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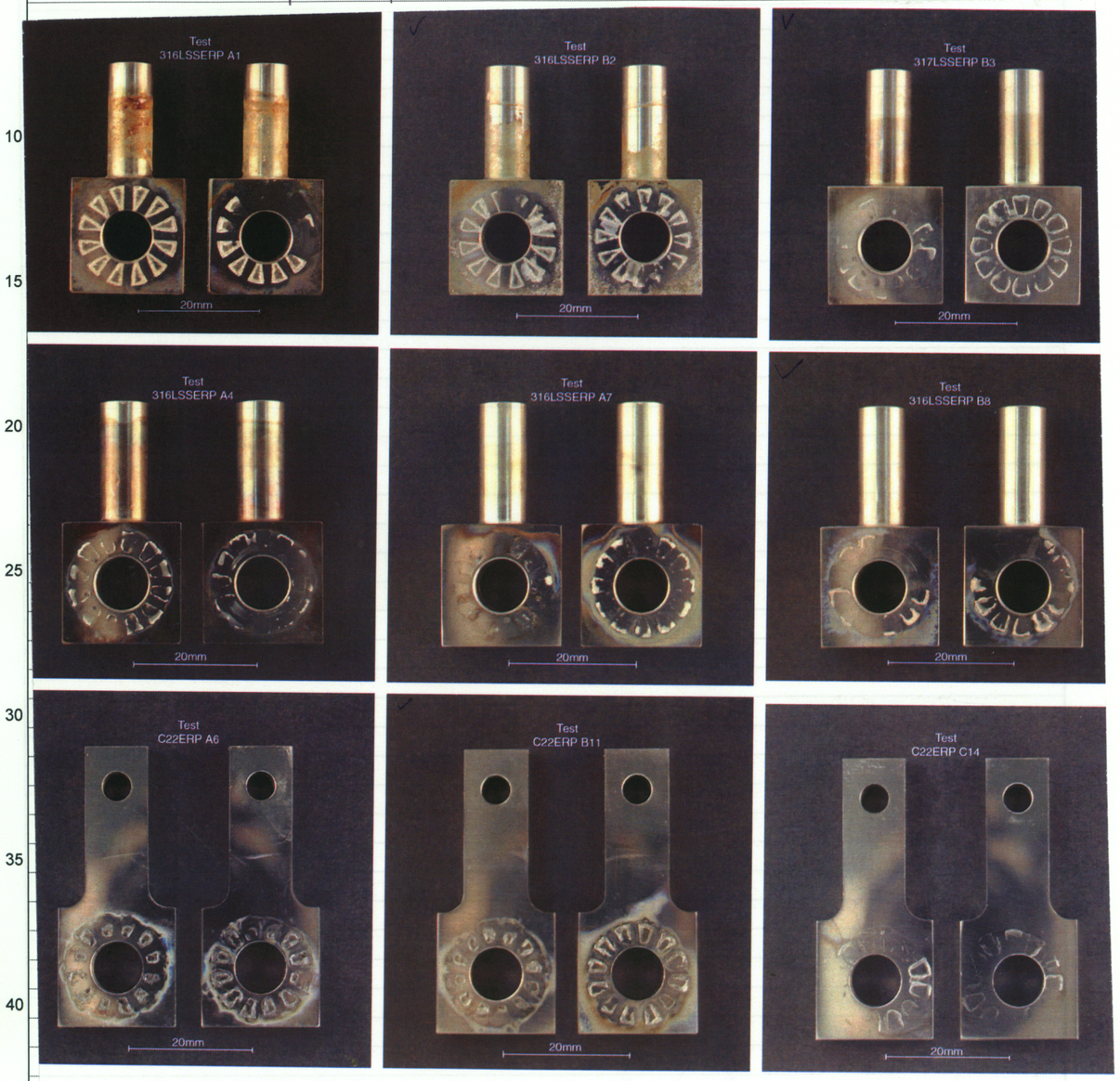
Optical photos for some tests



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POTENTIODYNAMIC TEST

Objective: see page #1

Specimen: C22 specimen Heat# 2277-3-3266 CNWRA Drawing 20.06002.01.322.002 polished to a 600 grit finish cleaned with Acetone then used ceramic crevice washers wrapped in teflon tape THE Method

Torque Screwdriver: True Craft 70 in-lbs **SN:** 694000621 **Cal:** 7/25/06 **Due:** 7/25/07

Initial Weight: 23.83523g **Final Weight:** 23.82701g **Model:** Sartorius Genius **SN:** 12809099 **Cal:** 5/11/07 **Due:** 11/11/07

SOLUTION: 0.01M NaCl
1.166g NaCl
+DI to 2000mL
lot #066010

Reagents measured with **Model:** OHAUS **SN:** 2883 **Cal:** 7/5/07 **Due:** 1/5/08

Initial pH: 4.86 **Final pH:** 7.91 **Model:** Orion **SN:** 2330 **CAL:** 7/6/07 **DUE:** 7/6/08
pH Probe: #13-620-296 **SN:** 5003095

TEST TEMPERATURE: 90°C **Measured with Hg Thermometer SN:** H98-187 **Cal:** 8/19/06 **Due:** 8/19/07

Counter Electrode: Platinum Flag

Reference Electrode: Fisher SCE **SN:** 6166050

Gas: 99.999% Nitrogen

Ecorr: -512.6mV vs. SCE **Ept:** -7.2mV vs. SCE ~~**Eapplied (vs SCE):**~~ BB 7/27/07 **Model:** Keithley 614 **SN:** 467374 **Cal:** 1/25/07 **Due:** 1/25/08

Potentiostat: Solartron 1287 **SN#** 00186634 cal: 6/26/07 due: 12/26/07
Test ID: C22Erpe22

Specimen Examination: 24 /24

One crevice washer cracked, but stayed intact
crevice corrosion on 24/24 feet of ceramic washer
surface staining around washer perimeter

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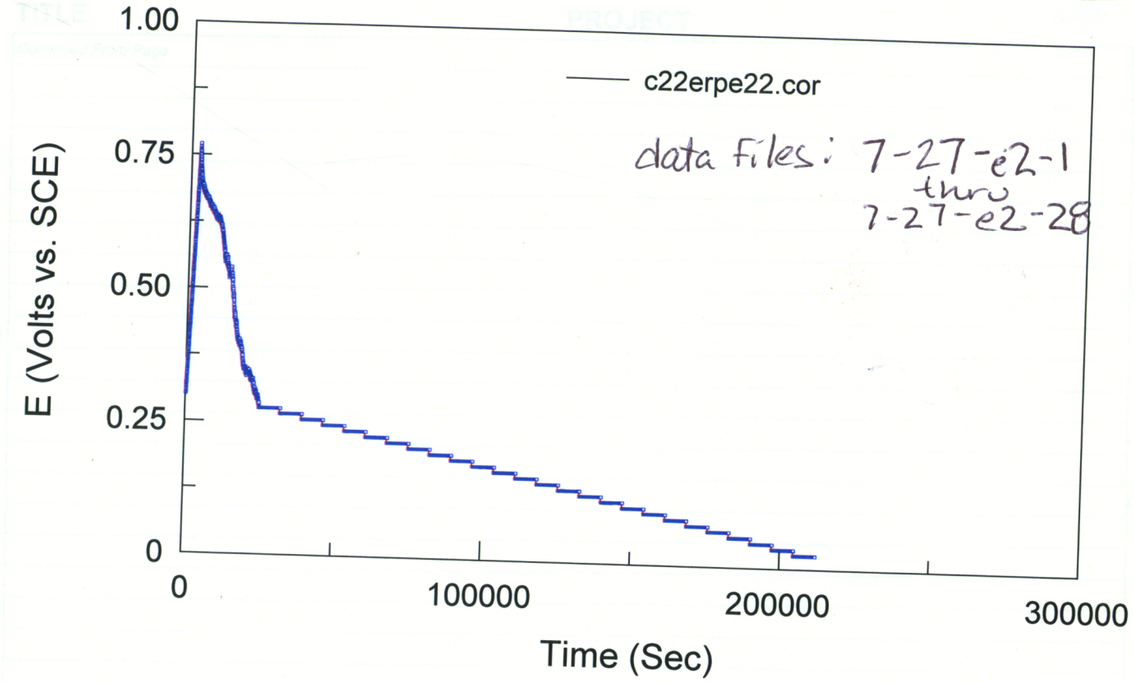

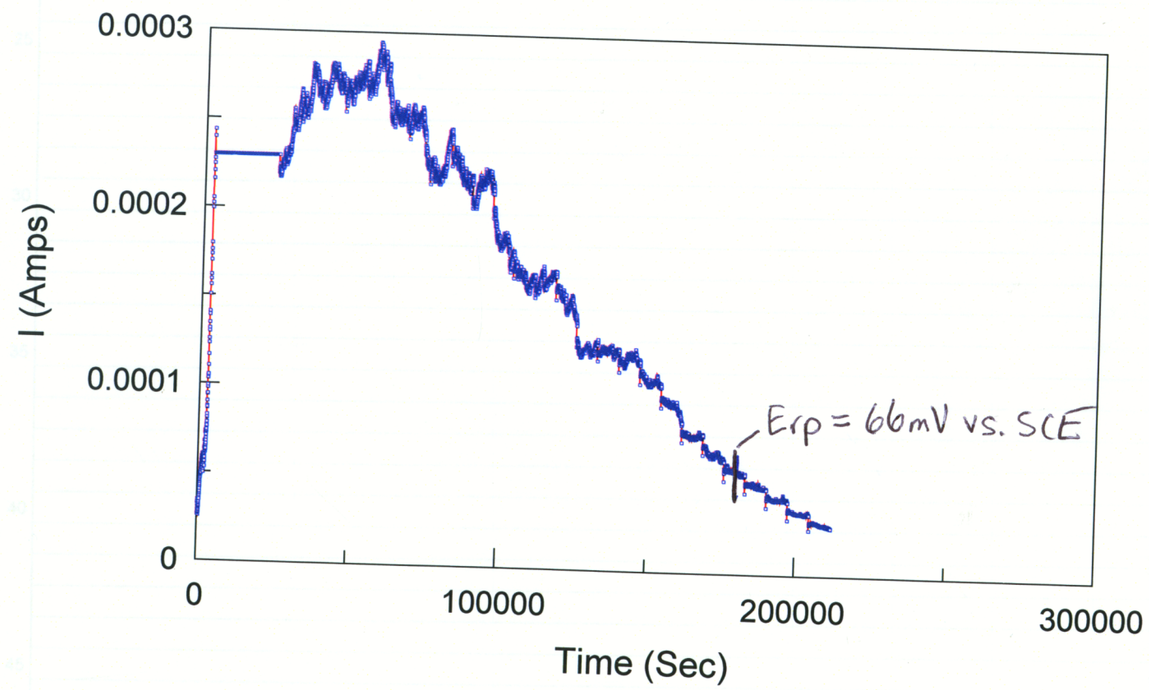

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Potentiostatic Test

Objective: Investigate the time required to initiate localized corrosion under constant applied potential.

Alloy / Heat No. : C22 **HT# 2277-3-3266**

Specimen Preparation: Specimen machined to dimensions specified in CNWRA Drawing.#20.06002.01.322.002 polished to 600 Grit finish using SiC Specimen cleaned in acetone PTFE crevice forming washers attached to specimen

Test ID: Pstat-250mV-A

Torque Screwdriver: Proto 6104 **Cal:** 9/5/07 **SN:** 139072 **Due:** 4/5/08

Initial Weight: 23.81173g **Final Weight:** 23.81167g **Model:** Sartorius Genius **Cal:** 5/11/07 **SN:** 12809099 **Due:** 11/11/07

Solution: 1.0 m NaCl
116.90g NaCl Lot # 066010
+DI To 2000mls

Reagents measured with **Model:** OHAUS **Cal:** 7/5/07 **SN:** 2883 **Due:** 1/5/08

Initial pH: 5.93 **Final pH:** Not Taken **Model:** Orion 940 **Cal:** 7/6/07 **pH Probe:** #13-620-296 **SN:** 2330 **Due:** 7/6/08 **SN:** 5003095

Test Temperature: 90°C **Measured with Hg Thermometer SN:** H 98-179 **Cal:** 5/2/07 **Due:** 5/2/08

Counter Electrode: Platinum Flag

Reference Electrode: Fisher SCE **SN:** 4028035

Gas: 99.999% Nitrogen

Ecorr: -265 mV **Ept:** +271 mV **Model:** Keithley 614 **Cal:** 5/8/07 **SN:** 0704934 **Due:** 5/8/08

Eapplied (vs SCE): +250 mV vs SCE

Potentiostat: Solartron 1287 **SN:** 00153550 Test: 10/16/07 – 11/2/07
Last Verification Date: 5/20/07 **Verification Due:** 11/20/07

Number of Crevice Corrosion Sites: 0 /24 (24 max.) Test time: 1.4×10^6 seconds = 16 days
No Corrosion 0/24 feet of PTFE Crevice Washer
No staining on Surface of Specimen

* Note: Repolished specimen To Continue Testing In Same Solution And Same Conditions

Data files: C22Pstat10-16, C22Pstat10-23, C22Pstat10-30, ~~C22Pstat11-6~~
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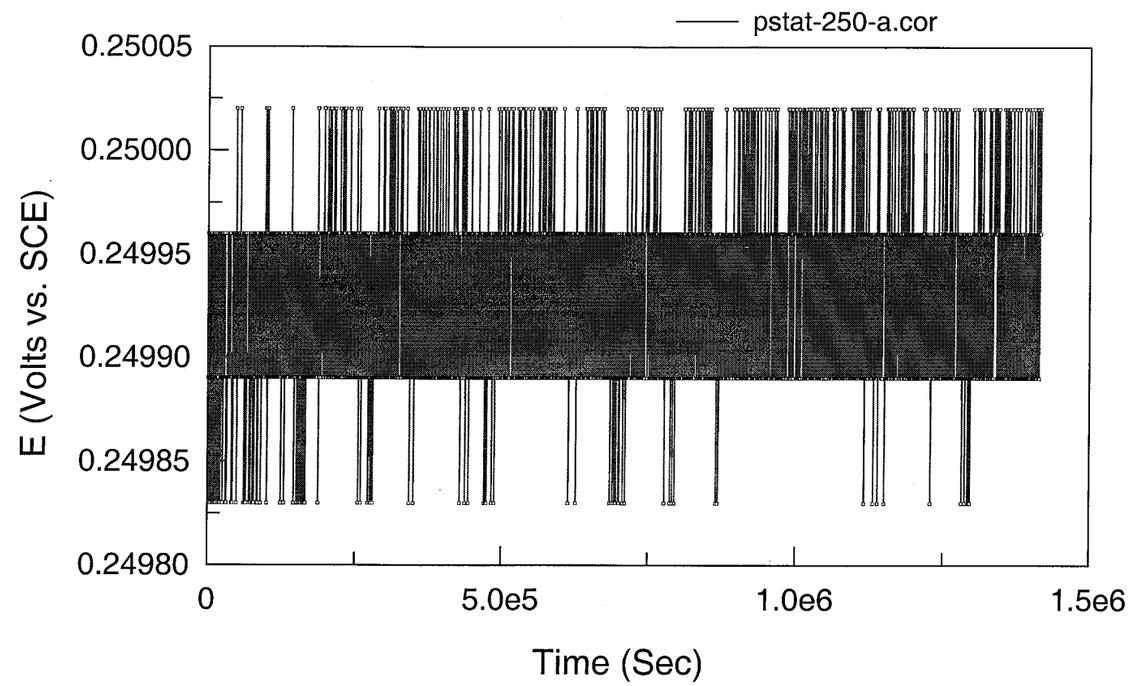

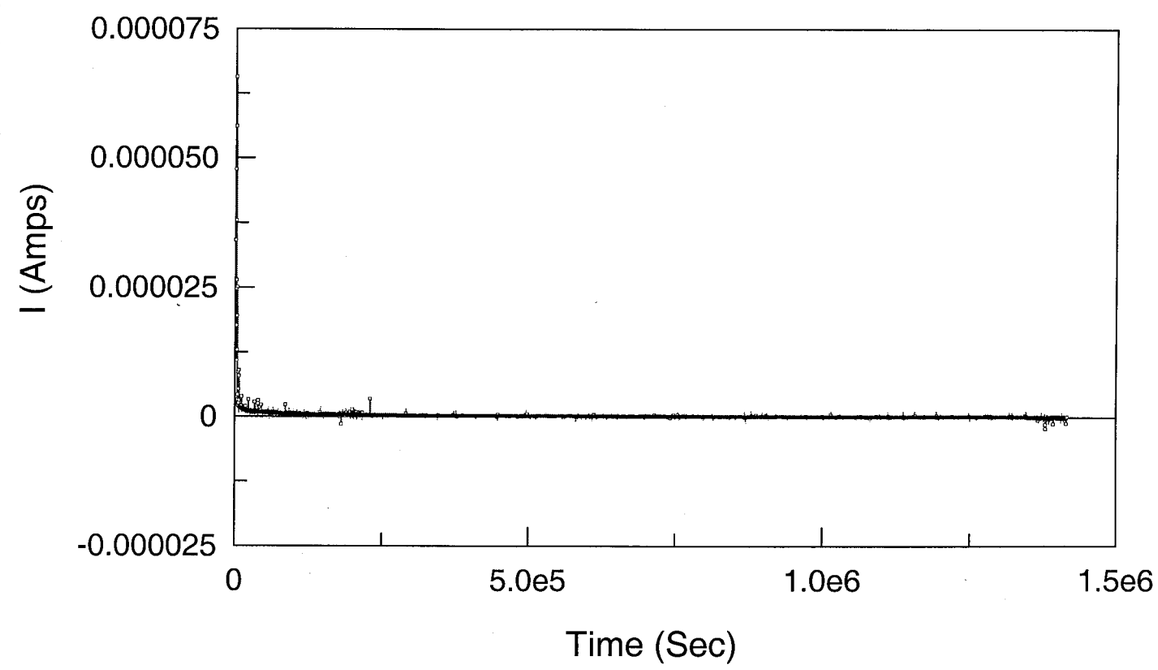

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Potentiostatic Test

Objective: Investigate the time required to initiate localized corrosion under constant applied potential.

Alloy / Heat No. : C22 **HT# 2277-3-3266**

Specimen Preparation: Specimen machined to dimensions specified in CNWRA Drawing.#20.06002.01.322.002 polished to 600 Grit finish using SiC Specimen cleaned in acetone ~~PTFE~~ crevice forming washers attached to specimen

Torque Screwdriver: Proto 6164 **Cal:** 9/5/07 **SN:** 139072 **Due:** 4/5/08

Initial Weight: 23.70333g **Final Weight:** 23.67630g **Model:** Sartorius Genius **Cal:** 5/11/07 **SN:** 12809099 **Due:** 11/11/07

Solution: 1.0 m NaCl
116.89g NaCl Lot#066010
+ DI To 2000mls

Reagents measured with **Model:** OHAUS **Cal:** 7/5/07 **SN:** 2883 **Due:** 1/5/08

Initial pH: 5.73 **Final pH:** 5.27 **Model:** Orion 940 **Cal:** 7/6/07 **SN:** 2330 **Due:** 7/6/08
pH Probe: #13-620-296 **SN:** 5003095

Test Temperature: 90°C **Measured with Hg Thermometer SN:** H98-179 **Cal:** 5/2/07 **Due:** 5/2/08

Counter Electrode: Platinum Flag

Reference Electrode: Fisher SCE **SN:** 3328225

Gas: 99.999% Nitrogen

Ecorr: -372 mV Vs SCE **Ept:** +108 mV Vs SCE **Model:** Keithley 614 **Cal:** 5/8/07 **SN:** 0704934 **Due:** 5/8/08

Eapplied (vs SCE): 550 mV Vs SCE

Potentiostat: Solartron 1480 **SN:** 00240551
Last Verification Date: 10/2/07 **Verification Due:** 4/1/08

Number of Crevice Corrosion Sites: 0 /24 (24 max.)

No Corrosion 0/24 Sect of PTFE Crevice Washers - Brown Dark Color Staining on All Surfaces of Specimen

File/Test ID: C22Erp550

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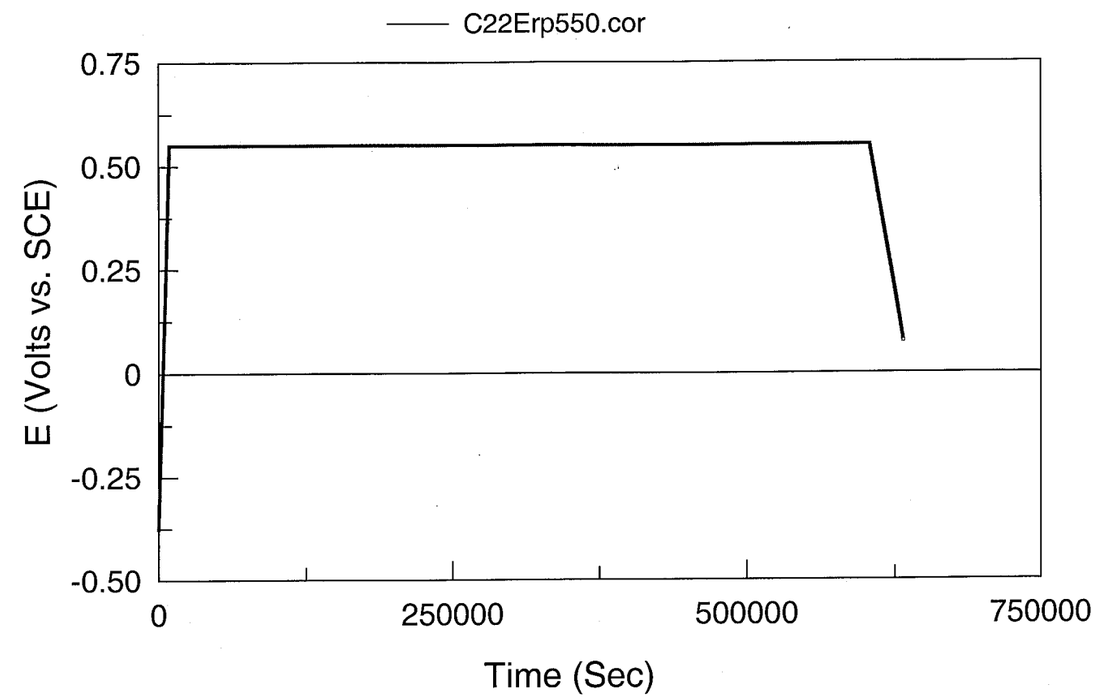
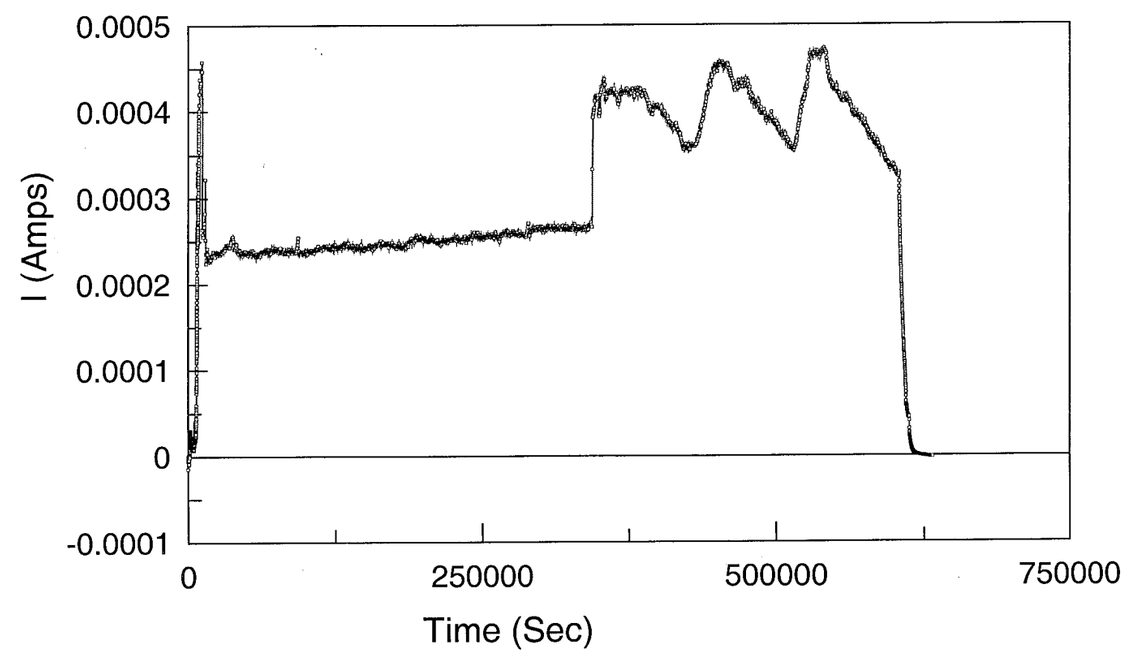


* Corrosion is not initiated. So Erp is not drawn.



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Potentiostatic Test

Objective: Investigate the time required to initiate localized corrosion under constant applied potential.

Alloy / Heat No. : C22 **HT#** 2277-3-3266

Specimen Preparation: Specimen machined to dimensions specified in CNWRA Drawing.#20.06002.01.322.002 polished to 600 Grit finish using SiC Specimen cleaned in acetone PTFE crevice forming washers attached to specimen

Torque Screwdriver: Proto 6104 **Cal:** 9/5/07 **SN:** 139072 **Due:** 4/5/08

Initial Weight: 23.75205 g **Final Weight:** 23.75216 g **Model:** Sartorius Genius **Cal:** 5/11/07 **SN:** 12809099 **Due:** 11/11/07

Solution:

1.0 m NaCl
116.91 g NaCl Lot # 066010
+ DI To 2000 mls

Reagents measured with **Model:** OHAUS **Cal:** 7/5/07 **SN:** 2883 **Due:** 1/5/08

Initial pH: 5.67 **Final pH:** 5.13 **Model:** Orion 940 **Cal:** 7/6/07 **SN:** 2330 **Due:** 7/6/08

pH Probe: #13-620-296 **SN:** 5003095

Test Temperature: 90 °C **Measured with Hg Thermometer SN:** 5287 **Cal:** 6/5/07 **Due:** 6/5/08

Counter Electrode: Platinum Flag

Reference Electrode: Fisher SCE **SN:** 0251429

Gas: 99.999% Nitrogen

Ecorr: -363 mV Vs SCE
Ept: +131 mV Vs SCE
Eapplied (vs SCE): 600 mV Vs SCE

Model: Keithley 614 **Cal:** 5/8/07 **SN:** 0704934 **Due:** 5/8/08

Potentiostat: Solartron 1480 **SN:** 00240551
Last Verification Date: 10/2/07 **Verification Due:** 4/1/08

Number of Crevice Corrosion Sites: /24 (24 max.)

Lost Temperature Controller
* Repolish specimen for further Testing

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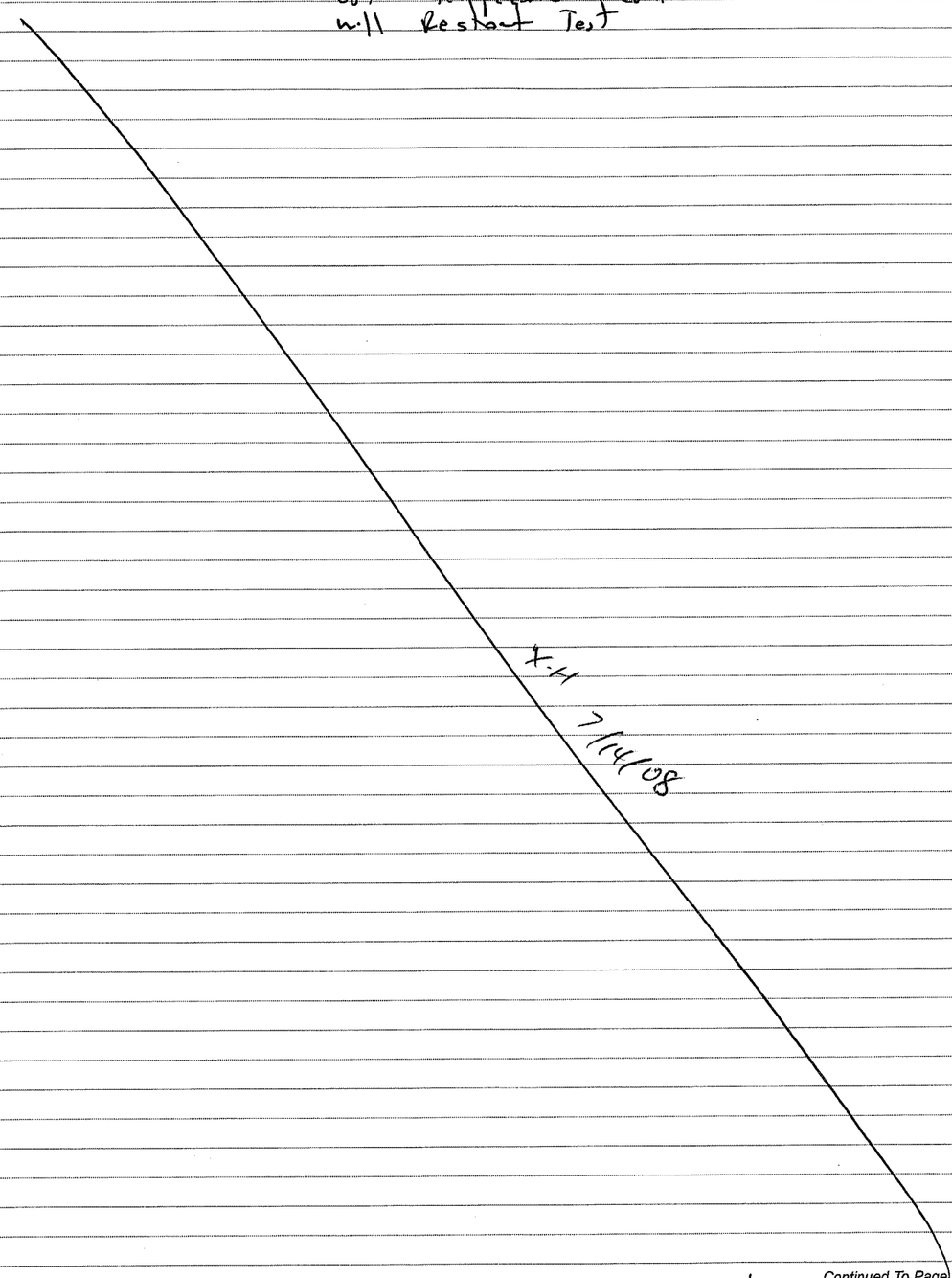
Lost Temperature Controller
will Restart Test



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Potentiostatic Test

Objective: Investigate the time required to initiate localized corrosion under constant applied potential.

Alloy / Heat No. : **C22** **HT# 2277-3-3266**

Specimen Preparation: Specimen machined to dimensions specified in CNWRA Drawing.#20.06002.01.322.002 polished to 600 Grit finish using SiC Specimen cleaned in acetone PTFE crevice forming washers attached to specimen

Torque Screwdriver: Proto 6104 **SN:** 139072
Cal: 9/5/07 **Due:** 4/5/08

Initial Weight: 23.73352g **Model:** Sartorius Genius **SN:** 12809099
Final Weight: 23.70122g **Cal:** 5/11/07 **Due:** 11/11/07

Solution:
1.0 m NaCl
116.89g NaCl Lot #066010
+ DI to 2000ml

Reagents measured with **Model:** OHAUS **SN:** 2883
Cal: 7/5/07 **Due:** 1/5/08

Initial pH: 5.95 **Model:** Orion 940 **SN:** 2330
Final pH: 6.06 **Cal:** 7/6/07 **Due:** 7/6/08
pH Probe: #13-620-296 **SN:** 5003095

Test Temperature: 90°C **Measured with Hg Thermometer SN:** 5283
Cal: 6/5/07 **Due:** 6/5/08

Counter Electrode: Platinum Flag

Reference Electrode: Fisher SCE **SN:** 0251479

Gas: 99.999% Nitrogen

Ecorr: -242 mV vs SCE **Model:** Keithley 614 **SN:** 0704934
Ept: +262 mV vs SCE **Cal:** 5/8/07 **Due:** 5/8/08
Eapplied (vs SCE): 600 mV vs SCE

Potentiostat: solartron 1480 **SN:** 00240551
Last Verification Date: 10/2/07 **Verification Due:** 4/1/08

Number of Crevice Corrosion Sites: 1 /24 (24 max.)
Crevice Corrosion on 1/24 feet of PTFE Crevice Washers
Dark Brown Color Staining on All Surfaces of Specimen

File/Test ID C22 E_RP 600

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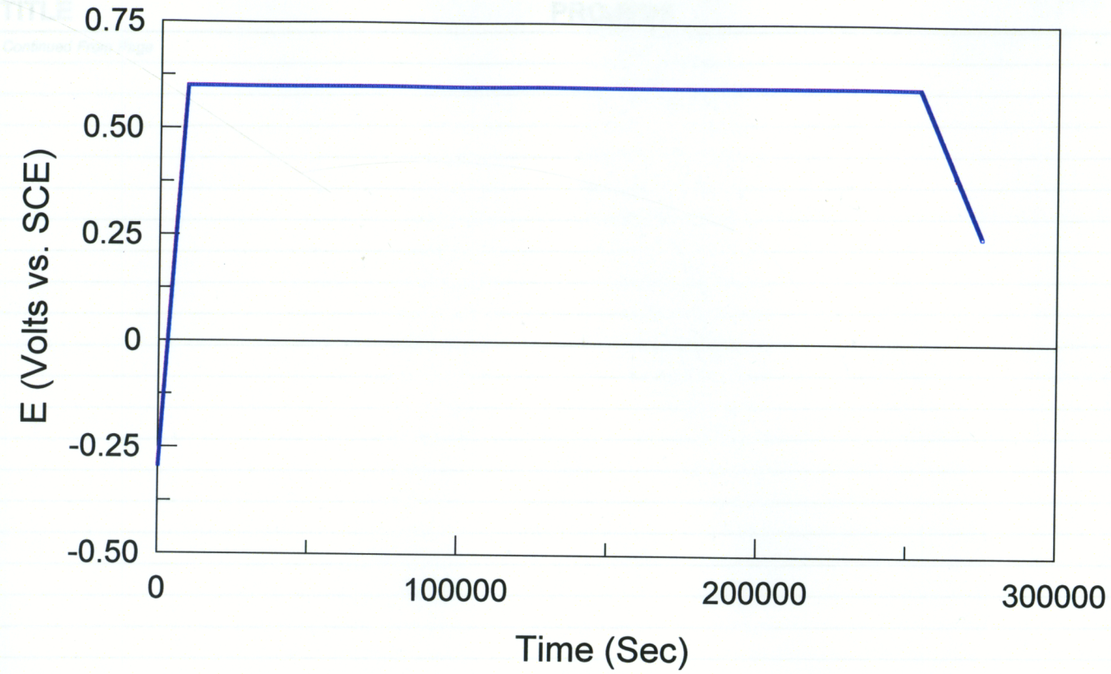

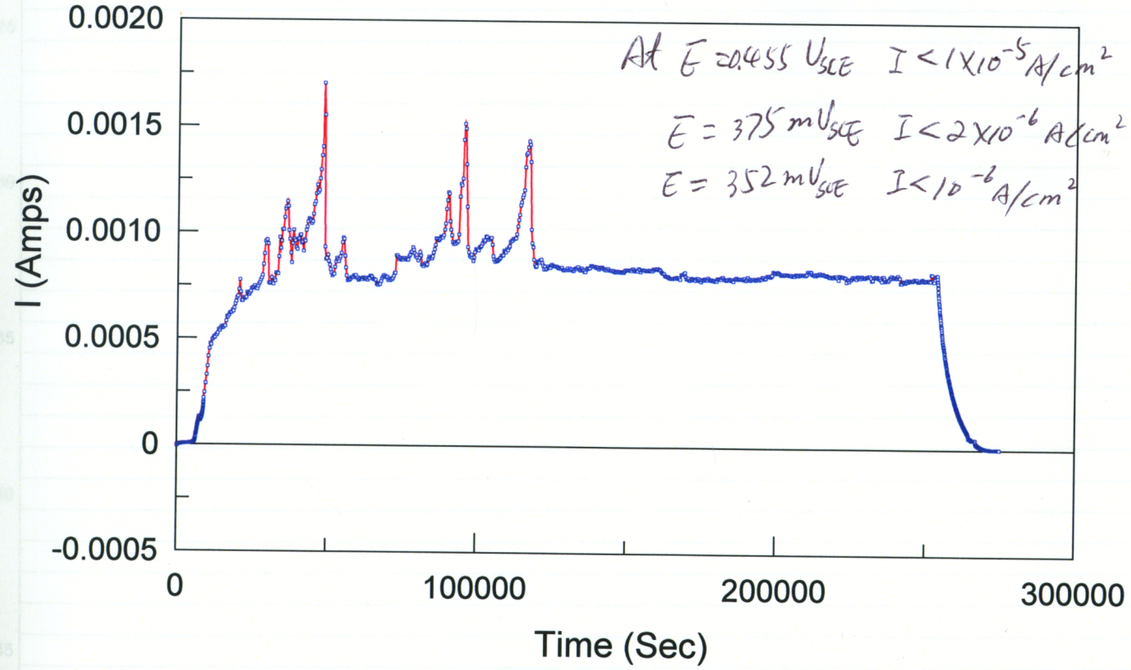

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