-037 and 779-043

Introduction

3-6548 silicone RTV foam is specially formulated to have fire resistant properties coupled with good flexibility under the most demanding conditions. It's most effective when used to seal gaps and holes of all sizes through which cables, wires, ductwork and piping pass. Whilst it has been made to withstand high temperatures and confine such hazards as smoke, fire and gases, it can also be used to seal buildings and rooms from other damaging contaminants like dirt, dust and water.

A two-part product supplied in liquid A and B components in one unit, can be easily mixed on-site, expanding rapidly to surround and completely seal off cables, conduits or piping within only minutes of being applied.

Typical properties

Below are properties of hand mixed equal parts of part A and B at 25°C.

Working time	1.0-2.0 min
Density	14.0-20.0 lb/ft³

Benefits

- Up to 6 hour fire-rating can be achieved
- Forms an airtight seal – prevents spread of smoke, water and other liquid or gaseous contaminants
- Fast foaming – liquid foams and expands rapidly to fill any size or shape of penetration
- Easy to repair – can be removed and replaced at will for changes or repair. Excellent adhesion to itself
- Long lasting thermoset cure elastomer does not melt or soften at high temperature and has excellent UV and weathering resistance.

Specifications

Has been blast tested in various seal configurations and has been shown able to withstand explosive over pressures of up to 148kN/m² depending on seal design.

It successfully passes many fire sealing tests, including:

- Factory Mutual Test ASTM E-119 3 hours rating
- BS 476 (part 8 – 1972) – 1 through 6 hours rating
- Mobil hydrocarbon curve – 1 through 6 hours rating
- NelPia (Nuclear Energy Liability Insurance Association) – 3 hours rating
- Lloyd's Register of Shipping for Class A bulkheads, for piping, and Class H bulkheads for cable trays and piping – 2 to 6 hours rating
- UL (Underwriters Laboratory) rating per ASTM E-814, 2 and 3 hours
- Swedish National Authority for testing (Statens Provningsanstalt) – 1, 1½ and 2 hours ratings
- SINTEF – 1 hour rating
- CSTB – 3½ hours rating.

3-6548 RTV foam is approved to meet the requirements for use in the construction of nuclear power plants and their safety control systems. It is a FM and UL-classified material. (Factory Mutual Serial No. 26543 from DC Corporation and UL 10 B.)

Other ratings include HF-1 according to UL 94 and a Class I flame spread by ASTM E84.

Typical Properties

Typical properties of the LDSE can be found in the table to the right.

Fire Qualification

Numerous full-scale fire tests have been successfully performed at nationally recognized, independent and accredited laboratories for various seal configurations including electrical and mechanical elements in large complex block out openings, gaining major insurance company and regulatory body acceptance. Seal designs have been qualified both with and without permanent damming materials.

Pressure Testing

Differential testing for electrical block out and mechanical penetrations with this design indicate a 20-psi pressure resistance with zero leakage using a four-inch depth of LDSE. Other configurations may vary with regard to pressure resistance.

LDSE TYPICAL PROPERTIES

AS SUPPLIED:	
Appearance (Part A/Part B)	Black/Buff
Mixing Ratio, by weight or volume	1 : 1 ± 2%
Specific Gravity at 25°C (77°F nominal)	0.98
AS CATALYZED:	
Appearance (Part A/Part B)	Dark Gray
Cure Time (Fast Cure) at 25°C (77°F)	10 minutes
Cure Time (Regular Cure) at 25°C (77°F)	8 hours
Volume Expansion during cure	0 to 1%
Recommended Installation Temperature Range	50° to 90°F (10° to 32°C)
AS CURED – PHYSICAL:	
Appearance	Dark Gray
Density	55 lb/ft³
Service Temperature Range	-67°F to 392°F (-55°C to 200°C)
Thermal Conductivity (BTU-in/hr-ft² - °F)	3.6
ASTM D149 Dielectric Strength, volts/mil	270
ASTM D257 Volume Resistivity, ohm-cm	2×10^{16}
ASTM D732 Shear Strength, psi	154
ASTM D2240 Durometer Hardness (Shore A)	59

Radiation Resistance

LDSE has been subjected to substantial radiation exposure levels (2×10^8 Rads Gamma) with no significant changes reported to the material's physical properties.

Reparability

LDSE can be selectively removed with relative ease using blunt non-conductive tools and devices. Additions or deletions of elements can be easily accomplished, and new LDSE material can then be applied to previously cured material to become an integral matrix with the already installed LDSE.

Decontaminability

Surface can easily be decontaminated.

Cure Time

As indicated in the table above the cure time for the fast curing version is as little as 10 minutes, whereas the cure time for the regular cure is as long as 8 hours. By special request, custom cure times can be formulated.

Packaging

DESCRIPTION	NET WEIGHT	CONTAINER	AVG. SEAL VOLUME
LDSE A & B Set	60 Lbs.	2 ea. 5 gal. (Set)	1.0 cu. Ft.

A2152754-05, ATTACHMENT 4, 1/1

Kester, Paul R.

From: Cheryl Gilbert [cgilbert@polyspec.com]
Sent: Wednesday, October 25, 2006 9:25 AM
To: jrcpe@aol.com
Subject: Thiokol 2235M

John,
The density of the Thiokol 2235M is 12.5 lbs./gal.
Sorry for the delay.

Cheryl Gilbert
Customer Service Manager
PolySpec, L.P.
6614 Gant Road
Houston, TX 77066
Tel: 281-397-0033
Fax: 281-397-6512
Email: cgilbert@polyspec.com

Note: The density above was verified to be the as-cured density of the product. This was done verbally, between Jon Cavallo and Cheryl Gilbert on 10/25/06.

Paul Kester
Paul Kester

October 25, 2006

CORROSION
CONTROL
CONSULTANTS
AND LABS,
INC.

Howie Ray
Oyster Creek Nuclear Generating Station
AmerGen Energy Company, LLC
Forked River, NJ

Transmitted Electronically

EVALUATION OF POLYSPEC/THIOKOL 2235M INDUSTRIAL POLYSULFIDE JOINT SEALANT FOR USE IN THE DRYWELL OF THE OYSTER CREEK NUCLEAR GENERATING STATION

This letter report has been prepared at your request to provide my independent opinion concerning the suitability of Polyspec/Thiokol 2235M Industrial Polysulfide Sealant for use in the Oyster Creek Nuclear Generating Station (hereinafter Oyster Creek) Drywell. My work on this effort is in accordance with your Contract No. 01003193 dated May 30, 2006.

GENERAL INFORMATION

As part of the Technical Evaluation associated with A2152754 ECR06-00879, I was asked to recommend a caulking material suitable for application to the drywell shell to concrete interface at Elevation 10'. The recommended caulking must be suitable for the normal and accident environment in the Oyster Creek drywell and comply with the Oyster Creek licensing basis.

BASIS OF MY OPINIONS

To form my opinions, I reviewed the following References concerning Polyspec/Thiokol 2235M Industrial Polysulfide Sealant:

1. Polyspec Thiokol 2235M Technical Data Sheet

2. Polyspec Thiokol 2235M Material Safety Data Sheets (MSDS) (part A)

3. Polyspec Thiokol 2235M Material Safety Data Sheets (MSDS) (part B)

4. Korea Atomic Energy Research Institute Certificate of Radiation Processing dated July 7, 1994

5. Thiokol TD-569N 5/69, "Radiation Resistance of LP Liquid Polysulfide Polymer Based Compounds"

6. Engineering Paper No. 893, "The Effect of Nuclear radiation on Sealants"

7. NSF International Letter dated November 20, 1997 with NSF Test Report concerning Thiokol 2235-M

8. NSF/ANSI 61-05 with Addendum 1.0 (2005)

9. "Environmental Parameters – Oyster Creek NGS" (ES-027 Rev. 4) Tables 1 and 2

GENERAL DESCRIPTIONS OF POLYSPEC/THIOKOL 2235M INDUSTRIAL POLYSULFIDE SEALANT

Thiokol 2235M Industrial Polysulfide Joint Sealant, manufactured by Polyspec, is a high-performance, non-sag, NSF approved chemical resistant elastomeric joint sealant (Reference 1). Thiokol 2235M is not soluble in water and is suitable for use in critical services such as drinking water (NSF approved) and jet fuel.

Based upon the NSF testing per Reference 10 of Polyspec/Thiokol 2235M Industrial Polysulfide Sealant for drinking water service (Reference 7), no leachable ionic species or chemicals in unacceptable quantities would be expected to be released from the Polyspec/Thiokol 2235M Industrial Polysulfide Sealant if in service in the Oyster Creek drywell.

According to References 1, 2 and 3, Polyspec/Thiokol 2235M Industrial Polysulfide Sealant contains no solvents and, as such, will not chemically contaminate the Oyster Creek charcoal filters during application and cure.

I investigated the use of Polyspec/Thiokol 2235M Industrial Polysulfide Sealant in similar applications as that proposed for Oyster Creek at nuclear power plants in the United States and overseas. This sealant is approved for use comparable to that proposed for Oyster Creek at a number of commercial nuclear power plants, including Peach Bottom (Exelon), Turkey Point 3&4 (FPL), St. Lucie 1 & 2 (FPL), Oconee 1, 2 & 3 (Duke), Catawba 1 & 2 (Duke), McGuire 1&2 (Duke), and Wolsong 1-6 (KHNP).

IRRADIATION AND PHYSICAL PROPERTIES REQUIREMENTS

Reference 4 indicates that Polyspec/Thiokol 2235M Industrial Polysulfide Sealant was irradiation tested at 0.5 MRAD/hr (average) to a total absorbed dose of 200 MRAD (2E8 RADS), which envelopes the anticipated remaining plant life radiation exposure at the drywell shell to concrete interface at Elevation 10' (Reference 9).

Reference 5, which contains information concerning the base polysulfide resin used in the formulation of Polyspec/Thiokol 2235M Industrial Polysulfide Sealant, indicates that the physical properties of the sealant (particularly tensile strength and elongation) will be satisfactory after irradiation to a total absorbed dose of 1E8, which also envelopes the anticipated remaining plant life radiation exposure at the drywell shell to concrete interface at Elevation 10'.

According to Thiokol, the formulator of Polyspec/Thiokol 2235M Industrial Polysulfide Sealant, the cured polysulfide polymer in Polyspec/Thiokol 2235M Industrial Polysulfide Sealant exhibits acceptable mechanical properties after exposure to 250 deg F for one week (Reference 5). As such, the Polyspec/Thiokol 2235M Industrial Polysulfide Sealant is acceptable for use on the drywell shell to concrete interface at Elevation 10'.

CONCLUSIONS

It is my independent opinion that Polyspec/Thiokol 2235M Industrial Polysulfide Sealant is suitable for application to the drywell shell to concrete interface at Elevation 10'.

Should you require additional information, please contact me.

Jon R Cavallo

Jon R Cavallo, PE, PCS
Vice President