308 --- Q200506060007

Scientific Notebook No. 578: Department of Energy (DOE) Alloy 22 Repassivation Tests - Continuation of Scientific Notebook No. 540 (08/08/2002 through 04/03/2003)

LABORATORY NOTEBOOK

CNWRA/SwRI

NOTEBOOK NO. _____
ISSUED TO DARREL DUNN DD
ON _____ **20**____
DEPARTMENT _____
RETURNED _____ **20**____
Brian K Derby - Brian k. Derby - BKD

SCIENTIFIC NOTEBOOK COMPANY
2831 LAWRENCE AVENUE
STEVENSVILLE, MICHIGAN 49127
(800) 537-3028 - http://www.snco.com

From Page No.

Continued Testing from Notebook #505 & #540

Initial Scientific Notebook Entry for Department of Energy Alloy 22 Localized Corrosion Resistance Tests

Title: DOE Alloy 22 Repassivation Tests.

Tests Preformed by: Darrell S. Dunn, Div 20; Brian Derby, Div. 18

Objectives: Determine the effect of fabrication processes on the localized corrosion susceptibility of Alloy 22.

Equipment: Laboratory oven for exposure of test specimens at 600 to 1125 °C, Thermocouple and thermocouple meter. Keithley 614/617. Solartron 1287 Potentiostat and CorrView Software or equivalent, Electrochemical test cell.

Materials: Base alloy: Alloy N06022 Alleghany Ludlum heat 059902LL2 welded (GTAW) using Inco Alloys 622 heat XX2048BG filler. Other materials and heats to be added and identified prior to testing.

Specimen specifications: Specimens will be equivalent to 20.01402.571.006 rev. 1 unless otherwise specified. Location of specimens with respect to weld will be identified.

Measurement Parameters: Temperature and time of exposure, Potential and Current of specimen during test.

Required level of accuracy: Temperature of thermal exposure ± 10 °C Temperature during corrosion tests ± 2 °C, Time of exposure ± 1 minute, Potentials ± 1mV, Current ± 0.1 microamp.

Uncertainty and Sources of Error: Current measurement error can occur for localized corrosion processes because the actively corroding area is not the same as the surface area of the test specimen.

Copied from NB #505 & #540

To Page No.

Witnessed & Understood by me,	Date	Invented by	Date
		Recorded by BKD	3/12/03

From Page No.

Repassivation Potential of Alloy C-22

objective: Same As pg # 1

Specimen: DOE Alloy N06022 - Allegheny Ludlum Heat 059902LL2 Inco Alloy 622 heat XX 2048BG filler - Specimen Type 3 Row 4 Bot Contains weld Material - 600 Grit polished Finish - with 2 PTFE Crevice Washers Attached At 50 In-oz Using Proto # 6104 cal 3/6/03 Due 9/6/03

start wt: 34.31025 g Sartorious Genius sn# 12809099 cal 11/15/02 Due 5/15/03
End wt: 34.30972 g

Solution: 0.001 M NaCl
0.119 g NaCl Lot# 027878
+ DI water To 2000 mls

pH start: 5.832 Fisher Accumet 950 meter sn# 3340 cal 8/7/02 Due 8/7/03
pH End: 6.709 pH probe # 13-620-296 sn# 2251257 PL

potentiostat: EG & G model # 273 sn# 41108

Counter Electrode: PT Flag

Reference: Fisher 13-620-52 sn# 0249092

Temperature: 95°C Hg Thermometer sn# H98-170 cal 5/1/02 Due 5/1/03

Econn: -337 mv Keithley 614 sn# 0704934 Cal 5/26/02
Ept: +340 mv Due 5/26/03

Solution Deaerated with 99.999% N_2

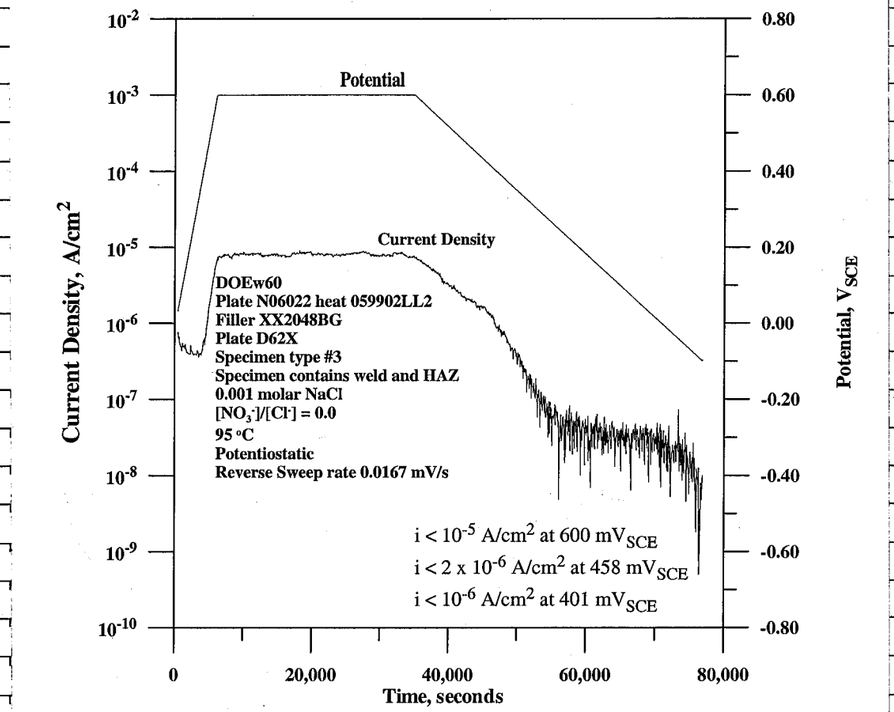
Specimen Examination: No Crevice Corrosion 0/24 feet of Crevice Washer mild staining on facial Surfaces of Specimen

Data DOE-W60

To Page No.

Witnessed & Understood by me,	Date	Invented by	Date
		Recorded by	3/27/03

From Page No.



To Page No.

Witnessed & Understood by me,	Date	Invented by	Date
		Recorded by	3/28/03

From Page No.

Repassivation Potential of Alloy C-22

objective: See pg #1

Specimen: DOE Alloy N06022 - Allegheny Ludlum heat 059902LL2 Inco Alloy 622 Heat XX2048BG filler - Specimen Type 3 Row 1 Top Contains weld Material - 600 Grit polished finish - with 2 PTFE Crevice Washers Attached At 50 In-Oz Using Proto #6104 SN# 139072 cal 3/6/02 Due 9/6/03

start wt: 33.96390g Santorious Genius SN# 12580909 cal 11/15/02
End wt: 33.96217g Due 5/15/03

Solution: 0.01 M NaCl
1.170g NaCl Lot# 027878
+ DI water To 2000 ml

pH start: 5.715 Fisher Accumet 950 meter SN# 3340 cal 8/7/02 Due 8/7/03
pH End: 7.366 pH probe Fisher # 13-620-296 SN# 2291257 PB

potentiostat: E G & G Model # 273 SN# 10120

Counter Electrode: Pt Flag

Reference: Fisher 13-620-52 SN# 0251439

Temperature: 95°C Hg thermometer SN# 00-3587 cal 5/10/02
Due 5/10/03

Ecorr: -311 mv Keithley 614 SN# 0704934 cal 5/26/02
Ept: +87 mv Due 5/26/03

Solution Deaerated with 99.999% N_2

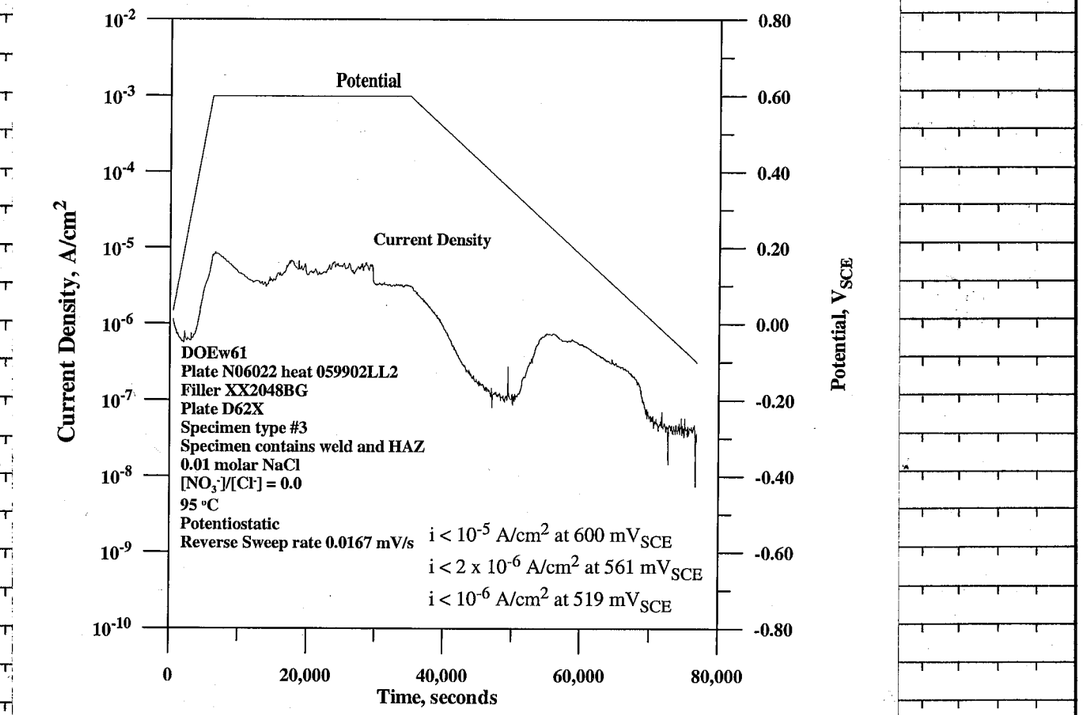
Specimen Examination: Crevice Corrosion on 2/24 feet of Crevice Washer
N/o Surface staining

DATA DOE_W61

To Page No.

Witnessed & Understood by me,	Date	Invented by	Date
		Recorded by	3/07/03

From Page No.



To Page No.

Witnessed & Understood by me,	Date	Invented by	Date
		Recorded by	3/28/03

Project No.
Book No. TITLE

From Page No.

Repassivation Potential of Alloy C-22

objective: SAME As pg #1

Specimen: DOE Alloy N06022- Allegheny Ludlum Heat 059902LL2
Inco Alloy 622 heat xx2048BG Filler - Specimen Type 3 Row 1 Bottom
Contains weld Material - 600 Grit polished Finish- with 2 PTFE
Crevice Washers Attached At 50 In-oz Using Proto #6104 SN# 139072
cal 3/6/02 due 9/6/03

start wt = 34.03725g Spatorius Genius SN# 12809099 cal 11/13/02 due 5/13/03
End wt = 34.03195g

Solution: 0.1 M NaCl
11.691g NaCl Lot # 027878
+ DI water To 2000mls

pH start = 5.983 Fisher Accumet 950 meter SN# 3340 cal 8/7/02 due 8/2/03
pH End = 7.286 pH probe # 13-620-296 SN# 2291257 P6

potentiostat: EG & G model # 273 SN# 41108

Counter Electrode: PT Flag

Reference: Fisher 13-620-52 SN# 0244092

Temperature: 95°C Hg Thermometer SN# H98-170 cal 5/10/02 due 5/10/03

Eoncp: -512mv Keithley 614 SN# 0704934 cal 5/24/02 due 5/24/03
Ept: +95mv

Solution Degenerated with 99.999% N_2

Specimen Examination: Crevice Corrosion on 1/24 feet of Crevice washer
staining Gold tint on All Surfaces of specimen

data DOE-W62

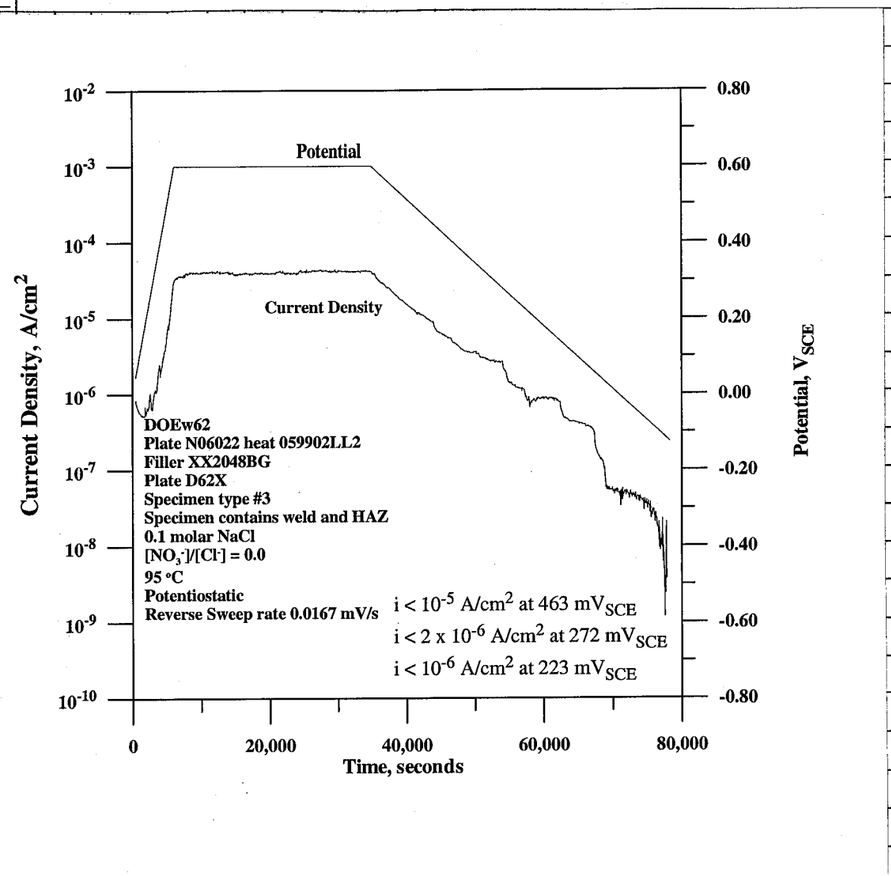
To Page No.

Witnessed & Understood by me,	Date	Invented by	Date
		Recorded by	4/1/03

Project No.
Book No.

TITLE

From Page No.



To Page No.

Witnessed & Understood by me,	Date	Invented by	Date
		Recorded by	4/2/03

From Page No.

Repassivation Potential of Alloy C-22

objective: See pg. #1

Specimen: DOE Alloy N06022 - Alleghany Ludlum Heat 059902LL2, Inco Alloy 622 Heat XX2048BG filler - Specimen Type 1 Rev 1 M10, Doesn't contain weld Material - 600 Grit polished Finish - with 2 PTFE Ceramic washers Attached At 50 In-oz Using Proto 6104 SN# 139072 cal 3/6/03 due 9/6/03

Start wt = 34.17980g Sartorious Genius SN# 12809099 cal 11/15/02 due 5/15/03
End wt = 34.17971g

Solution 0.001 m NaCl
0.119g NaCl Lot# 027878
+ DI To 2000 mls

pH start = 5.947 Fisher Accumet 950 meter SN# 3340 cal 8/7/02 due 8/7/03
pH End = 7.506 pH probe Fisher #13-620-296 SN# 2291257 PL

potentiostat = E G & G model #273 SN# 10120

Counter Electrode = PT Flg

Reference: Fisher 13-620-52 SN# 0751439

Temperature: 95°C Hg Thermometer SN# 00-387 cal 5/10/02 due 5/10/03

Eocp = -474 mv Keithley 614 SN# 0704934 cal 5/26/02 due 5/26/03
Ept = -93 mv

Solution Deaerated with 99.999% N_2

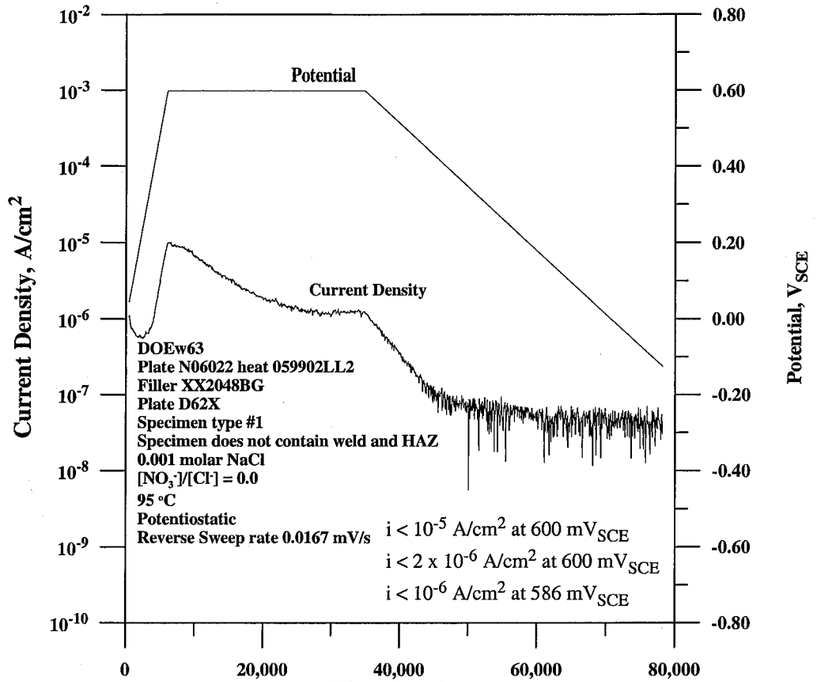
Specimen Examination: No Crevice Corrosion 0/24 feet of Crevice Washer m/o surface staining

data DOE_w63

To Page No.

Witnessed & Understood by me,	Date	Invented by	Date
		Recorded by	4/1/03

From Page No.



To Page No.

Witnessed & Understood by me,	Date	Invented by	Date
		Recorded by	4/2/03

Project No._____
Book No._____ TITLE _____

From Page No.___

Repassivation Potential of Alloy C-22

objective: Same As pg #1

Specimen: DOE Alloy N06022 - Allegheny Ludlum Heat 059902LL2
Inco Alloy 622 Heat XX2048BG filler - Specimen Type 1 Row 2 Top
Doesn't Contain Weld Material - 600 Grit polished Finish - with 2 PTFE
Crevice washers Attached At 50 In-Oz Using Proto #6104 sn# 139072
Cal 3/6/03 Due 9/6/03

start wt: 34.23934g Sartorious Genius sn# 12809099 cal 11/15/02 due 5/15/03
End wt: 34.23847g

Solution: 0.01M NaCl
1.171 g NaCl lot# 027878
+ DI water To 2000mL

pH start: 6.168 Fisher Accumet 950 meter sn# 3340 cal 8/7/02 due 8/7/03
pH End: ~~6.820~~ 6.820 pH probe # 13-620-296 sn# 2291257 P6
BMS 4/3/03

potentiostat: EG&G model # 273 sn# 41105

Counter Electrode: PT Flag

Reference: Fisher 13-620-52 sn# 0249897

Temperature: 95°C Hg thermometer sn# H98-170 cal 5/10/02 due 5/10/03

Econn = -415mV Keithley 614 sn# 0704934 cal 5/26/02 due 5/26/03
Ept: +92 mV

Solution Deaeration with 99.999% N_2

Specimen Examination: No Crevice Corrosion 0/24 feet of Crevice Washer
mild gold tint staining on all surfaces of Specimen

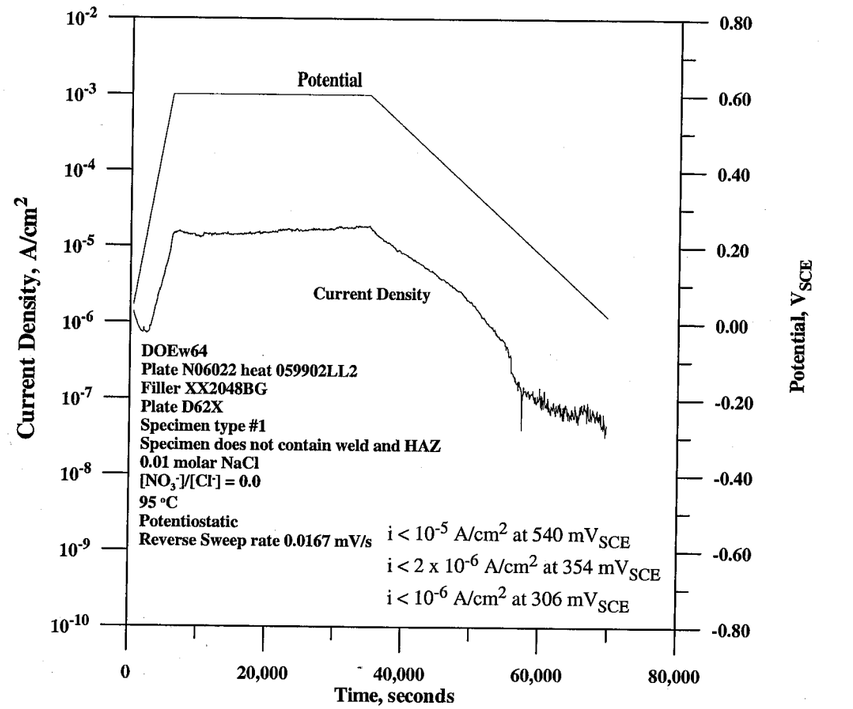
Data DOEw64

To Page No._____

Witnessed & Understood by me,	Date	Invented by	Date
		Recorded by	4/3/03

Project No._____
TITLE _____ Book No._____

From Page No.___



To Page No._____

Witnessed & Understood by me,	Date	Invented by	Date
		Recorded by	4/3/03

Project No._____
Book No._____ TITLE_____

From Page No.____

Repassivation Potential of Alloy C-22

objective: See pg #1

Specimen: DOE Alloy N06022 - Alleghany Ludlum Heat 059902LL2
Inco Alloy 622 Heat XX 2048BG filler - Specimen Type 1 Row 2 Min
Does not Contain Weld Material - 600 Grit polished Finish with 2 PTFE
Crevice washers Attached At 50 In-Oz Using Proto #6104 sn# 139072
Cal 3/6/03 Due 9/6/03

start wt: 34.28693g Sartorious Genius sn# 12809099 Cal 11/15/02
End wt: 34.27994g Due 5/15/03

Solution 0.1 M NaCl
11.689g NaCl 027878
+ DI water To 2000mls

pH start: 5.894 Fisher Aquamet 950 meter sn# 3340 cal 8/7/02 due 8/7/03
pH End: 6.489 pH probe Fisher #13-620-296 sn# 2291257 PL

potentiostat: EG&G Model # 273 sn# 10120

Counter Electrode: PT Flag

Reference: Fisher 13-620-52 sn# 0251434

Temperature: 95°C Hg Thermometer sn# 00-387 cal 5/10/02 due 5/10/03

Ecorr: -494mV Keithley 614 sn# 0704434 cal 5/26/02 due 5/26/03
Ept: -125mV

Solution Deaerated with 99.999% N_2

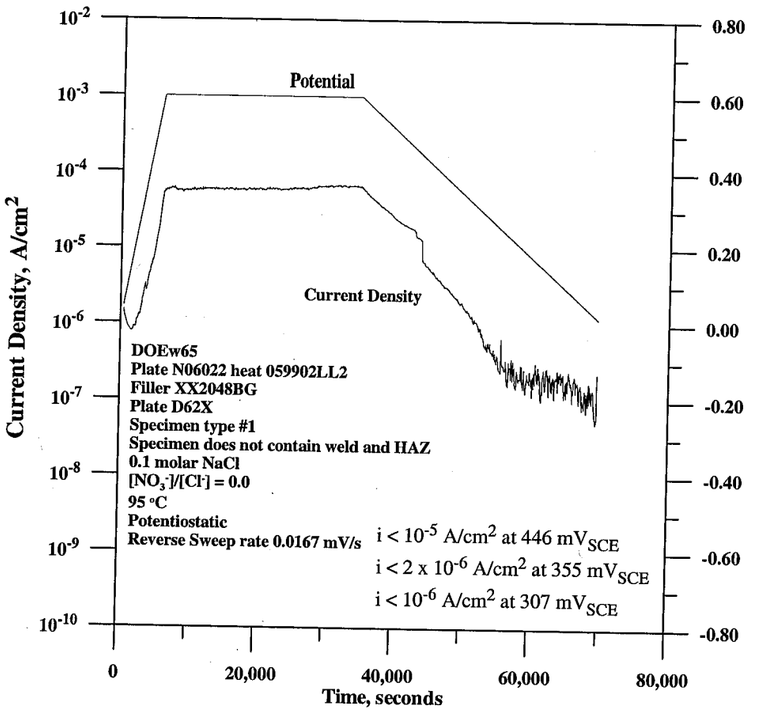
Specimen Examination: Crevice Corrosion on 1/24 face of Crevice
washer. Gold tint Staining on All surfaces of Specimen
Data DOE_W65

To Page No.____

Witnessed & Understood by me,	Date	Invented by	Date
		Recorded by	4/3/03

Project No._____
TITLE_____ Book No._____

From Page No.____



To Page No.____

Witnessed & Understood by me,	Date	Invented by	Date
		Recorded by	4/3/03

From Page No.

Repassivation Potential of Alloy C-22

Objective: Same As pg #1

Specimen: DOE Alloy N06022 - Alleghany Ludlum Heat 059902LL2
Inco Alloy 622 heat XX2048BG filler - Specimen Type 1 Row 2 Bot
Doesn't Contain Weld Material - 600 Grit polished Finish - with 2 PTFE
Crevice washers Attached At 50 In-Oz Using Proto SN# 139072 #6104
Cal 3/6/03 Due 9/6/03

Start wt: 34.21146g Santorius Genius SN# 12809099 Cal 11/15/03 Due 5/15/03
End wt: 34.21058

Solution: 0.25 m NaCl
29.236g NaCl Lot# 627878
+ DI water To 2000mls

pH Start = 6.219 Fisher Accumet 950 meter SN# 3340 Cal 8/7/02 Due 8/7/03
pH End = 7.567 pH probe #13-620-296 SN# 2291257 P6

Potentiostat: EG&G model #273 SN# 4110P

Counter Electrode: PT Flag

Reference: Fisher 13-620-52 SN# 024092

Temperature: 95°C Hg Thermometer SN# H9Y-170 Cal 5/10/02 Due 5/10/03

Econ = -443 mV Keithley 614 SN# 0704934 Cal 5/26/02
Eoc = +39 mV Due 5/26/03

Solution Bubbled/deaerated with 99.999% N_2

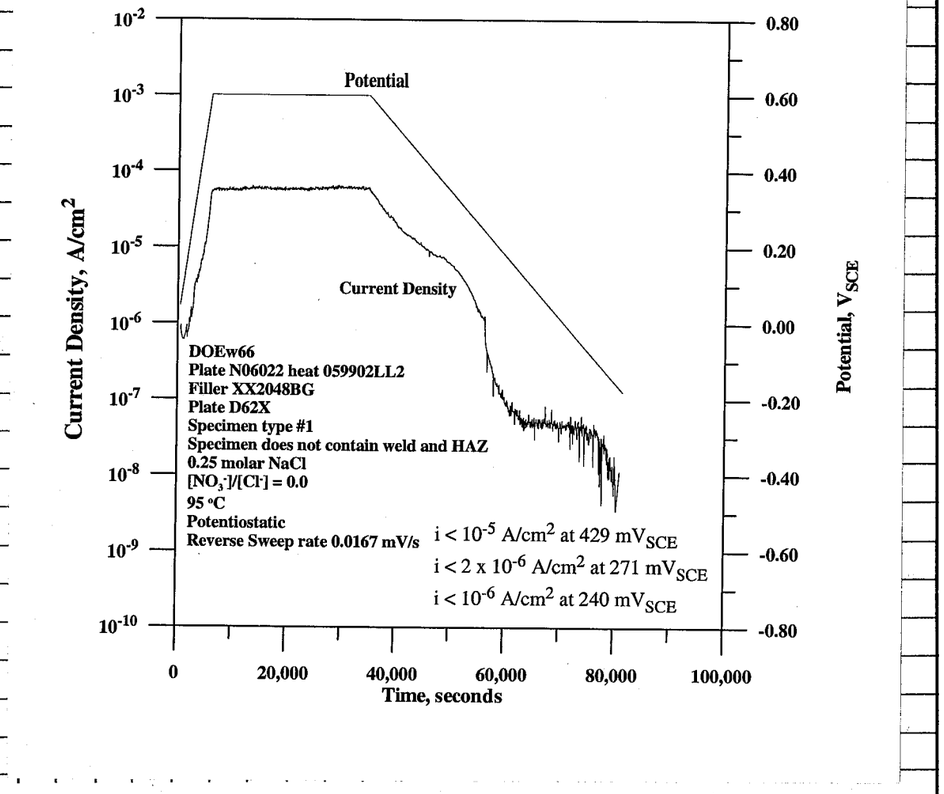
Specimen Examination No Crevice Corrosion 0/24 feet of Crevice washer
Gold tint staining on All Surfaces of Specimen

Data DOE_W66

To Page No.

Witnessed & Understood by me,	Date	Invented by	Date
		Recorded by	4/4/03

From Page No.



To Page No.

Witnessed & Understood by me,	Date	Invented by	Date
		Recorded by	4/7/03

Project No._____
Book No._____ TITLE _____

From Page No.____

Repassivation Potential of Alloy C-22

objective: Same As pg #1

Specimen: DOE Alloy N06027 - Alleghany Ludlum Heat 059902LL2
Inco Alloy 622 heat XX2048BG filler - Specimen Type 1 Row 3 Top
Doesn't Contain Weld Material - 600 Grit polished Finish - with 2 PTFE
Crevice Washers Attached At 50 In-oz Using Proto #6104 SN# 139072
cal 3/6/03 due 9/6/03

start wt: 34.28055g Sartorius Genius SN# 12809099 cal 11/15/02 due 5/15/03
End wt: 34.23385g

Solution: 0.5 M NaCl
58.49g NaCl 027878
+ DI water To 2000mls

pH Start: 6.079 Fisher Accumet 950 meter SN# 3340 cal 8/7/02 due 8/2/03
pH End: 7.783 pH probe # 13-620-296 SN# 2291257 P6

potentiostat: EG&G Model #273 SN# 10120

Counter Electrode: PT Flag

Reference: Fisher 13-620-52 SN# 025439

Temperature: 95°C Hg Thermometer SN# 00-387 cal 5/10/02 due 5/10/03

Ecorr: -466 mv Keithley 614 SN# 0704834 cal 5/26/02 due 5/26/03
Ept - -200 mv

Solution Deaerated with 99.995% N_2

Specimen Examination: Crevice Corrosion on 8/24 feet of Crevice Washer
Cobalt tint staining on All Surfaces

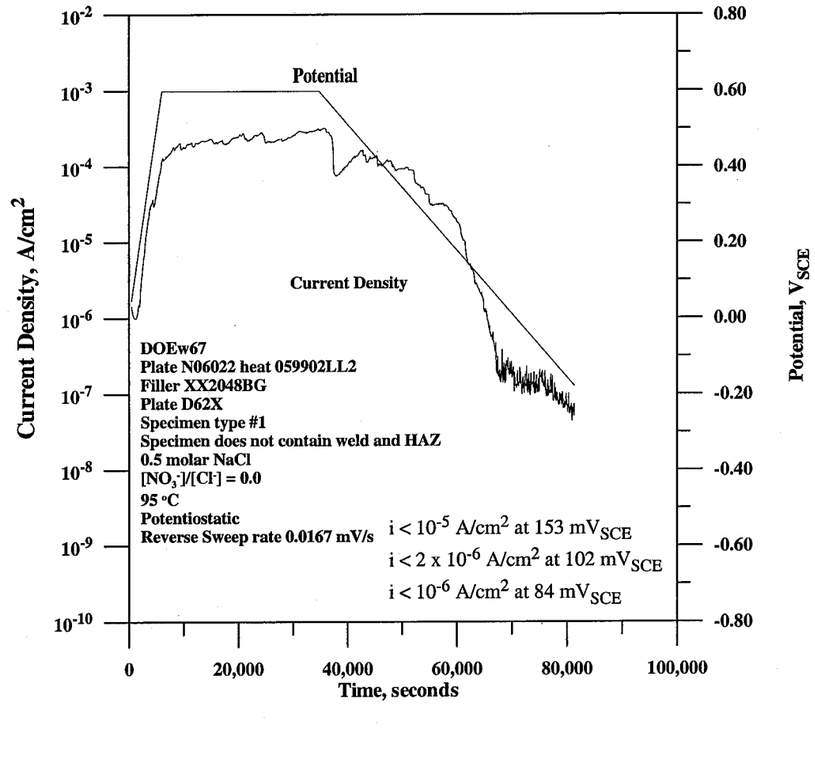
Data DOE-W67

To Page No.____

Witnessed & Understood by me,	Date	Invented by	Date
		Recorded by	4/4/03

Project No._____
Book No._____
TITLE _____

From Page No.____



To Page No.____

Witnessed & Understood by me,	Date	Invented by	Date
		Recorded by	4/7/03

From Page No.____

Repassivation Potential of Alloy C-22

Objective: Same As pg #1

Specimen: DOE Alloy N06022 - Allegheny Ludlum heat 059902LL2
Inco Alloy 622 heat XX2048BG filler - Specimen Type 2 Rev 1 Top
Down Contain Weld Material - 600 Grit polished Finish. - with 2 PTFE
Crevice Washers Attached At 50 In-Oz Using Proto #6104 SN# 139072
Cal 3/1/03 Due 9/6/03

Start wt: 34.15618 g Sartorious Genius SN# 12809059 cal 11/15/02 due 5/15/03
End wt: 34.15512 g

Solution: 0.01 M NaCl
11.695 g NaCl Lot# 027878
+ DI water To 2000 mL

pH start: 5.819 Fisher Accumet 950 meter SN# 3340 cal 8/7/02 due 8/7/03
pH End: 7.578 pH probe # 13-620-296 SN# 2251257 PL

potentiostat: EG&G model #273 SN# 41108

Counter Electrode: PT Flag

Reference: Fisher 13-620-52 SN# 0244092

Temperature: 95°C Hg Thermometer SN# H98-170 cal 5/10/02 Due 5/10/03

Ecorr -371 mV Keithley 614 SN# 0704934 cal 5/26/02 Due 5/26/03
Eapt +181 mV

Solution Deaerated with 99.999% N_2

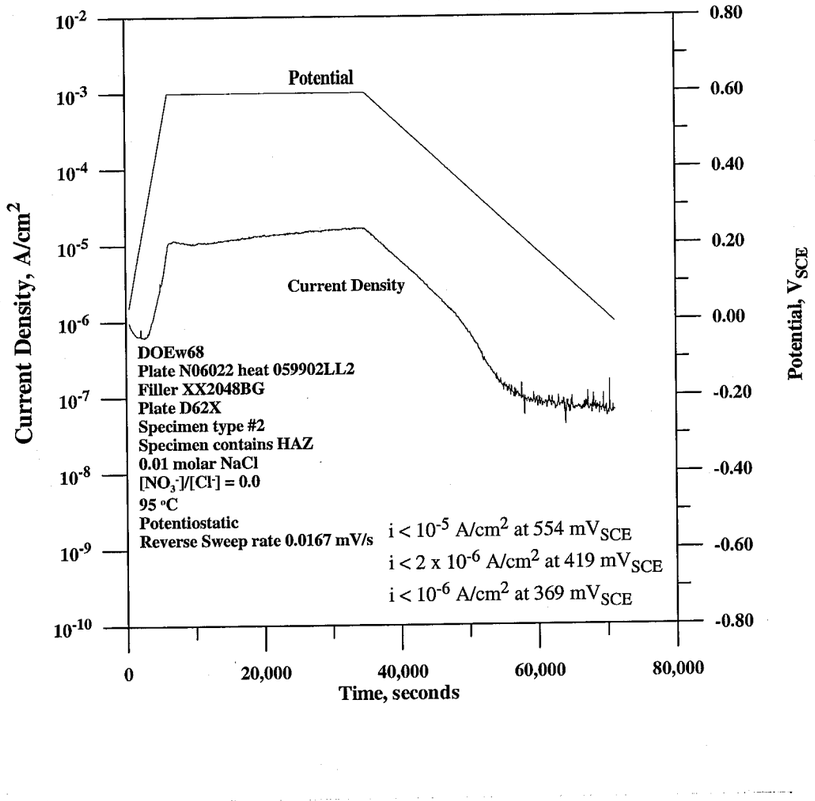
Specimen Examination: No Crevice Corrosion 0/24 feet of Crevice Washer
Staining on All surfaces of specimen

Data DOE-w68

To Page No.____

Witnessed & Understood by me,	Date	Invented by	Date
		Recorded by	4/2/03

From Page No.____



To Page No.____

Witnessed & Understood by me,	Date	Invented by	Date
		Recorded by	4/10/03

From Page No.

Repassivation Potential of Alloy C-22

Objective: See pg #1

Specimen: DOE Alloy N06022 - Alleghany Ludlum Heat 059902LL2, Inco Alloy 622 Heat XX2048BG filler - Specimen Type 2 Row 4 Top Down Contain Weld Material - 600 Grit polished Finish - with 2 PTFE Crevice Washer Attached At 50 In-Oz Using Proto #6104 SN# 139072 cal 3/6/03 Due 9/6/03

Start wt: 34.24414g Santorious Genius SN# 12809099 cal 8/15/03 due 5/15/03
End wt: 34.24399g

Solution: 0.001 M NaCl
0.125g NaCl Lot # 027878
+ DI water to 2000mls

pH start: 5.796 Fisher Accumet 950 meter SN# 3340 cal 8/7/02 due 2/7/03
pH End: 7.542 pH probe # 13-620-296 SN# 3291257P6

Potentiostat: EG & G Model # 273 SN# 16120

Counter Electrode: PT Flag

Reference: Fisher 13-620-52 SN# 025143

Temperature: 95°C Hg Thermometer SN# 00-357 cal 5/10/02 due 5/10/03

Eoxp: -492 mV Keithley 614 SN# 0704934 cal 5/26/02 due 5/26/03
Ept: -137 mV

Solution Deaerated with 99.999% N_2

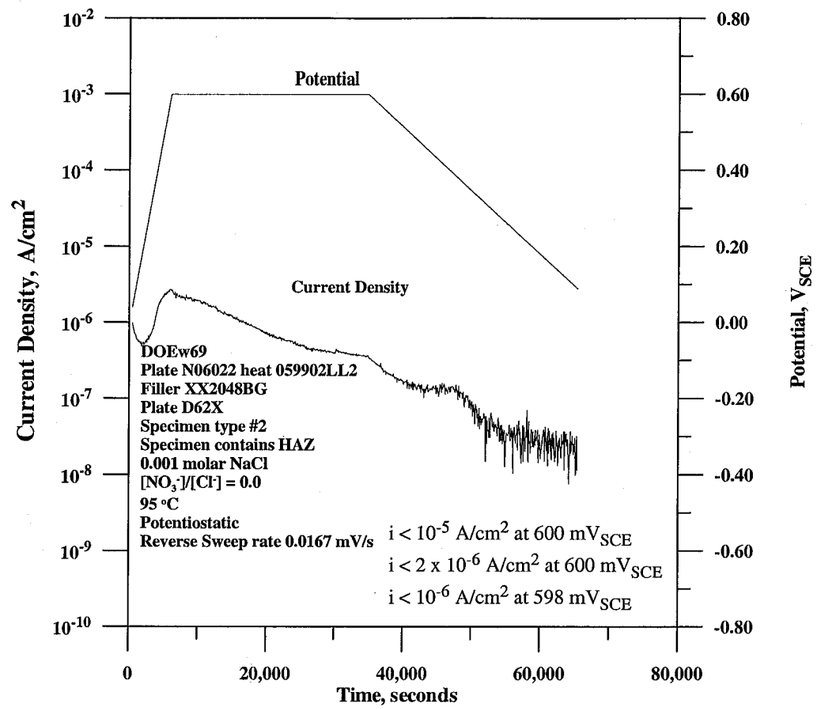
Specimen Examination: No Crevice Corrosion 0/24 Feet of Crevice Washer
Mild Surface Staining

Data DOE-w69

To Page No.

Witnessed & Understood by me,	Date	Invented by	Date
		Recorded by	4/7/03

From Page No.



To Page No.

Witnessed & Understood by me,	Date	Invented by	Date
		Recorded by	4/10/03

Project No._____
Book No._____ TITLE_____

From Page No.___

Repassivation Potential of Alloy C-22

objective: Same As pg #1

Specimen: DOE Alloy N06022 - Alleghany Ludlum Heat 059902LL2
Inco Alloy 622 heat XX2048BG filler - Specimen Type 2 Row 3 Bottom
Opposite Contain weld Material - 600 Grit polished Finish - with 2 PTFE
Crevice Washers Attached At 50 In-Oz Using Proto 6104 SN# 139072
Cal 3/6/03 Due 9/6/03

start wt = 34.06341 g Sartorious Genius SN# 12809099 Cal 11/15/02 Due 5/15/03
End wt = 34.63788 g

Solution: 0.25 M NaCl
29.228 g NaCl Lot# 027878
+ DI water To 2000 ml's

pH start: 5.754 Fisher Accumet 950 meter SN# 3340 Cal 8/7/02 Due 8/7/03
pH End = 8.075 pH probe # 13-620-296 SN# 2291257 Pt

potentiostat: EG+G Model # 273 SN# 4108

Counter Electrode: PT Flag

Reference: Fisher 13-620-52 SN# 0249092

Temperature: 95°C Hg Thermometer SN# M98-170 Cal 5/10/02 Due 5/10/03

Ecorr = -475 mV Keithley 614 SN# 0704934 Cal 5/26/02 Due 5/26/03
Ept = -123 mV

Solution Deaerated with 99.999% N_2

Specimen Examination: Crevice Corrosion on 8/24 feet of Crevice Washer
Color tint staining on All Surfaces of Specimen

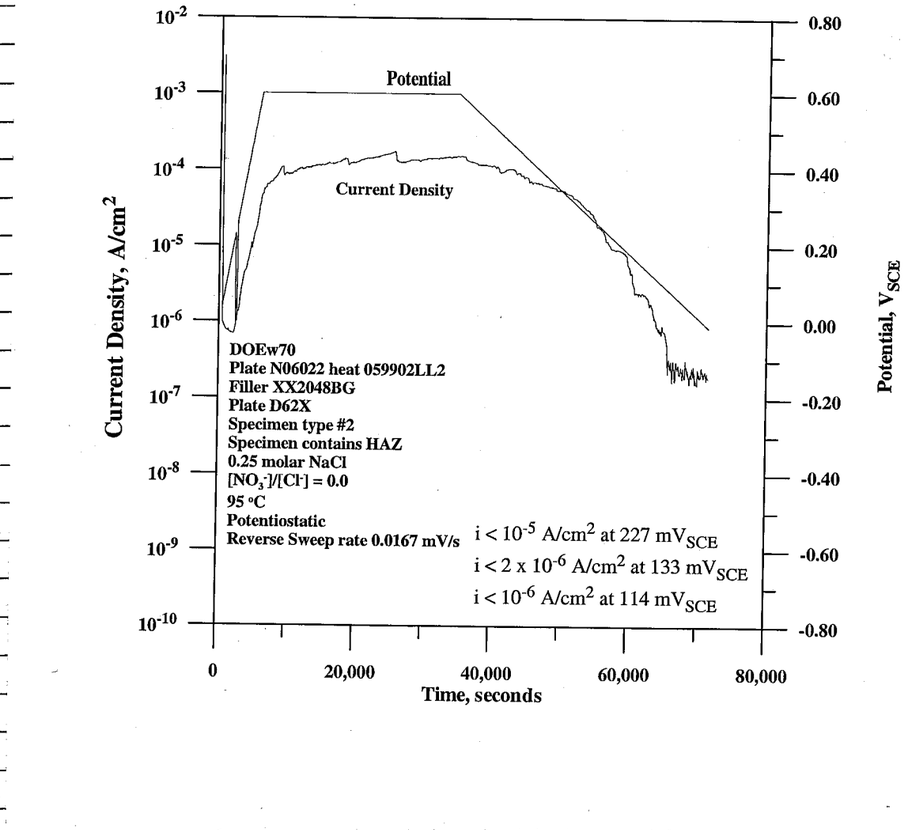
Data DOE-W70

To Page No.___

Witnessed & Understood by me,	Date	Invented by	Date
		Recorded by B-Ed	4/9/03

Project No._____
TITLE_____ Book No._____

From Page No.___



To Page No.___

Witnessed & Understood by me,	Date	Invented by	Date
		Recorded by	4/14/03

From Page No.____

Repassivation Potential of Alloy C-22

Objective: See pg #1

Specimen: DOE Alloy N06022 - Allegheny Ludlum Heat 059902LL2 Inco Alloy 622 Heat XX2048BG filler - specimen Type 2 Row 4 Bottom Doesn't Contain Weld Material - 600 Grit polished Finish - with 2 PTFE Crevice Washer Attached At 50 In-Oz Using Proto #6104 SN# 139072 Cal 3/6/03 Due 9/6/03

Start wt = 34.30989g Sartorious Genius SN# 12809099 Cal 11/15/02
End wt = 34.28094g Due 5/15/03

Solution 0.1 M NaCl
11.690 g NaCl Lot# 027878
+ DI water To 2000mls

pH Start = 6.079 Fisher Accumet 950 Meter #3340 Cal 8/7/02 Due 8/7/03
pH End = 7.249 pH probe #13-620-296 SN# 2291257P6

potentiostat: EG&G Model #273 SN# 10120

Counter Electrode: PT Flag

Reference: Fisher 13-620-52 SN# 0251439

Temperature: 95°C Hg thermometer SN# 00-387 Cal 5/10/02
Due 5/10/03

Ecorr = -503mv Keithley 614 SN# 0704534
Ept = -193mv Cal 5/26/02 Due 5/26/03

Solution Deaerated with 99.995% N_2

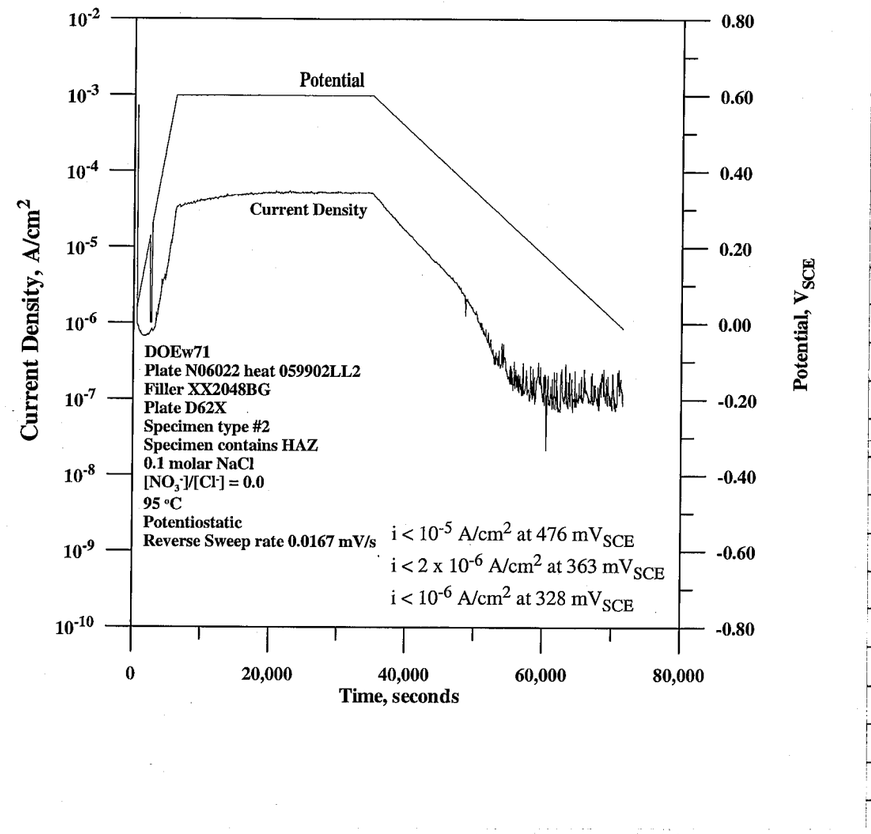
Specimen Examination: No Crevice Corrosion 0/24 feet of Crevice Washer Gold Tint Staining on All Surfaces

Data DOE_W71

To Page No.____

Witnessed & Understood by me,	Date	Invented by	Date
		Recorded by	4/9/03

From Page No.____



To Page No.____

Witnessed & Understood by me,	Date	Invented by	Date
		Recorded by	4/14/03

From Page No.

Thermal Treatment of Specimens

specimens Are Type 2 Near weld And Haz (3 specimens)

Oven:

Lindberg Model # 51333 SN# 909172

Oven Set point: 875°C

Temperature check: Omega HH22 Microprocessor thermometer

SN# T 94140

Cal 10/29/02 Due 4/29/02

Used Type K Thermocouple SN# 322 Cal 1/14/03 Due ~~6/14/03~~ 7/14/03 QD 4/11/03

Oven Temp Reading: 880.5°C

Procedure Thermally Aged @ 875°C for 5min

Start: 874°C Oven Temp:

1:00 min 876°C

2:00 min 876°C

3:00 min 875°C

4:00 min 875°C

End: Removed

* After Procedure then Solution Annealed:

Oven Set point = 1125°C

Omega HH22 SN# T 94140 Cal 10/29/02 Due 4/29/02

Type K Thermocouple SN# 322 Cal 1/14/03 Due 6/14/03

Temp: 1134.8°C Total Time 15:00 min @ 1125°C

To Page No.

Witnessed & Understood by me,	Date	Invented by	Date
		Recorded by	4/10/03

From Page No.

Thermal Treatment of Specimens

Specimens Are Type 3 that Contain Weld Material Total of 4 Specimens - Solution Annealed @ 1125°C for A total of 15 min.

Oven:

Lindberg Model # 51333 SN# 909172

Oven Set point: 1125°C

Temperature check: Omega HH22 Microprocessor thermometer

SN# T94140 Cal 10/29/02 Due 4/29/03

Used Type K Thermocouple SN# 332 Cal 1/14/03 Due ~~6/14/03~~ 7/14/03 QD 4/11/03

Oven temp Reading = 1134.8°C

All Specimens from pg 26 And 27 were polished To A 600 Grit prior To thermal Treatment And will be Repolished To 600 Grit finish

To Page No.

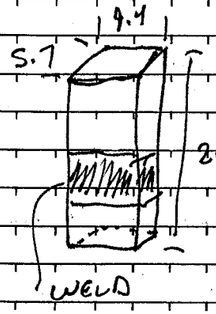
Witnessed & Understood by me,	Date	Invented by	Date
		Recorded by	4/10/03

Project No.____
Book No.____ TITLE____

From Page No.____

Thermal Treatment of Specimens

SPECIMENS: CUT FROM PLATE D62X AND CONTAIN WELD METAL SPECIMENS ARE APPROXIMATELY 20.4 x 9.4 x 5.7 mm STARRETT 734M SN 02457171 CAL 2/7/03 ~~DUE 3~~ DD 4/11/03 DUE 2/7/04



DETAILS OF WELD LOCATED IN NOTEBOOK 505

BASE METAL HEAT 05990211 2
FILLER METAL xx2048 BG

OVEN SETPOINT 1300°C
TEMP CHECK 1299°C OMEGA HH22 SN T54140
CAL 10/29/02 DUE 4/29/03
WITH TYPE K THERMOCOUPLE SN 332
CAL 1/14/03 DUE ~~6/4/03~~ 7/14/03
DD 4/11/03

OVEN SET POINT 1250°C
TEMP CHECK 1249°C OMEGA HH22 SN T54140
TYPE K SN 332

OVEN SET POINT 1200°C ~~DUE~~ DD 4/11/03
TEMP CHECK 1200°C OMEGA HH22 SN T54140
TYPE K SN 332

SPECIMEN SOLUTION ANNEAL TIME AND TEMP
1300°C FOR 15 min WATER QUENCH
1250°C FOR 15 min WATER QUENCH
1200°C FOR 15 min WATER QUENCH

To Page No.____

Witnessed & Understood by me,	Date	Invented by	Date
		Recorded by	4/11/03

Project No.____
TITLE____ Book No.____

From Page No.____

To Page No.____

Witnessed & Understood by me,	Date	Invented by	Date
		Recorded by	4/10/05

Project No._____
Book No._____ TITLE _____

From Page No.___

Repassivation Potential of Alloy C-22

objective: Same As pg #1

Specimen: DOE Alloy N06022 - Allegheny Ludlum Heat 059902LL2
Inco Alloy 622 heat xx 2048BG filler - Specimen Type 3 Row 2 Top
Contains weld Material - 600 Grit Polished finish - with 2 PTFE Crevice washers
Attached At 50 In-Oz Using Proto #6104 SN# 139072 cal 3/6/03 Due 9/6/03
* Specimen Solution Annealed see pg #27

Start wt = 33.84807g Sartorius Genius SN# 12809099 cal 11/15/02 Due 5/15/03
End wt = 33.84719g

Solution: 0.001 m NaCl
0.117g NaCl Lot # 027878
+ DI water To 2000 ml's

pH start = 5.787 Fisher Accumet 950 meter SN# 3340
pH End = 8.649

potentiostat = EG&G Model #273 SN# 41108

Counter Electrode = PT Flag

Reference: Fisher 13-620-52 SN# 0249092

Temperature: 95°C Hg Thermometer SN# 498-170 cal 3/10/02 Due 3/10/03

Eoper = -507 mV Keithley 614 SN# 0704934 Cal 5/26/02 Due 5/26/03
Ept = +165 mV

Solution Deaerated with 99.999% N_2

Specimen Examination: Crevice Corrosion on 7/24 feet of Crevice Washer
Mild Staining on All Surfaces of Specimen

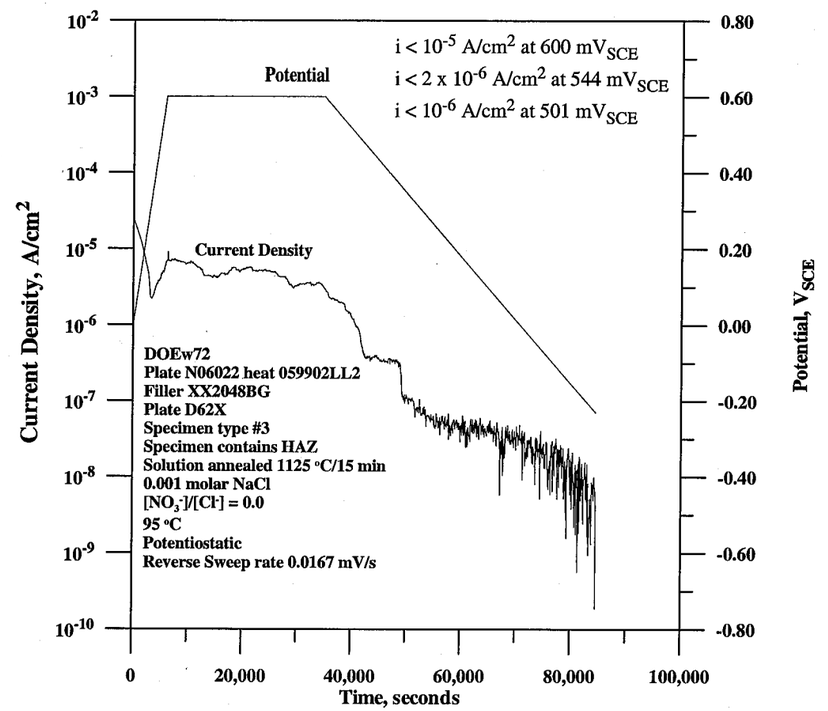
Data DOE_W72

To Page No.____

Witnessed & Understood by me,	Date	Invented by	Date
		Recorded by	4/14/03

Project No._____
Book No._____
TITLE _____

From Page No.___



To Page No.____

Witnessed & Understood by me,	Date	Invented by	Date
		Recorded by	4/17/03

From Page No.___

Repassivation Potential of Alloy C-22

objective: See pg #1

Specimen: DOE Alloy N06022 - Allegheny Ludlum Heat 059902LL2
Inco Alloy 622 Heat XX 2048BG filler - Specimen Type 3 Row 2 Bottom
Contains weld Material - 600 Grit Polished finish - with 2 PTFE Crevice Washers
Attached At 50 In-Oz Using Proto 6104 sn# 133072 cal 3/6/03 due 9/6/03
*Specimen Solution Annealed see pg #27

start wt: 33.99578g Sartorious Genius sn# 12509099 cal 11/15/02 due 5/15/03
End wt: 33.98930g

Solution: 0.01 M NaCl
1.172g NaCl Lot# 027878
+ DI water To 2000mls

pH Start: 5.728 Fisher Accumet 950 Meter sn# 3340 cal 8/7/02 due 8/7/03
pH End: 8.409 pH probe # 13-620-296 sn# 2291257 PL

potentiostat: EG&G Model # 273 SN# 10120

Counter Electrode: PT Flag

Reference: Fisher 13-620-52 SN# 0251439

Temperature: 95°C Hg Thermometer sn# 00-387 cal 5/10/02 due 5/10/03

Ecorr: -508 mv Keithley 614 sn# 0704934 cal 5/26/02 due 5/26/03
Eapt: -65 mv

Solution Deaerated with 99.999% N_2

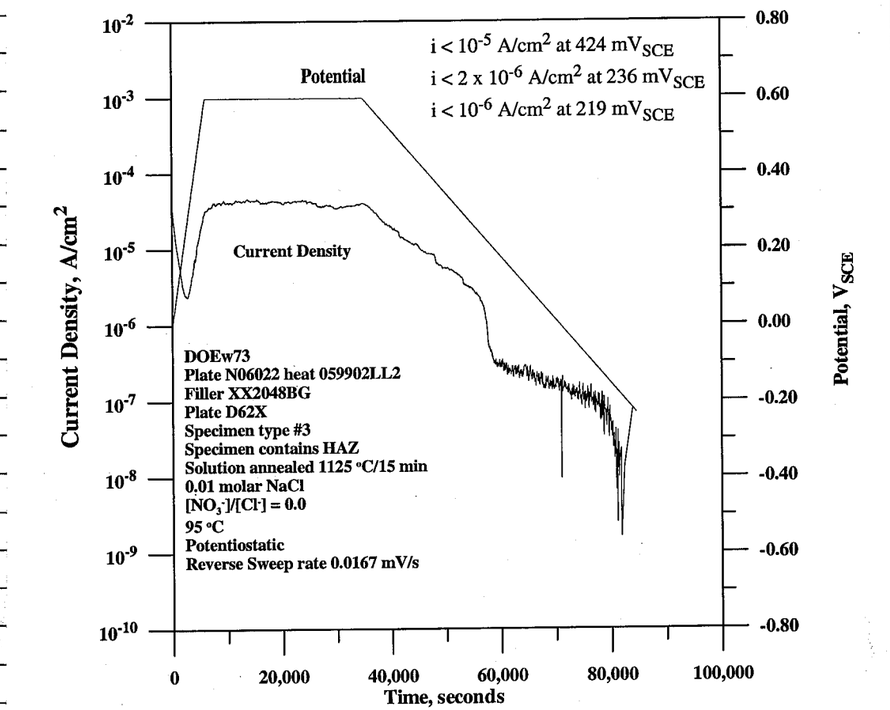
Specimen Examination: Crevice Corrosion on 14/24 feet of crevice washer
Gold tint staining on All surfaces of specimen

Data DOE-W73

To Page No._____

Witnessed & Understood by me,	Date	Invented by	Date
		Recorded by	4/14/03

From Page No.___



To Page No._____

Witnessed & Understood by me,	Date	Invented by	Date
		Recorded by	4/17/03

From Page No.

Repassivation Potential of Alloy C-22

objective: same As pg #1

Specimen: DOE Alloy N06022 - Allegheny Ludlum Heat 059902LL2 plate 1/8"
InCO Alloy 622 heat XX2048BG filler - Specimen Type 3 Row 4 Bottom Top
Contains weld Material - 600 Grit polished finish - with 2 PTFE crevice washers
Attached At 50 In-Oz Using Proto #6104 sn# 139072 cal 3/6/03 due 9/6/03
* Specimen Solution Annealed See pg #27

Start wt = 33.9564 g Sartorius Genius sn# 12809099 cal 11/15/02 due 5/15/03
End wt = 33.9028 g

Solution: 0.1 M NaCl
11.694 g NaCl Lot# 027878
+ DI water to 2000 mls

pH start = 6.348 Fisher Accumet 950 meter sn# 3340 cal 8/7/02 due 8/7/03
pH End = 8.098 pH probe # 13-620-296 sn# 2291257 Pt

potentiostat: EG&G Model #273 sn# 41108

Counter Electrode: PT Flag

Reference: Fisher 13-620-52 sn# 024892

Temperature: 95°C Hg thermometer sn# H98-170 cal 5/10/02 due 5/10/03

Epzc = -552 mv Keithley 614 sn# 0704934 cal 5/26/02 Due 5/26/03
Ept = +160 mv

Deaerated solution with 99.999% N_2

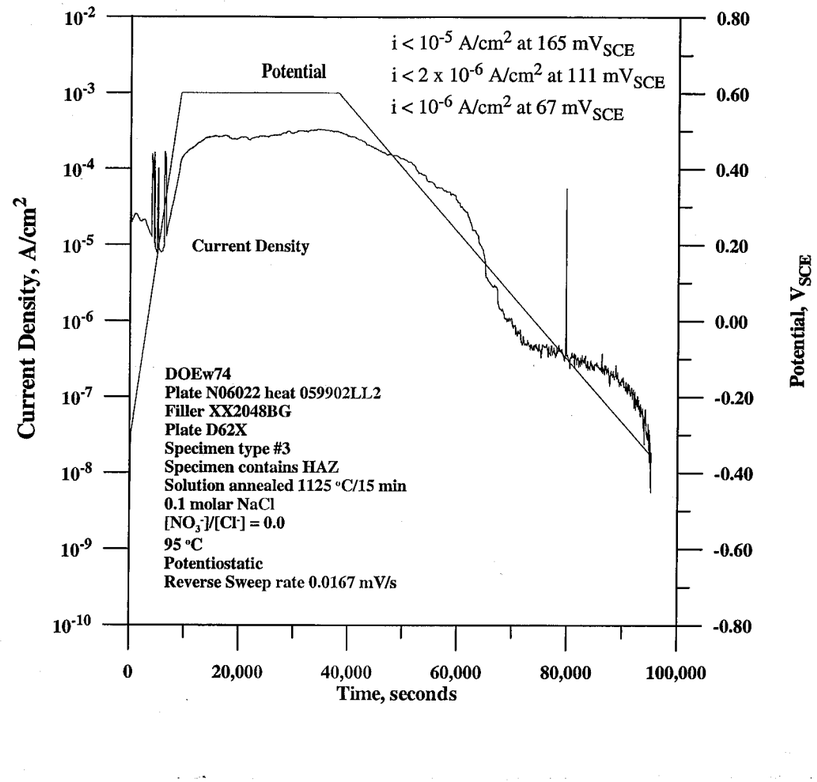
Specimen Examination: Crevice Corrosion on 20/24 Feet of Crevice Washer
staining Gold Tint on All Surfaces of Specim

Data DOE-W74

To Page No.

Witnessed & Understood by me,	Date	Invented by	Date
		Recorded by	4/18/03

From Page No.



To Page No.

Witnessed & Understood by me,	Date	Invented by	Date
		Recorded by	4/21/03

Project No.______
Book No.______ TITLE ______________

From Page No.____

Repassivation Potential of Alloy C-22

objective: same As pg #1

specimen: DOE Alloy N06022 - Alleghany Ludlum Heat 059902LL2
Inco Alloy 622 Heat XX2048BG filler - Specimen Type 3 Row4 Bottom
Contains weld Material - 600 Grit polished Finish - with 2 PTFE Crevice Washers
Attached At 50 In-Oz Using Proto #6104 SN#139072 Cal 3/6/03 Due 9/6/03
* Specimen Solution Annealed See pg #27

Start wt: 34.01910g Sartorious Genius SN# 12809099 cal 11/15/02 Due 5/15/03
End wt: 33.89036g

Solution: 0.25 M NaCl
29.264g NaCl Lot# 027878
+ DI water To 2000 mls

pH Start: 6.328 Fisher Accumet 950 meter SN# 3340 Cal 8/7/02 Due 8/7/03
pH End: 8.126 pH probe # 13-620-296 SN# 2291257 PL

potentiostat: EG + G model # 273 SN# 10120

Counter Electrode: PT Flag

Reference: Fisher 13-620-52 SN# 0251439

Temperature: 95°C Hg thermometer SN# 00-387 cal 5/10/02
Due 5/10/03

Ecorr: -528 mV Keithley 614 SN# 0704934
Ept: +21 mV cal 5/26/02 Due 5/26/03

Solution Deaerated with 99.999% N_2

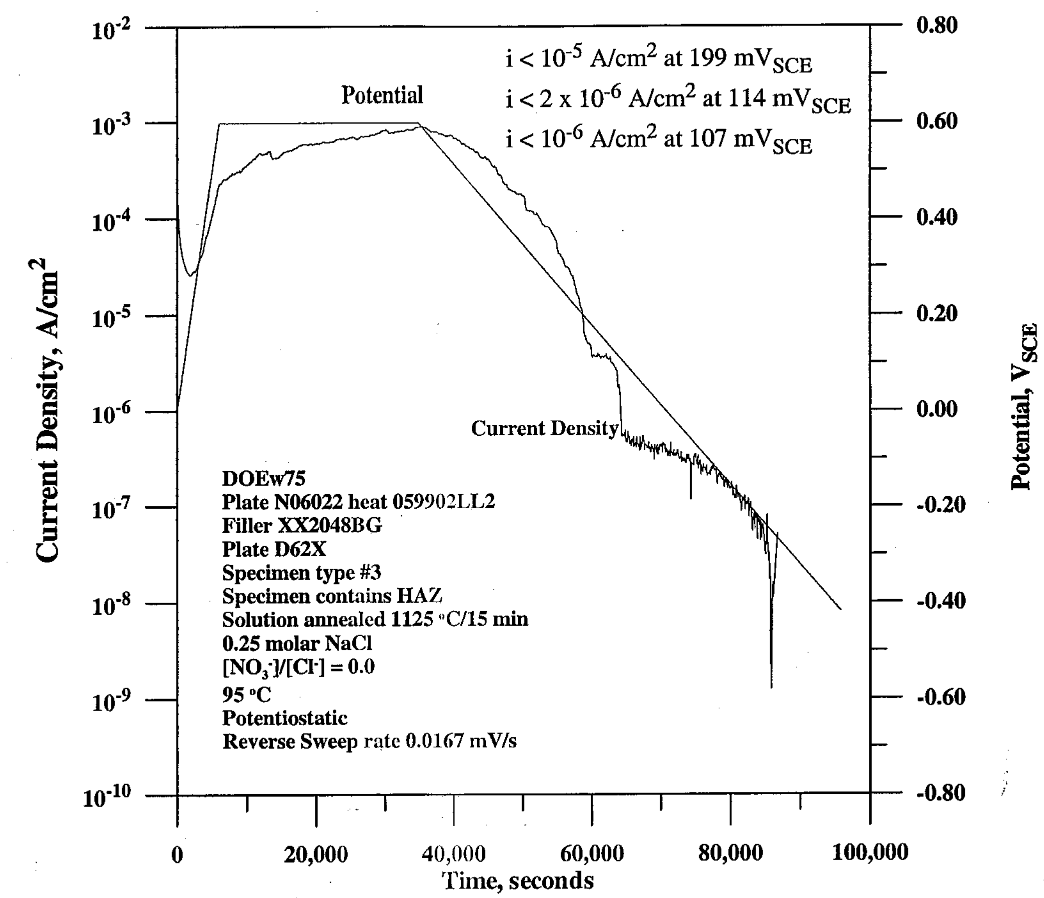
Specimen Examination: Crevice Corrosion on 20/24 feet of Crevice Washer
Staining on All Surfaces of specimen Gold tint.
Data DOE-w75

To Page No.______

Witnessed & Understood by me,	Date	Invented by	Date
		Recorded by [signature]	4/18/03

Project No.______
TITLE ______________ Book No.______

From Page No.____



To Page No.______

Witnessed & Understood by me,	Date	Invented by	Date
		Recorded by [signature]	4/21/03

From Page No.

Repassivation Potential of Alloy C-22

objective: Same As pg. #1

Specimen: DOE Alloy N06022 - Allegheny Ludlum Heat 059902LL2 - INCO Alloy 622 heat XX2048BG filler - Specimen Type 2 Rows 2 Top - Doesn't Contain weld material 600 Grit polished finish - with 2 PTFE Crevice Washers Attached At 50 In-Oz Using Proto 6104 sn# 139072 cal 3/6/03 due 9/6/03 * Specimen Thermally Aged 5 min @ 870°C then Solution Annealed see pg # 26

Start wt = 34.00892g Sartorious Genius sn# 12809099 cal 11/15/02
End wt = 34.00728g due 5/15/03

Solution: 0.001 M NaCl
0.124g NaCl Lot# 027878
+ DI To 2000 mls

pH Start = 6.112 Fisher Accumet 950 meter sn# 3340 cal 8/7/02 due 8/7/03
pH End = 6.773 pH probe # 13-620-296 sn# 2291257 PL

potentiostat: EG & G model # 273 sn# 41108

Counter Electrode: PT Flag

Reference: Fisher 13-620-52 sn# 0249092

Temperature: 95°C Hg Thermometer sn# H98-170 cal 5/16/02 due 5/16/03

E corr: -541mv Keithley 614 sn# 0704934 cal 5/26/02 Due 5/26/03
E pit: +118mv

Solution Deaerated with 99.999% N_2

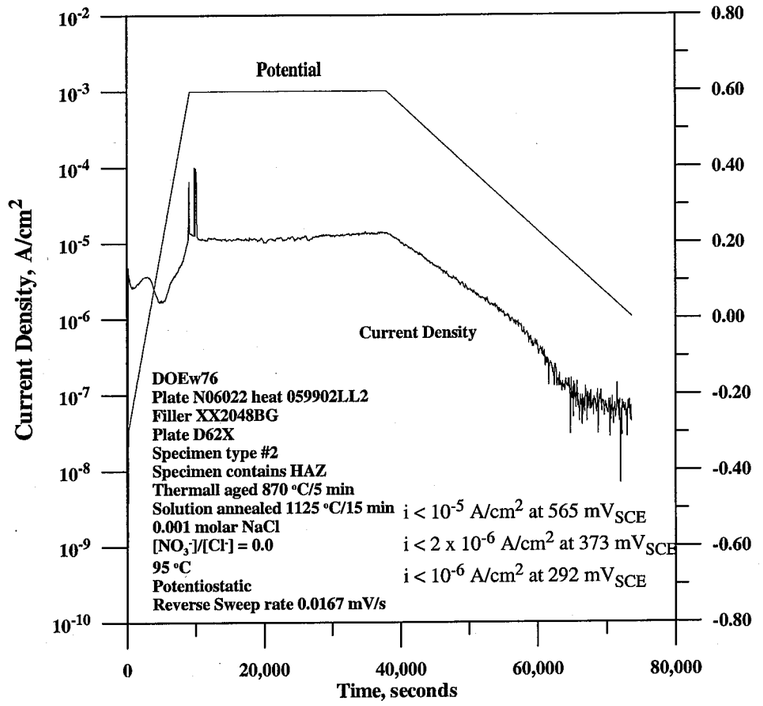
Specimen Examination: No Crevice Corrosion 0/24 Feet of Crevice Washer
Gold tint staining on All surfaces of Specimen

Data DOE_W76

To Page No.

Witnessed & Understood by me,	Date	Invented by	Date
		Recorded by	4/21/03

From Page No.



To Page No.

Witnessed & Understood by me,	Date	Invented by	Date
		Recorded by	4/22/03

Project No.________

Book No.________ TITLE ________

From Page No.____

Repassivation Potential of Alloy C-22

objective: See pg #1

specimen: DOE Alloy N06022 - Alleghany Ludlum Heat 059902LL2 · Inco Alloy 622 heat XX2048BG filler - Specimen Type 2 Rowl Center · Doesn't Contain Weld Material 600 Grit Polished Finish - with 2 PTFE Crevice washers Attached At 50 In·Oz Using Proto #6104 SN# 139072 * Cal 3/6/03 Due 9/6/03 * Specimen Thermally Aged for 5 min @ 870°C then Solution Annealed see pg #26

Start wt = 33.87151 g   Sartorius Genius SN# 12809099 cal 11/15/02 due 5/15/03

End wt = 33.86968 g

Solution: 0.01 M NaCl
1.176 g NaCl Lot# 027878
+ DI water To 2000 mls

pH start = 5.981   Fisher Accumet 950 meter SN# 3340 cal 8/7/02 due 8/7/03

pH End = 7.665   pH probe Fisher #13-620-296 SN# 2291257P6

potentiostat = EG+G model #273 SN# 10120

Counter Electrode: PT Flag

Reference: Fisher 13-620-52 SN# 0251439

Temperature: 95°C   Hg Thermometer SN# 00-387 cal 5/10/02 due 5/10/03

Ecorr = -539 mV   Keithley 614 SN# 0704934 cal 5/26/02 due 5/26/03

Ept = +18 mV

Solution Deaerated with 99.999% N_2

Specimen Examination: Crevice Corrosion on 3/24 feet of Crevice Washer Color tint staining mild on All Surfaces of Specimen

Data DOE_W77

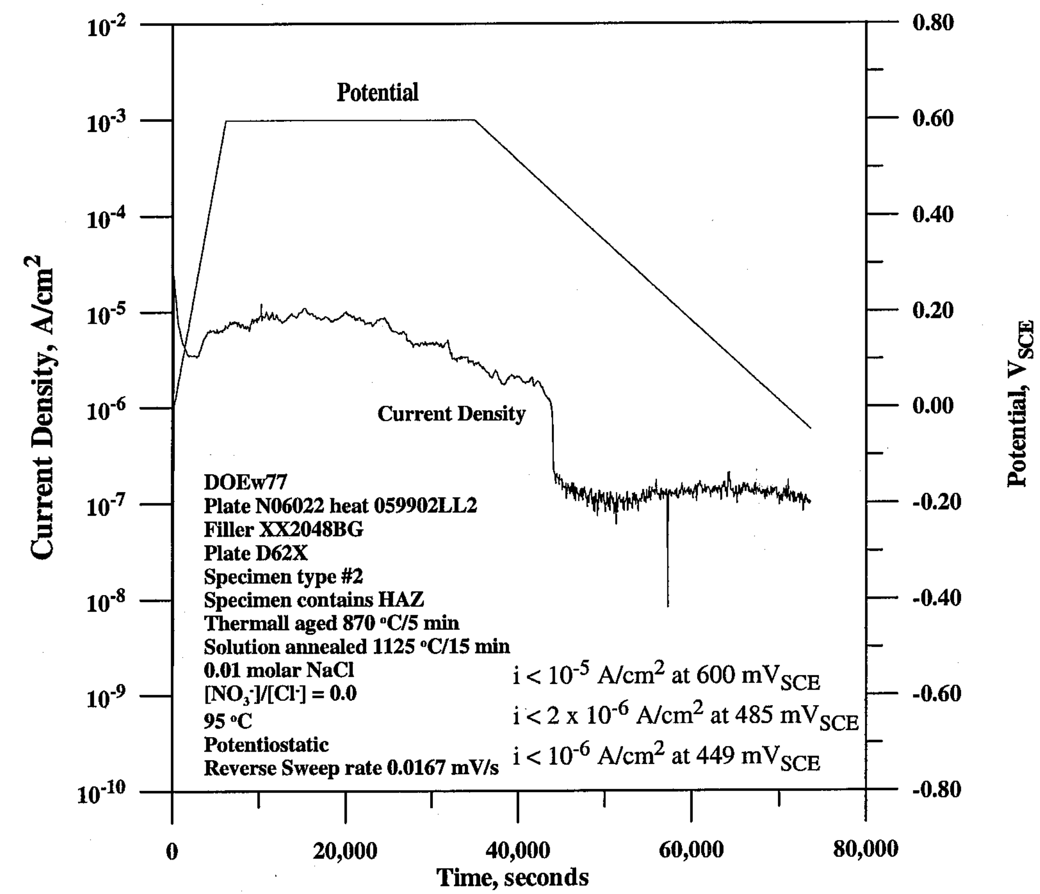
To Page No.____

Witnessed & Understood by me,	Date	Invented by / Recorded by	Date
		[signature]	4/21/03

Project No.________

TITLE ________ Book No.________

From Page No.____



To Page No.____

Witnessed & Understood by me,	Date	Invented by / Recorded by	Date
		[signature]	4/22/03

From Page No.

Repassivation Potential of Alloy C-22

objective: Same As pg #1

Specimen: DOE Alloy N06022 - Allegheny Ludlum Heat 059902LL2 · Inco Alloy 622 heat xx 2048BG filler · Specimen Type 2 Bowl Bottom · Doesn't Contain Weld Material 600 Grit polished Finish · with 2 PTFE Crevice washers Attached At 50 In-Oz Using Proto #6104 SN# 135077 cal 3/6/03 due 9/6/03 * Specimen Thermally Aged @ 870°C for 5 min then Solution Annealed See pg #26.

Start wt: 33.78510g Sartorious Genius SN# 12809099 cal 11/15/02 due 5/15/03
End wt: 33.76565g

Solution: 0.1 M NaCl
11.691g NaCl Lot# 027878
+ DI water to 2000ml

pH Start: 5.893 Fisher Accumet 950 Meter SN# 3340 cal 8/7/02 due 8/7/03
pH End: 8.073 pH probe SN# 13-620-296 SN# 2291257 pb

potentiostat: EG&G Model #273 SN# 41108

Counter Electrode: Pt Flag

Reference: Fisher 13-620-52 SN# 024902

Temperature: 95°C Hg Thermometer SN# H98-170 cal 5/10/02 due 5/10/03

E_{corr}: -430 mv Keithley 614 SN# 0704934
E_{pt}: -110 mv cal 5/26/02 due 5/26/03

Solution Deaerated with 99.999% N_2

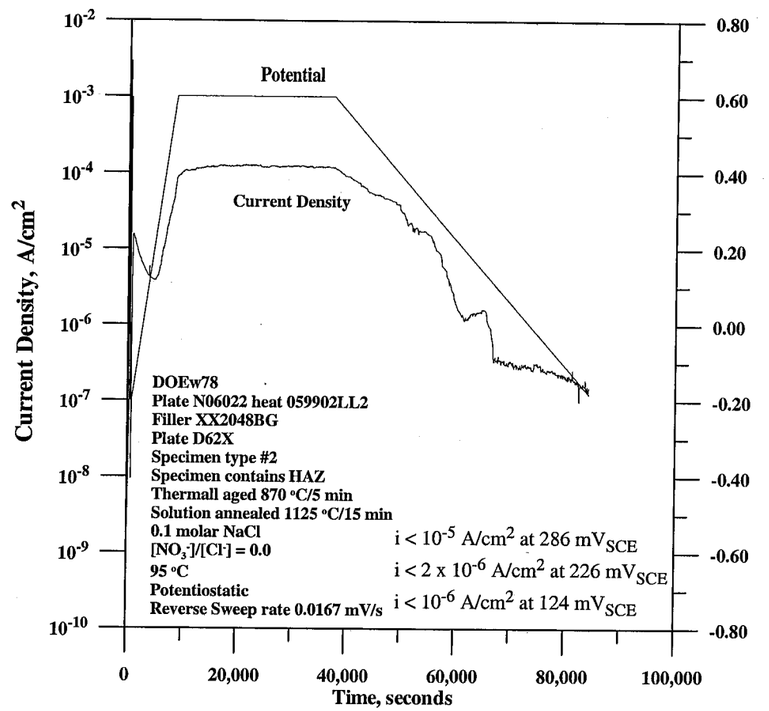
Specimen Examination: Crevice Corrosion on 9/24 feet of Crevice Washer.
Cupric Ferricyanide Staining on All Surfaces of Specimen

Data DOEw78

To Page No.

Witnessed & Understood by me,	Date	Invented by	Date
		Recorded by	4/23/03
			DD 4/16/04

From Page No.



To Page No.

Witnessed & Understood by me,	Date	Invented by	Date
		Recorded by	4/29/03

Project No._____

Book No._____ TITLE_____

From Page No.____

I have reviewed this scientific notebook and find it in compliance with QAP-001. There is sufficient information regarding procedures used for conducting tests, acquiring and analyzing data so that another qualified individual could repeat the activity.

6/6/05

To Page No._____

Witnessed & Understood by me,	Date	Invented by	Date
		Recorded by	

ADDITIONAL INFORMATION FOR SCIENTIFIC NOTEBOOK NO. 578

Document Date:	08/08/2002
Availability:	Southwest Research Institute® Center for Nuclear Waste Regulatory Analyses 6220 Culebra Road San Antonio, Texas 78228
Contact:	Southwest Research Institute® Center for Nuclear Waste Regulatory Analyses 6220 Culebra Road San Antonio, TX 78228-5166 Attn.: Director of Administration 210.522.5054
Data Sensitivity:	■"Non-Sensitive" □ Sensitive □"Non-Sensitive - Copyright" □ Sensitive - Copyright
Date Generated:	06/04/2005
Operating System: (including version number)	Windows
Application Used: (including version number)	Excel and others unknown
Media Type: (CDs, 3 1/2, 5 1/4 disks, etc.)	1 - CD
File Types: (.exe, .bat, .zip, etc.)	xls, dat
Remarks: (computer runs, etc.)	Media contains one folder named DOE welded Alloy 22 containing data files.