TITLE PROJECT

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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 with Teflon Tape

Torque Screwdriver: True Craft 70 In-lbs **Cal:** 7/25/06 **SN:** 694060691 **Due:** 7/25/07

Initial Weight: 24.243499 **Final Weight:** 24.23610g **Model:** Sartorius Genius **Cal:** 5/9/06 **SN:** 12809099 **Due:** 11/9/06

SOLUTION: 1.25 M $CaCl_2 \cdot 2H_2O$ (367.52g $CaCl_2 \cdot 2H_2O$: Lot# 0617120) + D.I to 2000 ml

Reagents measured with **Model:** OHAUS **Cal:** 7/5/06 **SN:** 2883 **Due:** 7/5/07

Initial pH: 7.04 **Final pH:** 4.49 **Model:** Orion **CAL:** 7/6/06 **pH Probe:** #13-620-296 **SN:** 2330 **DUE:** 7/6/07 **SN:** 5003045

TEST TEMPERATURE: 90°C **Measured with Hg Thermometer SN:** H98-190 **Cal:** 4/7/06 **Due:** 4/6/07

Counter Electrode: Platinum Flag

Reference Electrode: Fisher SCE **SN:** 3328255

Gas: 99.999% Nitrogen

Ecorr: -308 mV_{SCE} **Ept:** -551 mV_{SCE} ~~**Eapplied (vs SCE):** ---~~ **Model:** Keithley 614 **Cal:** 7/6/06 **SN:** 0724934 **Due:** 7/6/07

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Potentiostat: Solartron 1287 **SN#** 00186634 **Test ID:** C22 Erp11a Cal: 5/16/06 Due: 11/16/06

Specimen Examination: 1/24

One area is lightly corroded. Surface staining outside of the crevice area.

Cell #1.

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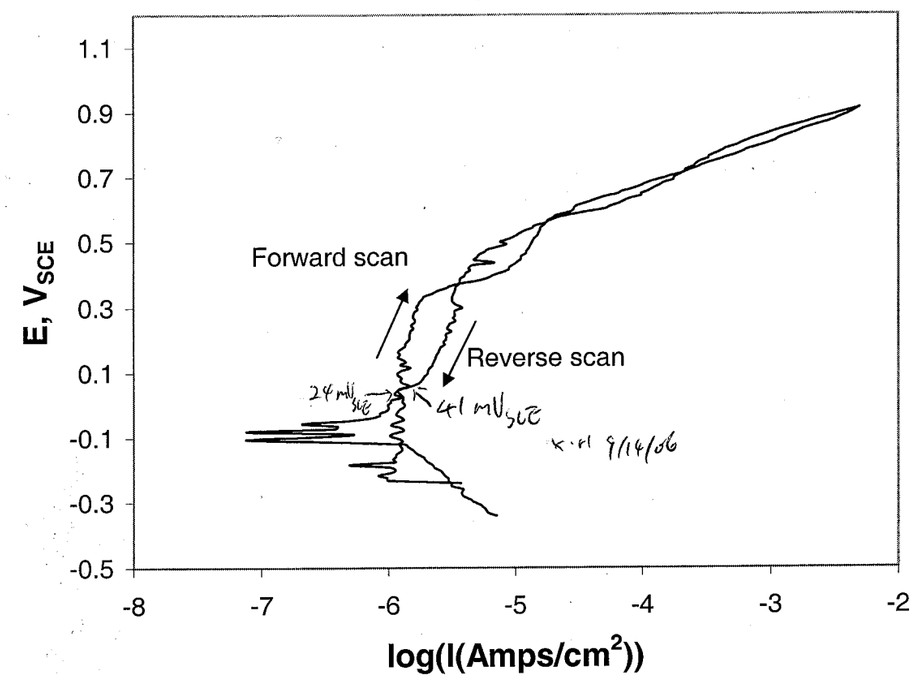
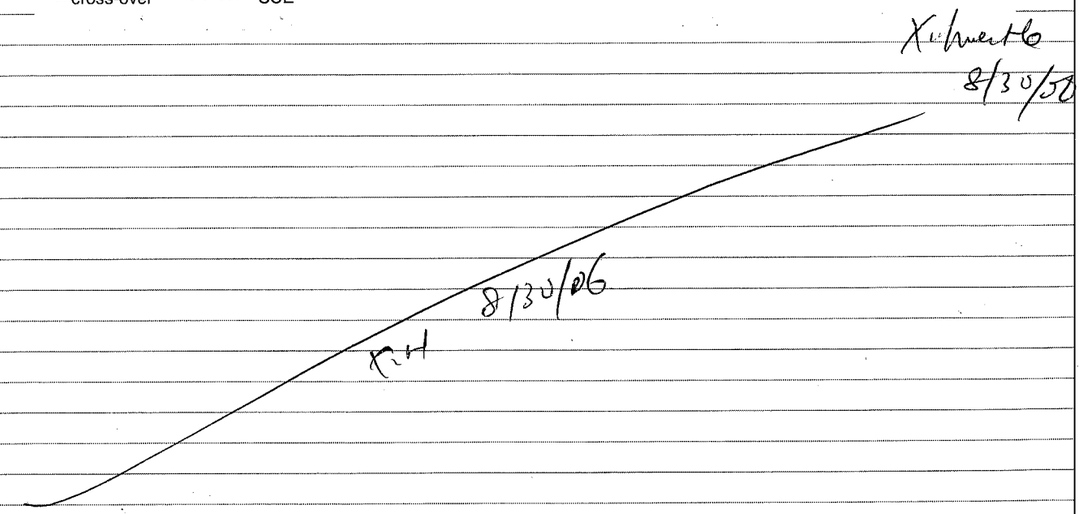


$E_{cross\text{-}over}$ = 41 mV_{SCE}



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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 with Teflon Tape

Torque Screwdriver: True Craft 70 in-lbs **Cal:** 7/25/06 **SN:** 694000691 **Due:** 7/25/07

Initial Weight: 23.35941 g **Final Weight:** 23.35229 g **Model:** Sartorius Genius **Cal:** 5/9/06 **SN:** 12809099 **Due:** 11/9/06

SOLUTION: 1.25 M $CaCl_2 \cdot 2H_2O$
(367.52 g $CaCl_2 \cdot 2H_2O$ · Lot # 061720)
+ D.I to 2000 mls

Reagents measured with **Model:** OHAUS **Cal:** 1/5/06 **SN:** 2883 **Due:** 1/5/07

Initial pH: 7.38 **Final pH:** 6.97 **Model:** Orion **CAL:** 7/6/06 **DUE:** 7/6/07 **pH Probe:** #13-620-296 **SN:** 5003045

TEST TEMPERATURE: 90°C **Measured with Hg Thermometer SN:** H98-119 **Cal:** 5/11/06 **Due:** 5/11/07

Counter Electrode: Platinum Flag

Reference Electrode: Fisher SCE **SN:** 4028036

Gas: 99.999% Nitrogen

Ecorr: −324 mV SCE **Ept:** −285 mV SCE **Eapplied (vs SCE):** — **Model:** Keithley 614 **Cal:** 7/6/06 **SN:** 0704934 **Due:** 7/6/07

Potentiostat: Solartron 1287 **SN#** 00148500 **Cal:** 5/15/06 **Due:** 11/15/06

Test ID: C22Erp11b

Specimen Examination: 0 /24

Surface staining outside of the crevice area

Cell #2

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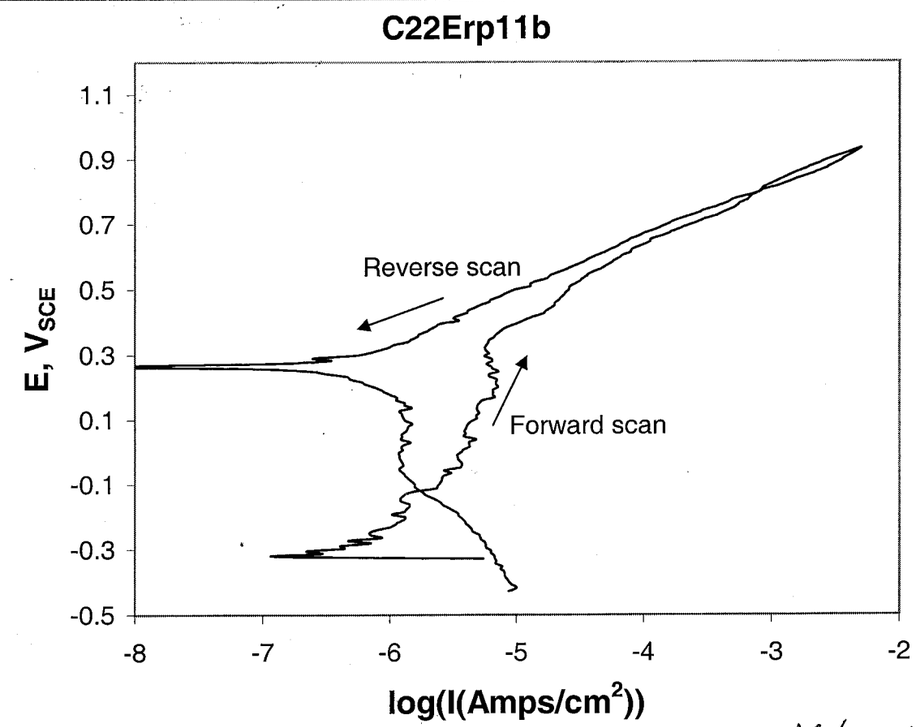

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POTENTIODYNAMIC TEST

Objective: see page #1

Specimen: C22 specimen Heat# 2277-3-3292 WN813 CNWRA Drawing 20.06002.01.322.002 polished to a 600 grit finish cleaned with Acetone then used ~~ceramic~~ Teflon 9/1/06 crevice washers wrapped in teflon tape

Torque Screwdriver: Proto 6104 50 In-oz **Cal:** 4/4/06 **SN:** 139072 **Due:** 10/4/06

Initial Weight: 23.42984 g **Model:** Sartorius Genius **SN:** 12809099

Final Weight: 23.39921 g **Cal:** 5/9/06 **Due:** 11/9/06

SOLUTION: 1.25 m $CaCl_2 \cdot 2H_2O$
367.55g $CaCl_2 \cdot 2H_2O$: Lot# 061720
+ D.I to 2000 mls

Reagents measured with **Model:** OHAUS **SN:** 2883
Cal: 9/5/06 **Due:** 1/5/07

Initial pH: 6.66 **Model:** Orion **SN:** 2330
Final pH: 7.21 **CAL:** 9/6/06 **DUE:** 9/6/07
pH Probe: #13-620-296 **SN:** 3003045

TEST TEMPERATURE: 90°C **Measured with Hg Thermometer SN:** H98-170
Cal: 4/7/06 **Due:** 4/6/07

Counter Electrode: Platinum Flag

Reference Electrode: Fisher SCE **SN:** 3328255

Gas: 99.999% Nitrogen

Ecorr: -452 mVSCE **Model:** Keithley 614 **SN:** 0704934

Ept: 49 mVSCE **Cal:** 9/6/06 **Due:** 9/6/07

Eapplied (vs SCE):

Potentiostat: Solartron 1287 **SN#** 00186634

Test ID: C22Erp12a **Cal** 5/16/06 **Due** 11/16/06

Specimen Examination: 2 /24

Two areas are corroded. Surface staining outside of the crevice area.

#1

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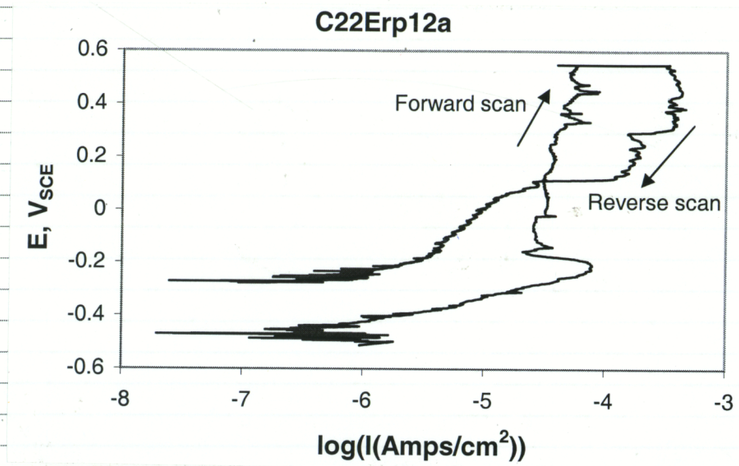

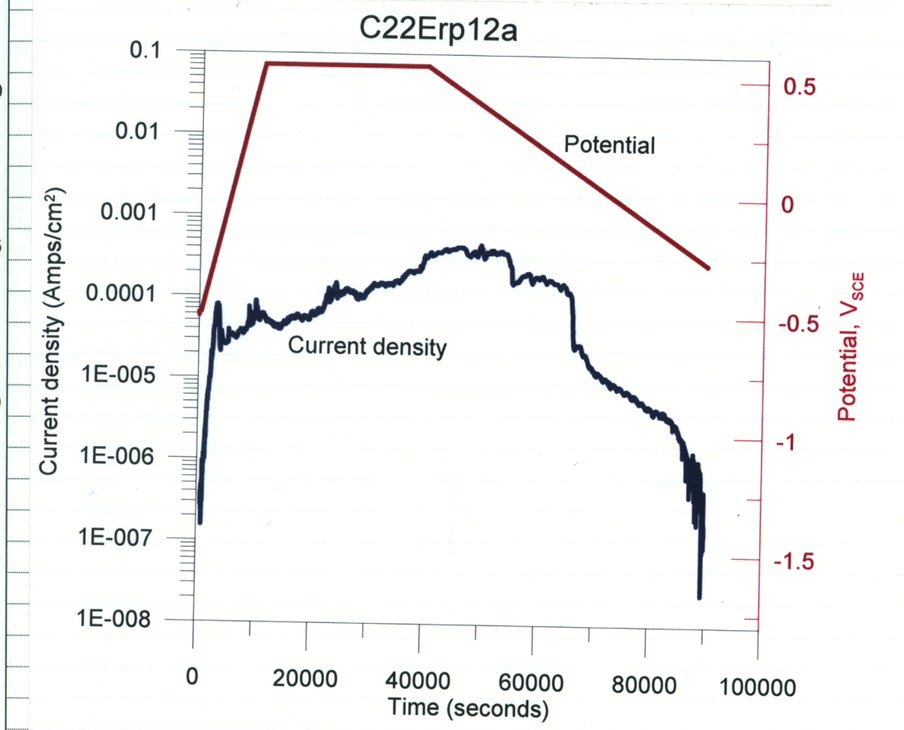

As-welded C22 with Teflon washer
N_2 deaerated, 90 °C, 1.25 M $CaCl_2$ solution
Forward scan rate: 0.1 mV/s, Potential hold: 550 mV_{SCE} for 8 hours
Reverse scan rate: 0.0167 mV/s
$i < 10^{-5}$ A/cm^2 at 10.2mV_{SCE}; $i < 2*10^{-6}$ A/cm^2 at -209 mV_{SCE};
$i < 10^{-6}$ A/cm^2 at -224 mV_{SCE}

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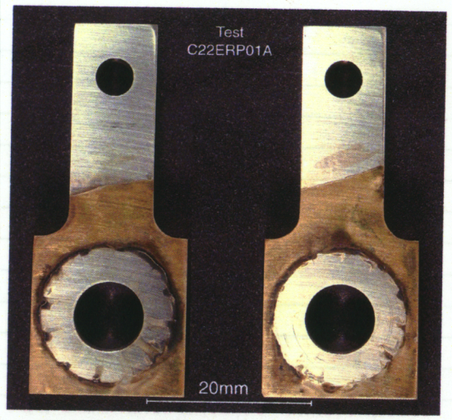

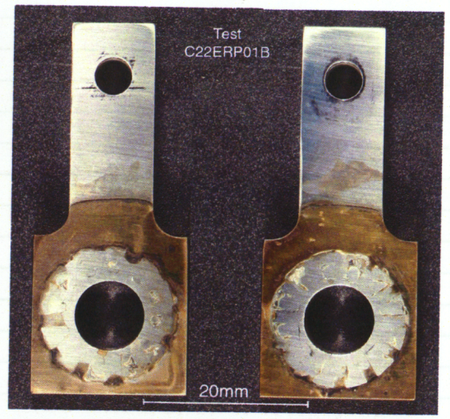

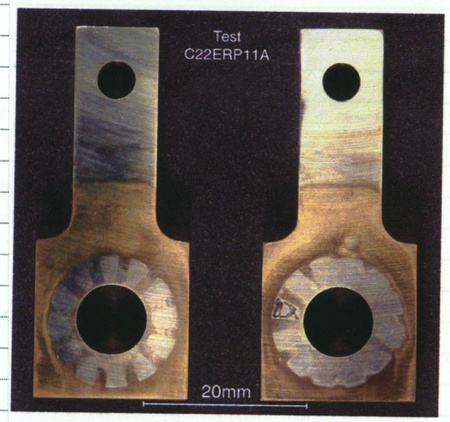

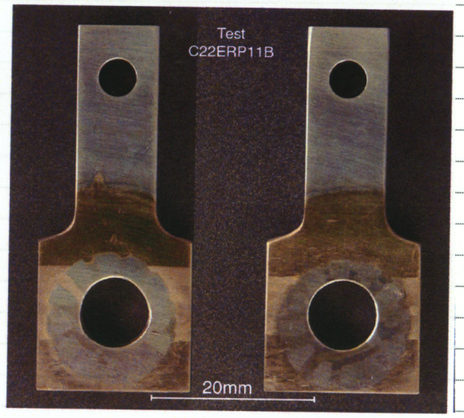

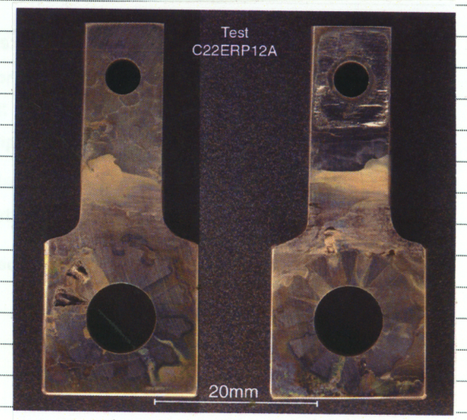

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[A N A L Y S I S R E P O R T]

GENERAL CONDITIONS
- Result File : JFS5100
- File Version : 1
- Background Method : Fit
- Decon Method : Gaussian
- Decon ChiSquared : 28.14
- Analysis Date : 29-SEP-2006
- Microscope : SEM
- Comments : Test C22ERP01A
  Yellow surface stain

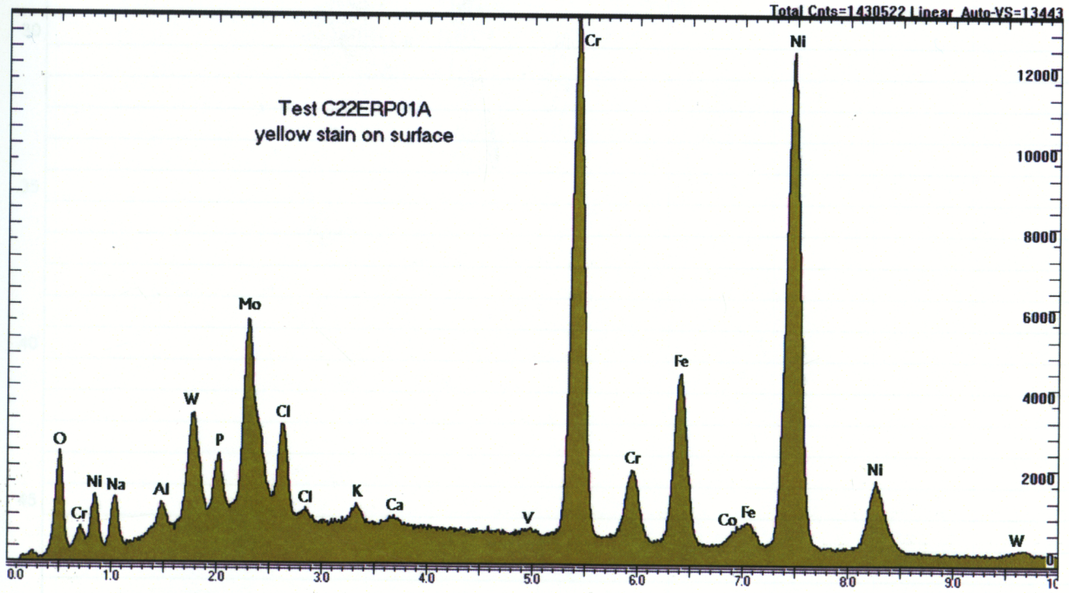
ANALYSIS CONDITIONS
- Quant. Method : ZAF/ASAP
- Acquire Time : 300 secs
- Normalization Factor: 100.00

SAMPLE CONDITIONS
- kV : 20.0
- Beam Current : 150.0 picoAmps
- Working Distance : 29.5 mm
- Tilt Angle : 0.0 Degrees
- TakeOff Angle : 35.0 Degrees
- Solid Angle*BeamCurrent: 0.8

Element	Line	Weight%	K-Ratio	Cnts/s	Atomic%
Na	Ka	2.77	0.0060	32.51	6.90
Al	Ka	1.36	0.0057	35.47	2.88
P	Ka	2.06	0.0122	69.43	3.80
Cl	Ka	2.71	0.0188	99.39	4.38
K	Ka	0.53	0.0043	19.89	0.78
Ca	Ka	0.16	0.0015	6.15	0.23
V	Ka	0.20	0.0018	5.89	0.22
Cr	Ka	20.54	0.2035	582.32	22.63
Fe	Ka	9.12	0.0918	202.46	9.36
Co	Ka	0.92	0.0088	16.84	0.90
Ni	Ka	38.44	0.3795	617.06	37.51
Mo	La	13.28	0.0941	196.02	7.93
W	Ma	7.91	0.0465	98.18	2.46
Total		100.00			

Note: Results do not include elements with Z<11 (Na).

Spectrum: JFS5100 Range:20 keV



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TITLE PROJECT

[A N A L Y S I S R E P O R T]

GENERAL CONDITIONS
- Result File : JFS5101
- File Version : 1
- Background Method : Fit
- Decon Method : Gaussian
- Decon ChiSquared : 8.34
- Analysis Date : 29-SEP-2006
- Microscope : SEM
- Comments : Test C22ERP01A Area off stain

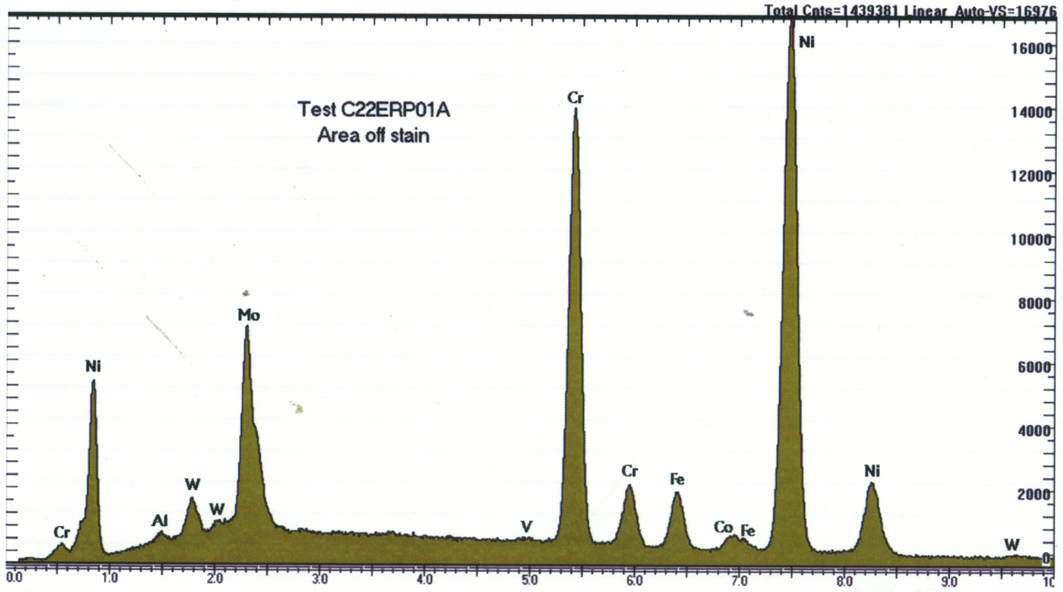
ANALYSIS CONDITIONS
- Quant. Method : ZAF/ASAP
- Acquire Time : 300 secs
- Normalization Factor: 100.00

SAMPLE CONDITIONS
- kV : 20.0
- Beam Current : 150.0 picoAmps
- Working Distance : 29.5 mm
- Tilt Angle : 0.0 Degrees
- TakeOff Angle : 35.0 Degrees
- Solid Angle*BeamCurrent: 0.8

Element	Line	Weight%	K-Ratio	Cnts/s	Atomic%
Al	Ka	0.41	0.0016	9.76	0.94
V	Ka	0.16	0.0016	4.95	0.20
Cr	Ka	21.74	0.2184	617.78	25.74
Fe	Ka	3.73	0.0386	84.10	4.11
Co	Ka	1.23	0.0118	22.17	1.28
Ni	Ka	54.03	0.5347	859.10	56.65
Mo	La	15.70	0.1136	233.78	10.08
W	Ma	2.99	0.0165	34.42	1.00
Total		99.99			

Note: Results do not include elements with Z<11 (Na).

Spectrum: JFS5101 Range:20 keV Total Cnts=1439381 Linear Auto-VS=16976



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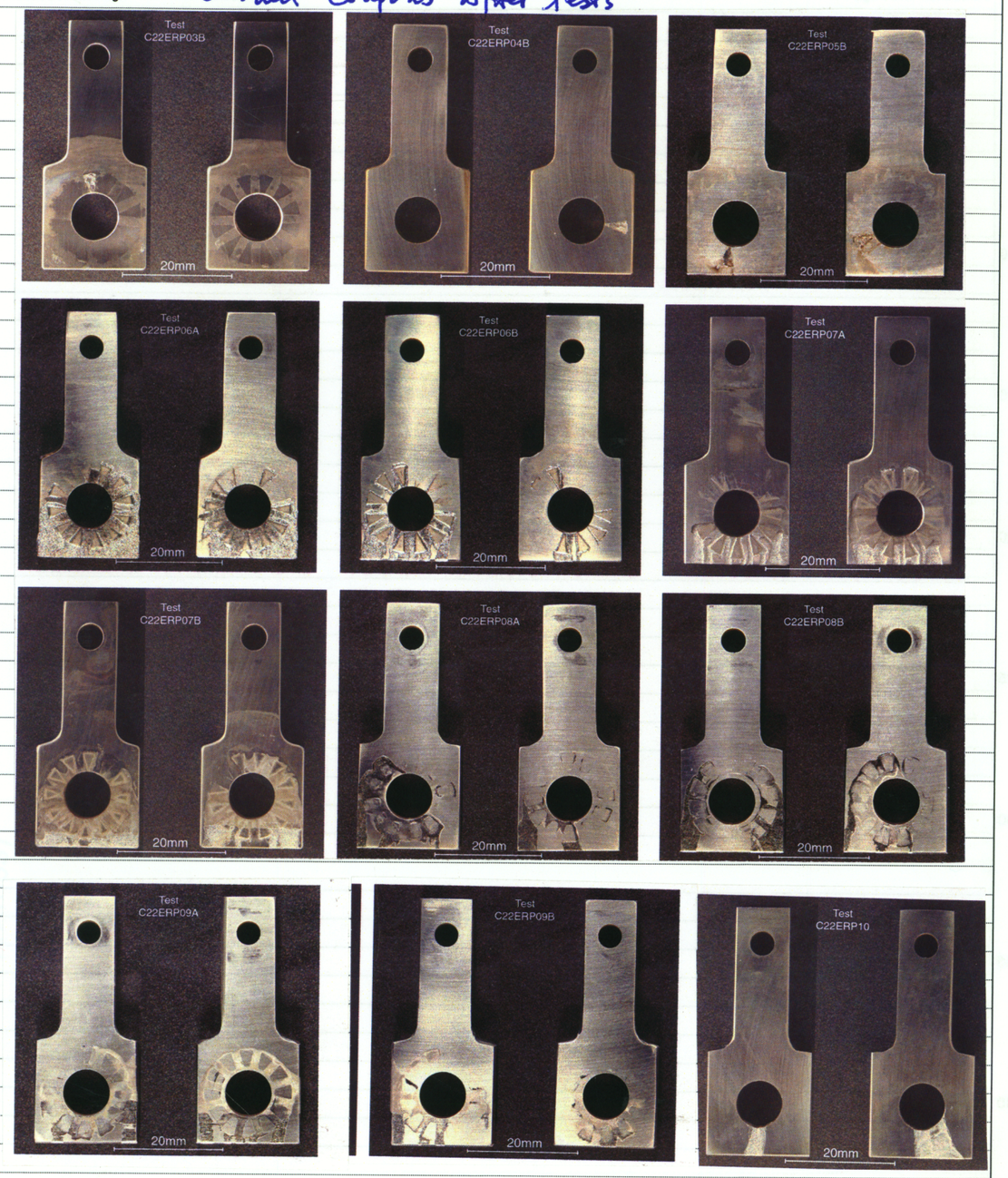
TITLE PROJECT

Continued From Page Corroded Coupons After tests



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