1/16/93 REPASSIVATION POTENTIAL ALLOY 825 RP825P5

SPECIMEN ALLOY 825 600 GRIT FINISH HH 4371FG
l = 1.912" d = 0.251" WET AREA ≅ 8.0 cm²
START WT = 12.00802 g
END WT = 11.53983 g DD 1/28/93
SPECIMEN CLEANED IN DI H_2O, ACETONE,
10% HNO_3 FOR 60 min. RINSED IN DI WATER
SOLUTION 10000 PPM Cl^- 85 PPM HCO_3 20 PPM $SO_4^=$
10 PPM NO_3^- 2 PPM F^- 2000 ml MADE AS FOLLOWS
32.96336 g NaCl LOT 922649A
0.23610 g $NaHCO_3$ LOT 897789
40 ml STOCK SOLUTION # SO4-1/93 (1000 PPM $SO_4^=$)
20 ml STOCK SOLUTION # NO_3-1/93 (1000 PPM NO_3^-)
4 ml STOCK SOLUTION # F-1/93 (1000 PPM F^-)
+ DI WATER TO 2000 ml (SS# INFO P.164)
T = 95°C N_2 THERMO # 1238004 PURGED
WITH 99.999% N_2
START pH: 7.896
END pH: 8.674
POTENTIOSTAT ESC 440-1 CHANNEL #3 DATA
SAVED ON WORKBENCH DATA AS RP825P5.DAT
USING WB\WBB\REPASS2B
ELECTRODE SCE FISHER 13-620-51 SN
E_{CORR} = -582.2 mV SCE KEITHLEY 614
E_{PT} = +161.9 mV SCE " "
CATHODIC STRIP -2.00 V FOR 2 MIN
PIT INITIATION 600 mV SCE FOR 15 min
PIT GROWTH 400 mV SCE FOR 15 min
SPECIMEN STARTED 3:17 pm 1/16/93
SPECIMEN STOPPED 7:17 AM 1/18/93
RUNTIME : 144,000 SEC
REPASSIVATION POTENTIAL: -3.9 mV SCE
CHARGE DENSITY 240 COUL/cm²

Donald S. Dunn 1/18/93

1/16/93 REPASSIVATION POTENTIAL ALLOY 825 RP825P6

SPECIMEN ALLOY 825 600 GRIT FINISH HH 4371FG
l = 1.916 d = 0.249" WET AREA ≅ 8.0 cm²
START WT 11.86695 g
END WT 10.73949 DD 1/28/93
SPECIMEN CLEANED IN DI H_2O, ACETONE
10% HNO_3 FOR 60 min RINSED IN DI H_2O
SOLUTION SAME AS RP825P5 p170
T = 95°C N_2 THERMO # 1238001
PURGED WITH 99.999% N_2
START pH: 7.896
END pH: 8.592
POTENTIOSTAT ESC 440-1 CHANNEL # 2
DATA SAVED AS WB\DATA\RP825P6.DAT
USING WB\WBB\REPASS2B
ELECTRODE SCE FISHER 13-620-51 SN
E_{CORR} = -582.7 mV SCE KEITHLEY 614
E_{PT} = +255.3 mV SCE " "
CATHODIC STRIP -2.00 V FOR 2 min
PIT INITIATION 400 mV FOR 30 min
PIT GROWTH 200 mV FOR 12 HOURS
SPECIMEN STARTED 3:25 pm 1/16/93
SPECIMEN STOPPED 7:20 AM 1/18/93
RUNTIME 143,900 SEC
REPASSIVATION POTENTIAL 9.2 mV SCE
CHARGE DENSITY 620 COUL/cm²

Donald S. Dunn
1/18/93

1/21/93 REPASSIVATION POTENTIAL RP825P7

SPECIMEN ALLOY 825 HN4371FG 600 GRIT FINISH
l = 1.913" d = 0.248" WET AREA = 8.0 cm^2
START WT = ~~11.50~~ DR 1/21/94 11.85058 g
END WT. 11.78631 1/28/93
SPECIMEN CLEANED IN DI N_2O ACETONE
10% HNO_3 FOR 60 min AND RINSED IN DI H_2O
SOLUTION 10,000 PPM Cl^- 85 PPM ~~Cl~~ HCO_3
20 PPM $SO_4^=$ 10 PPM NO_3 2 PPM F^-
2 l OF SOLUTION MADE AS FOLLOWS.
32.95955 g NaCl LOT 922649A
0.23197 g $NaHCO_3$ LOT 897789
40 ml STOCK SOLUTION # SO_4-1/93
20 ml STOCK SOLUTION # NO_3-1/93
1/21/94 ~~2 PPM~~ 4 ml STOCK SOLUTION SS# F-1/93
+ DI WATER TO 2000 ml (SS# P 164)
T = 95°C Hg THERMO 1238001 PURGED
WITH N_2
START pH = 7.918
END pH = 9.003
POTENTIOSTAT ESC 440-1 CHANNEL #3 DATA
SAVED AS WB\DATA\RP825P7.DAT
USING REPASS3B
ELECTRODE FISHER SCE 13-620-51 SN# 0169033
E_{CORR} = -668.1 mV SCE KEITHLEY 614
E_{PT} = +244.0 mV SCE " "
CATHODIC STRIP -2.00 V SCE FOR 2 min
PIT INITIATION +400 mV SCE FOR 10 min
PIT GROWTH +200 mV SCE FOR 10 min
SPECIMEN STARTED 12:22 PM 1/21/93
SPECIMEN STOPPED 2:55 PM 1/22/93
RUNTIME 95,000
REPASSIVATION POTENTIAL + 15.5 mV
CHARGE DENSITY 32 COUL/cm^2
1/22/93

1/21/93 REPASSIVATION POTENTIAL RP825P8

SPECIMEN ALLOY 825 HN 4371FG 600 GRIT FINISH
l = 1.910" d = 0.248" WET AREA = 8.0 cm^2
START WT 11.82733
END WT 11.62899 1/28/93
SPECIMEN CLEANED IN DI H_2O ACETONE
10% HNO_3 FOR 60 min AND RINSED IN DI H_2O
SOLUTION 500 PPM Cl^- 85 PPM NCO_3 20 PPM $SO_4^=$
10 PPM NO_3^- 2 PPM F^- 1000 ml MADE AS FOLLOWS:
0.82424 g NaCl LOT 922649A
0.11580 g $NaHCO_3$ LOT 897789
20 ml STOCK SOLUTION SO_4-1/93
10 ml STOCK SOLUTION NO_3-1/93
2 ml STOCK SOLUTION F-1/93
+ WATER TO 1000 ml (STOCK SOLUTION P 164)
T = 95 °C Hg THERMO # 1238004 PURGED
WITH N_2
START pH 8.195
END pH 9.058
POTENTIOSTAT ESC 440-1 CHANNEL # 2 DATA SAVED
AS WB\DATA\RP825P8.DAT USING REPASS3B.
ELECTRODE FISHER SCE 13-620-51 SN 0165415
E_{CORR} = -658.0 mV SCE KEITHLEY 614
E_{PT} = -221.2 mV SCE " "
CATHODIC STRIP -2.00 V SCE FOR 2 min
PIT INITIATION + 600 mV SCE FOR 30 min
PIT GROWTH + 500 mV SCE FOR 24 hr
SPECIMEN STARTED 12:28 PM 1/21/93
SPECIMEN STOPPED 8:00 AM 1/25/93
RUNTIME 330,000 SEC
REPASSIVATION POTENTIAL + 137.5 mV
CHARGE DENSITY. 110 COUL/cm^2

DATA NOT COLLECTED UNTIL 1/22/93 2:55 PM
≈ 95,000 SEC INTO TEST DUE TO ERROR.
V = 291 mV I = 6.2×10^{-4} AT START OF DATA COLLECTION
1/22/93

1/28/93 REPASSIVATION POTENTIAL RP825P9

SPECIMEN ALLOY 825 HH 4371FG 600 GRIT FINISH
l = 1.915 d = 0.248" WET AREA = 8.0 cm^2
START WT: 11.61027 g
END WT: 11.55039 g
SPECIMEN CLEANED IN DI H_2O ACETONE
10% HNO_3 FOR 60 min AND RINSED IN
DI H_2O
SOLUTION 10000 PPM Cl^- 85 PPM HCO_3 20 PPM $SO_4^=$
10 PPM NO_3 2 PPM F^- 1000 ml MADE AS FOLLOWS
16.48081 g NaCl LOT 922649A (FISHER)
0.11550 g $NaHCO_3$ LOT 897789 (FISHER)
20 ml STOCK SOLUTION # SO_4 - 1/93
10 ml STOCK SOLUTION # NO_3 - 1/93
2 ml STOCK SOLUTION F - 1/93
(STOCK SOLUTIONS P 164)
+ DI WATER TO 1000 ml T = 95°C
N_2 THERMO # 1238001 PURGED WITH N_2
START PH: 8.020
END PH: 9.007 2/1/93
POTENTIOSTAT ESC 440-~~#~~1 CHANNEL 3 DATA SAVED
AS RP825P9.DAT IN WORKBENCH DATA SUB DIR
USING REPASS4F (FAST SCAN = 2 SEC)
ELECTRODE FISHER SCE 13-620-51 SN#
E_{CORR} -544.9 mV SCE KEITHLEY 617
E_{PT} -124.2 mV " "
CATHODIC STRIP -2.00V FOR 2 min
PIT INITIATION 400 mV SCE FOR 10 min
PIT GROWTH 200 mV SCE FOR 50 min
SPECIMEN STARTED 1/28/93 3:35 pm
SPECIMEN STOPPED 1/29/93 5:32 pm
RUNTIME 93260 sec
REPASSIVATION POTENTIAL -3.8 mV
CHARGE DENSITY. 28 COUL/cm^2

1/29/93

1/28/93 REPASSIVATION POTENTIAL RP825P10

SPECIMEN ALLOY 825 HH 4371FG 600 GRIT FINISH
l = 1.913" d = 0.250" WET AREA = 8.0 cm^2
START WT: 11.59955 g
END WT: 11.49354 g
SPECIMEN CLEANED IN DI H_2O ACETONE
10% HNO_3 FOR 60 min AND RINSED IN DI WATER.
SOLUTION. 1000 PPM Cl^- 85 PPM HCO_3^- 20 PPM $SO_4^=$
10 PPM NO_3^- 2 PPM F^- 1000 ml MADE AS FOLLOWS
1.64884 g NaCl LOT 922649A
0.11547 g $NaHCO_3$ LOT 897789
20 ml STOCK SOLUTION SO_4 - 1/93
10 ml STOCK SOLUTION NO_3 - 1/93
2 ml STOCK SOLUTION F - 1/93
(STOCK SOLUTIONS P 164)
+ DI WATER TO 1000 ml T = 95°C
N_2 THERMO 1238004 PURGED WITH N_2
START PH 8.184
END PH 9.250 2/1/93
POTENTIOSTAT ESC 440-1 CHANNEL 2 DATA SAVED
AS WB\DATA\RP825P10.DAT USING
REPASS4F.
ELECTRODE FISHER 13-620-51 SN
E_{CORR} = -557.3 mV KEITHLEY 617
E_{PT} -43.0 mV "
CATHODIC STRIP -2.00 V FOR 2 min
PIT INITIATION 600 mV SCE FOR 30 min
PIT GROWTH 400 mV SCE FOR 12 HOURS.
SPECIMEN STARTED 1/28/93 3:42 PM
SPECIMEN STOPPED 1/29/93 5:32 PM
RUNTIME 92900 sec
REPASSIVATION POTENTIAL -62.8 mV
CHARGE DENSITY. 52 COUL/cm^2

1/29/93

2/2/93

DR 7/27/94

REPASSIVATION POTENTIAL ~~825RPH~~ RP825P11

SPECIMEN ALLOY 825 600 GRIT FINISH NN4371FG
l = 1.915 d = 0.250 WET AREA = 8.0 cm^2
SPECIMEN CLEANED IN DI WATER 10% HNO_3
FOR 60 min RINSED IN DI WATER, ACETONE
AND DRIED
START WT 11.99808 g
END WT 11.86047

SOLUTION 500 PPM Cl^- 85 PPM HCO_3^- 20 PPM $SO_4^=$
10 PPM NO_3^- 2 PPM F^- 1000 ml MADE AS FOLLOWS
0.82416 g NaCl LOT 922649A
0.11677 g $NaHCO_3$ LOT 897789
20 ml STOCK SOLUTION SO_4-1/93
10 ml STOCK SOLUTION NO_3-1/93
2 ml STOCK SOLUTION F-1/93
(STOCK SOLUTIONS P164)
+ DI N_2O TO 1000 ml T=95°C Hg
THERMO # 1238001
START PH 8.163
END PH 9.293

POTENTIOSTAT ESC 440-1 CHANNEL #3 DATA SAVED
AS RP825P11.DAT USING REPASS4F (WORKBENCH)
ELECTRODE FISHER SCE 13-620-51 SN 0165415
E_{CORR} = -447 mV SCE KEITHLEY 617
E_{PT} = -143 mV SCE " "
CATHODIC STRIP -2.00V FOR 2 min
PIT INITIATION +600 mV SCE FOR 30 min
PIT GROWTH +500 mV SCE FOR 12 HR.
SPECIMEN STARTED 12:56 pm 2/2/93
SPECIMEN STOPPED 9:10 AM 2/4/93
RUNTIME 159,000 SEC
REPASSIVATION POTENTIAL -23.56 mV SCE
CHARGE DENSITY. 65 COUL/cm^2

2/4/93

POTENTIOSTATIC POLARIZATION CR825N1

SPECIMEN ALLOY 825 MILL FINISH SURFACE
ON 3.22 cm^2 600 SiC GRIT FINISH
ON 5.11 cm^2 TOTAL WET AREA = 8.33 cm^2
NN4371FC. SPECIMEN CLEANED IN
DI WATER, ACETONE AND DRIED
START WT 23.90918 g
END WT 23.90214 g

SOLUTION 1000 PPM Cl^- 85 PPM HCO_3 20 PPM $SO_4^=$
10 PPM NO_3^- 2 PPM F^- 1000 ml MADE AS FOLLOWS
1.64780 g NaCl LOT 922649A
0.11601 g $NaHCO_3$ LOT 897789
20 ml STOCK SOLUTION SO_4-1/93
10 ml STOCK SOLUTION NO_3-1/93
2 ml STOCK SOLUTION F-1/93
(STOCK SOLUTIONS P164)
+ DI N_2O TO 1000 ml T=95°C
Hg THERMO # 1238004
START PH 8.172
END PH 9.532

POTENTIOSTAT ESC 440-1 CHANNEL #2 DATA
SAVED AS CR825N1.DAT USING REPASS4F
ELECTRODE FISHER SCE 13-620-51 SN 0165403
E_{CORR} -491 mV SCE KEITHLEY 617
E_{PT} -367 mV SCE " "
E_{APP} +197 mV SCE
SPECIMEN STARTED 12:39 pm 2/2/93
SPECIMEN STOPPED 9:30 AM 2/4/93
RUNTIME 161,000
CHARGE DENSITY. 2.4 COUL/cm^2
CURRENT DENSITY 10^{-7} A/cm^2

2/4/93

2/12/93 REPASSIVATION POTENTIAL RP825P12

SPECIMEN ALLOY 825 HN4371FG 600SIC
CLEANED IN ULTRASONIC BATH RINSED
IN DI WATER, ACETONE IMMERSED
IN 10% HNO_3 FOR 60 min & RINSED
IN DI WATER l= 1.912 d= 0.250
START WT 11.88171 g. WET AREA = 8.0 cm^2
END WT 11.83824 g 2/24/93 DD
SOLUTION 500 PPM Cl^- 85 PPM HCO_3 20 PPM $SO_4^=$
10 PPM NO_3^- 2 PPM F^- 1000 ml AS FOLLOWS
0.82412 g NaCl LOT 922649A
0.12003 g $NaHCO_3$ LOT 897789
20 ml STOCK SOLUTION SO_4-2/93
10 ml STOCK SOLUTION NO_3-2/93
2 ml STOCK SOLUTION F-2/93 + DI N_2O TO 1000 ml
STOCK SOLUTIONS P180
T=95°C N_2 THERMO 1238001
N_2 PURGED
START pH 8.165
END pH 9.368
POTENTIOSTAT ESC 440 #1 CHANNEL 3 DATA
SAVED AS RP825P12.DAT USING REPASS 4F
REFERENCE SCE FISHER 13-620-51 SN 0165403
E_{CORR} -743 mV SCE KEITHLEY 614
E_{PT} -574.5 mV SCE " "
CATHODIC STRIP -2.000 V 2 min
PIT INITIATION +600 mV SCE FOR 30 min
PIT GROWTH +500 mV SCE FOR 6 h
SPECIMEN STARTED 3:32 PM 2/12/93
SPECIMEN STOPPED DD 7/27/94 7:38 PM 2/13/93
RUNTIME 100,700 SEC
REPASSIVATION POTENTIAL +0.056 V KEITHLEY 614
CHARGE DENSITY 21 Coul/cm^2

2/13/93

REPASSIVATION POTENTIAL RP825P13

SPECIMEN ALLOY 825 HN4371FG 600SIC
CLEANED AS BEFORE (p178)
l= 1.914 d= 0.250 WET AREA = 8.0 cm^2
START WT. 11.92249 g
END WT. 11.83108 g 2/24/93 DD
SOLUTION 10000 PPM Cl^- 85 PPM HCO_3 20 PPM $SO_4^=$
10 PPM NO_3^- 2 PPM F^- 1000 ml MADE AS FOLLOWS
16.48015 g NaCl LOT 922649A
0.11863 g $NaHCO_3$ LOT 897789
20 ml STOCK SOLUTION SO_4-2/93
10 ml STOCK SOLUTION NO_3-2/93
2 ml STOCK SOLUTION F-2/93
+ DI H_2O TO 1000 ml STOCK SOLUTIONS
P180 T= 95°C N_2 THERMO 1238004
N_2 PURGED
START pH 8.032
END pH ~~9.368~~ DD (2/16/93) 8.973
POTENTIOSTAT ESC 440 #1 CHANNEL #2 DATA
SAVED AS RP825P13.DAT USING REPASS 4F.
REFERENCE SCE FISHER 13-620-51 SN 0169033
E_{CORR} -506.2 mV SCE KEITHLEY 614
E_{PT} ~~-268 mV SCE~~ DD 7/27/94 -268 mV_{SCE}
CATHODIC STRIP -2.00 V SCE FOR 2 min
PIT INITIATION +400 mV SCE FOR 10 min
PIT GROWTH +200 mV SCE FOR 110 min
SPECIMEN STARTED 330 pm 2/12/93
SPECIMEN STOPPED 7:39 pm 2/13/93
RUNTIME 101,000 SEC
REPASSIVATION POTENTIAL -20 mV KEITHLEY 614
CHARGE DENSITY: 44 Coul/cm^2

2/13/93

2/16/93 STOCK SOLUTIONS

SO4-2/93 1000 PPM $SO_4^=$ AS Na_2SO_4
1.47850 g Na_2SO_4 LOT 901213
+ DI WATER TO 1000 ml
2/3/93 EXP 3/3/93

NO_3-2/93 1000 PPM NO_3^- AS $NaNO_3$
1.37169 g $NaNO_3$ LOT 897183
+ DI WATER TO 1000 ml
2/3/93 EXP 3/3/93

F-2/93 1000 PPM F^- AS NaF
2.21231 g NaF LOT 896405
+ DI WATER TO 1000 ml
2/3/93 EXP 3/3/93

1M NaCl STOCK SOLUTION 1M Cl-2/93
58.44135 g NaCl LOT 922649A
+ DI WATER TO 1000 ml
2/10/93 EXP 3/10/93

1000 Cl-2/93 1000 PPM Cl^- AS NaCl
3.29594 g NaCl LOT 922649
+ DI WATER TO 2000 ml
2/10/93 EXP 3/10/93

100 Cl-2/93 100 PPM Cl^- AS NaCl
100 ml STOCK SOLUTION 1000 Cl-2/93
+ 900 ml DI WATER
2/10/93 EXP 3/10/93

2/16/93 REPASSIVATION POTENTIAL RP825P14

SPECIMEN ALLOY 825 HH4371FG 600SiC
FINISH CLEANED IN ULTRASONIC BATH
DI WATER, ACETONE AND DRIED
l = 1.913" d = 0.248" WET AREA ≈ 8.0 cm^2
START WT 11.78402 g
END WT 11.74881 g 2/24/93
SOLUTION 1000 PPM Cl^- 85 PPM HCO_3 20 PPM $SO_4^=$
10 PPM NO_3^- 2 PPM F^- 1000 ml AS FOLLOWS
1.64867 g NaCl LOT 922649A
0.12077 g $NaHCO_3$ LOT 897789
20 ml STOCK SOLUTION SO4-2/93
10 ml STOCK SOLUTION NO_3-2/93
2 ml STOCK SOLUTION F-2/93
+ DI WATER TO 1000 ml
STOCK SOLUTIONS P180
T = 95°C Hg THERMO 0323004
CALIBRATED 2 FEB 93
N_2 PURGED
POTENTIOSTAT ESC 440-1 CHANNEL #2 DATA
SAVED AS RP825P14.DAT USING
REPASS4F. (WORKBENCH)
REFERENCE FISHER SCE 13-620-51 SN
E_{CORR} -606 mV REFINDEX 614
E_{PT} -51 mV " "
CATHODIC STRIP -2.000 FOR 2m
PIT INITIATION 600 mV SCE FOR 30m
PIT GROWTH 400 mV SCE FOR
SPECIMEN STARTED 2/16/93 4:00 PM
SPECIMEN STOPPED 2/18/93 4:40 PM
RUNTIME 174,000 SEC
REPASSIVATION POTENTIAL +70 mV SCE
CHARGE DENSITY 12+
SOLUTION START PH 8.110
END PH 9.195 E_{CORR} END -450 mV
2/18/93 E_{PT} END -219 mV

2/16/93 RP825 P15 REPASSIVATION POTENTIAL ALLOY 825

SPECIMEN : PREPARED AS RP825P14 P181 (ALLOY 825) –
l = 1.914 d = 0.248" WET AREA = 8.0 cm²
START WT 12.00023 g HEAT # HN4371FG
END WT 11.76128 g 2/24/93 DD
SOLUTION 1000 PPM Cl⁻ 85 PPM HCO_3 20 PPM $SO_4^{=}$
10 PPM NO_3^- 2 PPM F⁻ 1000 ml AS FOLLOWS
1.65071 g NaCl LOT 922649A
0.11826 g $NaHCO_3$ LOT 897789
20 ml STOCK SOLUTION SO_4-2/93
10 ml STOCK SOLUTION NO_3-2/93
2 ml STOCK SOLUTION F-2/93
+ DI WATER TO 1000 ml
STOCK SOLUTIONS P180
START pH 8.160
END pH 8.957
T = 95°C N_2 THERMO 1238004
N_2 PURGED
POTENTIOSTAT ESC 440-1 CHANNEL #3 DATA
SAVED AS RP825P15.DAT USING REPASS4F
ON WORKBENCH
REFERENCE SCE FISHER 13-620-51 SN
E_{CORR} – ~~606 mV~~ DD 7/27/94 -488 mV KEITHLEY 614
E_{pt} – ~~51 mV~~ DD 7/27/94 -40.0 mV " "
CATHODIC STRIP -2.00 V FOR 2 min
PIT INITIATION 600 mV SCE FOR 30 min
PIT GROWTH 400 mV SCE FOR
SPECIMEN STARTED 2/16/93 4:00 PM
SPECIMEN STOPPED 2/18/93 4:40 PM
RUNTIME 174,000 SEC
REPASSIVATION POTENTIAL -95 mV
CHARGE DENSITY 110 COUL/cm²

DD 2/18/93

2/16/93 RP825 P16 REPASSIVATION POTENTIAL ALLOY 825

SPECIMEN : PREPARED THE SAME AS RP825P14
P181 ALLOY 825 NN 4371FG
l = 1.914 d = 0.250 WET AREA 8.0 cm²
START WT 12.00977 g
END WT 11.11817 g 2/24/93 DD
SOLUTION 1000 PPM Cl⁻ 85 PPM HCO_3 20 PPM SO_4
10 PPM NO_3 2 PPM F 1000 ml AS FOLLOWS
1.64954 g NaCl LOT 922649A
0.11661 g $NaHCO_3$ LOT 897789
20 ml STOCK SOLUTION SO_4-2/93
10 ml STOCK SOLUTION NO_3-2/93
2 ml STOCK SOLUTION F-2/93
+ DI WATER TO 1000 ml
STOCK SOLUTIONS P180
START PH 8.169
END PH 8.998
T = 95°C N_2 THERMO 1238001
N_2 PURGED
POTENTIOSTAT ESC 440-1 CHANNEL #4 DATA
SAVED AS RP825P16.DAT USING
REPASS4F (WORKBENCH)
REFERENCE SCE FISHER 13-620-51 SN
E_{CORR} -696 mV KEITHLEY 614
E_{pt} -253 mV " "
CATHODIC STRIP -2.00 V FOR 2 min
PIT INITIATION 600 mV SCE FOR 30 min
PIT GROWTH 400 mV SCE FOR
SPECIMEN STARTED 2/16/93 4:00 PM
SPECIMEN STOPPED 2/18/93 4:40 PM
RUNTIME 174,000 SEC
REPASSIVATION POTENTIAL -110 mV SCE
CHARGE DENSITY 430 COUL/cm²

DD 2/18/93

2/22/93 CREVICE CORROSION EXPT 825-8.

SPECIMEN ALLOY 825 HH4371FG 600 SIC CLEANED IN ULTRASONIC BATH RINSED IN DI WATER ACETONE AND DRIED
l = 2.493" W = 0.498" T = 0.121"
AREA = 20.68 cm²
START WT 23.69590 g
END WT 23.47191 g

SOLUTION 0.5m NaCl 85 PPM HCO_3 20 PPM SO_4^- 10 PPM NO_3^- 2 PPM F^- AS FOLLOWS.
29.22437 g NaCl LOT 922649A
0.12450 g $NaHCO_3$ LOT 897789
20 ml STOCK SOLUTION SO_4 - 2/93
10 ml STOCK SOLUTION NO_3 - 2/93
2 ml STOCK SOLUTION F - 2/93
+ DI WATER TO 1000 ml
STOCK SOLUTIONS P180
START PH 7.831
END PH 7.625

SETUP: CELL SAME AS 827-7 P167 WITH PLEXIGLASS CELL WITH TWO PORTS

PORT #1 AT TIP
MI200 ISE (FLEXABLE) #44436 } Cl TIP
MI403 REF Ag/AgCl #43647
MI506 GLASS PH #44060 } ~~Cl~~ pH TIP
MI402 Ag/AgCl REF #41402
TIP REFERENCE = Ag/AgCl #44671

PORT #2 AT MOUTH
MI200 Cl ISE (FLEXABLE) #44431 } Cl MOUTH
MI403 REF Ag/AgCl #43636
MI506 GLASS PH #43720 } ~~pH~~ MOUTH
MI402 Ag/AgCl REF #41436
MOUTH REF Ag/AgCl #44629

2/22/93 CREVICE CORROSION EXPT 825-8

BULK ELECTRODES
MI200 (RIGID) #42978 } Cl BULK
MI 403 (Ag/AgCl) #44628
MI 506 GLASS PH #44817 } PH BULK
MI 402 Ag/AgCl REF #41432
+ FISHER 13-620-53 SN 8118182

Cl TIP TO ORION EA920 S001A & ABB S6120 #1 CHART REC.
Cl BULK TO ORION ~~720~~ A720A CH 2 SN 5885 QD 7/27/94
Cl MOUTH TO ORION 720A CH 1 & ABB S6120 CHART #2

PH TIP TO ORION EA940 SN 2330 AND ABB120 #1 CHART
PH BULK TO ORION 720A CH 2 SN 003368
PH MOUTH TO ORION 720A 003368 CH1 AND ABB S6120 # 2

Pt COUNTER ELECTRODE IN SEPARATE COMPARTMENT.

ELECTRODE CALIBRATIONS
PH TIP
mV = -57.787 (PH) + 408.33
PH = ~~-0.0173~~ QD 7/27/94 PH = -17.3(V) + 7.066
PH MOUTH
mV = -57.55 (PH) + 406.7
PH = -17.4 (V) + 7.067
PH BULK
mV = -57.083 (PH) + 380.93
PH = -17.5 (V) + 6.673
Cl TIP
mV = -22.97 * ln (PPM Cl⁻) + 269.60
PPM Cl⁻ = EXP [-0.0435 mV + 11.739]
Cl MOUTH
mV = -23.60 * ln (PPM Cl⁻) + 274.95
PPM Cl⁻ = EXP [-0.0424 mV + 11.649]
Cl BULK
mV = -21.21 * ln (PPM Cl⁻) + 257.28
PPM Cl⁻ = EXP [-0.0471 mV + 12.129]

2/22/93 CREVICE CORROSION 825-8

CELL ASSEMBLED 2/18/93 TORQUED TO 20IN/OZ
AND MONITORED FROM 2/20/93
AT 11:00 AM 2/22/93
Cl TIP 24.2mV
Cl MOUTH 28.3mV
Cl BULK 47.7mV
pH TIP -53.5mV
pH MOUTH -43.7mV
pH BULK -78.8mV
READINGS STABLE
$E_{SPECIMEN} = E_{OC}$ 0.018 V Ag/AgCl
$E_{CREVICE\ TIP}$ = 0.016 V "
E_{CMOUTH} = 0.015 V "
2/22/93

11:43 AM SPECIMEN POLARIZED TO +200mV
2/26/93 10:42 AM READINGS CONSTANT SINCE SHORTLY
AFTER POLARIZATION TO 200mV, Cl CONC STABLE
PH STABLE SO INCREASE ~~#6~~ OD 11/27/94 TO + 250mV Ag/AgCl
2/26/93

3/1/93 10:13 AM Cl CONC AND PH UNCHANGED SINCE
POLARIZATION TO 250mV Ag/AgCl SPECIMEN
INCREASED TO 300mV Ag/AgCl
3/1/93

3/15/93 FOLLOWING INCREASE TO 600mV TO INITIATE
CREVICE CORROSION AND REPASSIVATION AT
0mV SPECIMEN WAS STOPPED
3/15/93

pH AND Cl⁻ ISE CALIBRATION DATA SAVED AS
825CAL.DAT ON IWAK 02S-DISK

2/24/93 REPASSIVATION POTENTIAL RP825P17

SPECIMEN ALLOY 825 NN 4371FG 600SIC CLEANED
IN ULTRASONIC BATH RINSED IN DI
WATER, ACETONE THEN CLEANED IN 10%
HNO_3 FOR 1hr l = 1.914 d = 0.249
START WT 11.97488g
END WT 11.93115g
SOLUTION 1000 PPM Cl^- 85PPM HCO_3 20PPM $SO_4^=$
10PPM NO_3^- 2PPM F^- 1000ml AS FOLLOWS
1.64894 g NaCl LOT 922649A
0.11837 g $NaHCO_3$ LOT 897789
20ml STOCK SOLUTION SO_4-2/93
10ml STOCK SOLUTION NO_3-2/93
2ml STOCK SOLUTION F-2/93
+ DI WATER TO 1000ml STOCK
SOLUTIONS P 180, T=95°C, H_2
THERMO 1238001, N_2 PURGED
START PH 8.104
END PH 9.390
POTENTIOSTAT ESC440-1 CHANNEL # 2 DATA
SAVED AS RP825P17.DAT USING WORKBENCH
BRASS 4F.
REFERENCE SCE FISHER 13-620-51 SN 0169033
E_{CORR} -768 mV KEITHLEY 617
E_{PT} -167 mV " "
CATHODIC STRIP -2.00V FOR 10 min
PIT INITIATION 600mV 10 min
PIT GROWTH 400mV
SPECIMEN STARTED 4:00 PM 2/24/93
SPECIMEN STOPPED 7:28 AM 2/25/93
RUNTIME 55,608 SEC
REPASSIVATION POTENTIAL -70 mV
CHARGE DENSITY 21 COUL/cm²
2/25/93

2/24/93 REPASSIVATION POTENTIAL RP825P18

SPECIMEN: ALLOY 825 NN4371FC PREPARED
TNG SAME AS RP825P17 P 187
l = 1.913 d = 0.230 WET AREA ≈ 8.0 cm^2
START WT 12.00254 g
END WT 11.99713 g
SOLUTION 1000 PPM Cl^- 85 PPM HCO_3 20 PPM $SO_4^=$
10 PPM NO_3^- 2 PPM F^- 1000 ml AS FOLLOWS
1.64855 g NaCl LOT 922649A
0.11889 g $NaHCO_3$ LOT 897789
20 ml STOCK SOLUTION SO_4-2/93
10 ml STOCK SOLUTION NO_3-2/93
2 ml STOCK SOLUTION F-2/93
+ DI WATER TO 1000 ml STOCK
SOLUTIONS P180 T = 95°C Hg THERMO
1238004 N_2 PURGED
START PH 8.183
END PH 9.376
POTENTIOSTAT ESC 440-1 CHANNEL # 3
DATA SAVED AS RP825P18.DAT USING
REPASS4F
REFERENCE SCE FISHER SCE 13-620-51 SN 0165403
E_{CORR} -753 mV KEITHLEY 617
E_{PT} -218 mV " "
CATHODIC STRIP -2.00 V FOR 2 min
PIT INITIATION 600 mV FOR 5 min
PIT GROWTH 400 mV
SPECIMEN STARTED 4:05 PM 2/24/93
SPECIMEN STOPPED 7:26 AM 2/25/93
RUNTIME 55,000 SEC
REPASSIVATION POTENTIAL 276 mV
CHARGE DENSITY 2.4 COUL/cm^2

[signature] 2/28/93

2/24/93 REPASSIVATION POTENTIAL RP825P19

SPECIMEN ALLOY 825 NN4371FG PREPARED TNG
SAME AS RP825P17 P187
l = 1.915 d = 0.249 WET AREA ≈ 8.0 cm^2
START WT 11.96909 g
END WT 11.94859 g
SOLUTION 500 PPM Cl^- 85 PPM NCO_3 20 PPM $SO_4^=$
10 PPM NO_3^- 2 PPM F^- 1000 ml AS FOLLOWS
0.82542 g NaCl LOT 922649A
0.11877 g $NaHCO_3$ LOT 897789
20 ml STOCK SOLUTION SO_4-2/93
10 ml STOCK SOLUTION NO_3-2/93
2 ml STOCK SOLUTION F-2/93 + DI WATER 10
1000 ml. STOCK SOLUTIONS P180 T = 95°C Hg THERMO
0323004 N_2 PURGED
START PH 8.223
END PH 9.401
POTENTIOSTAT ESC 440-1 CHANNEL # 4 DATA SAVED
AS ~~REPAS~~ RP825P19.DAT USING REPASS4F
REFERENCE SCE FISHER 13620-51 SN 8211163
E_{CORR} -747 mV KEITHLEY 617
E_{PT} -130 mV
CATHODIC STRIP -2.00V FOR 2 min
PIT INITIATION 600 mV FOR 30 min
PIT GROWTH 500 mV FOR 60 min
SPECIMEN STARTED 4:15 PM 2/24/93
SPECIMEN STOPPED 7:24 AM 2/25/93
RUNTIME 54,000 SEC
REPASSIVATION POTENTIAL 147 mV
CHARGE DENSITY 10 COUL/cm^2

[signature] 2/28/93

2/26/93 REPASSIVATION POTENTIAL RP825 P20

SPECIMEN ALLOY 825 HN4371FG 600 S.C PREPARED
TAG SAME AS RP825P17 P187
ℓ = 1.912" d = 0.24A" WET AREA = 8.0 cm²
START WT 11.97213 g
END WT 11.42693 g
SOLUTION 10000 PPM Cl⁻ 85 PPM HCO_3^- 20 PPM $SO_4^=$
10 PPM NO_3^- 2 PPM F⁻ 1000 ml AS FOLLOWS
16.48078 g NaCl LOT 922649A
0.11858 g $NaHCO_3$ LOT 897789
20 ml STOCK SOLUTION SO_4-2/93
10 ml STOCK SOLUTION NO_3-2/93
2 ml STOCK SOLUTION F-2/93
+ DI WATER TO 1000 ml STOCK
SOLUTIONS P 180 T = 95°C
N_2 TNERMO # 0323004 N_2 PURGED
POTENTIOSTAT ESC 440-1 CHANNEL #2 DATA
SAVED AS RP825P20.DAT USING
WORKBENCH REPASS4F.
REFERENCE SCE FISHER 13-620-51 SN 8211163
START PH 7.904
END PH 9.013
ECORR -703 4/22/94
EPT ~~+52~~ DD + 426 mV
CATHODIC STRIP -2.00V FOR 2m
PIT INITIATION 400mV FOR 10m
PIT GROWTH 200mV FOR 10 h
SPECIMEN STARTED 4:40 PM 2/26/93
SPECIMEN STOPPED 3:30 PM 2/28/93
RUNTIME 167000 SEC
REPASSIVATION POTENTIAL -140 mV
CHARGE DENSITY 260 COUL/cm²

[signature] 3/1/93

2/26/93 REPASSIVATION POTENTIAL RP825P21

SPECIMEN ALLOY 825 HN4371FG 600 S.C PREPARED
TAG SAME AS RP825P17 P187
ℓ = 1.915" d = 0.24A WET AREA = 8.0 cm²
START WT 11.90749 g
END WT 11.89366 g
SOLUTION 10000 PPM Cl⁻ 85 PPM HCO_3 20 PPM $SO_4^=$
10 PPM NO_3^- 2 PPM F⁻ 1000 ml AS FOLLOWS
16.48238 g NaCl LOT 922649A
0.11895 g Na_2CO_3 LOT 897789
20 ml STOCK SOLUTION SO_4-2/93
10 ml STOCK SOLUTION NO_3-2/93
2 ml STOCK SOLUTION F-2/93
+ DI WATER TO 1000 ml STOCK
SOLUTIONS P180 T = 95°C
H_2 TNERMO 1238004 N_2 PURGED
POTENTIOSTAT ESE 440-1 CHANNEL #3 DATA
SAVED AS RP825P21.DAT USING
WORKBENCH REPASS4F.
REFERENCE SCE FISHER 13-620-51 SN 0169033
START PH 8.047
END PH ~~+8 mV~~ DD 8.937 7/27/94
E_{CORR} -688 mV
E_{PT} +8 mV
CATHODIC STRIP -2.00V FOR 2m
PIT INITIATION ~~5~~ 400mV FOR 5m
PIT GROWTH 200mV FOR 30m
SPECIMEN STARTED 4:35 PM 2/26/93
SPECIMEN STOPPED 3:16 PM 2/28/93
RUNTIME 168,000 SEC
REPASSIVATION POTENTIAL +86 mV
CHARGE DENSITY 6.1 COUL/cm²

[signature] 3/1/93

2/26/93 REPASSIVATION POTENTIAL RP825P22

SPECIMEN ALLOY 825 HN4371FG 600 SiC PREPARED
AS RP825P17 P 187
d = 1.915 d = 0.247 WET AREA ≈ 8.0 cm²
START WT 11.79403
END WT 11.36997 g
SOLUTION 500 ppm Cl⁻ 85 ppm NCO_3 20 ppm $SO_4^=$
10 ppm NO_3^- 2 ppm F⁻ 1000 ml AS FOLLOWS
0.82677 g NaCl LOT 922649A
0.11899 g Na_2NCO_3 LOT 897789
20 ml STOCK SOLUTION SO_4 - 2/93
10 ml STOCK SOLUTION NO_3 - 2/93
2 ml STOCK SOLUTION F - 2/93
+ DI WATER TO 1000 ml STOCK
SOLUTIONS P 180 T = 95°C
N₂ TNGRMD 1238001 N_2 PURGED
POTENTIOSTAT ESC 440-1 CHANNEL 4 DATA
SAVED AS RP825P22.DAT USING WORKBENCH
REPASS4F. DD 2/27/94
REFERENCE SCE FISHER ~~137~~ 13-620-51 SN 0165403
START PH 8.247
END PH 9.160
E_{CORR} -762 mV
E_{PT} -20.9
CATHODIC STRIP -2.00V FOR 2 hr
PIT INITIATION 600 mV
PIT GROWTH 500 mV
SPECIMEN STARTED 4:20 PM 2/26/93
SPECIMEN STOPPED 3:35 PM 2/28/93
RUNTIME 169000 SEC
REPASSIVATION POTENTIAL -61 mV
CHARGE DENSITY 210 COUL/cm²

3/1/93

3/4/93 POTENTIOSTATIC POLARIZATION CR825N2

SPECIMEN ALLOY 825 MILL FINISHED SURFACES
HN4371FG SAME AS CR825N1 P177
START WT 23.78584 g
END WT 23.53047 g
SOLUTION 1000 ppm Cl⁻ 85 ppm NCO_3 20 ppm $SO_4^=$
10 ppm NO_3 2 ppm F⁻ 1000 ml AS FOLLOWS
1.64893 g NaCl LOT 922649A
0.12054 g Na_2NCO_3 LOT 897789
20 ml STOCK SOLUTION SO_4 - 3/93
10 ml STOCK SOLUTION NO_3 - 3/93
2 ml STOCK SOLUTION F - 3/93
+ DI WATER TO 1000 ml STOCK
SOLUTIONS P ~~196~~ 199 DD 7/27/94 T = 95°C
N₂ TNGRMD 1238004 N_2 PURGED
START PH 8.244
END PH 9.021
POTENTIOSTAT ESC 440-1 CHANNEL #2 DATA
SAVED AS CR825N2.DAT USING REPASS4F
REFERENCE SCE FISHER 13-620-51 SN 0165403
E_{CORR} -548 mV
E_{PT} +523 mV
E_{APP} +300 mV FOR 336500 SEC.
SPECIMEN STARTED 5:00 PM 3/3/93
SPECIMEN STOPPED 10:43 PM 3/7/93
RUNTIME 366,000 SEC
REPASSIVATION POTENTIAL -71 mV
CHARGE DENSITY 120 COUL/cm²

OPEN CIRCUIT POTENTIALS AT END OF TEST
E_{CORR} -288 mV
E_{PT} -378 mV

DD 7/27/94
WEIGHT LOSS = ~~23.0553~~ 0.25537 g
SPECIMEN PITTED ON ~~OR~~ DEPLETED SURFACES

3/8/93

3/4/93 POTENTIOSTATIC POLARIZATION CR825N3

SPECIMEN ALLOY 825 HW4371FG MILL FINISHED
SURFACES SAME AS CR825N1 P177
START WT 23.92592g
END WT 23.69552g
SOLUTION 1000 PPM Cl^- 85 PPM HCO_3 20 PPM $SO_4^=$
10 PPM NO_3^- 2 PPM F^- DI 1000 ml AS FOLLOWS
1.64431g NaCl LOT ~~922649A~~ 922649A
0.12093g $NaHCO_3$ LOT 897789
20ml STOCK SOLUTION SO_4-3/93
10ml STOCK SOLUTION NO_3-3/93
2ml STOCK SOLUTION F-3/93
+ DI WATER TO 1000 ml STOCK
SOLUTIONS P ~~196~~ 199 T=95°C N_2 TNGRMD
0323006 N_2 PURGED
START PH 8.203
END PH 9.122
POTENTIOSTAT ESC440-1 CHANNEL #3 DATA
SAVED AS CR825N3.DAT USING REPASS4F
REFERENCE SCE FISHER 13-620-51 SN 8211163
E_{CORR} -535mV
E_{PT} +354 mV
E_{APP} +375 mV FOR 140,000 SEC
SPECIMEN STARTED 5:05 pm 3/3/93
SPECIMEN STOPPED
RUNTIME 160,000 SEC
REPASSIVATION POTENTIAL -38mV SCE
CHARGE DENSITY 110 COUL/CM²

REST POTENTIAL AT END OF TEST
E_{CORR} -292 mV
E_{PT} -541 mV
SPECIMEN PITTED ON Cr DEPLETED SURFACES
WEIGHT LOSS 0.23040g

3/8/93

3/4/93 POTENTIOSTATIC POLARIZATION CR825N4

SPECIMEN ALLOY 825 HW4371FG MILL FINISHED
SURFACES SAME AS CR825N1 P177
START WT 23.89772g
END WT 23.67289
SOLUTION 1000 PPM Cl^- 85 PPM HCO_3 20 PPM $SO_4^=$
10 PPM NO_3^- 2 PPM F^- 1000 ml AS FOLLOWS
1.64456g NaCl LOT 922649A
0.12070g $NaHCO_3$ LOT 897789
20ml STOCK SOLUTION SO_4-3/93
10 ml STOCK SOLUTION NO_3-3/93
2 ml STOCK SOLUTION F-3/93
+ DI WATER TO 1000 ml STOCK
SOLUTIONS P ~~196~~ 199 T=95°C N_2 TNGRMD
1238001 N_2 PURGED
START PH 8.135
END PH 9.218
POTENTIOSTAT ESC440-1 CHANNEL 4 DATA
SAVED AS CR825N4.DAT USING REPASS4F
REFERENCE SCE FISHER 13-620-51 SN 0169033
E_{CORR} -515mV
E_{PT} +47mV
E_{APP} +450mV SCE FOR 20 hr
SPECIMEN STARTED 5:10 pm 3/3/93
SPECIMEN STOPPED 5:00 pm 3/4/93
RUNTIME 85,700 SEC
REPASSIVATION POTENTIAL +39mV
CHARGE DENSITY 110 COUL/CM²

WEIGHT LOSS = 0.22483g
SPECIMEN PITTED ON Cr DEPLETED SURFACES.

3/8/93

3/9/93 REPASSIVATION POTENTIAL RP825 P23

SPECIMEN ALLOY 825 HN4371FG 600 SiC
THERMALLY TREATED AT 300 °C FOR 30 DAYS
l = 1.912 d = 0.250 WET AREA = 8.0 cm²
START WT 11.99760 g
AFTER 30 DAYS 11.99756 g
END WT 11.97257
SOLUTION 1000 PPM Cl⁻ 85 PPM NCO_3 20 PPM $SO_4^=$
10 PPM NO_3^- 2 PPM F^- 1000 ml AS FOLLOWS
1.64923 g NaCl LOT 922649A
0.12055 g $NaNCO_3$ LOT 897789
20 ml STOCK SOLUTION SO_4 - 3/93
10 ml STOCK SOLUTION NO_3 - 3/93
2 ml STOCK SOLUTION F - 3/93
+ DI WATER TO 1000 ml
STOCK SOLUTIONS P ~~196~~ 199
T = 95 °C N_2 THERMO
N_2 PURGED
START pH 8.216
END pH 9.373
POTENTIOSTAT ESC 440 #1 CHANNEL # 2 DATA
SAVED AS RP825P23.DAT USING REPASS4F.
REFERENCE SCE FISHER 13/620/51 SN 0169033
E_{CORR} - 166 mV KEITHLEY 614
E_{pr} +143 mV " "
CATHODIC STRIP -2.00 V FOR 2 min
PIT INITIATION 600 mV FOR 30 min
PIT GROWTH ~~+143 mV~~ NO 7/21/94 400 mV FOR 90 min
SPECIMEN STARTED 5:33 PM 3/9/93
SPECIMEN STOPPED 5:43 PM 3/10/93
RUNTIME 87,000 SEC
REPASSIVATION POTENTIAL 119 mV SCE KEITHLEY 614
CHARGE DENSITY 12 COUL/cm²
WEIGHT LOSS. 0.00004 g

Donald Du 3/10/93

3/9/93 REPASSIVATION POTENTIAL RP825P24

SPECIMEN ALLOY 825 HN4371FG 600 SiC
THERMALLY TREATED AT 300 °C FOR 30 DAYS
l = 1.913 d = 0.244 WET AREA = 8.0 cm²
START WT 11.70453
AFTER 30 DAYS 11.70442 g
END WT NOT RECORDED
SOLUTION 1000 PPM Cl⁻ 85 PPM NCO_3 20 PPM SO_4
10 PPM NO_3^- 2 PPM F^- 1000 ml AS FOLLOWS
1.64897 g NaCl LOT 922649A
0.12021 g $NaNCO_3$ LOT 897789
20 ml SO_4 - 3/93
10 ml NO_3 - 3/93
2 ml F - 3/93
STOCK SOLUTIONS P 199
T = 95 °C N_2 THERMO
N_2 PURGED
START pH 8.214
END pH 9.315
POTENTIOSTAT ESC 440 # 1 CHANNEL # 3 DATA
SAVED AS RP825P24.DAT USING REPASS4F
REFERENCE SCE FISHER 13-620-51 SN 8211163
E_{CORR} -196 mV KEITHLEY 614
E_{pr} +34 mV " "
CATHODIC STRIP -2.00 V FOR 2 min
PIT INITIATION 600 mV FOR 30 min
PIT GROWTH 400 mV FOR 14 h
SPECIMEN STARTED 5:42 PM 3/9/93
SPECIMEN STOPPED 5:45 PM 3/10/93
RUNTIME 87,000 SEC
REPASSIVATION POTENTIAL -65 mV SCE
CHARGE DENSITY 60 COUL/cm²
WEIGHT LOSS NOT RECORDED

Donald Du 3/10/93

3/9/93 REPASSIVATION POTENTIAL - RP825P25

SPECIMEN ALLOY P25 HN4371FG 600 S.C
THERMALLY TREATED AT 100°C FOR 30 DAYS.
l = 1.913 d = 0.251 WET AREA = 8.0 cm²
START WT 11.96336 AFTER 30 DAYS 11.96326g
END WT 11.69107g
SOLUTION 1000 PPM Cl⁻ 85 PPM NCO_3 20 PPM $SO_4^=$
10 PPM NO_3^- 2 PPM F⁻ 1000 ml AS FOLLOWS
1.64952 g NaCl LOT 922649A
0.12124g $NaHCO_3$ LOT 897789
20 ml SO_4 - 3/93
10 ml NO_3 - 3/93
2 ml F - 3/93
(STOCK SOLUTIONS P 199) + WATER
TO 1000 ml T = 95°C N_2 THERMO
N_2 PURGED
START PN 8.250
END PN 9.189
POTENTIOSTAT ESC 440-1 CHANNEL #4 DATA
SAVED AS RP825P25.DAT USING REPASS 4F
REFERENCE SCE FISHER 13-620-51 SN 0165403
E_{CORR} -518 mV KEITHLEY 614
E_{PT} +200 mV " "
CATHODIC STRIP -2.00 V FOR 2m
PIT INITIATION 600mV FOR 30min
PIT GROWTH 400mV
SPECIMEN STARTED 5:48 PM 3/9/93
SPECIMEN STOPPED 5:46 PM 3/10/93
RUNTIME 86,000 SEC DD 7/27/94
REPASSIVATION POTENTIAL ~~-91 mV~~ -91 mV
CHARGE DENSITY 130 COUL/cm²
WEIGHT LOSS 0.27229g

[signature] 3/10/93

3/4/93 STOCK SOLUTIONS

SO_4 - 3/93
1000 PPM SO_4 AS Na_2SO_4
1.48310 g Na_2SO_4 LOT 901213
+ DI WATER TO 1000 ml

NO_3 - 3/93
1000 PPM NO_3 AS $NaNO_3$
1.37156 g $NaNO_3$ LOT 897183
+ DI WATER TO 1000 ml

F - 3/93 DD 7/27/94
1000 ~~ppm~~ PPM F⁻ AS NaF
2.21213 g NaF LOT 896405
+ DI WATER TO 1000 ml

[signature] 3/9/93

3/19/93 REPASSIVATION POTENTIAL RP825P26

SPECIMEN ALLOY 825 HN4371FG 600S.C
THERMALLY TREATED AT 100 °C 30 DAYS
l = ~~2.48~~ 1.914" d = ~~1.914~~ 0.248" 7HG PH WET AREA 8.0 Cm²
START WT 11.81330 g
AFTER THERMAL TREATMENT 11.81332 g
END WT 11.79855 g
SOLUTION 1000 PPM Cl⁻ 85 PPM HCO_3 20 PPM $SO_4^=$
10 PPM NO_3 2 PPM F⁻ 1000 ml AS FOLLOWS
1.64924 g NaCl LOT 922649A
0.11906 g $NaHCO_3$ LOT 897789
20 ml STOCK SOLUTION SO_4-3/93
10 ml STOCK SOLUTION NO_3-3/93
2 ml STOCK SOLUTION F-3/93
+ DI WATER TO 1000 ml STOCK SOLUTIONS
P 199 T = 95 °C Hg THERMO 0323004
N_2 PURGED
START PH 8.211
END PH 9.711
POTENTIOSTAT ESC 440-1 CHANNEL #2 DATA
SAVED AS RP825P26.DAT USING REPASS4F
REFERENCE SCE FISHER 13-620-51 SN 0165403
E_{CORR} -475 mV REITHLEY 614
E_{PT} -109 mV "
CATHODIC STRIP -2.00 V FOR 2 min
PIT INITIATION 600 mV FOR 30 min
PIT GROWTH 400 mV FOR 90 min
SPECIMEN STARTED 7:00 PM 3/19/93
SPECIMEN STOPPED 10:50 AM 3/20/93
RUNTIME 57,000 SEC
REPASSIVATION POTENTIAL -1.006 V
CHARGE DENSITY 7.2 COUL/cm²
WEIGHT LOSS 0.01477 g
OBVIOUS LOGIC ERROR IN PROGRAM -1.0 V
REPASSIVATION POTENTIAL TOO LOW BRINGS TUBE
LEAK E_{RP} FROM DATA FILE 80 mV [signature] 3/23/93

3/19/93 REPASSIVATION POTENTIAL RP825P27.

SPECIMEN ALLOY 825 HN4371FG 600S.C
THERMALLY TREATED AT 300 °C 1 DAY
l = 1.914" d = 0.248" WET AREA = 8.0 cm²
START WT 11.86955 g
AFTER THERMAL TREATMENT 11.86965 g
END WT 11.69550 g
SOLUTION 1000 PPM Cl⁻ 85 PPM HCO_3 20 PPM $SO_4^=$
10 PPM NO_3^- 2 PPM F⁻ 1000 ml AS FOLLOWS.
1.64858 g NaCl LOT 922649A
0.11937 g $NaHCO_3$ LOT 897789
20 ml STOCK SOLUTION SO_4-3/93
10 ml STOCK SOLUTION NO_3-3/93
2 ml STOCK SOLUTION F-3/93
+ DI WATER TO 1000 ml STOCK SOLUTIONS
P 199 T = 95 °C Hg THERMO 1238004
N_2 PURGED
START PH 8.297
END PH 9.505
POTENTIOSTAT ESC 440-1 CHANNEL #3 DATA SAVED
AS RP825P27.DAT USING REPASS 4F
REFERENCE SCE FISHER 13-620-51 SN 0169033
E_{CORR} -278 mV REITHLEY 614
E_{PT} +588 mV
CATHODIC STRIP -2.00 V FOR ~~30 min~~ DD 7/27/94 2 min
PIT INITIATION 600 mV FOR 30 min
PIT GROWTH 400 mV FOR 14 hr
SPECIMEN STARTED 7:04 PM 3/19/93
SPECIMEN STOPPED 10:50 AM ~~DD~~ 7/27/94 3/20/93
RUNTIME 56,000 SEC
REPASSIVATION POTENTIAL -65 mV
CHARGE DENSITY 85 COUL/cm²
WEIGHT LOSS. 0.17405 g
[signature] 3/28/93

3/19/93 REPASSIVATION POTENTIAL RP825P28

SPECIMEN ALLOY 825 NN4371FG 600S.C
THERMALLY TREATED AT 100°C 1 DAY
l = 1.912 d = 0.249 WET AREA = 8.0 cm^2
START WT 11.79770 g
AFTER THERMAL TREATMENT 11.79787 g
END WT 11.60114 g
SOLUTION 1000 PPM Cl^- 85 PPM NCO_3 20 PPM $SO_4^=$
10 PPM NO_3^- 2 PPM F^- 1000 ml AS FOLLOWS
1.64865 g NaCl LOT 922649A
0.11947 g $NaNCO_3$ LOT 897789
20 ml STOCK SOLUTION SO_4 - 3/93
10 ml STOCK SOLUTION NO_3 - 3/93
2 ml STOCK SOLUTION F - 3/93
+ DI WATER TO 1000 ml STOCK SOLUTIONS
P 199 T = 95°C N_2 PURGED
N_2 THERMO 1238001
START pH 8.302
END pH 9.470
POTENTIOSTAT ESC 440-1 CHANNEL #4 DATA SAVED
AS RP825P28.DAT USING REPASS 4F
REFERENCE SCE FISHER 13-620-51 SN82 11163
E_{CORR} -600 mV KEITHLEY 614
E_{PT} -323 mV
CATHODIC STRIP -2.00V FOR 2 min
PIT INITIATION 600 mV FOR 30 min
PIT GROWTH 400 mV FOR 14 hr
SPECIMEN STARTED 7:08 pm 3/19/93
SPECIMEN STOPPED 10:50 AM 3/20/93
RUNTIME 56,000 SEC
REPASSIVATION POTENTIAL -80 mV
CHARGE DENSITY 96 COUL/cm^2
WEIGHT LOSS 0.19656 g

3/23/93

3/24/93 REPASSIVATION POTENTIAL RP825P29

SPECIMEN ALLOY 825 NN4371FG 600S.C
PICKLED IN 10% HNO_3 FOR 60 min
l = 1.913 d = 0.249 WET AREA = 8.0 cm^2
START WT 11.99818 g
END WT 11.77474
SOLUTION 10,000 PPM Cl^- 85 PPM NCO_3 20 PPM $SO_4^=$
10 PPM NO_3^- 2 PPM F^- 1000 ml AS FOLLOWS
16.48033 g NaCl LOT 922649A
0.11881 g $NaNCO_3$ LOT 897789
20 ml STOCK SOLUTION SO_4 - 3/93
10 ml STOCK SOLUTION NO_3 - 3/93
2 ml STOCK SOLUTION F - 3/93
+ DI WATER TO 1000 ml STOCK
SOLUTIONS P 199 T = 95°C N_2 PURGED
N_2 THERMO 1238001
START pH 7.939
END pH 8.979
POTENTIOSTAT ESC 440-1 CHANNEL #2 DATA SAVED
AS RP825P29.DAT USING REPASS 4F
REFERENCE SCE FISHER 13-620-51 SN 0169033
E_{CORR} -726 mV KEITHLEY 614
E_{PT} -12 mV
CATHODIC STRIP -2.00V FOR 2 min
PIT INITIATION 600 mV FOR ~~30 min~~ 15 min
PIT GROWTH 200 mV FOR
SPECIMEN STARTED 4:36 pm 3/24/93
SPECIMEN STOPPED 5:12 pm 3/25/93
RUNTIME 88,000 SEC
REPASSIVATION POTENTIAL -81 mV KEITHLEY 614
CHARGE DENSITY 110 C/cm^2
WEIGHT LOSS 0.22344 g

3/26/93

3/24/93 REPASSIVATION POTENTIAL RP825P30

SPECIMEN ALLOY 825 NH4371FG 600S.C
PICKLED IN 10% HNO_3 FOR 60 min
l= 1.914" d= 0.249" WET AREA = 8.0cm²
START WT 12.00025 g
END WT 11.25280 g
SOLUTION 10000 PPM Cl⁻ 85 PPM NCO_3 20 PPM $SO_4^=$
10 PPM NO_3 2PPM F⁻ 1000 ml AS FOLLOWS
16.48776 g NaCl LOT 922649A
0.11821 g Na NCO_3 LOT 897789
20ml STOCK SOLUTION SO_4-3/93
10ml STOCK SOLUTION NO_3-3/93
2ml STOCK SOLUTION F-3/93
+ DI WATER TO 1000 ml STOCK SOLUTIONS
P 199 T=95°C Ng THERMO 1238004
N_2 PURGED
START PH 8.022
END PH 8.989
POTENTIOSTAT ESC 440-1 CHANNEL #3 DATA
SAVED AS RP825P30.DAT USING REPASS 4F
REFERENCE SCE FISHER 13-620-51 SN 0165403
E_{CORR} -709 mV KEITHLEY 614
E_{PT} -204 mV "
CATHODIC STRIP -2.00 V FOR 2 MIN 7/27/94
PIT INITIATION 400 mV FOR ~~30 min~~ 20 min
PIT GROWTH 200 mV
SPECIMEN STARTED 4:38 pm 3/24/93
SPECIMEN STOPPED 5:15 pm 3/25/93
RUNTIME 88,000 SEC
REPASSIVATION POTENTIAL -153 mV KEITHLEY 614
CHARGE DENSITY 370 C/cm²
WEIGHT LOSS 0.74745 g

Daniel D 3/26/93

3/31/93 REPASSIVATION TIME ALLOY 825 REPTIM23.

SPECIMEN ALLOY 825 NH4371FG 600 S.C FINISH
CLEANED AS BEFORE REPTIM21 P.160
l= 1.913" d= 0.250" WET AREA = 8.0cm²
START WT 12.02180 g
END WT 11.87438 g
SOLUTION 500 PPM Cl⁻ 85 PPM NCO_3 20 PPM SO_4
10 PPM NO_3^- 2PPM F⁻ 1000 ml AS FOLLOWS
0.82499 g NaCl LOT 922649A
0.11895 g Na NCO_3 LOT 897789
20ml STOCK SOLUTION SO_4-3/93
10 ml STOCK SOLUTION NO_3-3/93
2ml STOCK SOLUTION F-3/93
STOCK SOLUTIONS P 199 + DI WATER TO
1000 ml T=95°C Ng THERMO 1238004
N_2 PURGED
START PH 8.084
END PH 9.341
POTENTIOSTAT ESC 440-1 CHANNEL #2 DATA SAVED
AS REPTIM23.DAT USING REPTIMER.WBB
REFERENCE SCE FISHER 13-620-51 SN 0165403
PIT INITIATION 600 mV FOR 30 min
PIT GROWTH 400 mV FOR 9 HOURS
REPASSIVATION 180 mV
E_{CORR} -725 mV KEITHLEY 614
E_{PT} -231 mV KEITHLEY 614
SPECIMEN STARTED 4:16 PM 3/31/93
SPECIMEN STOPPED 4:07 PM 4/2/93
RUNTIME 172,000 SEC 7/27/94
REPASSIVATION TIME ~~72 C/cm²~~ DID NOT REPASSIVATE
CHARGE DENSITY 72 C/cm²
WEIGHT LOSS. 0.14742 g

Daniel D 4/2/93

3/31/93 REPASSIVATION TIME ALLOY 825 REPTIM 24

SPECIMEN ALLOY 825 HN4371FG 600 S.C FINISH
PREPARED SAME AS REPTIM 21 P160
l = 1.913" d = 0.250" WET AREA = 8.0 cm^2
START WT 12.04032 g
END WT 11.85214 g
SOLUTION 500 ppm Cl^- 85 ppm NCO_3 20 ppm $SO_4^=$
10 ppm NO_3^- 2 ppm F^- 1000 ml MADE AS FOLLOWS.
0.82496 g NaCl LOT 922649A
0.11949 g $NaHCO_3$ LOT 897789
20 ml STOCK SOLUTION SO_4-3/93
10 ml STOCK SOLUTION NO_3-3/93
2 ml STOCK SOLUTION F-3/93
+ DI WATER TO 1000 ml STOCK SOLUTIONS
P 199 T = 95°C N_2 THERMO 123 8007
N_2 PURGED
START PH 8.243
END PH 9.258
POTENTIOSTAT ESC 440-1 CHANNEL #3 DATA SAVED
AS REPTIM 24.DAT USING REPTIMER.WBB
REFERENCE SCE FISHER 13-620-51 SN 0169033
PIT INITIATION 600 mV FOR 30 min
PIT GROWTH 400 mV FOR 9 HOURS
REPASSIVATION 170 mV
E_{CORR} -709 mV
E_{PT} -103 mV KEITHLEY 614
SPECIMEN STARTED 4:20 PM 3/31/93
SPECIMEN STOPPED 4:02 PM 4/2/93
RUNTIME 172000 SEC
REPASSIVATION TIME DID NOT REPASSIVATE
CHARGE DENSITY 91 C/cm^2
WEIGHT LOSS 0.18818 g

4/2/93

3/31/93 REPASSIVATION TIME ALLOY 825 REPTIM 25

SPECIMEN ALLOY 825 HN4371FG 600 S.C FINISH
PREPARED SAME AS REPTIM 21 P 199
l = ~~0.8~~ 1.914" d = 0.249 WET AREA = 8.0 cm^2
START WT 12.01383 g
END WT 11.84088 g
SOLUTION 500 ppm Cl^- 85 ppm NCO_3 20 ppm $SO_4^=$
10 ppm NO_3^- 2 ppm F^- 1000 ml AS FOLLOWS.
0.82576 g NaCl LOT 922649A
0.11830 g $NaHCO_3$ LOT 897789
20 ml STOCK SOLUTION SO_4-3/93
10 ml STOCK SOLUTION NO_3-3/93
2 ml STOCK SOLUTION F-3/93
+ DI WATER TO 1000 ml STOCK SOLUTIONS
P199 T = 95°C N_2 THERMO ~~FCS~~ OR 9/29/94 0323004
N_2 PURGED
START PH 8.265
END PH 9.268
POTENTIOSTAT ESC 440-1 CHANNEL #4 DATA SAVED
AS REPTIM 25.DAT USING REPTIMER.WBB
REFERENCE SCE FISHER 13-620-51 SN 9214083
PIT INITIATION 600 mV FOR 30 min
PIT GROWTH 400 mV FOR 9 HOURS
REPASSIVATION 160 mV
E_{CORR} -744 mV
E_{PT} -260 mV
SPECIMEN STARTED 4:26 PM 3/31/93
SPECIMEN STOPPED 4:02 PM 4/2/93
RUNTIME 172,000 SEC
REPASSIVATION TIME DID NOT REPASSIVATE
CHARGE DENSITY 84 C/cm^2
WEIGHT LOSS 0.17295 g

4/2/93

4/7/93 REPASSIVATION TIME REPTIM 26

SPECIMEN ALLOY 825 NN4371FG 600 S.C
CLEANED IN ULTRASONIC BATH, RINSED
WITH DI WATER, ACETONE AND DRIED
l = 1.914" d = 0.248" WET AREA = 8.0 cm^2
START WT 12.03345
END WT 11.95671 g
SOLUTION 1000 PPM Cl^- 85 PPM NCO_3 20 PPM $SO_4^=$
10 PPM NO_3^- 2 PPM F^- 1000 ml MADE AS FOLLOWS
1.64878 g NaCl LOT 922649A
0.11820 g $NaNCO_3$ LOT 897789
20 ml STOCK SOLUTION SO_4 - 4/93
10 ml STOCK SOLUTION NO_3 - 4/93
2 ml STOCK SOLUTION F^- - 4/93
+ DI WATER TO 1000 ml STOCK SOLUTIONS
P 211 T = 95°C N_2 PURGED
Hg THERMO 1238001
START PH 8.173
END PH 9.283
POTENTIOSTAT ESC 440-1 CHANNEL # 2 DATA SAVED
AS REPTIM 26.DAT USING REPTIMER.WBB
REFERENCE SCE FISHER 13-620-51 SN 0169033
PIT INITIATION 600 mV FOR 30 min
PIT GROWTH 400 mV FOR 6 HOURS
REPASSIVATION 190 mV
E_{CORR} -759 mV KEITHLEY 614
E_{PT} -333 mV KEITHLEY 614
SPECIMEN STARTED 4:50 pm 4/7/93
SPECIMEN STOPPED 7:20 AM 4/9/93
RUNTIME 138,000 SEC
REPASSIVATION TIME DID NOT REPASSIVATE
WEIGHT LOSS 0.07674 g
CHARGE DENSITY 37 COUL/cm^2

4/9/93

4/7/93 REPASSIVATION TIME REPTIM 27

SPECIMEN ALLOY 825 NN4371FG 600 S.C
CLEANED SAME AS REPTIM 26 P 208
l = 1.915" d = 0.249" WET AREA = 8.0 cm^2
START WT 11.83946
END WT 11.64943 g
SOLUTION 1000 PPM Cl^- 85 PPM NCO_3 20 PPM $SO_4^=$
10 PPM NO_3^- 2 PPM F^- 1000 ml MADE AS FOLLOWS
1.64948 g NaCl LOT 922649A
0.11812 g $NaNCO_3$ LOT 897789
20 ml STOCK SOLUTION SO_4 - 4/93
10 ml STOCK SOLUTION NO_3 - 4/93
2 ml STOCK SOLUTION F^- - 4/93
+ DI WATER TO 1000 ml, STOCK SOLUTIONS
P 211, T = 95°C, N_2 PURGED, Hg THERMO 1238004
START PH 8.195
END PH 9.302
POTENTIOSTAT ESC 440-1 CHANNEL # 3 DATA SAVED AS
REPTIM 27.DAT USING REPTIMER.WBB
REFERENCE SCE FISHER 13-620-51 SN 9214083
PIT INITIATION 600 mV FOR 30 min
PIT GROWTH 400 mV FOR 6 HOURS
REPASSIVATION 175 mV
E_{CORR} -742 mV KEITHLEY 614
E_{PT} -312 mV " "
SPECIMEN STARTED 4:55 pm 4/7/93
SPECIMEN STOPPED 7:20 AM 4/9/93
RUNTIME 138,000 SEC
REPASSIVATION TIME DID NOT REPASSIVATE
WEIGHT LOSS 0.19003
CHARGE DENSITY 92 COUL/cm^2

4/9/93

4/7/93 REPASSIVATION TIME REPTEM 28

SPECIMEN ALLOY 825 NN4371FG 600S.C
CLEANED SAME AS REPTEM 26 P 208
l = 1.913" d = 0.248" WET AREA 8.0 cm²
START WT 12.00705 g
END WT 11.77801 g
SOLUTION 1000 ppm Cl⁻ 85 ppm HCO₃ 20 ppm SO₄²⁻
10 ppm NO₃⁻ 2 ppm F⁻ 1000 ml MADE AS FOLLOWS
1.64908 g NaCl LOT 922649A
0.11992 g NaHCO₃ LOT 897789
20 ml STOCK SOLUTION SO₄ - 4/93
10 ml STOCK SOLUTION NO₃ - 4/93
2 ml STOCK SOLUTION F - 4/93
+ DI WATER TO 1000 ml STOCK SOLUTIONS
p 211 T=95°C N₂ PURGED N₂ THERMO 0323004
START PH 8.304
END PH 9.397
POTENTIOSTAT ESC 440-1 CHANNEL #4 DATA SAVED
AS REPTEM 28.DAT USING REPTIMER.WBB.
REFERENCE SCE FISHER 13-620-51 SN 0165403
PIT INITIATION 600 mV FOR 30m
PIT GROWTH 400 mV FOR 6 HOURS
REPASSIVATION 160 mV
E_{CORR} -744 mV KEITHLEY 614
E_{PT} -318 mV " "
SPECIMEN STARTED 5:01 PM 4/7/93
SPECIMEN STOPPED ≈10:00 AM 4/8/93
RUNTIME 56,000 SEC
REPASSIVATION TIME DID NOT REPASSIVATE
WEIGHT LOSS 0.22904 g
CHARGE DENSITY - 112 COUL/cm²

POTENTIAL ADJUSTED TO 150 mV 100 mV AND
0.0 mV PRIOR TO END OF EXPT
4/9/93

4/7/93 STOCK SOLUTIONS

SO₄ - 4/93, 1000 ppm SO₄⁻ AS Na₂SO₄
1.48101 g Na₂SO₄ FISHER LOT # 901213
+ DI WATER TO 1000 ml 4/6/93 EXP 5/6/93

NO₃ - 4/93, 1000 ppm NO₃ AS NaNO₃
1.37175 g NaNO₃ FISHER LOT # 897183
+ DI WATER TO 1000 ml 4/6/93 EXP 5/6/93

F - 4/93 1000 ppm F⁻ AS NaF
2.21768 g NaF FISHER LOT # 896405
+ DI WATER TO 1000 ml 4/6/93 EXP 5/6/93
7/22/94
1M Cl - 4/93 58.44108 g NaCl LOT 922649A
+ DI WATER TO 1000 ml 4/6/93 EXP 5/6/93

0.5M Cl - 4/93 29.22357 g NaCl FISHER LOT
922649A + DI WATER TO 1000 ml
4/6/93 EXP 5/6/93

1000 Cl - 4/93 3.29522 g NaCl FISHER LOT
922649A + DI WATER TO 2000 ml
4/6/93 EXP 5/6/93

100 Cl - 4/93 100 ml 1000 Cl - 4/93 +
900 ml DI WATER 4/6/93 EXP 5/6/93

4/7/93

4/9/93 CREVICE CORROSION EXPT 304L-1

SPECIMEN 304L HT T0954 600 S.C FINISH
CLEANED IN ULTRASONIC BATH RINSED
WITH DI WATER, ACETONE AND DRIED
l = 2.503" W = 0.498" T = 0.124"
AREA = 20.885 cm^2
START WT = 21.16457 g
END WT = 21.16270 g
SOLUTION 1000 PPM Cl^- 85 PPM NCO_3 20 PPM $SO_4^=$
10 PPM NO_3^- 2 PPM F^- 1000 ml AS FOLLOWS
1.64878 g NaCl LOT 922649A
0.11817 g Na NCO_3 LOT 897789
20 ml STOCK SOLUTION SO_4 - 4/93
10 ml STOCK SOLUTION NO_3 - 4/93
2 ml STOCK SOLUTION F - 4/93
+ DI WATER TO 1000 ml
STOCK SOLUTIONS PAGE 211
START PH = 8.171
END PH = 7.40
SETUP SPECIMEN PLACED IN PLEXIGLASS CELL
WITH TWO PORTS TORQUED TO 20 IN-OZ
PORT #1 AT TIP
MI200 Cl ISE (FLEXABLE) # 44200 } Cl TIP
MI 402 Ag/AgCl REF # 43636
MI 506 GLASS PH # 43720 } PH TIP
MI 402 Ag/AgCl REF # 41436
MI 402 Ag/AgCl REF - TIP REFERENCE #
PORT #2 AT MOUTH
MI200 Cl ISE (FLEXABLE) ~~# 43647~~ DD 7/27/94 # 44431 } Cl MOUTH
MI 402 Ag/AgCl REF # 43647
MI 506 PH GLASS # 44060 } PH MOUTH
MI 402 Ag/AgCl REF # 41402
MI 402 Ag/AgCl REF - ~~TIP~~ DD 7/27/94 REFERENCE #

4/9/93 CREVICE CORROSION EXPT 304L-1
BULK ELECTRODES
MI 200 Cl ISE # 42483 } BULK Cl
MI 402 Ag/AgCl REF # 44629
MI 506 GLASS PH # 44817 } BULK PH
MI 402 Ag/AgCl REF # 45860
FISNER 13-620-53 SN 8118182 - REFERENCE Ag/AgCl

Cl TIP TO ORION EA920 S001A & ABB, SE120, ID# 0515265
Cl BULK TO ORION EA920 S001A CH2 & ABB, SE120, ID# 0515265
Cl MOUTH TO ORION ~~&~~ DD 7/27/94 720A 5885 CH1 & ABB, SE120, ID# 0049616

PH TIP TO ORION EA940 2330 CH#1 & ABB, SE120, ID # 0515265
PH BULK TO ORION EA940 2330 CH#2 & ABB, SE120, ID # 0515265
PH MOUTH TO ORION 720A 003368 CH1 & ABB, SE120, ID# 0049616

FISNER 13-620-53 SN 8118182 TO CHANNEL #1
OF ESC 440 #2
TIP REFERENCE TO CHANNEL #3 OF ESC 440-2
MOUTH REFERENCE TO CHANNEL #2 OF ESC 440-2

Pt COUNTER ELECTRODE AND SPECIMEN CONNECTED
TO ESC 440-2 CHANNEL #1

PLEXIGLASS CELL WITH SPECIMEN PLACED
IN GLASS VESSEL WITH PLEXIGLASS LID.
ENTIRE ASSEMBLY WAS PLACED IN FARADAY
CAGE ON 4/8/93 AND MONITORED FROM
4:00 PM 4/8/93 TO 4:00 PM 4/9/93
AT OPEN CURCUIT SOLUTION WAS
NOT DEAERATED.

PRIOR TO ASSEMBLY ELECTRODES WERE
CALIBRATED USING 100 PPM Cl^-, 1000 PPM Cl^-
0.5 m ~~PPM~~ DD 7/27/94 Cl^- AND 1 m Cl^- PH ELECTRODES
WERE CALIBRATED USING BUFFERS 1, 4, 7, 10

4/9/93 CREVICE CORROSION EXPT 304L-1

ELECTRODE CALIBRATIONS

pH TIP
mV = -57.473 (pH) + 395.053
pH = -17.4 (V) + 6.873

pH MOUTH
mV = -57.33 (pH) + 391.84
pH = -17.4 (V) + 6.835

pH BULK
mV = -58.3 (pH) + 385.75
pH = -17.2 (V) + 6.6166

Cl⁻ TIP
mV = -22.3446 * ln (ppm Cl⁻) + 265.28
ppm Cl⁻ = Exp (-0.0448 * mV + 11.8722)

Cl⁻ MOUTH
mV = -23.5961 * ln (ppm Cl⁻) + 276.396
ppm Cl⁻ = Exp (-0.0417 * mV + 11.7136)

Cl BULK
mV = -22.918 * ln (ppm Cl⁻) + 273.01
ppm Cl⁻ = Exp (-0.0436 * mV + 11.9125)

INITIAL VALUES AT 4:00 PM 4/9/93
EXTERNAL POTENTIAL -0.092 V
TIP POTENTIAL -0.124 V
MOUTH POTENTIAL -0.123 V
TIP Cl 44.0 mV
TIP pH -48.0 mV
MOUTH Cl 62.3 mV
MOUTH pH -68.7 mV
BULK Cl 111.4 mV
BULK pH -96.4 mV

AT 4:06 PM SET POTENTIAL TO -0.082 V
TIMER AT 86,700 SEC
4/12/93 7:10 AM t = 313800 POTENTIAL SET TO -0.042 V
4/12/93 2:58 PM t = 341700 POTENTIAL SET TO +0.008 V
4/14/93 8:12 AM t = 419116 SEC POTENTIAL SET TO +0.108 V
4/14/93 3:54 PM t = 517826 SEC POTENTIAL SET TO +0.158 V

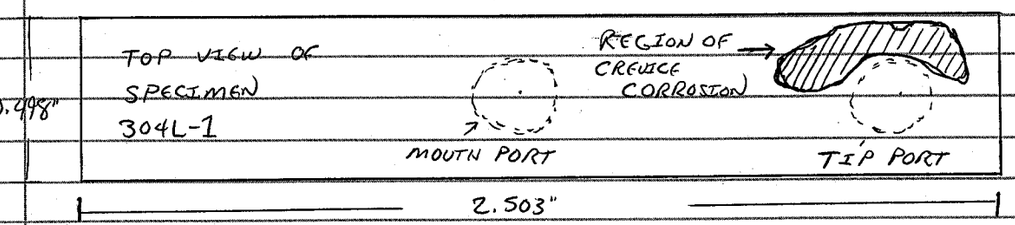
4/14/93 CREVICE CORROSION EXPT 304L-1

4/14/93 t = 526630 SEC POTENTIAL SET TO 0.208 V
4/16/93 7:42 AM t = 661040 SEC POTENTIAL SET TO 0.0 V
4/16/93 9:52 AM t = 668900 SEC POTENTIAL SET TO -0.050 V
4/16/93 2:13 PM t = 684530 SEC POTENTIAL SET TO -0.100 V
4/16/93 t = 691470 END OF EXPT

4/16/93 FINAL pH FISHER ACCUMET 950 7.40

4/26/93 CHARGE DENSITY 0.414 COULOMBS/cm²

SPECIMEN HAS SMALL REGION OF CREVICE CORROSION ON TOP SIDE OF SPECIMEN NEAR TIP ELECTRODE PORT AS SHOWN: SCALE ≈ 2:1

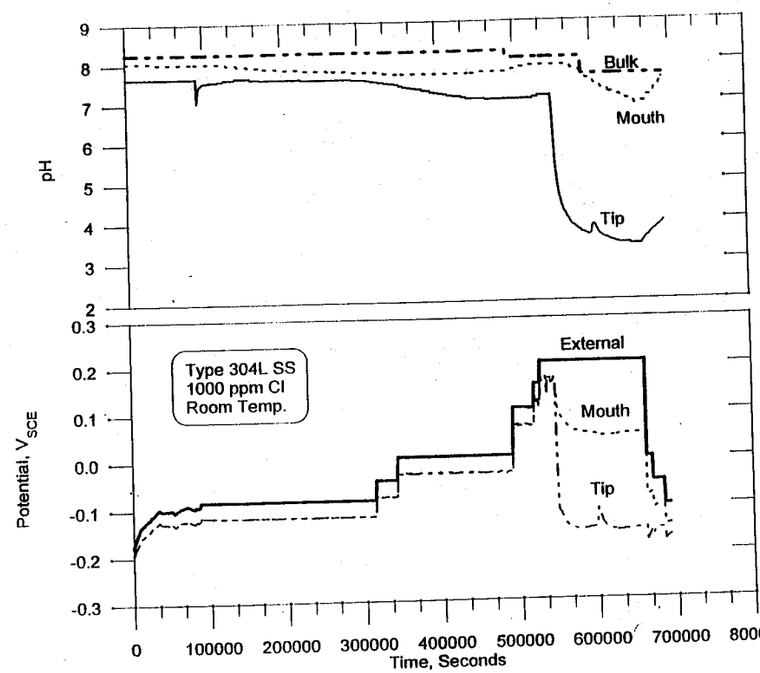


REGION OF CREVICE CORROSION MEASURES L_{MAX} 1.4 cm W_{MAX} = 0.4 cm W_{MIN} = 0.2 cm ESTIMATED SURFACE AREA (GEOMETRICAL) OF CREVICE CORROSION REGION IS 0.5 cm², UNDER 70× MAGNIFICATION CREVICE CORROSION REGION IS VERY SHALLOW.

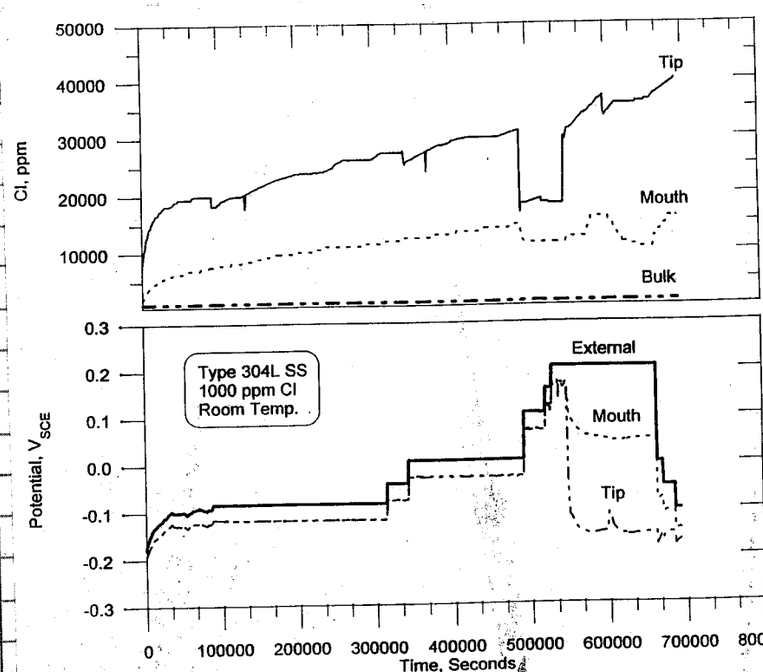
4/26/93

pH AND Cl⁻ ISE CALIBRATION DATA SAVED AS 304L1CAL.DAT ON IWPE 025. DISK 4/28/94

4/26/93 CREVICE CORROSION EXPT. 304L-1

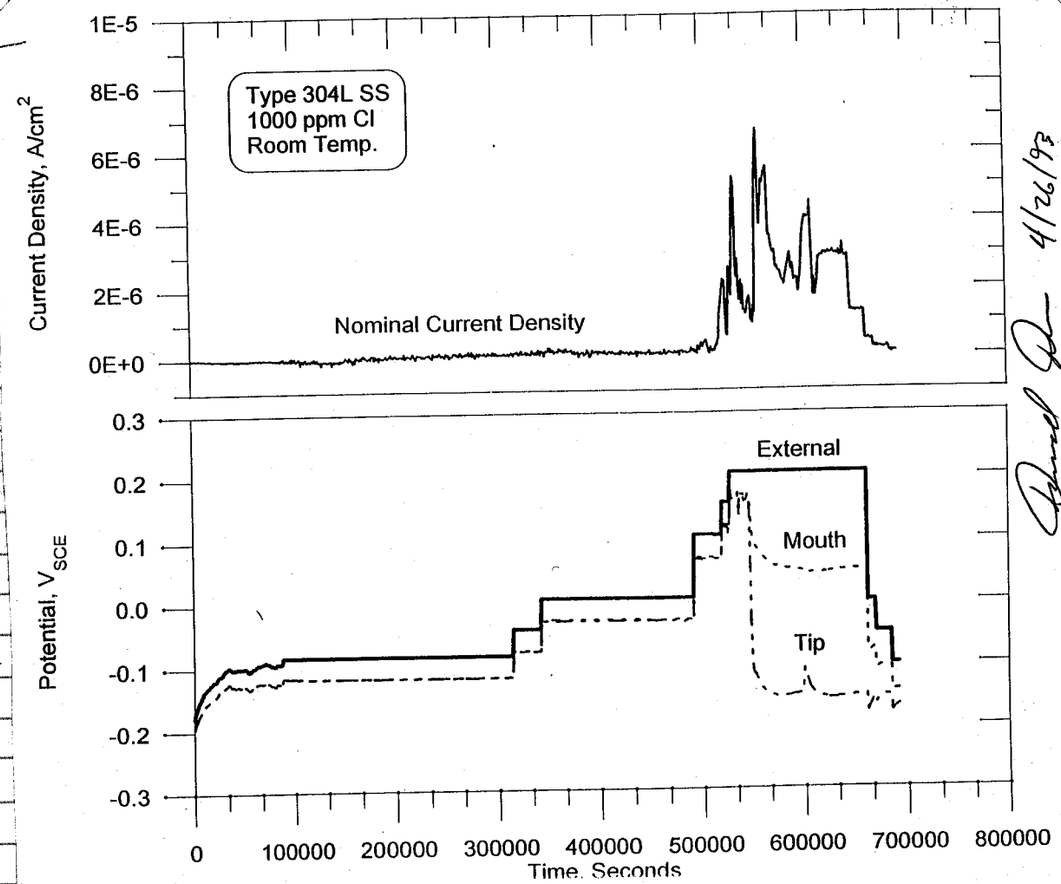


4/26/93



4/26/93

4/26/93 CREVICE CORROSION EXPT. 304L-1



4/26/93

DATA SAVED AS 304L-1.DAT USING CREVICE.WRB COMPLETE DATA FILE SAVED AS 304L1FLE.WR1 USING QUATTRO PRO

4/26/93

4/13/93 POTENTIOSTATIC POLARIZATION CR825N5

SPECIMEN ALLOY 825 NH4371FG MILL FINISHED SURFACES ULTRASONICALLY CLEANED IN ACETONE AND DRIED t = 0.525" l = 0.778 w = 0.500 MILL FINISHED SURFACE AREA = 3.22 cm²
TOTAL EXPOSED SURFACE AREA = 8.30 cm²
START WT 26.49824 g
END WT 26.47859 g
SOLUTION 1000 PPM Cl⁻ 85 PPM NCO_3 20 PPM $SO_4^=$
10 PPM NO_3 2 PPM F⁻ 1000 ml MADE AS FOLLOWS
1.64810 g NaCl LOT 922649A
0.11932 g $NaHCO_3$ LOT 897789
20 ml STOCK SOLUTION SO_4 - 4/93
10 ml STOCK SOLUTION NO_3 - 4/93
2 ml STOCK SOLUTION F - 4/93
+ DI WATER TO 1000 ml STOCK SOLUTIONS
P. 211. T = 95 °C N_2 PURGED
H_2 THERMO 1238001
START PH 8.135
END PH 9.206
POTENTIOSTAT ESC 440-1 CHANNEL #2 DATA SAVED AS CR825N5.DAT USING REPASS4F
REFERENCE SCE FISHER 13-620-51 SN 9214083
E_{CORR} -633 mV KEITHLEY 614
E_{PT} -231 mV "
$E_{APPLIED}$ +225 mV
SPECIMEN STARTED 4/14/93 9:00 AM
SPECIMEN STOPPED 4/19/93
RUN TIME 460,000 SEC
REPASSIVATION POTENTIAL NOT RECORDED
CHARGE DENSITY NOT RECORDED

David Du 4/19/93

4/13/93 POTENTIOSTATIC POLARIZATION. CR825N6

SPECIMEN ALLOY 825 NH4371FG MILL FINISHED SURFACES ULTRASONICALLY CLEANED IN ACETONE AND DRIED t = 0.525 l = 0.789
w = 0.503 MILL FINISH SURFACE AREA = 3.40 cm²
TOTAL EXPOSED SURFACE AREA. 8.49 cm²
START WT 27.15901 g
END WT 27.01413 g
SOLUTION 1000 PPM Cl⁻ 85 PPM NCO_3 20 PPM $SO_4^=$
10 PPM NO_3 2 PPM F⁻ 1000 ml MADE AS FOLLOWS.
1.64810 g NaCl LOT 922649A
0.11850 g $NaHCO_3$ LOT 897789
20 ml STOCK SOLUTION SO_4 - 4/93
10 ml STOCK SOLUTION NO_3 - 4/93
2 ml STOCK SOLUTION F - 4/93
+ DI WATER TO 1000 ml STOCK SOLUTIONS
P 211 T = 95 °C N_2 PURGED Hg THERMO
0323004
START PH 8.204
END PH 9.351
POTENTIOSTAT ESC 440-1 CHANNEL #3 DATA SAVED AS CR825N6.DAT USING REPASS4F.
REFERENCE SCE FISHER 13-620-51 SN 0165403
E_{CORR} -603 mV KEITHLEY 614
E_{PT} -280 mV "
$E_{APPLIED}$ +250 mV
SPECIMEN STARTED 4/14/93 9:03 AM
SPECIMEN STOPPED 4/19/93
RUNTIME 460,000 SEC.
REPASSIVATION POTENTIAL NOT RECORDED
CHARGE DENSITY. NOT RECORDED

David Du 4/19/93

4/13/93 POTENTIOSTATIC POLARIZATION CR825N7

SPECIMEN ALLOY 825 NN4371 FG MILL FINISH
SURFACES ULTRASONICALLY CLEANED IN ACETONE
AND DRIED. t = 0.525 l = 0.775
w = 0.502 MILL FINISHED SURFACE AREA = 3.24 cm²
TOTAL EXPOSED SURFACE AREA 8.32 cm²
START WT 26.59405 g
END WT 26.56707 g
SOLUTION 1000 PPM Cl⁻ 85 PPM NCO_3 20 PPM $SO_4^{=}$
10 PPM NO_3^- 2 PPM F⁻ 1000 ml MADE AS FOLLOWS
1.64956 g NaCl LOT 922649A
0.11828 g Na HCO_3 LOT 897789
20 ml STOCK SOLUTION SO_4 - 4/93
10 ml STOCK SOLUTION NO_3 - 4/93
2 ml STOCK SOLUTION F - 4/93
+ DI WATER TO 1000 ml STOCK SOLUTIONS
P211, N_2 PURGED, 95°C H_g THERMO 1238004.
START PH 8.271
END PH 9.193
POTENTIOSTAT ESC 440-1 CHANNEL #4 DATA SAVED
AS CR825N7.DAT USING REPASS4F.
REFERENCE SCE FISHER 13-620-51 SN 0169033
E_{CORR} -552 mV KEITHLEY 614
E_{PT} -313 mV "
$E_{APPLIED}$ +275 mV
SPECIMEN STARTED 4/14/93 9:06 AM
SPECIMEN STOPPED 4/19/93
RUNTIME 460,000 SEC
REPASSIVATION POTENTIAL NOT RECORDED
CHARGE DENSITY NOT RECORDED

Daniel D. 4/19/93

4/28/93 REPASSIVATION TIME. REPTIM29.DAT

SPECIMEN ALLOY 825 NN4371FG 600 SiC
PREPARED THE SAME AS REPTIM21 P160
l = 1.915 d = 0.248 WET AREA = 8.0 cm²
START WT 11.61104
END WT 11.25522
SOLUTION 1000 PPM Cl⁻ 85 PPM NCO_3 20 PPM $SO_4^{=}$
10 PPM NO_3 2 PPM F⁻ 1000 ml MADE AS FOLLOWS
1.64957 g NaCl LOT 922649A
0.11814 g Na HCO_3 LOT 897789
20 ml STOCK SOLUTION SO_4 - 4/93
10 ml STOCK SOLUTION NO_3 - 4/93
2 ml STOCK SOLUTION F - 4/93
+ DI WATER TO 1000 ml STOCK SOLUTIONS
P211 N_2 PURGED 95°C H_g THERMO 1238004
START PH 8.031
END PH 9.485
POTENTIOSTAT ESC 440-1 CHANNEL #2 DATA
SAVED AS REPTIM29.DAT USING REPTIMER.WBR.
REFERENCE SCE FISHER 13-620-51 SN 0165403
E_{CORR} -677 mV KEITHLEY 614
E_{PT} -354 mV "
PIT INITIATION 600 mV FOR 30 min
PIT GROWTH 400 mV FOR 6 HOURS
REPASSIVATION 160 mV
SPECIMEN STARTED 3:50 PM 4/28/93
SPECIMEN STOPPED 8:26 AM 4/29/93
RUNTIME 59,000 SEC
REPASSIVATION TIME DID NOT REPASSIVATE
CHARGE DENSITY 182 C/cm²
WEIGHT LOSS 0.35582 g

Daniel D. 4/30/93

4/28/93 REPASSIVATION TIME REPTIM 30.DAT

SPECIMEN ALLOY 825 NN4371FG 600S.C
PREPARED SAME AS REPTIM 21 P160
l = 1.914 d = 0.249 WET AREA = 8.0 cm²
START WT 11.84023 g
END WT 11.67757 g
SOLUTION 1000 PPM Cl⁻ 85 PPM HCO_3^- 20 PPM $SO_4^=$
10 PPM NO_3^- 2 PPM F⁻ 1000 ml MADE AS FOLLOWS:
1.65142 g NaCl LOT 922649A
0.12074 g $NaHCO_3$ LOT 897789
20 ml SO_4 - 4/93 STOCK SOLUTION
10 ml NO_3 - 4/93 " "
2 ml F - 4/93 " "
+ DI WATER TO 1000 ml STOCK SOLUTIONS
PAGE 211 T = 95°C N_2 THERMO 1238001
N_2 PURGED
START PH 8.150
END PH 9.503
POTENTIOSTAT ESC 440-1 CHANNEL #3 DATA SAVED
AS REPTIM 30.DAT USING REPTIMER.WBB
REFERENCE SCE FISHER 13-620-51 SN 0169033
E_{CORR} -551 mV KEITHLEY 614
E_{PT} -293 mV " "
PIT INITIATION 600 mV FOR 30 min
PIT GROWTH 400 mV FOR 6 HOURS
REPASSIVATION 170 mV
SPECIMEN STARTED 3:54 pm 4/28/93
SPECIMEN STOPPED 8:25 am 4/29/93
RUNTIME 54,000 SEC
REPASSIVATION TIME DID NOT REPASSIVATE
CHARGE DENSITY 79.4 C/cm²
WEIGHT LOSS. 0.16266 g

4/30/93

4/28/93 REPASSIVATION TIME REPTIM 31.DAT

SPECIMEN ALLOY 825 NN4371FG 600S.C
PREPARED SAME AS REPTIM 21 P160
l = 1.913 d = 0.249 WET AREA = 8.0 cm²
START WT 11.69730 g
END WT 11.56124 g
SOLUTION 1000 PPM Cl⁻ 85 PPM HCO_3 20 PPM ~~NO~~ $SO_4^=$ 7/27/94
10 PPM NO_3 2 PPM F⁻ 1000 ml AS FOLLOWS
1.65063 g NaCl LOT 922649A
0.11855 g $NaHCO_3$ LOT 897789
20 ml SO_4 - 4/93 STOCK SOLUTION
10 ml NO_3 - 4/93 " "
2 ml F - 4/93 " "
+ DI WATER TO 1000 ml STOCK SOLUTIONS
P 211, T = 95°C, N_2 THERMO 0323004, N_2 PURGED
START PH 8.177
END PH 9.631
POTENTIOSTAT ESC 440-1 CHANNEL #4 DATA SAVED
AS REPTIM 31.DAT USING REPTIMER.WBB
REFERENCE SCE FISHER 13-620-51 SN 2134032
E_{CORR} -603 mV KEITHLEY 614
E_{PT} -42 mV
PIT INITIATION 600 mV FOR 30 min
PIT GROWTH 400 mV FOR 6 HOURS
RE PASSIVATION 180 mV
SPECIMEN STARTED 3:58 pm 4/28/93
SPECIMEN STOPPED 4/29/93 8:15 AM
RUNTIME 58,300 SEC
REPASSIVATION TIME DID NOT REPASSIVATE
CHARGE DENSITY 66.7 C/cm²
WEIGHT LOSS. 0.13606 g

LOGIC ERROR SET REPASSIVATION POTENTIAL AT 161 mV
INSTEAD OF 180 mV

4/30/93

5/4/93 REPTIM 32 REPASSIVATION TIME

SPECIMEN ALLOY 825 NN4371FG 600 S.C
CLEANED SAME AS REPTIM 21 P 160
l= 1.914 d= 0.248 WET AREA = 8.0
START WT 11.82219
END WT 11.66317 DD 7/27/94
SOLUTION 1000 PPM Cl⁻ 85 PPM NCO3 ~~87~~
20 PPM SO4⁻⁻ 10 PPM NO3⁻ 2 PPM F⁻ 1000 ml AS FOLLOWS
1.64929 g NaCl LOT 922649A
0.11802 g NaNCO3 LOT 897789
20 ml SO4 - 5/93 STOCK SOLUTION
10 ml NO3 - 5/93 "
2 ml F - 5/93 "
+ DI WATER TO 1000 ml STOCK SOLUTIONS
P 226 T= 95°C N2 THERMO 0323007
N2 PURGED.
START PH 8.13
END PH 9.27
POTENTIOSTAT ESC 440 -1 CHANNEL #2 DATA
SAVED AS REPTIM 32.DAT USING REPTIMER.WBB
REFERENCE SCE FISHER 13-620-51 SN 0165403
E_{CORR} -640 mV SCE KEINLET 6/4
E_{PT} -156 mV SCE
PIT INITIATION 600 mV FOR 30 min
PIT GROWTH 400 mV FOR 6 HOURS
REPASSIVATION 160 mV
SPECIMEN STARTED 5/4/93 5:50 pm
SPECIMEN STOPPED 5/5/93 10:00 AM
RUNTIME 60,000 SEC
REPASSIVATION TIME DID NOT REPASSIVATE
CHARGE DENSITY 80 C/cm²
WEIGHT LOSS 0.15902

5/5/93

5/4/93 REPTIM 33 REPASSIVATION TIME

SPECIMEN ALLOY 825 NN4371FG 600 S.C
CLEANED SAME AS REPTIM 21 P 160
l= 1.915 d= 0.246 WET AREA = 8.0 cm²
START WT 11.76349
END WT 11.58831
SOLUTION 1000 PPM Cl⁻ 85 PPM NCO3 20 PPM SO4⁻⁻
10 PPM NO3 2 PPM F⁻ 1000 ml AS FOLLOWS
1.64818 g NaCl LOT 922649A
0.11847 g NaHCO3 LOT 897789
20 ml SO4 - 5/93 STOCK SOLUTIONS
10 ml NO3 - 5/93 "
2 ml F - 5/93 "
+ DI WATER TO 1000 ml STOCK SOLUTIONS
P 226 T= 95°C N2 THERMO 1238004
N2 PURGED.
START PH 8.21
END PH 9.33
POTENTIOSTAT ESC 440-1 CHANNEL #3 DATA
SAVED AS REPTIM 33.DAT USING REPTIMER.WBB
REFERENCE SCE FISHER 13-620-51 SN 2134032
E_{CORR} -724 mV
E_{PT} -240
PIT INITIATION 600 mV FOR 30 min
PIT GROWTH 400 mV FOR 6 HOURS
REPASSIVATION DD 7/27/94 ~~160 mV~~ 170 mV
SPECIMEN STARTED 5/4/93 5:52 pm
SPECIMEN STOPPED 5/5/93 10:00 AM
RUNTIME 60,000 SEC
REPASSIVATION TIME DID NOT REPASSIVATE.
CHARGE DENSITY 88 C/cm²
WEIGHT LOSS. DD 7/27/94 0.17518 g

5/5/93

5/7/93 STOCK SOLUTIONS

SO_4 - 5/93 1000 PPM $SO_4^=$
1.48505 g Na_2SO_4 LOT 901213 +
DI WATER TO 1000 ml EXP 6/6/93

NO_3 - 5/93 1000 PPM NO_3^-
1.37662 g $NaNO_3$ LOT 897783 +
DI WATER TO 1000 ml EXP 6/6/93

F- 5/93 1000 PPM F^-
2.21413 g NaF LOT 896405 + DI
WATER TO 1000 ml EXP 6/6/93

1M Cl - 5/93 1 MOLAR Cl^-
58.44197 g NaCl LOT 922649A +
DI WATER TO 1000 ml EXP 6/6/93

0.5 M Cl - 5/93 0.5 MOLAR Cl^-
29.22179 g NaCl LOT 922649A +
DI WATER TO 1000 ml EXP 6/6/93

1000 Cl - 5/93 3.29230 g NaCl
LOT 922649A + DI WATER TO 2000 ml
1000 PPM Cl^- AS NaCl EXP 6/6/93

100 Cl - 5/93 100 PPM Cl^-
100 ml 1000 Cl - 5/93 + 900 ml
DI WATER EXP 6/6/93

5/7/93

5/7/93 REPTIM 34 ALLOY 825 REPASSIVATION TIME

SPECIMEN ALLOY 825 NN4371FG 600S.C
CLEANED SAME AS REPTIM 21 P160
l = 1.912 d = 0.248 WET AREA = 8.0 cm^2
START WT 11.85735
END WT 11.37564
SOLUTION 1000 PPM Cl^- 85 PPM NCO_3 20 PPM $SO_4^=$
10 PPM NO_3 2 PPM F^- 1000 ml AS FOLLOWS.
1.64857 g NaCl LOT 922649A
0.11947 g $NaNCO_3$ LOT 897789
20 ml SO4 - 5/93 STOCK SOLUTION)
10 ml NO_3 - 5/93 "
2 ml F - 5/93 "
+ DI WATER TO 1000 ml STOCK
SOLUTIONS P 226 T = 95°C Ng THERMO
1238004 N_2 PURGED
START pH 8.204
END pH 9.020
POTENTIOSTAT ESC 440-1 CHANNEL #2 DATA
SAVED AS REPTIM 34.DAT USING REPTIMER.WBB
REFERENCE SCE FISHER 13-620-51 SN 0165403
E_{CORR} -684 mV KEITHLEY 614
E_{PT} -110 mV " DD 7/27/94
PIT INITIATION 600 mV FOR ~~30 min~~ 60 min
PIT GROWTH 400 mV FOR 33 HOURS
REPASSIVATION -0.050 V SCE
SPECIMEN STARTED 2:00 PM 5/7/93
SPECIMEN STOPPED 5:33 PM 5/10/93
RUNTIME 273000 SEC
CHARGE DENSITY 235 C/cm^2
WEIGHT LOSS. 0.48171 g
REPASSIVATION TIME 569 SEC

5/10/93

5/7/93 REPTIM 35 ALLOY 825 REPASSIVATION TIME

SPECIMEN: ALLOY 825 HN4371 FG 600 S.C
PREPARED SAME AS REPTIM 21 P160
l= 1.915 d= 0.246 WET AREA = 8.0 cm^2
START WT 11.64536
END WT 11.24499
SOLUTION 1000 PPM Cl^- 85 PPM HCO_3 20 PPM ~~NO~~ $SO_4^=$
10 PPM NO_3^- 2 PPM F^- 1000 ml AS FOLLOWS
1.64852 g NaCl LOT 922649A
0.11980 g $NaHCO_3$ LOT 897789
20 ml SO_4 - 5/93 STOCK SOLUTION
10 ml NO_3 - 5/93 STOCK SOLUTION
2 ml F - 5/93 STOCK SOLUTION
+ DI WATER TO 1000 ml STOCK
SOLUTIONS P226 T=95°C N_2 TNENMD
1238001 N_2 PURGED
START pH 8.170
END pH 9.065
POTENTIOSTAT ESC 440-1 CHANNEL #3 DATA
SAVED AS REPTIM35.DAT USING REPTIMER.IWBB
REFERENCE SCE FISHER 13-620-51 SN 2134032
E_{CORR} -686 mV KEITHLEY 614
E_{pt} -256 mV " " DD 7/27/94
PIT INITIATION 600 mV FOR ~~30 min~~ 60 min
PIT GROWTH 400 mV FOR 33 HOURS
REPASSIVATION 0.0 V SCE
SPECIMEN STARTED 2:00 pm 5/7/93
SPECIMEN STOPPED 5:33 pm 5/10/93
RUNTIME 272970 SEC
REPASSIVATION TIME DID NOT REPASSIVATE
CHARGE DENSITY 249 C/cm^2
WEIGHT LOSS 0.40037 g

5/10/93

5/11/93 CREVICE CORROSION EXPT 304L-2

SPECIMEN 304L HT# T0954 600 S.C FINISH
CLEANED IN ULTRASONIC BATH RINSED
WITH DI WATER, ACETONE AND DRIED
l= 2.500 w= 0.497 t= 0.124
AREA = 20.827 cm^2
START WT 21.14781 g
END WT. NOT RECORDED
SOLUTION 1000 PPM Cl^- 85 PPM HCO_3 20 PPM $SO_4^=$
10 PPM NO_3 2 PPM F^- 1000 ml AS FOLLOWS
1.64886 g NaCl LOT 922649A
0.11986 g $NaHCO_3$ LOT 897789
20 ml SO_4 - 5/93 STOCK SOLUTION
10 ml NO_3 - 5/93 "
2 ml F - 5/93 "
+ DI WATER TO 1000 ml
STOCK SOLUTIONS P226
START PH 8.211
END PH 8.077
SETUP SPECIMEN PLACED IN PLEXIGLASS CELL
WITH TWO PORTS TORQUED TO 20 IN-OZ
USING PROTO 6103 CAL DUE ~~70~~ 7/20/93 DD 7/27/94
PORT #1 AT TIP
MI 200 Cl^- ISE FLEXABLE #44199
MI 506 GLASS PH #43720
MI 402/403 DOUBLE JUNCTION REFERENCE #41402
PORT # 2 AT MOUTH
MI 200 Cl^- ISE FLEXABLE # 44176
MI 506 GLASS pH # 44060
MI 402/403 DOUBLE JUNCTION REFERENCE. #43636
REFERENCE ELECTRODES IN BULK
MI 402 44629 REF FOR MI 200 44199 AT TIP
MI 402 41436 REF FOR MI 506 43720 AT TIP
MI 402 44671 REF FOR MI 200 44176 AT MOUTH
MI 402 44628 REF FOR MI 506 44060 AT MOUTH

5/11/93

CREVICE CORROSION 304L-2

BULK ELECTRODES

MI 200 Cl ISE # 42983
MI 402 Ag AgCl REF # 43647
MI 506 GLASS pH # 44817
MI 402 Ag AgCl REF # 45860
FISHER 13-620-53 SN 8118182 REFERENCE Ag/AgCl

Cl TIP TO ORION EA920 SN 5001A AND ABB S6120 0515265
Cl BULK TO ORION EA920 SN 5001A AND ABB S6120 0515265
Cl MOUTH TO ORION 720A IO 5885 AND ABB S6120 0049616

pH TIP TO ORION EA940 SN 2330 AND ABB S6120 0515265
pH BULK TO ORION EA940 SN 2330 AND ABB S6120 0515265
pH MOUTH TO ORION 720A 003368 AND ABB S6120 0049616

FISHER 13-620-53 SN 8118182 TO CHANNEL #1 OF ESC 440 #2
TIP REFERENCE TO CHANNEL #3 OF ESC 440 #2
MOUTH REFERENCE TO CHANNEL #2 OF ESC 440 #2

Pt COUNTER ELECTRODE AND SPECIMEN CONNECTED TO ESC 440-2 CHANNEL # 1

PLEXIGLASS CELL WITH SPECIMEN PLACED IN GLASS CELL WITH PLEXIGLASS LID ENTIRE ASSEMBLY PLACED IN FARADAY CAGE ON 5/11/93 AT 2:45 PM SOLUTION WAS NOT DEAERATED.

PRIOR TO ASSEMBLY ELECTRODES WERE CALIBRATED USING 100 PPM Cl^- 1000 PPM Cl^- 0.5 M Cl^- 1.0 M Cl^- AND 2.5 M Cl^- pH ELECTRODES WERE CALIBRATED USING BUFFERS 1.00, 4.00, 7.00, AND 10.00.

5/11/93

CREVICE CORROSION 304L-2 WR

pH TIP MI506/MI402 41436/43720
mV = ~~-17.7(V)~~ 7/27/94 -56.51 (pH) + 397.887
pH = -17.7(V) + 7.04
pH BULK MI506/MI402 44817/45860
mV = -58.47 (pH) + 386.11
pH = -17.1 (V) ~~+7.01~~ 7/27/94 + 6.60
pH MOUTH MI506/MI402 44060/44628
mV = -58.4533 (pH) + 409.793
pH = -17.1 V ~~+6.60~~ 7/27/94 + 7.01
Cl TIP MI 200/MI402 44199/44629
mV = -23.4852 ln (ppm Cl^-) + 275.901
ppm Cl^- = Exp [-0.0426 mV + 11.7479]
Cl BULK MI200/MI402 42983/43647
mV = -23.7019 ln (ppm Cl^-) + 279.653
ppm Cl^- = Exp [-0.0422 mV + 11.7973]
Cl MOUTH MI200/MI402 44176/44671
mV = -21.6523 ln (ppm Cl^-) + 260.659
ppm Cl^- = Exp [-0.0462 mV + 12.038]

INITIAL CONDITIONS AT START OF EXPT 5/11/93 3:00PM

POTENTIALS

TIP	-0.216	Ag/AgCl
MOUTH	-0.236	Ag/AgCl
SPECIMEN	-0.223	Ag/AgCl

pH

TIP	7.47	-28.5 mV
MOUTH	8.20	-75.0 mV
BULK	8.44	-85.4 mV

Cl

TIP	79.5 mV
MOUTH	107.3 mV
BULK	110.0 mV

5/11/93 CREVICE CORROSION 304L-2

3:00 PM POTENTIAL SET AT 0.100 V Ag/AgCl 5/11/93
TIMER STARTED FROM 0 SEC

5/12/93 8:00 AM POTENTIAL CHANGED TO 0.0 V Ag/AgCl
TIMER = 61160 SEC Cl TIP READING
320 mV 5/12/93

T = 90261 SEC POTENTIOSTAT TURNED OFF

5/13/93 9:00 AM 0.10 V APPLIED Cl TIP READING CORRECTLY
mV = 95 5/13/93

5/14/93 265100 SEC 4:40 PM EXPT STOPPED
Cl ELECTRODE IN TIP STILL NOT PERFORMING WELL AND IS VERY NOISY. EXPERIMENT ENDED.

5/14/93

5/21/93 CHLORIDE AT TIP VARIED FROM 90 mV TO 325 mV IN THE RANGE OF DATA RECORDED SHORTLY AFTER START OF EXPERIMENT Cl AT TIP WENT OFF SCALE OR GREATER THAN 200 mV

pH AT TIP VARIED FROM 0 mV TO + 350 mV OR FROM pH 7.04 TO pH 0.8 LOW pH READINGS CORRESPONDED WITH LOW Cl CONCENTRATIONS AT THIS LOCATION. SIGNAL WAS AT TIMES VERY NOISY.

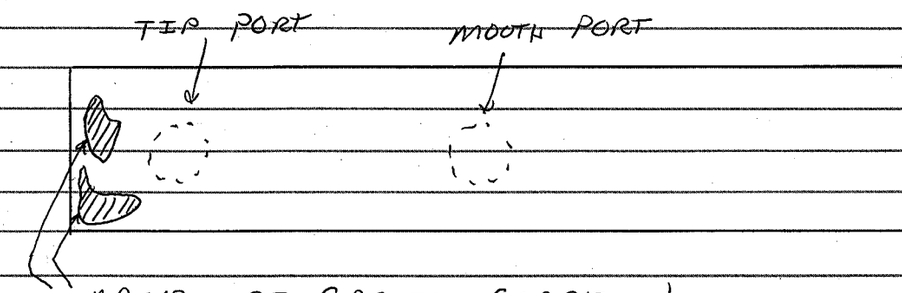
CHLORIDE AT MOUTH VARIED FROM 140 mV TO 108 mV OR FROM 1151 ppm TO 262 ppm SIGNAL WAS AT TIMES VERY NOISY ESPECIALLY NEAR THE END OF THE EXPERIMENT. LARGE SPIKE IN Cl READING OCCURED AT t = 61160 SEC

5/21/93 CREVICE CORROSION 304L-2

WHEN POTENTIAL WAS CHANGED TO 0.0 V INDICATING POSSIBLE INTERFERENCE WITH EXTERNAL ELECTRODE.

pH AT MOUTH VARIED FROM + 50 TO − 50 mV OR FROM pH 6.15 TO 7.92 pH GRADUALLY DECREASED THROUGHT COURSE OF EXPERIMENT SIGNAL WAS SOMEWHAT NOISY. SPIKE IN pH ELECTRODE OUTPUT OCCURED AT t = 61160 SEC INDICATING POSSIBLE INTERFERENCE WITH EXTERNAL ELECTRODE.

DRAWING OF TOP OF CREVICE SPECIMEN



AREAS OF CREVICE CORROSION

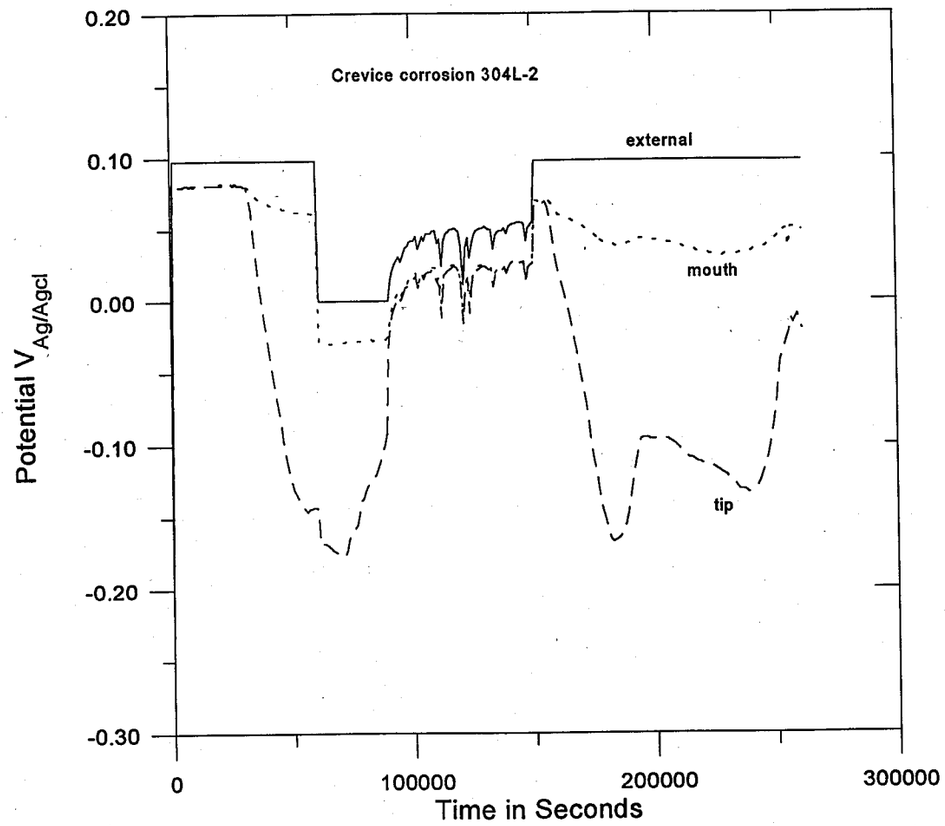
NO CREVICE CORROSION WAS OBSERVED ON BOTTOM SIDE OF SPECIMEN.

DATA FILE SAVED AS 304L-2.DAT USING CREVICE.WBB

5/21/93

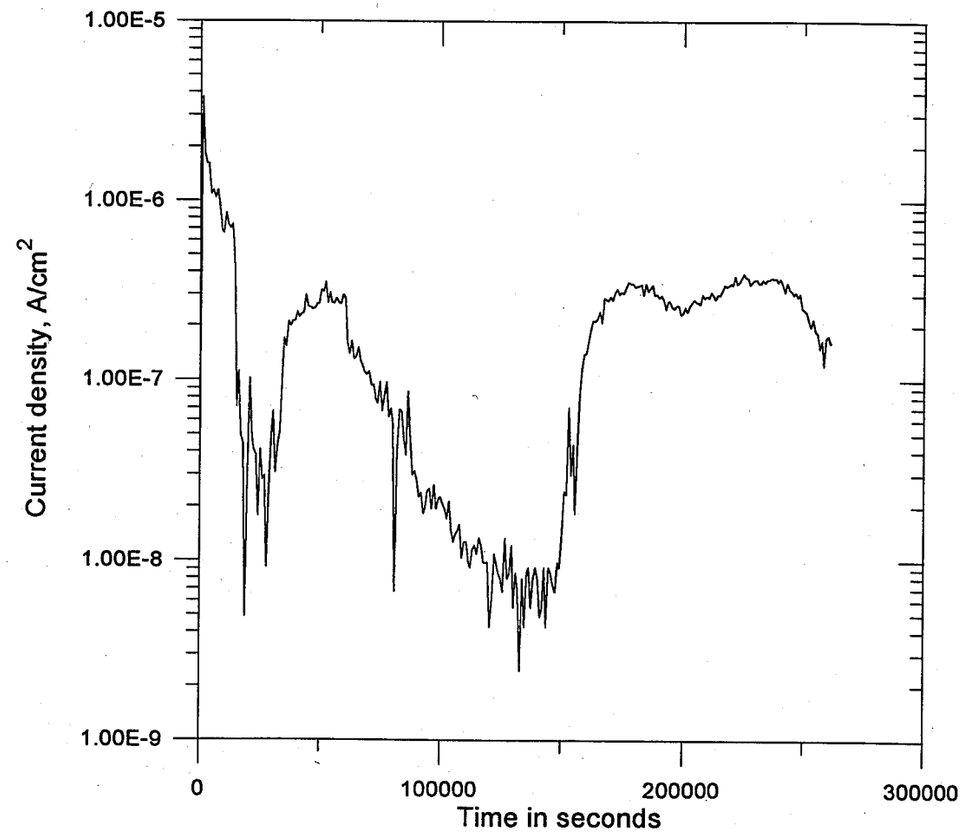
pH AND Cl⁻ ISE CALIBRATION DATA SAVED AS 304L2CAL.DAT ON IWPE-025 DISK

5/21/93 CREVICE CORROSION 304L-2



5/21/93

5/21/93 CREVICE CORROSION 304L-2



5/21/93

5/13/93 REPTIM 36 REPASSIVATION TIME

SPECIMEN ALLOY 825 HN4371FG 600S.C
CLEANED SAME AS REPTIM 21 P160
l= 1.913 d= 0.248 WET AREA = 8.0 cm²
START WT 11.83055 g
END WT 11.38602 g
SOLUTION 1000 ppm Cl⁻ 85 ppm HCO₃ 20 ppm SO₄⁻²
10 ppm NO₃⁻ 2ppm F⁻ 1000 ml AS FOLLOWS
1.65024 g NaCl LOT 922649A
0.11819 g NaHCO₃ LOT 897789
20 ml STOCK SOLUTION SO₄ - 5/93
10 ml NO₃ - 5/93
2 ml F - 5/93
+ DI WATER TO 1000 ml STOCK SOLUTIONS
P 226 T=95°C N₂ THERMO 1238002
DEAERATED WITH NITROGEN.
START PH 8.171
END PH 9.118
POTENTIOSTAT ESC 440-1 CHANNEL # 2 DATA
SAVED AS REPTIM36.DAT USING REPTIMER.WRB
REFERENCE SCE FISHER 13-620-51 SN 0165415
E_{CORR} - 733 mV
E_{PT} - 254 mV
PIT INITIATION 600 mV FOR 30 min
PIT GROWTH 400 mV FOR 33 HOURS
REPASSIVATION. - 40 mV
SPECIMEN STARTED 11:23 AM 5/13/93
SPECIMEN STOPPED 11:15 AM 5/15/93
RUNTIME 174,360 SEC
REPASSIVATION TIME 481 SEC
CHARGE DENSITY 218 C/cm²
WEIGHT LOSS 0.45053 g

5/15/93

5/13/93 REPTIM 37 REPASSIVATION TIME

SPECIMEN ALLOY 825 600 S.C
CLEANED SAME AS REPTIM 21 P160
l= 1.913 d= 0.248 WET AREA = 8.0 cm²
START WT 11.76750 g
END WT 11.29108 g
SOLUTION 1000 ppm Cl⁻ 85 ppm HCO₃⁻ 20 ppm SO₄⁻²
10 ppm NO₃⁻ 2 ppm F⁻ 1000 ml AS FOLLOWS
0.11904 g NaHCO₃ LOT 897789
1.64908 g NaCl LOT 922649A
20 ml SO₄ - 5/93
10 ml NO₃ - 5/93
2 ml F - 5/93
+ DI WATER TO 1000 ml STOCK SOLUTIONS
P 226 T= 95°C N₂ THERMO 0323007
DEAERATED WITH NITROGEN
START PH 8.094
END PH 9.178
POTENTIOSTAT ESC 440-1 CHANNEL # 3 DATA
SAVED AS REPTIM37.DAT USING REPTIMER.WRB
REFERENCE SCE FISHER 13-620-51 SN 0169033
E_{CORR} - 757 mV
E_{PT} - 257 mV
PIT INITIATION 600 mV FOR 30 min
PIT GROWTH 400 mV FOR 33 HOURS
REPASSIVATION - 30 mV
SPECIMEN STARTED 11:29 AM 5/13/93
SPECIMEN STOPPED 11:13 AM 5/15/93
RUNTIME 173 800 SEC
REPASSIVATION TIME 977 SEC
CHARGE DENSITY 231 C/cm²
WEIGHT LOSS. 0.47642 g

5/15/93

REPTIM 38 REPASSIVATION TIME

SPECIMEN ALLOY 825 HN 4371FG 600 S.C
PREPARED SAME AS REPTIM 21 P160
l = 1.911 d = 0.248 WET AREA = 8.0 cm²
START WT 11.91772 g
END WT 11.63853 g
SOLUTION 1000 PPM Cl⁻ 85 PPM HCO_3 20 PPM SO_4^{2-}
10 PPM NO_3^- 2 PPM F⁻ 1000 ml AS FOLLOWS
1.64902 g NaCl LOT 922649A
0.11926 g $NaHCO_3$ LOT 897789
20 ml SO_4 - 5/93
10 ml NO_3 - 5/93
2 ml F - 5/93
+ DI WATER TO 1000 ml STOCK SOLUTIONS
P 226 T = 95°C Hg THERMO# 1238001
DEAERATED WITH NITROGEN
START PH 8.072
END PH 9.138
POTENTIOSTAT ESC 440-1 CHANNEL # 4 DATA
SAVED AS REPTIM 38.DAT USING REPTIMER.WBB
REFERENCE SCE FISHER 13-620-51 SN 8211163
E_{CORR} -749 mV
E_{PT} -298 mV
PIT INITIATION 600 mV FOR 30 min
PIT GROWTH 400 mV FOR 33 HOURS
REPASSIVATION -60 mV
SPECIMEN STARTED 11:33 AM 5/13/93
SPECIMEN STOPPED 11:13 AM 5/13/93
RUNTIME 173400 SEC
REPASSIVATION TIME 721 SEC
CHARGE DENSITY 134 C/cm²
WEIGHT LOSS 0.27919 g
SAMPLE MOUNTED IN BAKELITE AND SECTIONED

Daniel Dan 5/16/93

5/19/93

REPTIM 39 REPASSIVATION TIME

SPECIMEN ALLOY 825 HN4371FG 600 S.C
PREPARED SAME AS REPTIM 21 P160
l = 1.915 d = 0.248 WET AREA 8.0 cm²
START WT 11.82507
END WT 11.42881 g
SOLUTION 1000 PPM Cl⁻ 85 PPM HCO_3 20 PPM SO_4^{2-}
10 PPM NO_3^- 2 PPM F⁻ 1000 ml AS FOLLOWS.
1.64831 g NaCl LOT 922649A
0.11916 g $NaHCO_3$ LOT 897789
20 ml SO_4 - 5/93
10 ml NO_3 - 5/93
2 ml F - 5/93
+ DI WATER TO 1000 ml STOCK SOLUTIONS
P226 T = 95°C Hg THERMO 1238004
DEAERATED WITH NITROGEN
START PH 8.141
END PH 9.051
POTENTIOSTAT ESC 440-1 CHANNEL #2 DATA
SAVED AS ~~REPTIMER~~ DR 7/27/94 REPTIM 39.DAT USING REPTIMER.WBB
REFERENCE SCE FISHER 13-620-51 SN 9214083
E_{CORR} -726 mV
E_{PT} -57 mV
PIT INITIATION 600 mV FOR 30 min
PIT GROWTH 400 mV FOR 33 HOURS
REPASSIVATION -20 mV
SPECIMEN STARTED 4:30 PM 5/19/93
SPECIMEN STOPPED 8:00 AM 5/21/93
RUNTIME 143,000
REPASSIVATION TIME 1005 SEC
CHARGE DENSITY 193 C/cm²
WEIGHT LOSS 0.39626 g

Daniel Dan 5/21/93

5/19/93 REPTIM 40 REPASSIVATION TIME

SPECIMEN ALLOY 825 NN4371FG 600S.C
PREPARED SAME AS REPTIM 21 P160
l = 1.915 d = 0.248 WET AREA = 8.0 cm²
START WT 11.87470
END WT 11.27739
SOLUTION 1000 PPM Cl⁻ 85 PPM NCO_3 20 PPM $SO_4^{=}$
10 PPM NO_3 2 PPM F⁻ 1000 ml AS FOLLOWS
1.64979 g NaCl LOT 922649A
0.12095 g $NaHCO_3$ LOT 897789
20 ml SO_4 - 5/93
10 ml NO_3 - 5/93
2 ml F - 5/93
+ DI WATER TO 1000 ml STOCK SOLUTIONS
P 226 T = 95°C Ng TNGRMD 0323007
DEAERATED WITH NITROGEN
START PH 8.104
END PH 9.103
POTENTIOSTAT ESC 440-1 CHANNEL #3 DATA
SAVED AS REPTIM40.DAT USING REPTIMER.WBB
REFERENCE SCE FISHER 13-620-51 SN 0165415
E_{CORR} -710 mV
E_{PT} -49 mV
PIT INITIATION 600 mV FOR 30 min
PIT GROWTH 400 mV FOR 33 HOURS
REPASSIVATION -0.013V
SPECIMEN STARTED 4:35 pm 5/19/93
SPECIMEN STOPPED 8:00 AM 5/21/93
RUNTIME 143,000 SEC
REPASSIVATION TIME 1.663 SEC
CHARGE DENSITY 2.89 C/cm²
WEIGHT LOSS 0.59731 g
SAMPLE MOUNTED IN BAKELITE AND SECTIONED

Darell Dr 5/21/93

5/19/93 REPTIM 41 REPASSIVATION TIME

SPECIMEN ALLOY 825 NN4371FG 600S.C
PREPARED SAME AS REPTIM 21 P160
l = 1.913 d = 0.249 WET AREA = 8.0 cm²
START WT 11.87044
END WT 11.52707 g
SOLUTION 1000 PPM Cl⁻ 85 PPM NCO_3 20 PPM $SO_4^{=}$
10 PPM NO_3^- 2 PPM F⁻ 1000 ml AS FOLLOWS.
1.64891 g NaCl LOT 922649A
0.11819 g $NaNCO_3$ LOT 897784
20 ml SO_4 - 5/93
10 ml NO_3 - 5/93
2 ml F - 5/93
+ DI WATER TO 1000 ml STOCK SOLUTIONS
P 226 T = 95°C Ng TNGRMD 1238001
DEAERATED WITH NITROGEN
START PH 8.132
END PH 9.071
POTENTIOSTAT ESC 440-1 CHANNEL #4 DATA SAVED
AS REPTIM41.DAT USING REPTIMER.WBB
REFERENCE SCE FISHER 13-620-51 SN 8211163
E_{CORR} -744 mV
E_{PT} -324 mV
PIT INITIATION 600 mV FOR 30 min
PIT GROWTH 400 mV FOR 33 HOURS
REPASSIVATION -4 mV
SPECIMEN STARTED 4:40 pm 5/19/93
SPECIMEN STOPPED 8:00 AM 5/21/93
RUNTIME 143,000 SEC ~~DD~~ 7/22/94
REPASSIVATION TIME ~~1.663 SEC~~ 1.506 SEC
CHARGE DENSITY 170 C/cm²
WEIGHT LOSS 0.34337 g

Darell Dr 5/21/93

5/20/93 CREVICE CORROSION 304L-3

SPECIMEN 304L HT # T0954 600 SiC FINISH
CLEANED IN ULTRASONIC BATH, RINSED
WITH DI WATER, ACETONE AND DRIED
l = 2.500 w = 0.497 t = 0.122
AREA = 20.75 cm²
START WT = 21.09321 g
END WT = 21.09320 g
SOLUTION 1000 PPM Cl⁻ 85 PPM HCO₃ 20 PPM SO₄⁻²
10 PPM NO₃ 2 PPM F⁻
1.64631 g NaCl LOT 922649A
0.11817 g NaHCO₃ LOT 897789
20 ml SO₄⁻ 5/93 STOCK SOLUTION
10 ml NO₃⁻ 5/93 "
2 ml F⁻ 5/93 "
+ DI WATER TO 1000 ml STOCK SOLUTIONS
P 226
START pH 8.171
END pH 8.201
SETUP SAME AS 304L-2 P 229
PORT #1 AT TIP
MI 200 Cl⁻ ISE 44199
MI 506 GLASS pH 43720
MI 402/403 DOUBLE JUNCTION REFERENCE #41402
PORT #2 AT MOUTH
MI 200 Cl⁻ ISE 44447
MI 506 GLASS pH 43717
MI 402/403 DOUBLE JUNCTION REFERENCE 43636
REFERENCE ELECTRODES IN BULK
MI 402 44629 REF FOR MI 200 44199 AT TIP
MI 402 41436 REF FOR MI 506 43720 AT TIP
MI 402 44671 REF FOR MI 200 44447 AT MOUTH
MI 402 44628 REF FOR MI 506 43717 AT MOUTH

5/20/93 CREVICE CORROSION 304L-3

BULK ELECTRODES
MI 200 42983 Cl⁻ ISE
MI 402 43647 Ag/AgCl REF
MI 506 44817 GLASS pH
MI 402 45860 Ag/AgCl REF
FISHER 13-620-53 SN 8118182 REFERENCE Ag/AgCl

Cl TIP TO ORION EA 920 SN 5001A AND ABB SE120 0515265
Cl BULK TO ORION EA 920 SN 5001A AND ABB SE120 0515265
Cl MOUTH TO ORION 720A ID 5885 AND ABB SE120 0049616
pH TIP TO ORION EA 940 SN 2330 AND ABB SE120 0515265
pH BULK TO ORION EA 940 SN 2330 AND ABB SE120 0515265
pH MOUTH TO ORION 720A SN 003368 AND ABB SE120 0049616
FISHER 13-620-53 SN 8118182 TO ESC 440 #2 CHANNEL #1
TIP REF TO CHANNEL #3 OF ESC 440 #2
MOUTH REF TO CHANNEL #2 OF ESC 440 #2
Pt COUNTER ELECTRODE AND SPECIMEN CONNECTED TO ESC 440 #2 CHANNEL #1

PLEXIGLASS CELL WITH SPECIMEN AND ELECTRODES PLACED IN GLASS VESSEL WITH PLEXIGLASS LID AND ENTIRE ASSEMBLY WAS PLACED INSIDE FARADAY CAGE. ON 5/20/93 SOLUTION WAS NOT DEAERATED

PRIOR TO ASSEMBLY ELECTRODES WERE CALIBRATED USING STOCK SOLUTIONS 100 PPM Cl⁻, 1000 PPM Cl⁻, 0.5 M Cl⁻ 1.0 M Cl⁻ AND 2.5 M Cl⁻ pH ELECTRODES WERE CALIBRATED USING BUFFERS 1.00, 4.00 7.00 & 10.00

pH TIP MI 506 / MI 402 43720 / 41436
mV = -58.9367 (pH) + 392.077
pH = -17.9 (V) + 7.00

5/20/93 CREVICE CORROSION 304L-3

pH BULK MI506 / MI 402 44817 / 45860
mV = -57.7633 (pH) + 383.573
pH = -17.3 (V) + 6.64
pH MOUTH MI506 / MI402 43717 / 44628
mV = -55.7633 (pH) + 395.823
pH = -17.9 (V) + 7.09
Cl TIP MI 200 / MI 402 44199 / 44629
mV = -23.6724 ln (ppm Cl) + 278.238
ppm Cl⁻ = EXP [-0.0422 mV + 11.753]
Cl BULK MI 200 / MI 402 42983 / 43647
mV = -21.0842 ln (ppm Cl⁻) + 254.274
ppm Cl⁻ = EXP [-0.0474 mV + 12.059]
Cl MOUTH MI 200 / MI 402 44447 / 44671
mV = -23.1872 ln (ppm Cl⁻) + 269.509
ppm Cl⁻ = EXP [-0.0431 mV + 11.623]

[signature] 5/20/93

5/21/93 INITIAL CONDITIONS AT START OF TEST
10:55 AM

Cl TIP = 93.8 pH TIP = -31.6 mV
Cl BULK = 104.1 pH BULK = -34.6 mV
Cl MOUTH = 101.4 pH MOUTH = -39.8 mV
POTENTIAL AT TIP = -116 mV
POTENTIAL AT MOUTH = ~~-0.8~~ 20 7/27/94 -87 mV
E_{CORR} = -125 mV

AT 11:05 AM t = 64800 SEC V_{SET} 0.0 V [signature] 5/21/93

5/26/93 AT 7:30 AM t = 483960 SEC V_{SET} 200 mV

AT 3:00 PM EXPERIMENT STOPPED.

[signature] 5/26/93

5/31/93 CREVICE CORROSION 304L-3

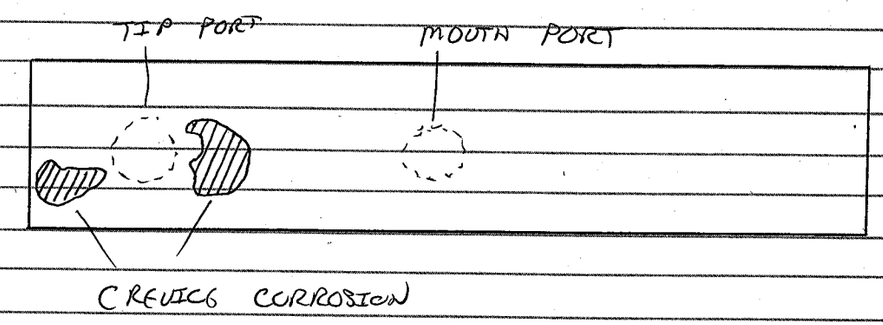
CHLORIDE AT MOUTH REMAINED BETWEEN 90 AND 100 mV OR 2423 ppm TO 1508 ppm

pH AT MOUTH REMAINED BETWEEN +40 AND +60 mV OR 6.37 TO 6.01

pH AT TIP VARIED FROM ~~+15~~ 20 7/27/94 -130 mV TO +40 mV OR 9.32 TO 6.28

Cl AT TIP WAS ERRATIC AND VARIED FROM APPROXIMATELY 500 mV TO -30 mV INTERFERENCE WITH ANOTHER ELECTRODE OR A BAD Cl REFERENCE MAY HAVE CAUSED THIS CONDITION.

TOP SIDE OF SPECIMEN

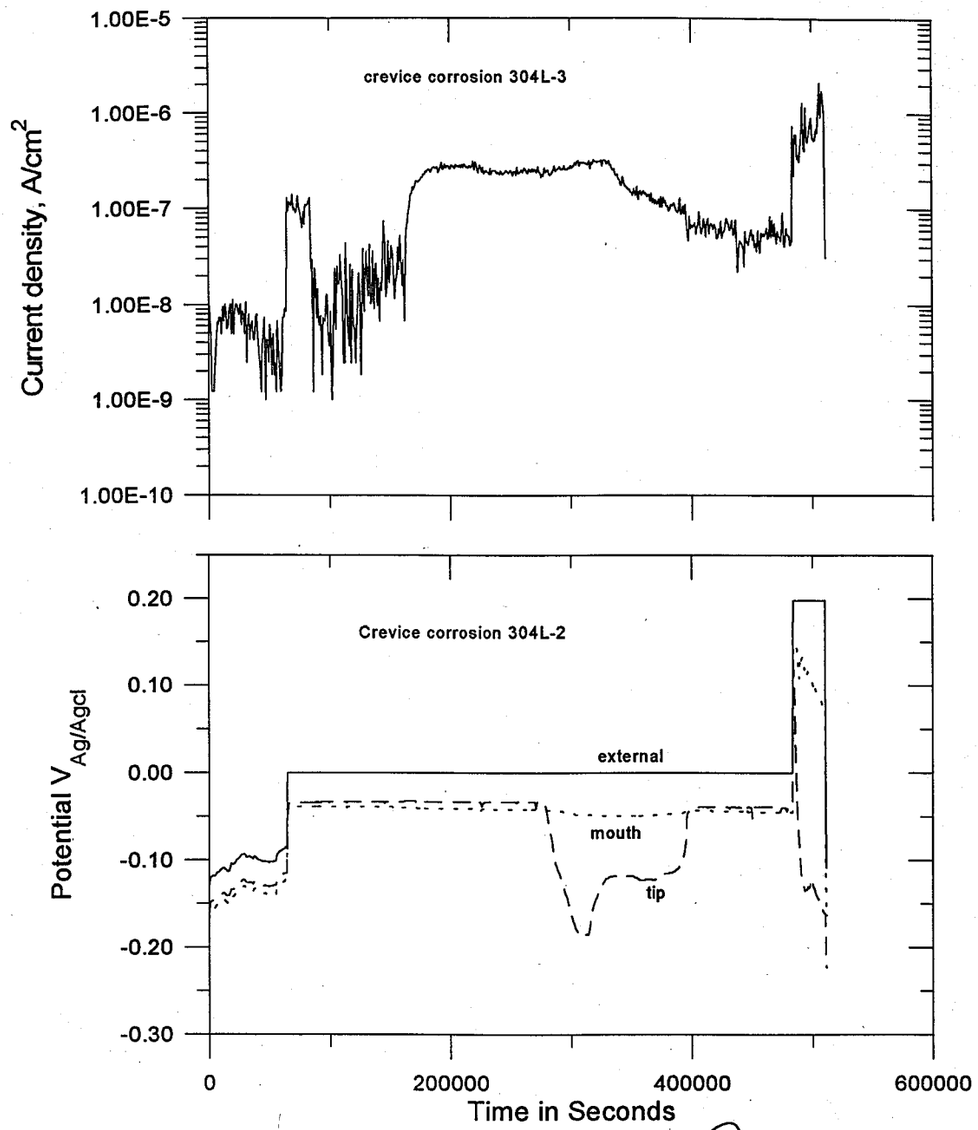


DATA FILE SAVED AS 304L-3.DAT USING CREVICE.WBB

[signature] 5/31/93

pH AND Cl⁻ ISE CALIBRATION DATA SAVED AS 304L3CAL.DAT ON IWPE 025-DISK [signature] 4/28/94

5/31/93 CREVICE CORROSION 304L-3



5/31/93

REPTIM 42 REPASSIVATION TIME

SPECIMEN ALLOY 825 NN4371FG 600S,C
PREPARED SAME AS REPTIM 21 P160
l = 1.914 d = 0.251 WET AREA =
START WT 11.9554g
END WT 11.60197g
SOLUTION 1000 PPM Cl^- 85 PPM NCO_3 20 PPM $SO_4^=$
10 PPM NO_3^- 2 PPM F^- 1000 ml AS FOLLOWS
1.65045 g NaCl LOT 922649A
0.12152 g $NaNCO_3$ LOT 897789
20 ml SO_4 -5/93 STOCK SOLUTION
10 ml NO_3 -5/93 "
2 ml F -5/93 "
+ DIWATER TO 1000 ml STOCK SOLUTIONS
P 226 T = 95°C Ng THERMO 1238004
DEAERATED WITH NITROGEN
START PH 8.121
END PH 8.927
POTENTIOSTAT ESC 440 #1 CHANNEL # 2 DATA SAVED
AS REPTIM 42.DAT USING REPTIMER.WBB
REFERENCE SCE FISHER 13-620-51 SN 0165415
PIT INITIATION 600 mV FOR 30 min
PIT GROWTH 400 mV FOR 33 HOURS
REPASSIVATION 25 mV
E_{CORR} -687 mV KEITHLEY 614
E_{PT} -222 mV "
SPECIMEN STARTED 4:55 PM 5/26/93 RESTARTED 9:00 AM 5/27/93
SPECIMEN STOPPED 1:13 PM 5/31/93
RUNTIME 366,000 SEC
REPASSIVATION TIME DID NOT REPASSIVATE
CHARGE DENSITY 269 C/cm²
WEIGHT LOSS 0.35352 g
SPECIMEN RESTARTED DUE TO LACK OF PITTING
AFTER 28 C/cm² PASSED PROBLEM DUE TO BAD
LUGGIN PROBE.
LUGGIN PROB LOST SOLUTION 5/30/93

5/31/93

5/26/93 REPTIM 43 REPASSIVATION TIME

SPECIMEN ALLOY 825 HN4371FG 600 S.C
PREPARED SAME AS REPTIM 21 P160
l = 1.912 d = 0.247 WET AREA = 8.0 cm^2
START WT 11.75108
END WT 11.42644 g
SOLUTION 1000 PPM Cl^- 85 PPM NCO_3 20 PPM ~~NO_3~~ $SO_4^=$ DD 7/27/94
10 PPM NO_3^- 2 PPM F^- 1000 ml AS FOLLOWS
1.64922 g NaCl LOT 922647A
0.11842 g $NaNCO_3$ LOT 897789
20 ml SO_4 - 5/93 STOCK SOLUTION
10 ml NO_3 - 5/93 "
2 ml F - 5/93 "
+ DI WATER TO 1000 ml STOCK SOLUTIONS
P 226 T = 95°C Hg THERMO 0323007
DEAERATED WITH NITROGEN
START pH 8.093
END pH 8.934
POTENTIOSTAT ESC 440 #1 CHANNEL #3 DATA
SAVED AS REPTIM43.DAT USING REPTIMER.WBB
REFERENCE SCE FISHER 13-620-51 SN 8211163
PIT INITIATION 600 mV FOR 30 min
PIT GROWTH 400 mV FOR 33 HOURS
REPASSIVATION 15 mV
E_{CORR} -690 mV KEITHLEY 614
E_{PT} -244 mV
SPECIMEN STARTED 4:55 PM 5/26/93
SPECIMEN STOPPED 12:22 PM 5/29/93
RUNTIME 244,600 SEC
REPASSIVATION TIME 708 SEC
CHARGE DENSITY 194 C/cm^2
WEIGHT LOSS 0.32464 g

LUGGIN PROBE LOST SOLUTION SCE NOT IN CONTACT WITH TEST SOLUTION
5/29/93

5/26/93 REPTIM 44 REPASSIVATION TIME

SPECIMEN ALLOY 825 HN4371FG 600 S.C
PREPARED SAME AS REPTIM 21 P160
l = 1.913 d = 0.248 WET AREA = 8.0 cm^2
START WT 11.89888 g
END WT 11.48502 g
SOLUTION 1000 PPM Cl^-, 85 PPM NCO_3^-, 20 PPM $SO_4^=$
10 PPM NO_3^-, 2 PPM F^-, 1000 ml AS FOLLOWS
1.64879 g NaCl LOT 922649A
0.11835 g $NaHCO_3$ LOT 897789
20 ml SO_4 - 5/93 STOCK SOLUTION
10 ml NO_3 - 5/93 "
2 ml F - 5/93 "
+ DI WATER TO 1000 ml STOCK SOLUTION
P 226 T = 95°C Hg THERMO 1238001
DEAERATED WITH NITROGEN.
START pH 8.132
END pH 9.052
POTENTIOSTAT ESC 440 #1 CHANNEL #3 DATA
SAVED AS REPTIM44.DAT USING REPTIMER.WBB
REFERENCE SCE FISHER 13-620-51 SN 9214083
PIT INITIATION 600 mV FOR 30 min
PIT GROWTH 400 mV FOR 33 HOURS
REPASSIVATION 5 mV
E_{CORR} -706 mV
E_{PT} -90 mV
SPECIMEN STARTED 4:55 PM 7/27/94 5/26/93
SPECIMEN STOPPED DD 7/27/94 ~~12:30~~ 12:30 PM 5/29/93
RUNTIME ~~633 SEC~~ 244,000 SEC
REPASSIVATION TIME 633 SEC
CHARGE DENSITY 202 C/cm^2

5/29/93

5/28/93 CREVICE CORROSION 304L-4

SPECIMEN 304L HT # T0954 600 S.C FINISH
CLEANED IN ULTRASONIC BATH RINSED WITH
DI WATER, ACETONE AND DRIED
l = 2.501" w = 0.498" t = 0.123"
AREA = 20.82 Cm^2
START WT = 21.32562g
END WT = 21.32508g
SOLUTION 1000 PPM Cl^- 85 PPM HCO_3 20 PPM $SO_4^=$
10 PPM NO_3^- 2 PPM F^- 1000ml AS FOLLOWS
1.64993g NaCl LOT 922649A
0.11909g $NaHCO_3$ LOT 897789
20ml SO_4 - 5/93 STOCK SOLUTION
10ml NO_3 - 5/93 "
2ml F - 5/93 "
+ DI WATER TO 1000ml
STOCK SOLUTIONS P 226
START pH 8.131
END pH 8.015
SETUP SAME AS 304L-2 P229
PORT #1 AT TIP
MI 200 Cl^- ISE FLEXABLE # 47228
MI 402/403 Ag/AgCl REF FOR MI 200 44629
MI 506 GLASS pH ELECTRODE. 43720
MI 402/403 Ag/AgCl TIP REFERENCE 41402
PORT #2 AT MOUTH
MI 200 Cl^- ISE FLEXABLE 44447
MI 402/403 Ag/AgCl REF FOR MI 200 44621
MI 506 GLASS pH ELECTRODE 43717
MI 402/403 Ag/AgCl REF FOR MOUTH 43636
BULK ELECTRODES
MI 402/403 41436 FOR MI 506 43720 AT TIP
MI 402/403 44628 FOR MI 506 43717 AT MOUTH
MI 506 ~~44816~~ 44817 BULK PH
MI 402/403 45860 Ag/AgCl FOR MI 506 44817

5/28/93 CREVICE CORROSION 304L-4

BULK ELECTRODES CONT.

MI 200 42998 Cl ISE IN BULK
MI 402 43647 Ag/AgCl REF FOR BULK MI 200
FISHER 13-620-53 SN 8118182

Cl TIP TO ORION EA 920 SN S001A AND ABB SE120 0515265 RECORDER
Cl BULK TO ORION EA920 SN S001A AND ABB SE120 0515265 RECORDER
Cl MOUTH TO ORION 720A ID 5885 AND ABB SE120 0049616 RECORDER

pH TIP TO ORION EA940 SN 2330 AND ABB SE120 0515265
pH BULK TO ORION EA940 SN 2330 AND ABB SE120 0515265
Cl MOUTH TO ORION 720A 003368 AND ABB SE120 0049616

FISHER ~~13-620-53~~ 7/27/94 13-620-53 SN 8118182 TO
CHANNEL #1 OF ESC 440 #2
TIP REFERENCE TO CHANNEL #3 OF ESC 440 #2
MOUTH REFERENCE TO CHANNEL #2 OF ESC 440 #2

Pt COUNTER ELECTRODE AND SPECIMEN CONNECTED
TO ESC 440 #2 CHANNEL #1

PLEXIGLASS CELL WITH SPECIMEN PLACED IN
GLASS VESSEL WITH PLEXIGLASS LID. ENTIRE
ASSEMBLY PLACED IN FARADAY CAGE ON
5/28/93 SOLUTION WAS NOT DEAERATED

PRIOR TO ASSEMBLY, ELECTRODES WERE CALIBRATED
USING 1000 PPM Cl^- 100 PPM Cl^- 0.5m Cl^-
1.0 M Cl^- AND 2.5 m Cl^- pH ELECTRODES
WERE CALIBRATED USING BUFFERS 1.00, 4.00
7.00 AND 10.00

5/28/93 CREVICE CORROSION 304L-4

pH TIP MI 506 / MI 402

mV = -57.0667 (pH) + 400.767

pH = -17.5 (V) + 7.02

pH BULK MI 506 / MI 402

mV = -59.0567 (pH) + 390.187

pH = -16.9 (V) + 6.60

pH MOUTH MI 506 / MI 402

mV = -58.3333 (pH) + 407.783

pH = -17.1 (V) + 6.99

Cl TIP MI 200 / MI 403

mV = -19.682 ln (ppm Cl⁻) + 243.27

ppm Cl⁻ = EXP [-0.0508 mV + 12.36]

Cl BULK MI 200 / MI 403

mV = -21.2495 ln (ppm Cl⁻) + 259.341

ppm Cl⁻ = EXP [-0.0471 mV + 12.20]

Cl MOUTH MI 200 / MI 403

mV = -21.4083 ln (ppm Cl⁻) + 263.153

ppm Cl⁻ = EXP [-0.0467 mV + 12.29]

INITIAL CONDITIONS AT START OF EXPT

5/29/93 2:00 pm

	POTENTIALS	pH	Cl⁻
TIP	-0.020	-25.8 mV	90.4 mV
BULK	0.018	-70.6 mV	112.6 mV
MOUTH	-0.028	-16.9 mV	89.9 mV

t = 64800 SEC VSET 0.050 V Ag/AgCl

DATA SAVED AS 304L-4.DAT USING CREVICE.WBB

5/29/93

pH AND Cl⁻ ISE CALIBRATION DATA SAVED AS 304L4CAL.DAT USING IWPE-025 DISK

4/28/94

6/14/93 CREVICE CORROSION 304L-4

pH AT TIP DECREASED TO +460 mV AT t = 417600 SEC

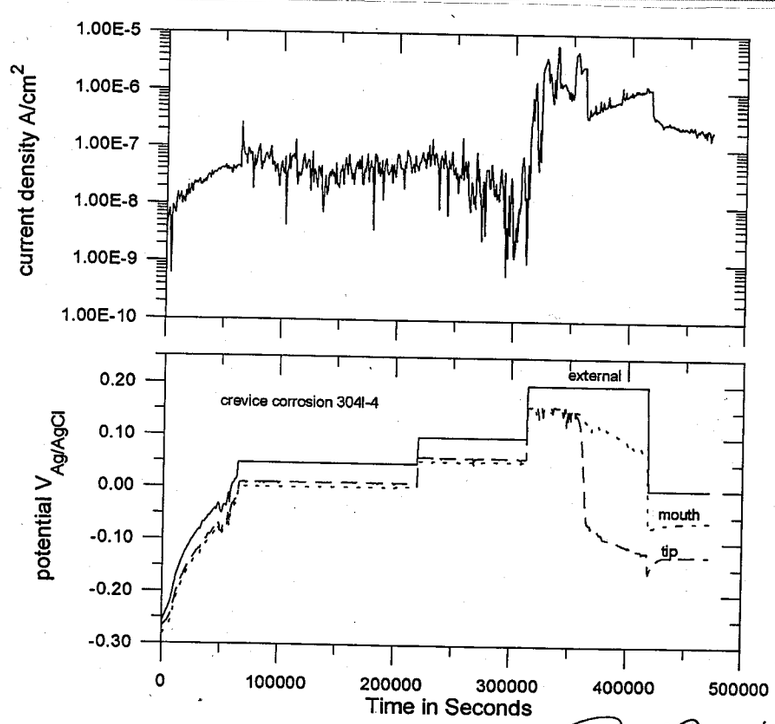
460 mV = pH -1.03 WHICH IS OUT OF pH CALIBRATION RANGE. pH SIGNAL WAS NOISY FROM t = 313200 SEC WHEN THE EXTERNAL POTENTIAL WAS CHANGED TO +200 mV. A SUDDEN DECREASE IN THE pH ELECTRODE SIGNAL WAS OBSERVED AT t = 417600 SEC WHEN EXTERNAL POTENTIAL WAS CHANGED TO 0.0 V

Cl AT TIP REACHED A MAXIMUM OF 2954 ppm (86 mV) AT t = 367200 SEC.

pH AT MOUTH DECREASED TO 5.79, SUDDEN CHANGE IN pH WAS OBSERVED AT t = 417600 SEC WHEN POTENTIAL WAS CHANGED TO 0.0V. Cl AT MOUTH INCREASED THROUGHOUT COURSE OF EXPERIMENT

OUTPUT OF Cl ELECTRODE AT END OF TEST = 79 mV

6/14/93



6/14/93

6/1/93 REPTIM 45 REPASSIVATION TIME

SPECIMEN ALLOY 825 NN4371FG 600 S.C
PREPARED SAME AS REPTIM 21 P160
l = 1.915 d = 0.250 WET AREA = 8.0 cm^2
START WT NOT RECORDED
END WT 11.54864 g
SOLUTION 500 PPM Cl^- 85 PPM NCO_3 20 PPM $SO_4^=$
10 PPM NO_3^- 2 PPM F^- 1000 ml AS FOLLOWS
0.82416 g NaCl LOT 922649A
0.11817 g $NaNCO_3$ LOT 897789
20 ml SO_4 - 5/93
10 ml NO_3 - 5/93
2 ml F - 5/93
+ DIWATER TO 1000 ml STOCK
SOLUTIONS P226 T = 95°C N_2 PURGED
START PH 8.206
END PH 9.131 DD 7/27/94
POTENTIOSTAT ~~ESC 440-3~~ ESC 440 #1 CHANNEL #2
DATA SAVED AS REPTIM 45 USING REPTIMER.WRB
REFERENCE SCE FISHER 13-620-51
PIT INITIATION 600 mV FOR 30 min
PIT GROWTH 500 mV FOR 40 hr
REPASSIVATION 0 mV
E_{CORR} -697 mV KEITHLEY 614
E_{PT} -52 mV "
SPECIMEN STARTED 4:08 PM 6/1/93
SPECIMEN STOPPED 12:24 PM 6/3/93
RUNTIME 159300 SEC
REPASSIVATION TIME 228 SEC
CHARGE DENSITY 125 C/cm^2

[signature] 6/3/93

6/1/93 REPTIM 46 REPASSIVATION TIME

SPECIMEN ALLOY 825 NN4371FG 600 S.C
PREPARED SAME AS REPTIM 21 P160
l = 1.913 d = 0.248 WET AREA = 8.0 cm^2
START WT NOT RECORDED
END WT 11.70936 g
SOLUTION 500 PPM Cl^- 85 PPM NCO_3 20 PPM ~~NO_3~~ $SO_4^=$ DD 7/27/94
10 PPM NO_3^- 2 PPM F^- 1000 ml AS FOLLOWS
0.82511 g NaCl LOT 922649A
0.11918 g $NaHCO_3$ LOT 897789
20 ml SO_4 - 5/93 STOCK SOLUTION
10 ml NO_3 - 5/93 "
2 ml F - 5/93 "
+ DIWATER TO 1000 ml STOCK SOLUTIONS
P 226 T = 95°C N_2 PURGED
START PH 8.094
END PH 9.011
POTENTIOSTAT ESC 440 #1 CHANNEL ~~#2~~ #3 DD 7/27/94 DATA
SAVED AS REPTIM 46.DAT USING REPTIMER.WRB
REFERENCE SCE FISHER 13-620-51
PIT INITIATION 600 mV FOR 30 min
PIT GROWTH 500 mV FOR 40 hr
REPASSIVATION -25 mV
E_{CORR} -712 mV KEITHLEY 614
E_{PT} -32 mV
SPECIMEN STARTED 4:03 PM 6/1/93
SPECIMEN STOPPED 12:23 PM 6/3/93
RUNTIME 159600 SEC
REPASSIVATION TIME 918 SEC
CHARGE DENSITY 121 C/cm^2

[signature] 6/3/93

6/9/93 REPTIM 47 REPASSIVATION TIME

SPECIMEN ALLOY 825 NN4371FG 600 S.C
PREPARED SAME AS REPTIM 21 P160
l= 1.912 d= 0.249 WET AREA= 8.0 cm²
START WT 11.94457
END WT 11.60034 g
SOLUTION 1000 PPM Cl⁻ 85 PPM NCO_3 20 PPM $SO_4^{=}$
10 PPM NO_3^- 2 PPM F^- 1000 ml AS FOLLOWS
1.64867 g NaCl LOT 922649A
0.11927 g $NaHCO_3$ LOT 897789
20 ml SO_4 -6/93 STOCK SOLUTION
10 ml NO_3 -6/93 "
2 ml F -6/93 "
STOCK SOLUTIONS P 260
T=95°C Hg THERMO 1238001
DEAERATED WITH NITROGEN
START pH 8.159
END pH 9.093
POTENTIOSTAT ESC440 #1 CHANNEL #2 DATA
SAVED AS REPTIM 47.DAT USING REPTIMER.WBB
REFERENCE SCE 13-620-51 SN 0169033
PIT INITIATION 600 mV FOR 30 min
PIT GROWTH 400 mV
REPASSIVATION 10 mV
E_{CORR} -690 mV KEITHLEY 614
E_{PT} -171 mV " 7/27/94
SPECIMEN STARTED ~~6/10/93~~ 6:30 pm 6/9/93
SPECIMEN STOPPED 6/11/93 3:50 pm
RUNTIME 163,000
REPASSIVATION TIME DID NOT REPASSIVATE
CHARGE DENSITY 309 C/cm²

CURRENT DENSITY IN 10^{-3} A/cm RANGE POSSIBLE
PROBLEM WITH LUGGIN PROBE

6/11/93

6/9/93 REPTIM 48 REPASSIVATION TIME

SPECIMEN ALLOY 825 NN4371FG 600 S.C
PREPARED SAME AS REPTIM 21 P160
l= 1.914 d= 0.250 WET AREA= 8.0 cm²
START WT 11.96256
END WT 11.47896
SOLUTION 1000 PPM Cl⁻ 85 PPM NCO_3 20 PPM $SO_4^{=}$
10 PPM NO_3^- 2 PPM F^- 1000 ml AS FOLLOWS.
1.64977 g NaCl LOT 922649A
0.11859 g $NaHCO_3$ LOT 897789
20 ml SO_4 -6/93 STOCK SOLUTION
10 ml NO_3 - 6/93
2 ml F - 6/93
+ DI WATER TO 1000 ml STOCK SOLUTIONS
P 260 T=95°C Hg THERMO 1238004
DEAERATED WITH NITROGEN
START pH 8.219
END pH 9.014
POTENTIOSTAT ESC 440 #1 CHANNEL #3 DATA
SAVED AS REPTIM 48.DAT USING REPTIMER.WBB.
REFERENCE SCE 13-620-51 SN 9214083
PIT INITIATION 600 mV FOR 30 min
PIT GROWTH 400 mV FOR
REPASSIVATION 20 mV
E_{CORR} -679 mV KEITHLEY 614
E_{PT} -225 mV " 7/27/94
SPECIMEN STARTED ~~6/10/93~~ 6:30 pm 6/9/93
SPECIMEN STOPPED 6/11/93 3:50 pm
RUNTIME 163,000
REPASSIVATION TIME 421 sec
CHARGE DENSITY 233 C/cm²

6/11/93

6/9/93 REPTIM 49 REPASSIVATION TIME

SPECIMEN ALLOY 825 NN4371FG 600 S.C
PREPARED SAME AS REPTIM 21 P160
l = 1.913 ~~l = 11.57905~~ 7/27/94 d = 0.248 WET AREA = 8.0 cm^2
START WT 11.57905 g
END WT 11.21971 g
SOLUTION 500 PPM Cl^- 85 PPM NCO_3 20 PPM $SO_4^=$
10 PPM NO_3^- 2PPM F^- 1000 ml AS FOLLOWS
0.82572 g NaCl LOT 922649A
0.11920 g $NaHCO_3$ LOT 897789
20ml SO_4 - 6/93 STOCK SOLUTION
10 ml NO_3 - 6/93 "
2 ml F - 6/93
+ DI WATER TO 1000 ml STOCK
SOLUTIONS P260 T = 95°C Hg THERMO 0323007
DEAERATED WITH NITROGEN
START PH 8.278
END PH 9.247
POTENTIOSTAT ESC 440 #3 CHANNEL #4 DATA
SAVED AS REPTIM 49.DAT USING REPTIMER.WBB
REFERENCE SCE 13-620-51 SN 8211163
PIT INITIATION 600 mV FOR 30 min
PIT GROWTH 400 mV FOR
REPASSIVATION 25 mV
E_{CORR} -560 mV KEITHLEY 614
E_{PT} -273 mV "
SPECIMEN STARTED 6/9/93 6:30 pm
SPECIMEN STOPPED 6/11/93 3:50 pm
RUNTIME 162,000 SEC
REPASSIVATION TIME 656 SEC
CHARGE DENSITY. 175 C/cm^2 ~~pp~~

Donald D 6/11/93

6/9/93 REPTIM 50 REPASSIVATION TIME.

SPECIMEN ALLOY 825 NN4371 FG 600 S.C
PREPARED SAME AS REPTIM 21 P160
l = 1.913 d = 0.250 WET AREA = 8.0 cm^2
START WT 11.96580
END WT 11.49795 g
SOLUTION 500 PPM Cl^- 85 PPM NCO_3 20 PPM $SO_4^=$
10 PPM NO_3^- 2PPM F^- 1000 ml AS FOLLOWS.
0.82688 g NaCl LOT 922649A
0.12067 g $NaNCO_3$ LOT 897789
20ml SO_4 - 6/93 STOCK SOLUTION
10 ml NO_3 - 6/93
2 ml F - 6/93
+ DI WATER TO 1000 ml STOCK SOLUTIONS
P260 T = 95°C Hg THERMO 0323005
DEAERATED WITH NITROGEN
START PH 8.380
END PH 9.221
POTENTIOSTAT ESC 440 #3 CHANNEL # 5 DATA
SAVED AS REPTIM 50.DAT USING REPTIMER.WBB
REFERENCE SCE 13-620-51 SN 0165415
PIT INITIATION 600 mV FOR 30 min
PIT GROWTH 400 mV FOR
REPASSIVATION ~~25 mV~~ 7/27/94 50 mV
E_{CORR} -561 mV KEITHLEY 614
E_{PT} -281 mV "
SPECIMEN STARTED ~~6/10/93~~ 7/27/94 6/9/93 6:30 pm
SPECIMEN STOPPED 6/11/93 3:50 pm
RUNTIME 162,000 SEC
REPASSIVATION TIME 850 SEC
CHARGE DENSITY. 226 C/cm^2

Donald D 6/11/93

6/6/93 STOCK SOLUTIONS

1000 PPM F^- AS NaF
STOCK SOLUTION F-6/93
2.21303 g NaF LOT 896405 / 1000 ml
6/6/93

1000 PPM NO_3^- AS $NaNO_3$
STOCK SOLUTION NO_3 - 6/93
1.37871 g $NaNO_3$ LOT 897183 +
DI WATER TO 1000 ml 6/6/93

1000 PPM SO_4 AS Na_2SO_4
STOCK SOLUTION SO_4 - 6/93
1.48509 g Na_2SO_4 LOT 901213
+ DI WATER TO 1000 ml 6/6/93

2 MOLE/LITER Cl AS NaCl
STOCK SOLUTION 2M Cl - 6/93 MADE 6/5/93
116.88220 g NaCl LOT 922649A + DI WATER TO 1000 ml

1 MOLE/LITER Cl^- AS NaCl
STOCK SOLUTION 1M Cl - 6/93 MADE 6/5/93
58.44077 g NaCl LOT 922649A + DI WATER TO 1000 ml

0.5 MOLE/LITER Cl AS NaCl
STOCK SOLUTION 0.5M Cl - 6/93 MADE 6/5/93
29.22509 g NaCl LOT 922649A + DI WATER TO 1000 ml

1000 PPM Cl^- AS NaCl
STOCK SOLUTION 1000 Cl - 6/93 - MADE 6/5/93
3.29644 g NaCl LOT 922649A + DI WATER TO 2000 ml

100 PPM Cl^- AS NaCl
STOCK SOLUTION 100 Cl - 6/93 MADE 6/5/93
100 ml STOCK SOLUTION 1000 Cl - 6/93 + 900 ml DI WATER.
[signature] 6/12/93

6/16/93 POTENTIOSTATIC POLARIZATION CR825N8

SPECIMEN ALLOY 825 NN4371FC MILL
FINISHED SURFACES = 4.5 cm^2
TOTAL SURFACE AREA = 14.2 cm^2
START WT 32.36937 g
END WT 31.76154
SOLUTION 1000 PPM Cl^- 85 PPM HCO_3 20 PPM $SO_4^=$
10 PPM NO_3^- 2 PPM F^- 1000 ml AS FOLLOWS
1.64975 g NaCl LOT 926368A
0.11819 g $NaHCO_3$ LOT 897789
20 ml SO_4 - 6/93 STOCK SOLUTION
10 ml NO_3 - 6/93 "
2 ml F - 6/93 "
+ DI WATER TO 1000 ml STOCK SOLUTIONS
P260 T = 95°C N_2 THERMO 1238004
DEAERATED WITH NITROGEN
START PH 8.094
END PH 8.856 @ 7/27/94
POTENTIOSTAT ESC 440 #3 CHANNEL #2 DATA SAVED
AS CR825N8.DAT USING REPASS4F.WBB
REFERENCE SCE 13-620-51 SN 8211163
E_{CORR} - 609 mV REITNERS 617
E_{PT} ~~+176~~ - 176 mV "
$E_{APPLIED}$ 300 mV
E_{RP} NOT RECORDED
SPECIMEN STARTED 6/16/93 6:11 PM
SPECIMEN STOPPED 6/23/93 3:20 PM
RUNTIME 595,000 SEC
CHARGE DENSITY 290 C/cm^2
SPECIMEN PITTED ON MILL FINISHED SURFACES

[signature] 6/23/93

6/16/93 POTENTIOSTATIC POLARIZATION CR825N9

SPECIMEN ALLOY 825 NN4371FG MILL FINISHED
SURFACE AREA = 4.5 cm^2 TOTAL SURFACE
AREA = 14.2 cm^2
START WT 31.23162 g
END WT 31.20632 g DD 7/27/94
SOLUTION 1000 PPM Cl^- 85 PPM NCO_3 20 PPM ~~Al~~ SO_4^{2}
10 PPM NO_3^- 2 PPM F^- 1000 ml AS FOLLOWS
1.64957 g NaCl LOT 926368A
0.11832 g $Na\,NCO_3$ LOT 897789
20 ml SO_4^- 6/93 STOCK SOLUTION
10 ml NO_3 - 6/93 "
2 ml F - 6/93 "
+ DI WATER TO 1000 ml STOCK SOLUTIONS
P260 T=95 °C N_2 THERMO 1238001
DEAERATED WITH NITROGEN
START PH 8.143
END PH 9.036
POTENTIOSTAT ESC440 #3 CHANNEL #3 DATA
SAVED AS CR825N9.DAT USING REPASS 4F.WBB
REFERENCE SCE FISHER 13620-51 SN 0169033
E_{CORR} -539 mV KEITHLEY 617
E_{PT} -81 mV "
E_{APP} 275 mV SCE
E_{RP} NO PITTING DD 7/27/94
SPECIMEN STARTED 6/16/93 6:11 PM
SPECIMEN STOPPED 6/23/93 3:00 PM
RUNTIME 594,000
CHARGE DENSITY 4.8 C/cm^2
SPECIMEN DID NOT PIT AT THIS POTENTIAL

6/23/93

6/16/93 POTENTIOSTATIC POLARIZATION CR825N10

SPECIMEN ALLOY 825 NN4371FG MILL FINISH
SURFACE AREA = 4.5 cm^2 TOTAL SURFACE
AREA 14.2 cm^2
START WT 28.67006
END WT 28.64765
SOLUTION 1000 PPM Cl^-, 85 PPM NCO_3 20 PPM SO_4^{2}
10 PPM NO_3^- 2 PPM F^- 1000 ml AS FOLLOWS
1.64883 g NaCl LOT 926368A
0.12031 g $NaNCO_3$ LOT 897789
20 ml SO_4 - 6/93 STOCK SOLUTION
10 ml NO_3 -6/93 "
2 ml F - 6/93 "
+ DI WATER TO 1000 ml STOCK SOLUTIONS
P260 T= 95 °C N_2 THERMO 0323005
DEAERATED WITH NITROGEN
START PH 8.097
END PH 9.046
POTENTIOSTAT ESC440 #3 CHANNEL #4 DATA SAVED
AS CR825N10.DAT USING REPASS 4F.WBB
REFERENCE SCE FISHER 13-620-51 SN 0165415
E_{CORR} -609 mV KEITHLEY 617
E_{PT} -229 mV
$E_{APPLIED}$ 250 mV SCE
$E_{REPASSIVATION}$ NO PITTING
SPECIMEN STARTED 6/16/93 6:11 PM
SPECIMEN STOPPED 6/23/93 3:00 PM
RUNTIME 594,000
CHARGE DENSITY 3.6 C/cm^2
SPECIMEN DID NOT PIT AT THIS POTENTIAL

6/23/93

6/16/93 POTENTIOSTATIC POLARIZATION CR825N11

SPECIMEN ALLOY 825 NN4371FC MILL FINISHED
SURFACES = 4.5 cm² TOTAL SURFACE AREA = 14.2 cm²
START WT 31.41461 g
END WT 31.39374 g
SOLUTION 1000 PPM Cl⁻ 85PPM NCO_3 20PPM SO_4^{2}
10 PPM NO_3^- 2PPM F⁻ 1000 ML AS FOLLOWS
1.64819 g NaCl LOT 926368A
0.11836 g $NaNCO_3$ LOT 897789
20ml SO_4 - 6/93 ~~SG~~ 7/27/94 STOCK SOLUTION
10ml NO_3 - 6/93 "
2ml F - 6/93 "
+ DI WATER TO 1000 ml STOCK SOLUTIONS
P 260 Nq THERMO 0323007 T=95°C
DEAERATED WITH NITROGEN
START PH 8.127
END PH 9.065
POTENTIOSTAT ESC 440 #3 CHANNEL #5 DATA
SAVED AS CR825N11.DAT USING REPASS4F.WBB
REFERENCE SCE FISHER 13-620-51 SN 9214083
E_{CORR} ~~-28~~ 7/27/94 -584 mV KEITHLEY 617
E_{PT} -28mV "
$E_{APPLIED}$ 225 mV SCE
E_{RP} NO PITTING
SPECIMEN STARTED 6/16/93 6:11 PM
SPECIMEN STOPPED 6/23/93 3:00 PM
RUNTIME 594,000
CHARGE DENSITY 3.2 C/cm²
SPECIMEN DID NOT PIT AT THIS POTENTIAL

Daniel Dan 6/23/93

6/11/93 CREVICE CORROSION 304L-S

SPECIMEN 304L HT# T0954 600 SiC FINISH
CLEANED IN ULTRASONIC BATH RINSED
WITH DI WATER, ACETONE AND DRIED
l= 2.502 w= 0.498 t= 0.124
AREA = 20.8773 cm²
START WT 21.31411 g
END WT 21.31266 g
SOLUTION 1000 PPM Cl⁻ 85PPM NCO_3 20 PPM SO_4^{2}
10 PPM NO_3^- 2PPM F⁻ 1000 ml AS FOLLOWS
1.64831 g NaCl LOT 926368A
0.11813 g $NaHCO_3$ LOT 897789
20ml SO_4 - 6/93 STOCK SOLN
10ml NO_3 - 6/93 "
2ml F - 6/93 "
+ DI WATER TO 1000 ml STOCK
SOLUTIONS P260
START PH 8.109
END PH 8.268
SETUP SPECIMEN PLACED IN PLEXIGLASS CELL
WITH TWO PORTS AND TORQUED TO 20 IN OZ
USING PROTO 6103 CAL DUE 7/20/93
PORT #1 AT TIP
MI 200 Cl ISE FLEXABLE #47228
MI 402/403 DOUBLE JUNCTION Ag/AgCl #44629
MI 506 GLASS PH #43720
MI 402/403 DOUBLE JUNCTION Ag/AgCl #41436
MI 402/403 DOUBLE JUNCTION Ag/AgCl #41402
PORT #2 AT MOUTH
MI 200 Cl ISE FLEXABLE #44447
MI 402/403 DOUBLE JUNCTION Ag/AgCl #44671
MI 506 GLASS PH #43717
MI 402/403 DOUBLE JUNCTION Ag/AgCl #44628
MI 402/403 DOUBLE JUNCTION Ag/AgCl #43636

6/11/93 CREVICE CORROSION 304L-S

BULK ELECTRODES

MI 200	Cl^- ISE	#42998
MI 402	Ag/AgCl	# 43647
MI 506	GLASS PH	# 44817
MI 402	Ag/AgCl	# 45860
FISHER	13-620-53 SN 8118182	Ag/AgCl

Cl TIP TO ORION EA 920 SN3001A AND ABB S6120 0515265
Cl MOUTH TO ORION ~~EA~~ DD 7/21/94 720A ID 5885 AND ABB S6120 0049616
Cl BULK TO ORION EA920 SN 3001A AND ABB S6120 0515265

PH TIP TO ORION EA940 SN 2330 AND ABB S6120 0515265
PH MOUTH TO ORION 720A 003368 AND ABB S6120 0049616
PH BULK TO ORION EA940 SN 2330 AND ABB S6120 0515265

FISHER 13-620-53 SN 8118182 TO CHANNEL #1 OF ESC 440 #2
TIP REFERENCE MI 402/403 # 41402 TO CHANNEL # 3 OF ESC 440 #2
MOUTH REFERENCE MI 402/403 # 43636 TO CHANNEL #2 OF ESC 440 #2

Pt COUNTER ELECTRODE AND SPECIMEN CONNECTED TO ESC440 #2 CHANNEL #1

PLEXIGLASS CELL WITH SPECIMEN PLACED IN GLASS CELL WITH PLEXIGLASS LID ENTIRE ASSEMBLY PLACED IN FARADAY CAGE ON 6/11/93 AT 4:00PM SOLUTION WAS NOT DEAERATED

PRIOR TO ASSEMBLY ELECTRODES WERE CALIBRATED
Cl ELECTRODES USING 100 PPM Cl^- 1000 PPM Cl^-
0.5 M Cl^- 1.0 M Cl^- 2.0 M Cl^- STOCK SOLNS P 260
PH ELECTRODES IN STANDARD BUFFERS 1.00, 4.00, 7.00, 10.00

6/11/93 CREVICE CORROSION 304L-S

pH TIP	MI 506/MI 403	43720/41436
pH =	$-17.9(V) + 6.84$	
pH MOUTH	MI 506/MI 403	43717/44628
pH =	$-17.2(V) + 6.85$	
pH BULK	MI 506/MI 403	44817/45860
pH =	$-17.0(V) + 6.57$	
Cl TIP	MI 200/MI 403	47228/44629
PPM Cl^- =	$Exp[-0.0469\,mV + 11.9377]$	
Cl MOUTH	MI 200/MI 403	44447/44671
PPM Cl^- =	$Exp[-0.0483\,mV + 12.0653]$	
Cl BULK	MI 200/MI 403	42998/43647
PPM Cl^- =	$Exp[-0.0436\,mV + 11.7832]$	

6/11/93

INITIAL VALUES AT 2:00 PM 6/12/93

E_{PT} = +425 mV
E_{EXT} = -0.074 V
E_{TIP} -0.111 V
E_{MOUTH} -0.114 V
PH TIP -97.2 mV
PH MOUTH -89 mV
PH BULK -123 mV
Cl TIP 87 mV
Cl MOUTH 105.6 mV
Cl BULK 111 mV

6/12/93

6/12/93	t = 75600 SEC	V_{SET} = 0.0 V
6/13/93	t = 165600 SEC	V_{SET} = 0.050 V
6/14/93	t = 230400 SEC	V_{SET} = 0.100 V
6/15/93	t = 313200 SEC	V_{SET} = 0.150 V
6/15/93	t = 342000 SEC	V_{SET} = 0.200 V
6/17/93	t = 520,000 SEC	V_{SET} = -0.080 V
6/18/93	t = 603,000 SEC	TEST STOPPED

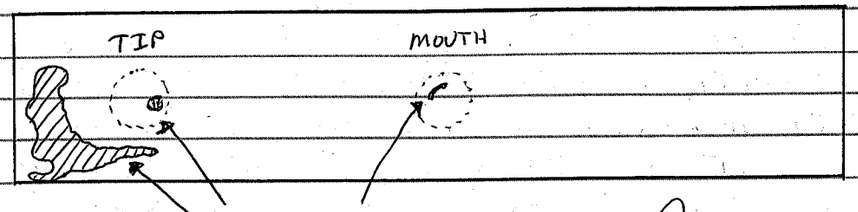
CELL DISSASSEMBLED

6/18/93

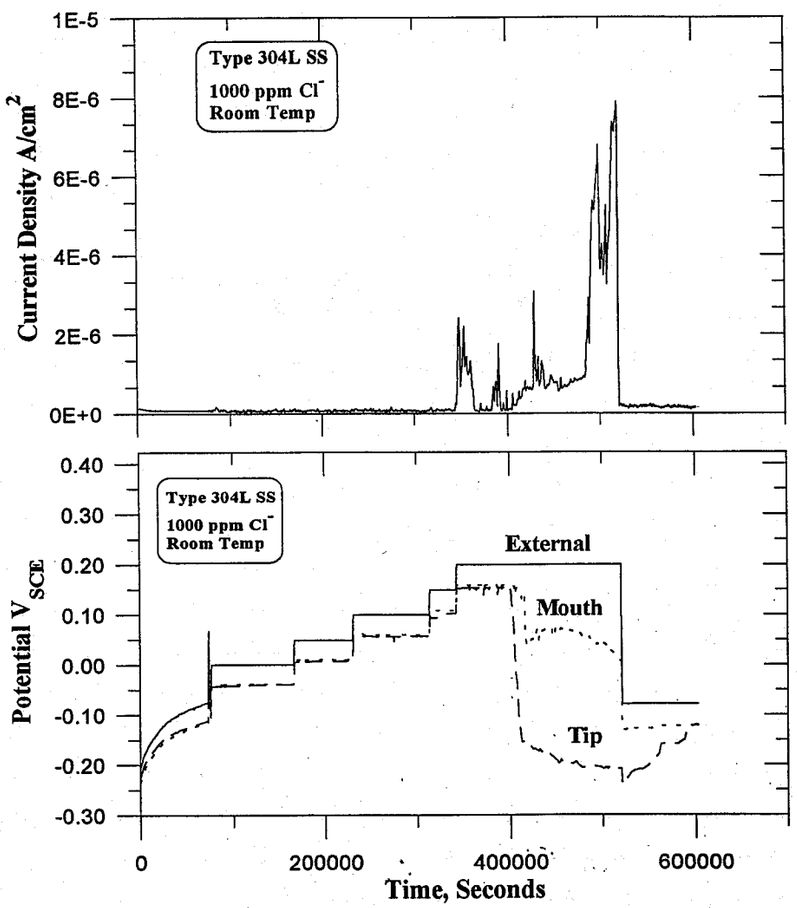
pH AND Cl^- ISE CALIBRATION DATA SAVED AS 304LSCAL.DAT ON IWPEOZS
4/28/94

CREVICE CORROSION 304L-5

SPECIMEN HAS SMALL REGION OF CREVICE CORROSION ON TOP SIDE NEAR TIP SMALL BUT DEEP REGION OF CREVICE CORROSION AT MOUTH ELECTRODE PORT SCALE = 2:1

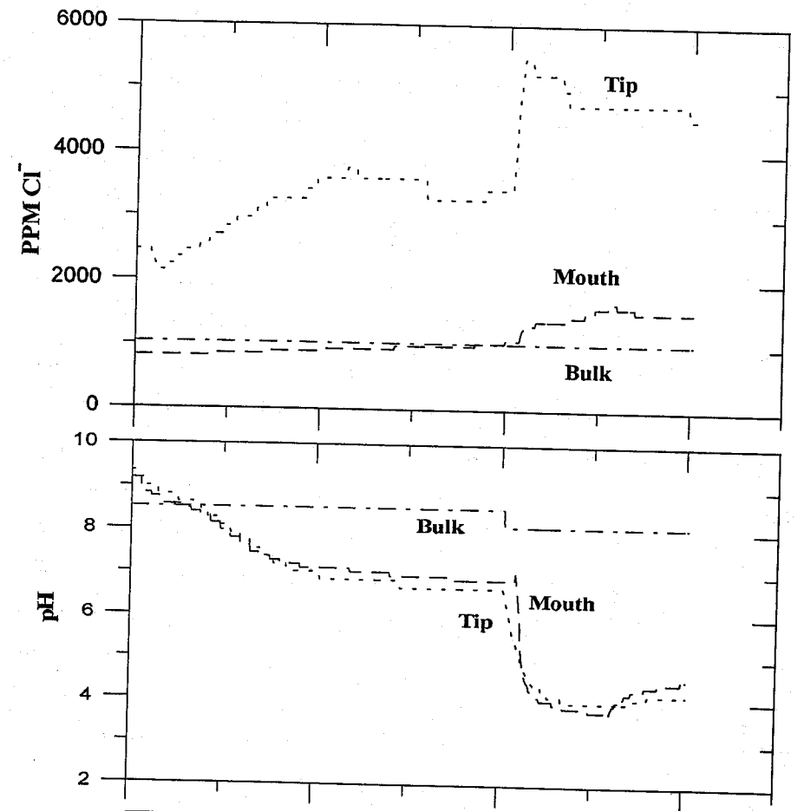


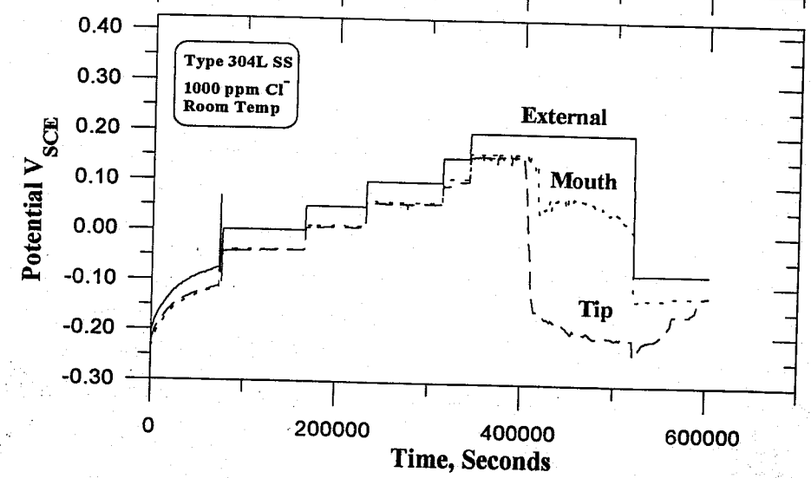
6/18/93



6/25/93

CREVICE CORROSION 304L-5





6/25/93

6/25/93

6/25/93 REPTIM51 REPASSIVATION TIME

SPECIMEN ALLOY 825 HH4371FG 600 S.C
PREPARED SAME AS REPTIM 21 P160
l= 1.913 d= 0.248 WET AREA= 8.0cm²
START WT 12.07524g
END WT 12.05121g
SOLUTION 1000 PPM Cl⁻ 85 PPM NCO_3 20 PPM $SO_4^=$
10 PPM NO_3^- 2PPM F⁻ 1000 ml AS FOLLOWS
1.64839 g NaCl LOT 926368A
0.11838g $NaNCO_3$ LOT 897789
20 ml SO_4 -6/93 STOCK SOLUTION
10 ml NO_3 -6/93 "
2ml F -6/93 "
+ DI WATER TO 1000 ml STOCK SOLUTIONS
P 260 T=95°C Hg THERMO 1238001
DEAERATED WITH NITROGEN
START PH 8.104
END PH 9.211
POTENTIOSTAT ESC 440 # 1 CHANNEL #2 DATA SAVED AS REPTIM 51.DAT USING REPTIMER.WBB
REFERENCE SCE 13-620-51 SN 0165403
PIT INITIATION 600mV FOR 30 min
PIT GROWTH 400mV FOR 6 HOURS
REPASSIVATION 128mV
E_{CORR} -626mV KEITHLEY 614
E_{PT} -174mV "
SPECIMEN STARTED 6/25/93 12:45pm
SPECIMEN STOPPED 6/26/93 9:16 AM
RUNTIME 74,000
REPASSIVATION TIME 187 SEC
CHARGE DENSITY 11.7 C/cm²
SAMPLE MOUNTED IN BAKELITE AND SECTIONED

Daniel D. 6/26/93

6/25/93 REPTIM52 REPASSIVATION TIME

SPECIMEN ALLOY 825 HH4371FG 600 S.C
PREPARED SAME AS REPTIM 21 P160
l= 1.913 d= 0.251 WET AREA= 8.0 Cm²
START WT 12.03471
END WT 11.96337g
SOLUTION 1000 PPM Cl⁻ 85 PPM HCO_3 20 PPM $SO_4^=$
10 PPM NO_3 2PPM F⁻ 1000 ml AS FOLLOWS
1.65117 g NaCl LOT 926368A
0.11812g $NaHCO_3$ LOT 897789
20ml SO_4 - 6/93 STOCK SOLUTION
10ml NO_3 -6/93 "
2ml F -6/93 "
+ DI WATER TO 1000 ml STOCK SOLUTIONS
P260 T=95°C Hg THERMO 0323005
DEAERATED WITH NITROGEN
START PH 8.044
END PH 9.302
POTENTIOSTAT ESC 440 #1 CHANNEL #3 DATA SAVED AS REPTIM52.DAT USING REPTIMER.WBB
REFERENCE SCE FISHER 13-620-51 SN 0169033
PIT INITIATION 600mV FOR 30 min
PIT GROWTH 400mV FOR 6 HOURS
REPASSIVATION 96mV
E_{CORR} -561 mV KEITHLEY 614
E_{PT} -63mV "
SPECIMEN STARTED 6/25/93 12:45PM
SPECIMEN STOPPED 6/26/93 9:16 AM
RUNTIME 74,000
REPASSIVATION TIME 457 SEC
CHARGE DENSITY 34.9 C/cm²
SAMPLE MOUNTED IN BAKELITE AND SECTIONED

Daniel D. 6/26/93

6/25/93 REPTIM 53 REPASSIVATION TIME

SPECIMEN ALLOY 825 NN4371FG 600 S.C
PREPARED SAME AS REPTIM 21 P160
l = 1.913 d = 0.248 WET AREA = 8.0 cm²
START WT 11.98876 g
END WT 11.94978 g
SOLUTION 1000 PPM Cl⁻ 85 PPM HCO_3^- 20 PPM $SO_4^=$
10 PPM NO_3^- 2 PPM F⁻ 1000 ml AS FOLLOWS
1.64815 g NaCl LOT 926368A
0.11839 g $NaHCO_3$ LOT 897789
20 ml SO_4 - 6/93 STOCK SOLUTION
10 ml NO_3 - 6/93 "
2 ml F - 6/93 "
+ DI WATER TO 1000 ml STOCK SOLUTIONS
P260 T = 95°C Hg THERMO 0323007
DEAERATED WITH NITROGEN
START PH 8.085
END PH 9.493
POTENTIOSTAT ESC 440 #1 CHANNEL #4 DATA
SAVED AS REPTIM 53.DAT USING REPTIMER.WBB
REFERENCE SCE 13-620-51 SN 8211163
PIT INITIATION 600 mV FOR 30 min
PIT GROWTH 400 mV FOR 6 HOURS
REPASSIVATION 4.9 mV
E_{CORR} -540 mV KEITHLEY 614
E_{PT} -195 mV "
SPECIMEN STARTED 6/25/93 12:45 PM
SPECIMEN STOPPED 6/26/93 9:16 AM
RUNTIME 73,700 SEC
REPASSIVATION TIME 91 SEC
CHARGE DENSITY 18.7 C/cm²

David Du 6/26/93

6/25/93 REPTIM 54 REPASSIVATION TIME

SPECIMEN ALLOY 825 NN4371FG 600 S.C
PREPARED SAME AS REPTIM 21 P160
l = 1.913 d = 0.247 ~~START~~ WET AREA =
START WT 11.87157 g
END WT 11.83235 g
SOLUTION 1000 PPM Cl⁻ 85 PPM HCO_3^- 20 PPM $SO_4^=$
10 PPM NO_3^- 2 PPM F⁻ 1000 ml AS FOLLOWS.
1.64813 g NaCl LOT 926368A
0.11974 g $NaHCO_3$ LOT 897789
20 ml SO_4 - 6/93 STOCK SOLUTION
10 ml NO_3 - 6/93 "
2 ml F - 6/93 "
+ DI WATER TO 1000 ml STOCK SOLUTIONS
P260 T = 95°C Hg THERMO 1238004
DEAERATED WITH NITROGEN
START PH 8.108
END PH 9.521
POTENTIOSTAT ESC 440 #1 CHANNEL #5 DATA SAVED
AS REPTIM 54.DAT USING REPTIMER.WBB
REFERENCE SCE 13-620-51 SN 0165415
PIT INITIATION 600 mV FOR 30 min
PIT GROWTH 400 mV FOR 6 HOURS
REPASSIVATION .8 mV
E_{CORR} -619 mV KEITHLEY 614
E_{PT} -5 mV "
SPECIMEN STARTED 6/25/93 12:45 PM
SPECIMEN STOPPED 6/26/93 9:16 AM
RUNTIME 73,300 SEC
REPASSIVATION TIME 165 SEC
CHARGE DENSITY 19.4 C/cm²

David Du 6/26/93

6/25/93 CREVICE CORROSION 304L-6

SPECIMEN 304L HT# T0954 600 S.C FINISH
CLEANED IN ULTRASONIC BATH RINSED IN
DI WATER, ACETONE AND DRIED
l= 2.500 w= 0.499 t= 0.124
AREA= 20.89512
START WT NOT RECORDED
END WT 21.31454 g
SOLUTION 1000 PPM Cl^- 85PPM HCO_3 20PPM $SO_4^=$
10 PPM NO_3^- 2PPM F^- 1000 ml AS FOLLOWS
1.64856 g NaCl LOT 926368A
0.11931 g $NaHCO_3$ LOT 897789
20ml ~~SO_4 7/93~~ 7/27/94 SO_4-6/93 STOCK SOLUTION
10ml ~~NO_3 7/93~~ NO_3-6/93 "
2ml ~~F 7/93~~ F-6/93 "
START pH 8.169
END pH:
SETUP SPECIMEN PLACED IN PLEXIGLASS CELL
USING TWO PORTS AND TORQUED TO 20 IN OZ
USING PROTO 6103 CAL DUE 7/20/93
PORT # 1 AT TIP
MI200 Cl ISE FLEXABLE # 47228
MI402/403 DOUBLE JUNCTION Ag/AgCl # 44629
MI506 GLASS pH # 43720
MI 402/403 DOUBLE JUNCTION Ag/AgCl # 41436
MI 402/403 DOUBLE JUNCTION Ag/AgCl # 41402
PORT # 2 AT MOUTH
MI 200 Cl ISE FLEXABLE # 44447
MI 402/403 DOUBLE JUNCTION Ag/AgCl # 44671
MI 506 GLASS pH # 43717
MI 402/403 DOUBLE JUNCTION Ag/AgCl # 44628
MI 402/403 DOUBLE JUNCTION Ag/AgCl # 43636

[signature] 6/25/93

6/25/93 CREVICE CORROSION: 304L-6

BULK ELECTRODES
MI 200 Cl ISE # 42998
MI 402 Ag/AgCl # 43647
MI 506 GLASS pH # 44817
MI 402 Ag/AgCl # 45860
FISHER ~~TZ~~ RD 7/27/94 13-620-53 SN 8118182 Ag/AgCl

Cl TIP TO ORION EA920 SN5001A AND ABB S6120 0515265 RECORDER
Cl MOUTH TO ORION 720A IA 5885 AND ABB S6120 0049616 RECORDER
Cl BULK TO ORION EA920 SN5001A AND ABB S6120 0515265 RECORDER.

pH TIP TO ORION EA ~~920~~ 940 BN 7/27/94 SN 2330 AND ABB S6120 0515265
pH MOUTH TO ORION 720A 003368 AND ABB S6120 0049616
pH BULK TO ORION EA940 SN 2330 AND ABB S6 120 0515265

FISHER 13-620-53 SN 8118182 TO CHANNEL #1 OF ESC 440 #2
TIP REFERENCE MI 402/403 # 41402 TO CHANNEL #3 OF ESC 440 #2
MOUTH REFERENCE MI 402/403 # 43636 TO CHANNEL #2 OF ESC 440 #2

pt COUNTER ELECTRODE AND SPECIMEN CONNECTED TO ESC 440 #2 CHANNEL #1

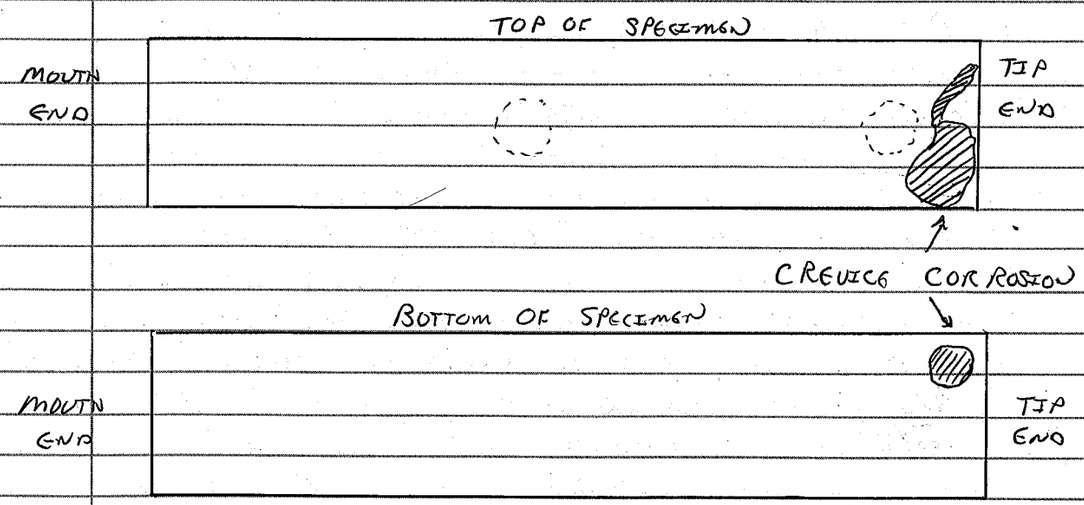
PLEXIGLASS CELL WITH SPECIMEN PLACED IN GLASS CELL WITH PLEXIGLASS LID. ENTIRE ASSEMBLY PLACED IN FARADAY CAGE ON 6/25/93 3:00 PM

PRIOR TO ASSEMBLY ELECTRODES WERE CALIBRATED
Cl ELECTRODES USING 100 PPM Cl^- 1000 PPM Cl^-
0.5 m Cl^- 1.0 m Cl^- 2.0 m Cl^- STOCK SOLUTIONS
P260 pH ELECTRODES IN STANDARD BUFFERS
1.00, 4.00, 7.00, 10.00 [signature] 6/25/93

6/25/93 CREVICE CORROSION 304L-6

pH TIP MI 506 / MI 403 43720 / 41436
pH = -18.3(V) + 7.10
pH MOUTH MI 506 / MI 403 43717 / 44628
pH = -17.4(V) + 6.90
pH BULK MI 506 / MI 402 44817 / 45860
pH = -17.1 (V) + 6.61
Cl TIP MI 200 / MI 403 47728 / 44629
PPM Cl⁻ = EXP [-0.0511 (mV) + 12.316]
Cl BULK MI 200 / MI 402 42998 / 43647
PPM Cl⁻ = EXP [-0.0475 (mV) + 12.42]
Cl MOUTH MI 200 / MI 403 44447 / 44671
PPM Cl⁻ = EXP [-0.0528 (mV) + 11.895 [signature] 6/25/93

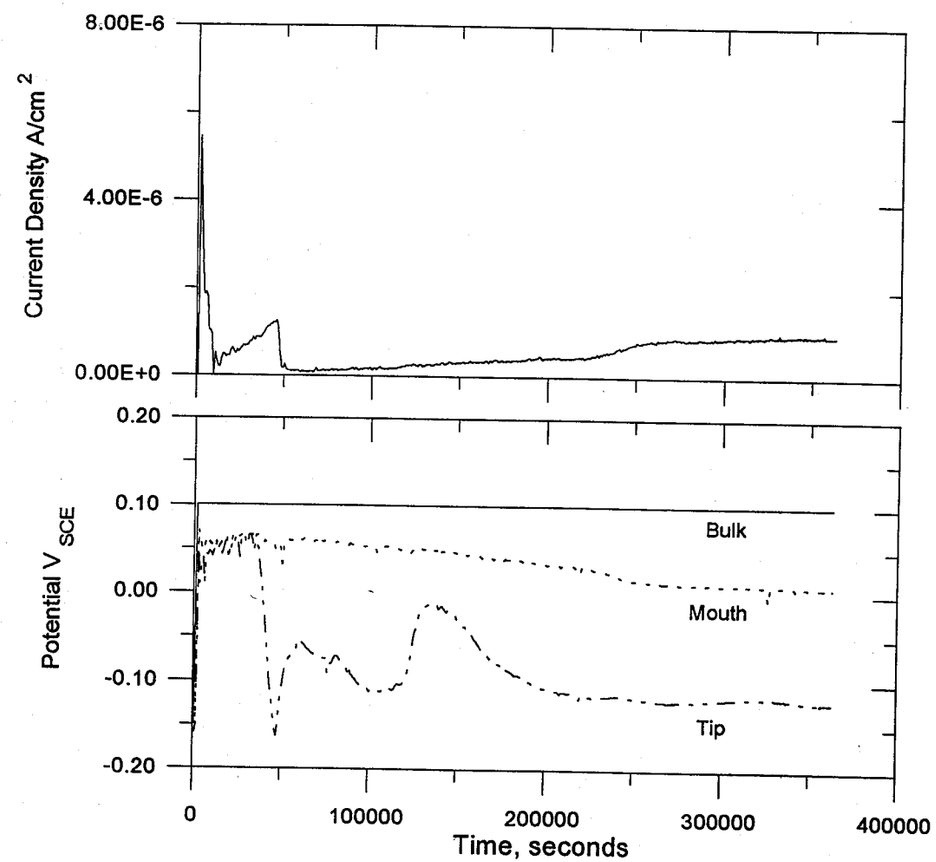
6/30/93 AT THE CONCLUSION OF THE TEST THE SPECIMEN WAS EXAMINED. A SMALL REGION OF CREVICE CORROSION WAS FOUND AT THE TIP ON BOTH THE TOP AND BOTTOM OF THE SPECIMEN.
SCALE 2:1



DP
[signature] ~~4/30/93~~ 6/30/93

pH AND Cl⁻ ISE CALIBRATION DATA SAVED AS 304L6CAL.DAT ON IWPE-025 DISK
[signature] 4/28/94

6/30/93 CREVICE CORROSION 304L-6

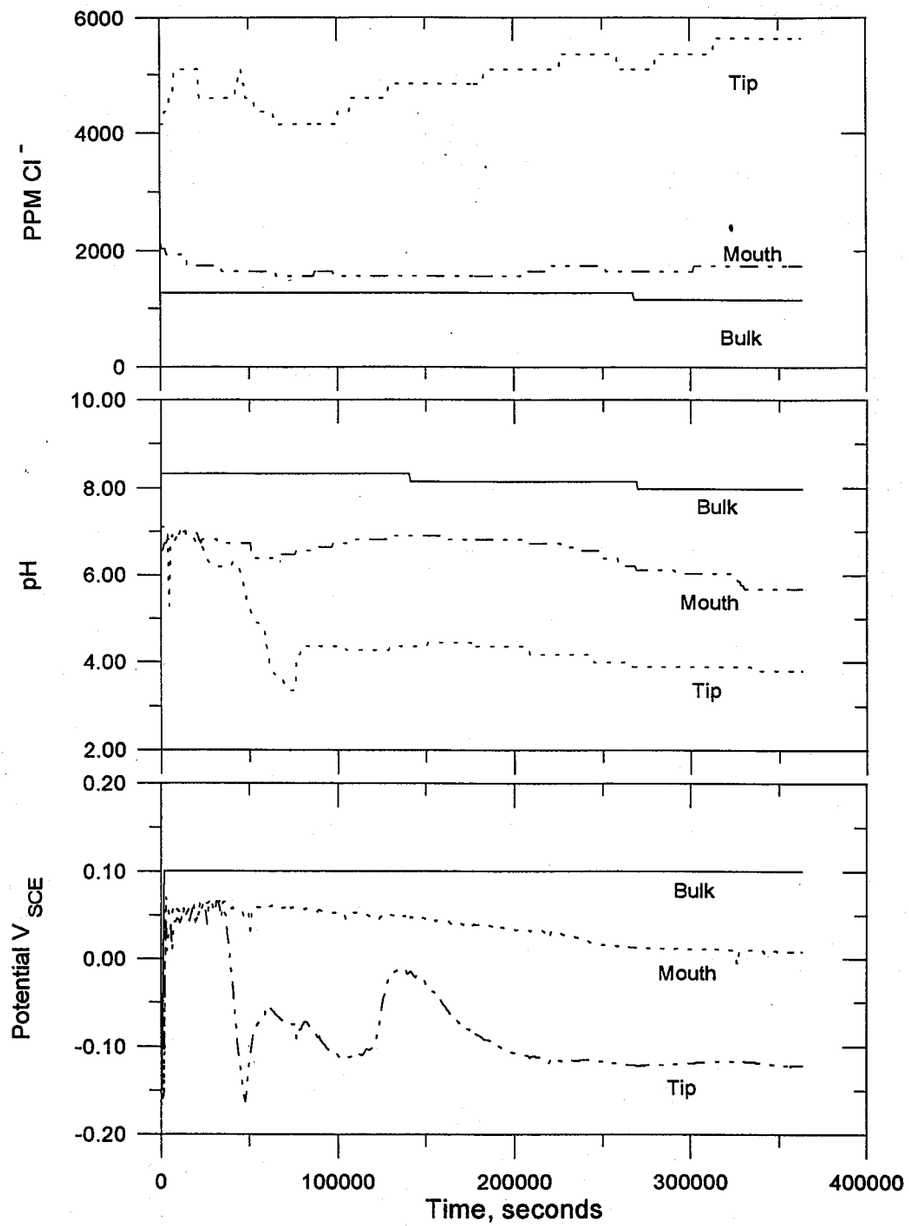


Crevice Corrosion Expt 304l-6

[signature] ~~4/30/93~~ 6/30/93

POTENTIAL AND CURRENT WRITTEN DIRECTLY TO DISC FILE 304L-6.DAT USING CREVICE.WBB. PH AND PPM Cl⁻ DATA WERE INPUT TO FILE FROM CHART RECORDER STRIPS.
DP
[signature] ~~4/30/93~~ 6/30/93

6/30/93 CREVICE CORROSION 304L-6



Crevice Corrosion Expt 304l-6

6/30/93

REPTIM SS REPASSIVATION TIME.

SPECIMEN ALLOY 825 HN4371FG 600S.C
PREPARED SAME AS REPTIM 21 P160
l = 1.912 d = 0.249 WET AREA = 8.0 cm^2
START WT 11.89646
END WT 11.86108g DD. 7/21/94
SOLUTION 500 ~~1000~~ PPM Cl^- 85 PPM NCO_3 20PPM $SO_4^=$
10 PPM NO_3^- 2PPM F^- 1000 ml AS FOLLOWS.
0.82454g NaCl LOT 926368A
0.12028g Na NCO_3 LOT 897789
20ml $SO_4^=$ 6/93 STOCK SOLN
10ml NO_3^- 6/93 "
2ml F^- 6/93 "
+ DI WATER TO 1000 ml STOCK SOLUTIONS
P260 T=95°C DEAERATED WITH NITROGEN.
START PH 8.245
END PH 9.341
POTENTIO STAT ESE 440-1 CHANNEL #2 DATA
SAVED AS REPTIM SS.DAT USING REPTIMER.WBB
REFERENCE SCE FISHER 13-620-51 SN 2134032
PIT INITIATION 600mV FOR 30m.
PIT GROWTH 7/27/94 500 mV FOR 6 HOURS
REPASSIVATION 129mV
E_{CORR} -632
E_{PT} -107
SPECIMEN STARTED 6/29/93 10:48 AM
SPECIMEN STOPPED 6/30/93 8:00AM
RUNTIME 62,700
REPASSIVATION TIME 126 SEC
CHARGE DENSITY. 16 C/cm^2

SPECIMEN RESTARTED AT 12:50 AM 6/29/93 AND
PITS INITIATED AT 750mV FOR 1 HOUR

6/30/93

6/29/93 REPTIM 56 REPASSIVATION TIME

SPECIMEN ALLOY 825 NN4371FG 600 S.C
PREPARED SAME AS REPTIM 21 P 160
l= 1.913 d= 0.247 WET AREA= 8.0 cm²
START WT 12.02371 g
END WT 11.98060 g
SOLUTION 500 ppm Cl⁻ 85 ppm HCO₃⁻ 20 ppm SO₄²⁻
10 ppm NO₃⁻ 2 ppm F⁻ 1000 ml AS FOLLOWS.
g NaCl LOT 926368A
g NaHCO₃ LOT 897789
20 ml SO₄⁻ 6/93 STOCK SOLUTION
10 ml NO₃⁻ 6/93 "
2 ml F⁻ 6/93 "
+ DI WATER TO 1000 ml STOCK SOLUTIONS
P 260 T=95°C DEAERATED WITH NITROGEN
START PH 8.235
END PH 9.299
POTENTIOSTAT ESC 440-1 CHANNEL #3 DATA
SAVED AS REPTIM 56.DAT USING REPTIMER.WBB
REFERENCE SCE FISHER 13-620-51 SN 3106337
PIT INITIATION 600 mV FOR 30 m
PIT GROWTH 500 mV FOR 6 HOURS
REPASSIVATION 157 mV
E CORR -589 KEITHLEY 614
E PT -1 "
SPECIMEN STARTED 10:51 AM 6/29/93
SPECIMEN STOPPED 6/30/93 8:00 AM
RUNTIME 62,300 SEC
REPASSIVATION TIME 370 SEC
CHARGE DENSITY 21 C/cm²

SPECIMEN RESTARTED AT 12:50 PM 6/29/93
PITS INITIATED AT 750 mV FOR 1 HOUR

[signature] 6/30/93

6/29/93 REPTIM 57 REPASSIVATION TIME

SPECIMEN ALLOY 825 NN4371 FG 600 S.C
PREPARED SAME AS REPTIM 21 P 160
l= 1.914 d= 0.248 WET AREA= 8.0 cm²
START WT 11.86898 g
END WT 11.83687 g
SOLUTION 500 ppm Cl⁻ 85 ppm HCO₃⁻ 20 ppm SO₄²⁻
10 ppm NO₃⁻ 2 ppm F⁻ 1000 ml AS FOLLOWS.
g NaCl LOT 926368A
g NaHCO₃ LOT 897789
20 ml SO₄⁻ 6/93 STOCK SOLUTION
10 ml NO₃⁻ 6/93 "
2 ml F⁻ 6/93 "
+ DI WATER TO 1000 ml STOCK SOLUTIONS
P 260 T=95°C DEAERATED WITH NITROGEN
START PH 8.239
END PH 9.453
POTENTIOSTAT ESC 440 #1 CHANNEL #4 DATA
SAVED AS REPTIM 57.DAT USING REPTIMER.WBB
REFERENCE SCE FISHER 13-620-51 SN 0169033
PIT INITIATION 600 mV FOR
PIT GROWTH 500 ~~400~~ mV FOR 6 HOURS
REPASSIVATION 180 mV
E CORR -604 KEITHLEY 614
E PT -149
SPECIMEN STARTED 6/29/93 10:54 AM
SPECIMEN STOPPED 6/30/93 8:00 AM
RUNTIME 62,100 SEC
REPASSIVATION TIME 345 SEC
CHARGE DENSITY 14 C/cm²

SPECIMEN RESTARTED AT 12:50 PM 6/29/93
PITS INITIATED AT 750 mV FOR 1 HOUR.
SAMPLE MOUNTED IN BAKELITE AND SECTIONED

[signature] 6/30/93

REPTIM 58 REPASSIVATION TIME

SPECIMEN ALLOY 825 HN4371FG 600S.C
l = 1.912 d = 0.249 WET AREA = 8.0 cm^2
PREPARED SAME AS REPTIM 21 P160
START WT 11.82009 g
END WT 11.78679 g
SOLUTION 500 PPM Cl^- 85 PPM NCO_3 20 PPM $SO_4^=$
10 PPM NO_3^- 2 PPM F^- 1000 ml AS FOLLOWS.
g NaCl LOT 926368A
g $NaHCO_3$ LOT 897789
20 ml SO_4 - 6/93 STOCK SOLUTION
10 ml NO_3 - 6/93 "
2 ml F - 6/93 "
+ DI WATER TO 1000 ml STOCK SOLUTIONS
P 260 T = 95°C DEAERATED WITH NITROGEN
START PH 8.257
END PH 9.226
POTENTIOSTAT ESC 440 #1 CHANNEL #5 DATA
SAVED AS REPTIM58.DAT USING REPTIMER.WBB
REFERENCE SCE FISHER 13-620-51 SN
PIT INITIATION 600 mV FOR 30 m
PIT GROWTH 500 mV FOR 6 HOURS
REPASSIVATION 198 mV
E_{CORR} -560 mV
E_{PT} 0 mV
SPECIMEN STARTED 10:55 AM 6/29/93
SPECIMEN STOPPED 8:00 AM 6/30/93
RUNTIME 62,500 SEC
REPASSIVATION TIME 340 SEC
CHARGE DENSITY 16 C/cm^2

SPECIMENS RESTARTED AT 12:50 PM 6/29/93
PITS INITIATED AT 750 mV FOR 1 HOUR.

6/30/93

7/9/93 REPTIM 59 REPASSIVATION TIME

SPECIMEN ALLOY 825 HN4371FG 600S.C
PREPARED SAME AS REPTIM 21 P160
START WT 11.73490 g
END WT 11.23136 g
l = 1.915 d = 0.245 WET AREA = 8.0 cm^2
SOLUTION 1000 PPM Cl^- 85 PPM NCO_3 20 PPM $SO_4^=$
10 PPM NO_3^- 2 PPM F^- 1000 ml MADE AS FOLLOWS
1.64890 g NaCl LOT 926368A
0.11965 g $NaHCO_3$ LOT 897789
20 ml SO_4 - 7/93 STOCK SOLUTION
10 ml NO_3 - 7/93 "
2 ml F - 7/93 "
+ DI WATER TO 1000 ml STOCK SOLUTIONS P 287
T = 95°C DEAERATED WITH NITROGEN
START PH = 8.189
END PH = 9.071
POTENTIOSTAT ESC440 #1 CHANNEL #2 DATA SAVED
USING ~~AS~~ OD 7/12/93 REPTIMER.WBB AS REPTIM59.DAT
REFERENCE SCE FISHER 13-620-51 SN 2134032
PIT INITIATION 600 mV FOR 30 min
PIT GROWTH 400 mV FOR 32.5 HOURS
REPASSIVATION 29 mV
E_{CORR} -658 KEITHLEY 614
E_{PT} -75 mV "
SPECIMEN STARTED 7/9/93 11:30 AM
SPECIMEN STOPPED 7/12/93 7:40 AM
RUNTIME 245082
REPASSIVATION TIME 1348 SEC
CHARGE DENSITY ~~24.5~~ 248.4 COUL/cm^2

5/30/94

7/12/93

7/9/93 REPTIM 60 REPASSIVATION TIME

SPECIMEN ALLOY 825 NN4371 FG 600 S.C
l = 1.912 d = 0.246 WET AREA = 8.0 cm^2
PREPARED SAME AS REPTIM 21 P160
START WT 11.74671 g
END WT 11.68915 g
SOLUTION 500 PPM Cl^- 85 PPM HCO_3 20 PPM $SO_4^=$
10 PPM NO_3^- 2 PPM F^- 1000 ml MADE AS FOLLOWS:
0.82652 g NaCl LOT 926368A
0.11792 g $NaHCO_3$ LOT 897789
20 ml SO_4 - 7/93 STOCK SOLUTION
10 ml NO_3 - 7/93 "
2 ml F - 7/93 "
+ DI WATER TO 1000 ml STOCK SOLUTIONS P287
T = 95°C DEAERATED WITH NITROGEN
START PH 8.247
END PH 9.126
POTENTIOSTAT ESC 440 #1 CHANNEL #3 DATA
SAVED AS REPTIM 60.DAT USING REPTIMER.WBB
REFERENCE SCE FISHER 13-620-51 SN 3106337
PIT INITIATION 750 mV FOR 1 hour
PIT GROWTH 500 mV FOR 3.5 hr
REPASSIVATION 245 mV
E_{CORR} -629 KEITHLEY 614
E_{PT} +21 "
SPECIMEN STARTED 7/9/93 12:42 pm
SPECIMEN STOPPED 7/12/93 7:40 pm
RUNTIME 241278 DD 7/27/94
REPASSIVATION TIME ~~17997 SEC~~ 71913 SEC
CHARGE DENSITY 30.0 C/cm^2
SAMPLE MOUNTED IN BAKELITE AND SECTIONED

Dinesh Dua 7/12/93

7/14/93 REPTIM 61 REPASSIVATION TIME

SPECIMEN ALLOY 825 HH4371FG 600 S.C
l = 1.912 d = 0.248 WET AREA = 8.0 cm^2
PREPARED SAME AS REPTIM 21 P160
START WT 11.85988 g
END WT 11.39194 g
SOLUTION 1000 PPM Cl^- 85 PPM HCO_3 20 PPM $SO_4^=$
10 PPM NO_3^- 2 PPM F^- 1000 ml MADE AS FOLLOWS
1.64925 g NaCl LOT 926368A
0.11979 g $NaHCO_3$ LOT 897789
20 ml SO_4 - 7/93 STOCK SOLUTION
10 ml NO_3 - 7/93 "
2 ml F - 7/93 "
+ DI WATER TO 1000 ml STOCK SOLUTIONS P 287
T = 95°C DEAERATED WITH NITROGEN
START PH 8.014
END PH 8.836
POTENTIOSTAT ESC 440 #1 CHANNEL #4 DATA
SAVED AS REPTIM 61.DAT USING REPTIMER.WBB.
REFERENCE SCE FISHER 13-620-51 SN 0169033
PIT INITIATION DD 7/27/94 ~~750 mV FOR 1 HOUR~~ 600 mV FOR 30 mi
PIT GROWTH DD 7/27/94 ~~500 mV FOR 3.5 HOURS~~ 400 mV FOR 33 HOURS
REPASSIVATION DD ~~245 mV~~ 7/27/94 49 mV
E_{CORR} -702 mV KEITHLEY 614
E_{PT} -155 mV "
SPECIMEN STARTED 7/12/93 DD 7/27/94 ~~12:42 PM~~ 1:07 PM
SPECIMEN STOPPED 7/14/93 DD 7/27/94 ~~7:40 AM~~ 1:20 PM
RUNTIME DD 7/27/94 ~~241278~~ SEC DD 7/27/94 173757 SEC
REPASSIVATION TIME ~~17997 SEC~~ 17997 SEC
CHARGE DENSITY DD 7/27/94 ~~30.0 C/cm^2~~ 229 C/cm^2

Dinesh Dua 7/14/93

7/13/93 REPTIM 62 REPASSIVATION TIME.

SPECIMEN ALLOY 825 NN4371EG 600 S.E
l = 1.913 d = 0.247 WET AREA: 8.0 cm²
PREPARED SAME AS REPTIM 21 P160
START WT 11.77588 g
END WT 11.72268 g
SOLUTION 500 PPM Cl⁻ 85PPM NCO_3 20PPM ~~N~~ $SO_4^=$ 7/27/94
10PPM NO_3^- 2PPM F⁻ 1000 ml MADE AS FOLLOWS
0.82407 g NaCl LOT 926368A
0.11803 g $NaNCO_3$ LOT 897789
20 ml SO_4 - 7/93 STOCK SOLUTION
10 ml NO_3 - 7/93 "
2 ml F - 7/93 "
+ DI WATER TO 1000 ml STOCK SOLUTION P 287
T = 95°C DEAERATED WITH NITROGEN
START pH 8.119
END pH 8.997
POTENTIOSTAT ESC 440 #1 CHANNEL #5 DATA
SAVED AS REPTIM62.DAT USING REPTIMER 1 WRB
REFERENCE SCE FISHER 13-620-51 SN 9214083
PIT INITIATION 750 mV FOR .1 HOUR
PIT GROWTH 500 mV FOR ~~39.5 HOURS~~ 7/27/94 3.0 HOURS
REPASSIVATION 222 mV
E_{CORR} -717 mV
E_{PT} -84 mV
SPECIMEN STARTED 7/12/93 1:08 PM
SPECIMEN STOPPED 7/13/93 6:40 AM
RUNTIME 63273 SEC
REPASSIVATION TIME 24873
CHARGE DENSITY. 25.9 C/cm²

[signature] 7/13/93

STOCK SOLUTIONS: MADE 7/7/93

F - 7/93
1000 PPM F⁻ AS NaF
2.21219 g NaF LOT 896405 + DI WATER
TO 1000 ml EXP 8/7/93

SO_4 - 7/93
1000 PPM $SO_4^=$ AS Na_2SO_4
1.48346 g Na_2SO_4 LOT 901213 + DI WATER
TO 1000 ml EXP 8/7/93

NO_3 - 7/93
1000 PPM NO_3^- AS $NaNO_3$
1.37207 g $NaNO_3$ LOT 897183 + DI WATER
TO 1000 ml EXP 8/7/93

2M Cl - 7/93 2 MOLES / LITER Cl⁻
116.89692 g NaCl LOT 926368A
+ DI WATER TO 1000 ml EXP 8/7/93

1M Cl - 7/93 1 MOLE / LITER Cl⁻
58.45118 g NaCl LOT 926368A
+ DI WATER TO 1000 ml EXP 8/7/93

0.5 M Cl - 7/93 0.5 MOLE / LITER Cl⁻
29.22222 g NaCl LOT 926368A
+ DI WATER TO 1000 ml EXP 8/7/93

1000 Cl - 7/93 1000 PPM Cl⁻
3.29606 g NaCl LOT 926368A
+ DI WATER TO 2000 ml EXP 8/7/93

100 Cl - 7/93 100 PPM Cl⁻
100 ml 1000 Cl - 7/93 + 900 ml DI WATER
EXP 8/7/93

[signature] 7/14/93

7/20/93 REPTIM 63 REPASSIVATION TIME

SPECIMEN ALLOY 825 NN4371FG 600S.C
PREPARED SAME AS REPTIM 21 P160
l = 1.913 d = 0.246 WET AREA = 8.0
START WT 11.71330 7/27/94
END WT ~~11.7330~~ NOT RECORDED
SOLUTION 1000 PPM Cl⁻ 85PPM NCO_3 20 PPM $SO_4^=$
10 PPM NO_3^- 2PPMF⁻ 2000 ml AS FOLLOWS
3.30080 g NaCl LOT 926368A
0.23591 g $NaNCO_3$ LOT 897789
40 ~~20~~ ml 7/27/94 SO_4 - 7/93 STOCK SOLUTION
20 ml NO_3 - 7/93 "
4 ~~2~~ ml 7/27/94 F - 7/93 "
+ DI WATER TO 2000 ml STOCK SOLUTIONS
P 287 T = 95°C N_1 THERMO 1238001
DEAERATED WITH NITROGEN
START PH ~~7.80~~ 7/27/94 8.216
END PH 8.986
POTENTIOSTAT ESC 440 #1 CHANNEL #2 DATA
SAVED AS REPTIM 63.DAT USING REPTIMER.WBB
REFERENCE SCE FISHER 13-620-51 SN 0169033
PIT INITIATION 600 mV FOR 30 min
PIT GROWTH 400 mV FOR 45 hr
REPASSIVATIONS 61 mV
E_{CORR} -725 mV KEITHLEY 614
E_{PT} -34 mV
SPECIMEN STARTED 3:30PM 7/20/93
SPECIMEN STOPPED 3:11 PM 7/22/93
RUNTIME ~~171860 SEC~~ 7/27/94 171960 SEC
REPASSIVATION TIME 1321 SEC
CHARGE DENSITY 178 C/cm²

7/22/93

7/20/93 REPTIM 64 REPASSIVATION TIME

SPECIMEN ALLOY 825 NN4371FG 600S.C
PREPARED SAME AS REPTIM 21 P160
l = 1.913 d = 0.246 WET AREA = 8.0 cm²
START WT 11.80035
END WT 11.74369 g
SOLUTION 500 PPM Cl⁻ 85PPM NCO_3 20 PPM $SO_4^=$
10 PPM NO_3^- 2PPMF⁻ 1000 ml AS FOLLOWS
0.82456 g NaCl LOT 926368A
0.12001 g $NaNCO_3$ LOT 897789
20 ml SO_4 - 7/93 STOCK SOLUTION
10 ml NO_3 - 7/93
2 ml F - 7/93
+ DI WATER TO 1000 ml STOCK SOLUTIONS
P 287 T = 95°C N_4 THERMO 0323007
DEAERATED WITH NITROGEN
START PH 8.14
END PH 9.321
POTENTIOSTAT ESC 440 #1 CHANNEL #3 DATA
SAVED AS REPTIM 64.DAT USING REPTIMER.WBB
REFERENCE SCE FISHER 13-620-51 SN 9214083
PIT INITIATION 750 mV FOR 1 hr
PIT GROWTH 500 mV FOR 4.5 HOURS
REPASSIVATION 21 mV
E_{CORR} -594 mV KEITHLEY 614
E_{PT} -128 mV "
SPECIMEN STARTED 3:34 PM 7/20/93
SPECIMEN STOPPED 7:03 AM 7/21/93
RUNTIME 55770 SEC
REPASSIVATION TIME 125 SEC
CHARGE DENSITY 28.4 C/cm²

7/21/93

7/20/93 REPTIM 65 REPASSIVATION TIME.

SPECIMEN ALLOY 825 HN4371FG 600S.C
PREPARED SAME AS REPTIM 21 P160
l = 1.912 d = 0.250 WET AREA = 8.0 cm²
START WT 11.79730
END WT NOT RECORDED
SOLUTION 1000 PPM Cl⁻ 85PPM HCO₃ 20 PPM SO₄²
10PPM NO₃⁻ 2PPM F⁻ 1000 ml AS FOLLOWS
~~0.82451~~ 7/27/94 1.65008 g NaCl LOT 926368A
0.12011 g NaHCO₃ LOT 897789
20ml SO₄⁻ 7/93 STOCK SOLUTION P 287
10ml NO₃⁻ 7/93 "
2ml F⁻ 7/93 "
+ DI WATER TO 1000ml T = 95°C
Hg THERMO 0323005 DEAERATED WITH NITROGEN
START PH 8.132
END PH 9.146
POTENTIOSTAT ESC 440 #1 CHANNEL 4 DATA
SAVED AS REPTIM 65.DAT USING REPTIMER.WBB
REFERENCE SCE FISHER 13-620-51 SN 0165403
PIT INITIATION 600mV FOR 30min
PIT GROWTH 400mV FOR 33 HOURS
REPASSIVATION 61 mV
E_{CORR} -667mV KEITHLEY 614
E_{PT} -193 mV "
SPECIMEN STARTED 9:16PM 7/20/93
SPECIMEN STOPPED 8:16 AM 7/22/93
RUNTIME ~~11~~ 7/27/94 126001 SEC
REPASSIVATION TIME ~~126001 SEC~~ 7/27/94 1081 SEC
CHARGE DENSITY. 90.3 C/cm²

7/22/93

7/19/93 CREVICE CORROSION 304L-7

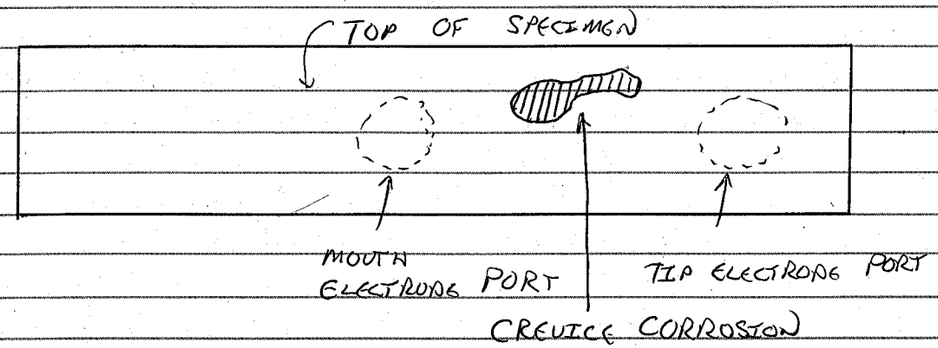
SPECIMEN 304L HT # 70954 60 S.C
CLEANED IN ULTRASONIC BATH RINSED
IN DI WATER, ACETONE AND DRIED
l = 2.502 ~~d~~ 0.498 7/27/94 t = 0.121
AREA = 20.754
START WT 20.87586 g
END WT 20.87534 g
SOLUTION 1000 PPM Cl⁻ 85 PPM HCO₃ 20 PPM SO₄²
10 PPM NO₃⁻ 2PPM F⁻ 2000ml AS FOLLOWS
3.30080 g NaCl LOT 926368A
0.23591 g NaHCO₃ LOT 897789
40ml SO₄⁻ 7/93 STOCK SOLUTION P287
20 ml NO₃⁻ 7/93 "
4 ml F⁻ 7/93 "
START PH 8.216
END PH 8.203
SETUP SPECIMEN PLACED IN PLEXIGLASS CELL WITH
TWO PORTS AND TORQUED TO 20 INOZ USING
PROTO 6103 CAL DUE 7/20/93 PLEXIGLASS
CELL WITH ELECTRODES AND SPECIMEN PLACED
IN GLASS CELL WITH PLEXIGLASS LID AT
8:00 PM 7/19/93
ELECTRODES #'S SAME AS CREVICE CORROSION
304L-6 P274 LOCATION OF ALL ELECTRODES
WERE KEPT THE SAME AS P274.
CONNECTION OF ELECTRODES WITH ORION pH
METERS SAME AS CREVICE CORROSION 304L-6 P274
STRIP CHART RECORDERS FOR pH AND Cl CONCENTRATION
MEASUREMENTS SAME AS CREVICE CORROSION 304L-6 P274
BULK Ag/AgCl TIP Ag/AgCl AND MOUTH Ag/AgCl
REFERENCE ELECTRODES CONNECTED TO ESC 440 #2
DATA SAVED AS 304L-7.DAT USING CREVICE.WBB
ELECTRODES CALIBRATED USING Cl STOCK SOLUTIONS
P 287 AND STANDARD BUFFERS 7/19/93

7/30/93

CREVICE CORROSION 304L-7

PH TIP MI506 # 43720 / Ag/AgCl REF # 41436
pH = -18.3(V) + 7.08
pH MOUTH MI506 # 43717 / Ag AgCl REF # 44628
pH = -17.2 (V) + 6.96
pH BULK MI 506 # 44817 / Ag AgCl REF # 45860
pH = -17.1 (V) + 6.67
Cl TIP MI200 # 47228 / Ag AgCl REF # 44629
ppm Cl⁻ = EXP [-0.0521 (mV) + 12.14]
Cl MOUTH MI200 # 47226 / Ag AgCl REF # 44671
ppm Cl⁻ = EXP [-0.0533 (mV) + 12.17
Cl BULK MI200 # 42998 / Ag/AgCl REF # 43647
ppm Cl⁻ = EXP [-0.0479 (mV) + 12.24]

AT THE CONCLUSION OF THE TEST THE SPECIMEN WAS OBSERVED TO HAVE SMALL REGIONS OF CREVICE CORROSION BETWEEN THE TWO ELECTRODE PORTS. NO CREVICE CORROSION WAS OBSERVED ON THE BOTTOM OF THE SPECIMEN. 2:1 SCALE



CURRENT DENSITY AND POTENTIAL WERE WRITTEN DIRECTLY TO DISC TO FILE 304L-7.DAT USING CREVICE.WBB. pH AND ppm Cl⁻ WERE ADDED FROM CHART RECORDER TRACES. DATA (COMPLETE) SAVED AS 304L-7.WK1 USING Q PRO

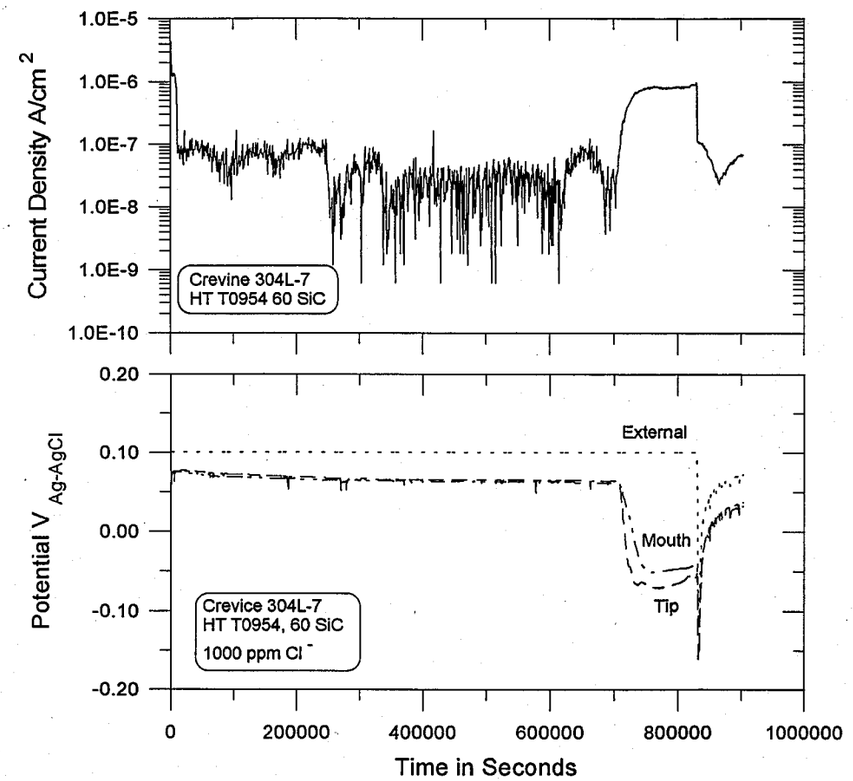
PLOTS P 293 & 294 7/30/93

7/30/93

CREVICE CORROSION 304L-7

DATA FOR CREVICE TIP POTENTIAL IN THE TIME SPAN OF 500,000 - 600000 SECONDS CORRECTED FOR ELECTRODE NOISE INTERFERENCE

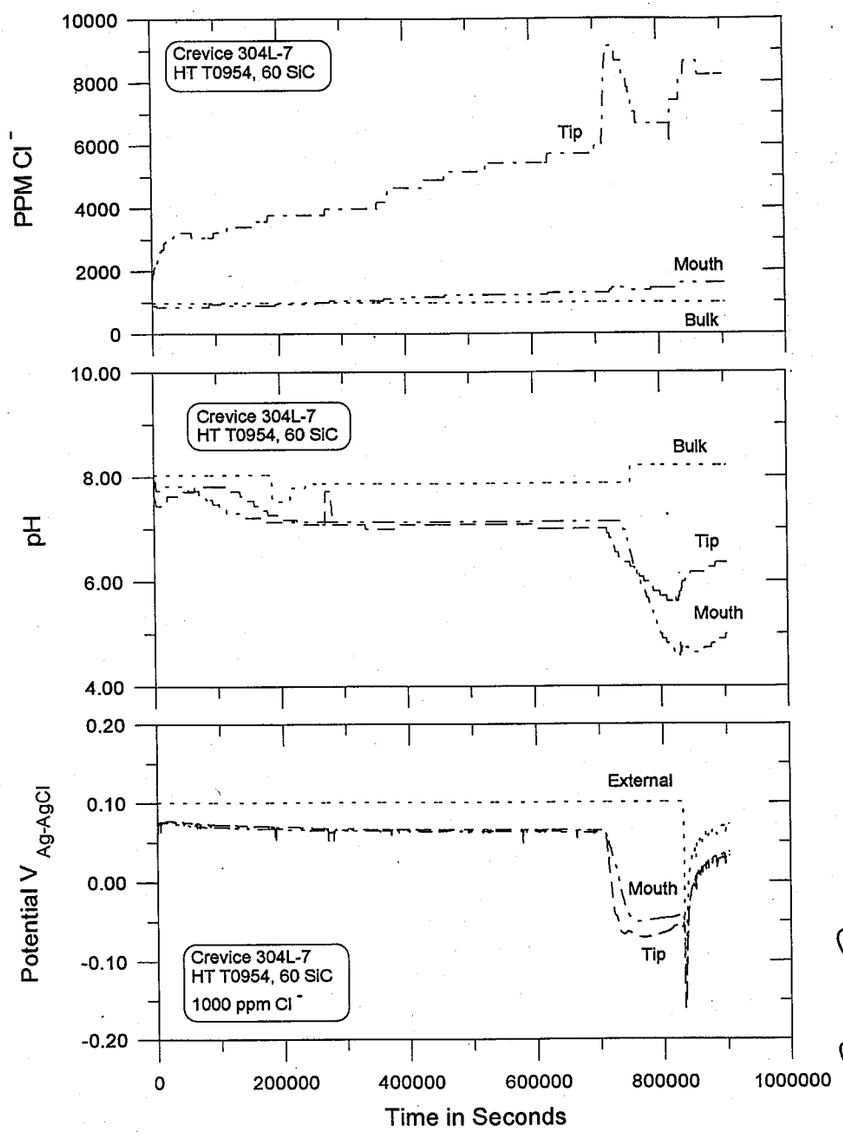
7/30/93



7/30/93

pH AND Cl⁻ ISE CALIBRATION DATA SAVED AS 304L7CAL.DAT ON IWAG 025 DISK

4/28/94



7/30/93

4/28/94

OBJECTIVES

- **Verify/Validate Model Predictions**
  - ☐ **Qualitatively**
  - ☐ **Quantitatively**
- **Understand Repassivation**
- **Develop Techniques to Study Local Environments**

4/28/94

JUSTIFICATION

1) Models currently predict that pCl, pH decreases first followed by increase in current 4/94

2) Models for stainless alloys independant of external potential.

3) Models predict that change in pH & pCl depend on surface roughness (crevice gap)

4) Models predict that pCl increases first and then repassivation occurs.

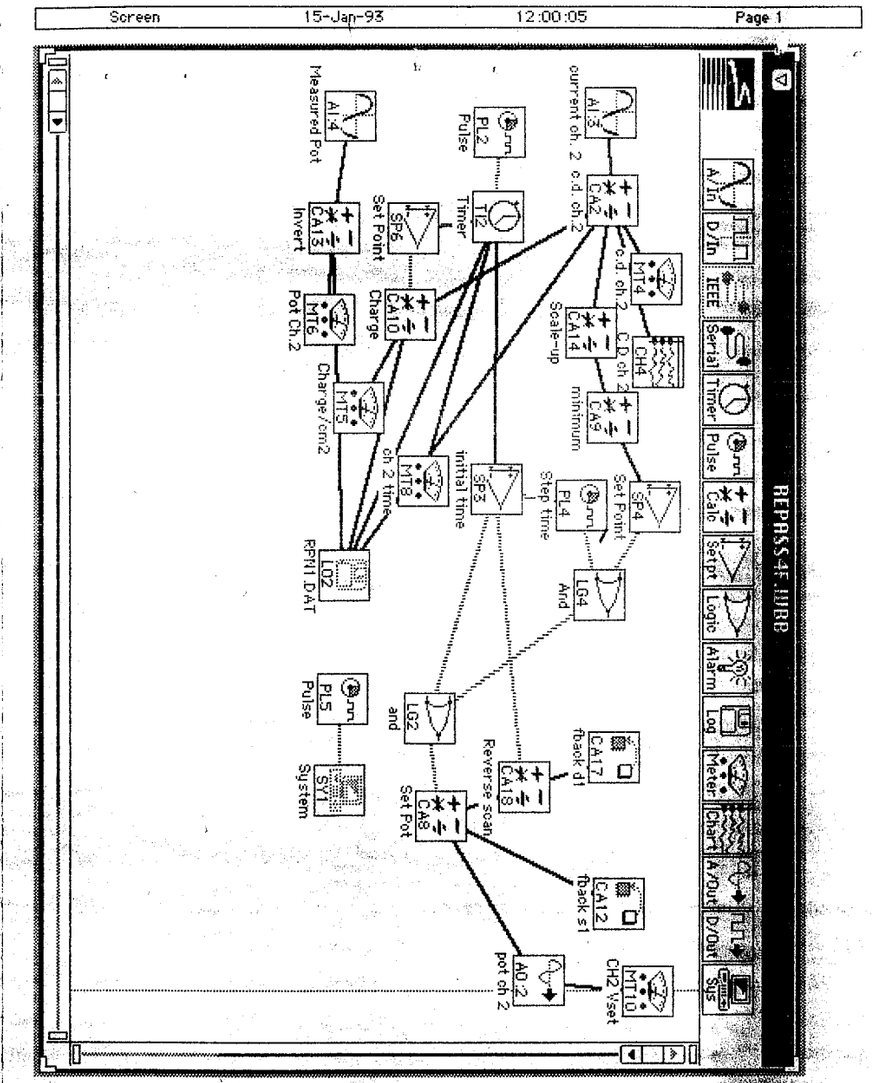
Approach

The above predictions will be verified/tested by simultaneously monitoring current, potential and pH and pCl inside a controlled crevice.

Microelectrodes of the flexible kind will be used. Plexiglas crevice will be used to provide a tight crevice. Tests will be done at near RT so pH electrodes of the flexible variety from Microelectrodes can be used.

N Sridhar 4/28/94

N. Sridhar
4/28/94



N. Sridhar
4/28/94

Worksheet Name: REPASS4F.WBB
Hardware list:

Name	AIs	AOs	DIOs	CTs	DIs	DOs
STI ACPC-16	16	0	16	0	0	0
STI ACAO-12	0	6	8	0	0	0

Maximum icons: 608
Grid size: 16
Snap to grid: < disabled >
Report Unsynch: < disabled >
Fast Mode: enabled
Fast Mode samples: 1000
Fast Mode rate: 1.0 Kilohertz
Trigger level: -10.0
Trigger source: Positive
Trigger slope: Analog
Trigger mode: None
Pre-trigger samples: 0
Com ports: 2

Port: COM 1
Comment: Mouse connected

Port: COM 2
Baud rate: 9600
Data bits: 8
Stop bits: 1
Duplex: Half
Parity: None
XonXoff: < disabled >
Echo wait: < disabled >
Line delay: < disabled >

IEEE: < disabled >

Type: Analog Input

Name: AI:3 current ch. 2
Card Type: STI ACPC-16
Channel Number: 3
Range: +¦-Auto V
Resolution: Lo Noise (17ms)
Output Type: Voltage
Sample rate: 10.0 Hertz
Fast Mode: < disabled >
Inputs:
< None >
Outputs:
CA2 c.d. ch.2

Name: AI:4 Measured Pot
Card Type: STI ACPC-16
Channel Number: 4
Range: +¦-Auto V
Resolution: Lo Noise (17ms)
Output Type: Voltage
Sample rate: 10.0 Hertz
Fast Mode: < disabled >
Inputs:
< None >
Outputs:
CA13 Invert

Name: AI:5 current ch.3
Card Type: STI ACPC-16

N. Sridhar
4/28/94

Channel Number:	5
Range:	+¦-Auto V
Resolution:	Lo Noise (17ms)
Output Type:	Voltage
Sample rate:	10.0 Hertz
Fast Mode:	< disabled >
Inputs:	
< None >	
Outputs:	
CA1 c.d. ch.3	

Name:	AI:6 Measured Pot
Card Type:	STI ACPC-16
Channel Number:	6
Range:	+¦-Auto V
Resolution:	Lo Noise (17ms)
Output Type:	Voltage
Sample rate:	10.0 Hertz
Fast Mode:	< disabled >
Inputs:	
< None >	
Outputs:	
CA7 Invert	

Name:	AI:7 current ch.4
Card Type:	STI ACPC-16
Channel Number:	7
Range:	+¦-Auto V
Resolution:	Lo Noise (17ms)
Output Type:	Voltage
Sample rate:	10.0 Hertz
Fast Mode:	< disabled >
Inputs:	
< None >	
Outputs:	
CA21 c.d. ch.4	

Name:	AI:8 Measured Pot
Card Type:	STI ACPC-16
Channel Number:	8
Range:	+¦-Auto V
Resolution:	Lo Noise (17ms)
Output Type:	Voltage
Sample rate:	10.0 Hertz
Fast Mode:	< disabled >
Inputs:	
< None >	
Outputs:	
CA26 Invert	

Name:	AI:9 current ch.5
Card Type:	STI ACPC-16
Channel Number:	9
Range:	+¦-Auto V
Resolution:	Lo Noise (17ms)
Output Type:	Voltage
Sample rate:	10.0 Hertz
Fast Mode:	< disabled >
Inputs:	
< None >	
Outputs:	
CA32 c.d. ch.5	

Name:	AI:10 Measured Pot
Card Type:	STI ACPC-16
Channel Number:	10

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Range: +¦-Auto V
Resolution: Lo Noise (17ms)
Output Type: Voltage
Sample rate: 10.0 Hertz
Fast Mode: < disabled >
Inputs:
< None >
Outputs:
CA37 Invert

Type: Timer

Name: TI1 Timer
Inputs:
PL1 Trigger start
Outputs:
SP1 initial time SP5 Set Point MT7 ch3 time
LO1 RPN2.DAT

Name: TI2 Timer
Inputs:
PL2 Pulse
Outputs:
SP3 initial time SP6 Set Point MT8 ch 2 time
LO2 RPN1.DAT

Name: TI3 Timer
Inputs:
PL7 Trigger start
Outputs:
SP7 initial time SP9 Set Point MT14 ch4 time
LO3 RPN3.DAT

Name: TI4 Timer
Inputs:
PL10 Trigger start
Outputs:
SP10 initial time SP12 Set Point MT20 ch5 time
LO4 RPN4.DAT

Type: Pulse

Name: PL1 Trigger start
High Duration: 10000.0 Hours
Low Duration: 0.1 Minutes
Start Value: Low
Reset on exit < disabled >
Inputs:
< None >
Outputs:
TI1 Timer

Name: PL2 Pulse
High Duration: 10000.0 Hours
Low Duration: 0.1 Minutes
Start Value: Low
Reset on exit < disabled >
Inputs:
< None >
Outputs:
TI2 Timer

Name: PL3 step time
High Duration: 0.1 Seconds
Low Duration: 2.0 Seconds
Start Value: Low

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```
Reset on exit                   enabled
Inputs:
    SP1   initial time
Outputs:
    LG3   And

Name:                           PL4   Step time
High Duration:                  0.1   Seconds
Low Duration:                   2.0   Seconds
Start Value:                    Low
Reset on exit                   enabled
Inputs:
    SP3   initial time
Outputs:
    LG4   And

Name:                           PL5   Pulse
High Duration:                  1.0   Minutes
Low Duration:                   3.0   Hours
Start Value:                    Low
Reset on exit                   enabled
Inputs:
    < None >
Outputs:
    SY1   System

Name:                           PL6   Pulse
High Duration:                  1.0   Minutes
Low Duration:                   3.0   Hours
Start Value:                    Low
Reset on exit                   enabled
Inputs:
    < None >
Outputs:
    SY2   System

Name:                           PL7   Trigger start
High Duration:                  10000.0   Hours
Low Duration:                   0.1   Minutes
Start Value:                    Low
Reset on exit                   < disabled >
Inputs:
    < None >
Outputs:
    TI3   Timer

Name:                           PL8   step time
High Duration:                  0.1   Seconds
Low Duration:                   2.0   Seconds
Start Value:                    Low
Reset on exit                   enabled
Inputs:
    SP7   initial time
Outputs:
    LG6   And

Name:                           PL9   Pulse
High Duration:                  1.0   Minutes
Low Duration:                   3.0   Hours
Start Value:                    Low
Reset on exit                   enabled
Inputs:
    < None >
Outputs:
    SY3   System
```

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Name: PL10 Trigger start
High Duration: 10000.0 Hours
Low Duration: 0.1 Minutes
Start Value: Low
Reset on exit enabled
Inputs:
< None >
Outputs:
TI4 Timer

Name: PL11 step time
High Duration: 0.1 Seconds
Low Duration: 2.0 Seconds
Start Value: Low
Reset on exit enabled
Inputs:
SP10 initial time
Outputs:
LG8 And

Name: PL12 Pulse
High Duration: 1.0 Minutes
Low Duration: 3.0 Hours
Start Value: Low
Reset on exit enabled
Inputs:
< None >
Outputs:
SY4 System

Type: Calculation

Name: CA1 c.d. ch.3
Function: aX / bY
X input: AI:5 current ch.3
Y input: 8.0
"a" constant: -1.0
"b" constant: 10.0
"c" constant: 0.0
Inputs:
AI:5 current ch.3
Outputs:
MT1 C.d. Ch.3 CH3 c.d. ch3 CA5 Charge
CA11 Scale-up LO1 RPN2.DAT

Name: CA2 c.d. ch.2
Function: aX / bY
X input: AI:3 current ch. 2
Y input: 8.0
"a" constant: -1.0
"b" constant: 10.0
"c" constant: 0.0
Inputs:
AI:3 current ch. 2
Outputs:
MT4 c.d. ch.2 CH4 C D ch 2 CA10 Charge
CA14 Scale-up LO2 RPN1.DAT

Name: CA3 Set Pot
Function: aX + bY + c
X input: LG1 and
Y input: CA16 Reverse scan
"a" constant: -0.01
"b" constant: 1.0
"c" constant: 0.275
Inputs:

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```
    LG1   and                    CA16  Reverse scan
Outputs:
    CA6   fback s1               MT9   CH3 Vset

Name:                            CA4   minimum
Function:                        Min(X) for last (a) seconds
X input:                         CA11  Scale-up
Y input:                         0.0
"a" constant:                    2.0
"b" constant:                    0.0
"c" constant:                    0.0
Inputs:
    CA11  Scale-up
Outputs:
    SP2   Set Point

Name:                            CA5   Charge
Function:                        Integral X dt
X input:                         CA1   c.d.  ch.3
Y input:                         SP5   Set Point
"a" constant:                    0.0
"b" constant:                    0.0
"c" constant:                    0.0
Inputs:
    CA1   c.d.  ch.3             SP5   Set Point
Outputs:
    MT2   Charge/cm2             LO1   RPN2.DAT

Name:                            CA6   fback s1
Function:                        Global Feedback(a:address)
X input:                         CA3   Set Pot
Y input:                         0.0
"a" constant:                    1.0
"b" constant:                    0.0
"c" constant:                    0.0
Inputs:
    CA3   Set Pot
Outputs:
    < None >

Name:                            CA7   Invert
Function:                        aX + bY
X input:                         AI:6  Measured Pot
Y input:                         0.0
"a" constant:                    -1.0
"b" constant:                    0.0
"c" constant:                    0.0
Inputs:
    AI:6  Measured Pot
Outputs:
    MT3   Pot Ch.3               LO1   RPN2.DAT

Name:                            CA8   Set Pot
Function:                        aX + bY + c
X input:                         LG2   and
Y input:                         CA18  Reverse scan
"a" constant:                    -0.01
"b" constant:                    1.0
"c" constant:                    0.3
Inputs:
    LG2   and                    CA18  Reverse scan
Outputs:
    AO:2  pot ch 2               CA12  fback s1

Name:                            CA9   minimum
Function:                        Min(X) for last (a) seconds
```

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```
X input:                    CA14  Scale-up
Y input:                    0.0
"a" constant:               2.0
"b" constant:               0.0
"c" constant:               0.0
Inputs:
    CA14  Scale-up
Outputs:
    SP4   Set Point

Name:                       CA10  Charge
Function:                   Integral X dt
X input:                    CA2   c.d. ch.2
Y input:                    SP6   Set Point
"a" constant:               0.0
"b" constant:               0.0
"c" constant:               0.0
Inputs:
    CA2   c.d. ch.2         SP6   Set Point
Outputs:
    MT5   Charge/cm2        LO2   RPN1.DAT

Name:                       CA11  Scale-up
Function:                   aX + bY
X input:                    CA1   c.d.  ch.3
Y input:                    0.0
"a" constant:               10000.0
"b" constant:               0.0
"c" constant:               0.0
Inputs:
    CA1   c.d.  ch.3
Outputs:
    CA4   minimum

Name:                       CA12  fback s1
Function:                   Global Feedback(a:address)
X input:                    CA8   Set Pot
Y input:                    0.0
"a" constant:               2.0
"b" constant:               0.0
"c" constant:               0.0
Inputs:
    CA8   Set Pot
Outputs:
    < None >

Name:                       CA13  Invert
Function:                   aX + bY
X input:                    AI:4  Measured Pot
Y input:                    0.0
"a" constant:               -1.0
"b" constant:               0.0
"c" constant:               0.0
Inputs:
    AI:4  Measured Pot
Outputs:
    MT6   Pot Ch.2          LO2   RPN1.DAT

Name:                       CA14  Scale-up
Function:                   aX + bY
X input:                    CA2   c.d. ch.2
Y input:                    0.0
"a" constant:               10000.0
"b" constant:               0.0
"c" constant:               0.0
Inputs:
```

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CA2 c.d. ch.2
Outputs:
CA9 minimum

Name:	CA15 fback d1
Function:	Global Feedback(a:address)
X input:	0.0
Y input:	0.0
"a" constant:	1.0
"b" constant:	0.0
"c" constant:	0.0

Inputs:
< None >
Outputs:
CA16 Reverse scan

Name:	CA16 Reverse scan
Function:	c (X + a)(Y + b)
X input:	CA15 fback d1
Y input:	SP1 initial time
"a" constant:	-0.25
"b" constant:	0.0
"c" constant:	1.0

Inputs:
CA15 fback d1 SP1 initial time
Outputs:
CA3 Set Pot

Name:	CA17 fback d1
Function:	Global Feedback(a:address)
X input:	0.0
Y input:	0.0
"a" constant:	2.0
"b" constant:	0.0
"c" constant:	0.0

Inputs:
< None >
Outputs:
CA18 Reverse scan

Name:	CA18 Reverse scan
Function:	c (X + a)(Y + b)
X input:	CA17 fback d1
Y input:	SP3 initial time
"a" constant:	-0.225
"b" constant:	0.0
"c" constant:	1.0

Inputs:
CA17 fback d1 SP3 initial time
Outputs:
CA8 Set Pot

Name:	CA19 Calculation
Function:	X + Y
X input:	0.275
Y input:	0.0
"a" constant:	0.0
"b" constant:	0.0
"c" constant:	0.0

Inputs:
< None >
Outputs:
< None >

Name:	CA21 c.d. ch.4
Function:	aX / bY

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```
X input:                    AI:7  current ch.4
Y input:                    8.0
"a" constant:               -1.0
"b" constant:               10.0
"c" constant:               0.0
Inputs:
    AI:7  current ch.4
Outputs:
    CH6   c.d. ch.4         MT11  C.d.  Ch.4          CA24  Charge
    CA27  Scale-up          LO3   RPN3.DAT

Name:                       CA22  Set Pot
Function:                   aX + bY + c
X input:                    LG5   and
Y input:                    CA29  Reverse scan
"a" constant:               -0.01
"b" constant:               1.0
"c" constant:               0.25
Inputs:
    LG5   and               CA29  Reverse scan
Outputs:
    CH5   set pot. ch.4     MT15  CH4 Vset            CA25  fback s1

Name:                       CA23  minimum
Function:                   Min(X) for last (a) seconds
X input:                    CA27  Scale-up
Y input:                    0.0
"a" constant:               2.0
"b" constant:               0.0
"c" constant:               0.0
Inputs:
    CA27  Scale-up
Outputs:
    SP8   Set Point

Name:                       CA24  Charge
Function:                   Integral X dt
X input:                    CA21  c.d.  ch.4
Y input:                    SP9   Set Point
"a" constant:               0.0
"b" constant:               0.0
"c" constant:               0.0
Inputs:
    CA21  c.d.  ch.4        SP9   Set Point
Outputs:
    MT12  Charge/cm2        LO3   RPN3.DAT

Name:                       CA25  fback s1
Function:                   Global Feedback(a:address)
X input:                    CA22  Set Pot
Y input:                    0.0
"a" constant:               3.0
"b" constant:               0.0
"c" constant:               0.0
Inputs:
    CA22  Set Pot
Outputs:
    < None >

Name:                       CA26  Invert
Function:                   aX + bY
X input:                    AI:8  Measured Pot
Y input:                    0.0
"a" constant:               -1.0
"b" constant:               0.0
"c" constant:               0.0
```

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Inputs:
AI:8 Measured Pot
Outputs:
MT13 Pot Ch.4 LO3 RPN3.DAT

Name: CA27 Scale-up
Function: aX + bY
X input: CA21 c.d. ch.4
Y input: 0.0
"a" constant: 10000.0
"b" constant: 0.0
"c" constant: 0.0
Inputs:
CA21 c.d. ch.4
Outputs:
CA23 minimum

Name: CA28 fback d1
Function: Global Feedback(a:address)
X input: 0.0
Y input: 0.0
"a" constant: 3.0
"b" constant: 0.0
"c" constant: 0.0
Inputs:
< None >
Outputs:
CA29 Reverse scan

Name: CA29 Reverse scan
Function: c (X + a)(Y + b)
X input: CA28 fback d1
Y input: SP7 initial time
"a" constant: -0.275
"b" constant: 0.0
"c" constant: 1.0
Inputs:
CA28 fback d1 SP7 initial time
Outputs:
CA22 Set Pot

Name: CA30 Calculation
Function: X + Y
X input: 0.25
Y input: 0.0
"a" constant: 0.0
"b" constant: 0.0
"c" constant: 0.0
Inputs:
< None >
Outputs:
< None >

Name: CA31 Calculation
Function: WB cycle time(msecs)
X input: 0.0
Y input: 0.0
"a" constant: 0.0
"b" constant: 0.0
"c" constant: 0.0
Inputs:
< None >
Outputs:
MT16 Cycle time

Name: CA32 c.d. ch.5

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Function: aX / bY
X input: AI:9 current ch.5
Y input: 8.0
"a" constant: -1.0
"b" constant: 10.0
"c" constant: 0.0
Inputs:
AI:9 current ch.5
Outputs:
CH8 c.d. ch.5 MT17 C.d. Ch.5 CA35 Charge
CA38 Scale-up LO4 RPN4.DAT

Name: CA33 Set Pot
Function: aX + bY + c
X input: LG7 and
Y input: CA40 Reverse scan
"a" constant: -0.01
"b" constant: 1.0
"c" constant: 0.225
Inputs:
LG7 and CA40 Reverse scan
Outputs:
CH7 set pot. ch.5 MT21 ch5 Vset CA36 fback s1

Name: CA34 minimum
Function: Min(X) for last (a) seconds
X input: CA38 Scale-up
Y input: 0.0
"a" constant: 2.0
"b" constant: 0.0
"c" constant: 0.0
Inputs:
CA38 Scale-up
Outputs:
SP11 Set Point

Name: CA35 Charge
Function: Integral X dt
X input: CA32 c.d. ch.5
Y input: SP12 Set Point
"a" constant: 0.0
"b" constant: 0.0
"c" constant: 0.0
Inputs:
CA32 c.d. ch.5 SP12 Set Point
Outputs:
MT18 Charge/cm2 LO4 RPN4.DAT

Name: CA36 fback s1
Function: Global Feedback(a:address)
X input: CA33 Set Pot
Y input: 0.0
"a" constant: 4.0
"b" constant: 0.0
"c" constant: 0.0
Inputs:
CA33 Set Pot
Outputs:
< None >

Name: CA37 Invert
Function: aX + bY
X input: AI:10 Measured Pot
Y input: 0.0
"a" constant: -1.0
"b" constant: 0.0

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"c" constant: 0.0
Inputs:
AI:10 Measured Pot
Outputs:
MT19 Pot Ch.5 LO4 RPN4.DAT

Name: CA38 Scale-up
Function: aX + bY
X input: CA32 c.d. ch.5
Y input: 0.0
"a" constant: 10000.0
"b" constant: 0.0
"c" constant: 0.0
Inputs:
CA32 c.d. ch.5
Outputs:
CA34 minimum

Name: CA39 fback d1
Function: Global Feedback(a:address)
X input: 0.0
Y input: 0.0
"a" constant: 4.0
"b" constant: 0.0
"c" constant: 0.0
Inputs:
< None >
Outputs:
CA40 Reverse scan

Name: CA40 Reverse scan
Function: c (X + a)(Y + b)
X input: CA39 fback d1
Y input: SP10 initial time
"a" constant: -0.275
"b" constant: 0.0
"c" constant: 1.0
Inputs:
CA39 fback d1 SP10 initial time
Outputs:
CA33 Set Pot

Name: CA41 Calculation
Function: X + Y
X input: 0.225
Y input: 0.0
"a" constant: 0.0
"b" constant: 0.0
"c" constant: 0.0
Inputs:
< None >
Outputs:
< None >

Type: Set Point

Name: SP1 initial time
Function: X > Y
X input: TI1 Timer
Y input: 1.0e+07
Dead Band: 0.0
Inputs:
TI1 Timer
Outputs:
LG1 and PL3 step time CA16 Reverse scan

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Name: SP2 Set Point
Function: X > Y
X input: CA4 minimum
Y input: 0.5
Dead Band: 0.1
Inputs:
CA4 minimum
Outputs:
LG3 And

Name: SP3 initial time
Function: X > Y
X input: TI2 Timer
Y input: 5.95e+05
Dead Band: 0.0
Inputs:
TI2 Timer
Outputs:
LG2 and PL4 Step time CA18 Reverse scan

Name: SP4 Set Point
Function: X > Y
X input: CA9 minimum
Y input: 0.5
Dead Band: 0.01
Inputs:
CA9 minimum
Outputs:
LG4 And

Name: SP5 Set Point
Function: X < Y
X input: TI1 Timer
Y input: 2.0
Dead Band: 0.0
Inputs:
TI1 Timer
Outputs:
CA5 Charge

Name: SP6 Set Point
Function: X < Y
X input: TI2 Timer
Y input: 2.0
Dead Band: 0.0
Inputs:
TI2 Timer
Outputs:
CA10 Charge

Name: SP7 initial time
Function: X > Y
X input: TI3 Timer
Y input: 1.0e+07
Dead Band: 0.0
Inputs:
TI3 Timer
Outputs:
LG5 and PL8 step time CA29 Reverse scan

Name: SP8 Set Point
Function: X > Y
X input: CA23 minimum
Y input: 0.5
Dead Band: 0.0
Inputs:

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CA23 minimum
Outputs:
LG6 And

Name: SP9 Set Point
Function: X < Y
X input: TI3 Timer
Y input: 2.0
Dead Band: 0.0
Inputs:
TI3 Timer
Outputs:
CA24 Charge

Name: SP10 initial time
Function: X > Y
X input: TI4 Timer
Y input: 1.0e+07
Dead Band: 0.0
Inputs:
TI4 Timer
Outputs:
LG7 and PL11 step time CA40 Reverse scan

Name: SP11 Set Point
Function: X > Y
X input: CA34 minimum
Y input: 0.5
Dead Band: 0.0
Inputs:
CA34 minimum
Outputs:
LG8 And

Name: SP12 Set Point
Function: X < Y
X input: TI4 Timer
Y input: 2.0
Dead Band: 0.0
Inputs:
TI4 Timer
Outputs:
CA35 Charge

Type: Logic

Name: LG1 and
Function: X AND Y
X input: SP1 initial time
Y input: LG3 And
Inputs:
SP1 initial time LG3 And
Outputs:
CA3 Set Pot

Name: LG2 and
Function: X AND Y
X input: SP3 initial time
Y input: LG4 And
Inputs:
SP3 initial time LG4 And
Outputs:
CA8 Set Pot

Name: LG3 And
Function: X AND Y

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```
X input:                    PL3   step time
Y input:                    SP2   Set Point
Inputs:
    PL3   step time         SP2   Set Point
Outputs:
    LG1   and

Name:                       LG4   And
Function:                   X AND Y
X input:                    PL4   Step time
Y input:                    SP4   Set Point
Inputs:
    PL4   Step time         SP4   Set Point
Outputs:
    LG2   and

Name:                       LG5   and
Function:                   X AND Y
X input:                    SP7   initial time
Y input:                    LG6   And
Inputs:
    SP7   initial time      LG6   And
Outputs:
    CA22  Set Pot

Name:                       LG6   And
Function:                   X AND Y
X input:                    PL8   step time
Y input:                    SP8   Set Point
Inputs:
    PL8   step time         SP8   Set Point
Outputs:
    LG5   and

Name:                       LG7   and
Function:                   X AND Y
X input:                    SP10  initial time
Y input:                    LG8   And
Inputs:
    SP10  initial time      LG8   And
Outputs:
    CA33  Set Pot

Name:                       LG8   And
Function:                   X AND Y
X input:                    PL11  step time
Y input:                    SP11  Set Point
Inputs:
    PL11  step time         SP11  Set Point
Outputs:
    LG7   and

Type: Log
```

```
Name:                       LO1   RPN2.DAT
Log Status:                 < disabled >
Sample Rate:                60.0  Seconds
Gate:                       < None >
Data Format:
Heading:                    < None >
File Path:                  C:\WB\DATA
File Name:                  RPN2.DAT
Date Stamp:                 enabled
Time Stamp:                 enabled
Inputs:
    TI1   Timer             CA7   Invert          CA1   c.d.  ch.3
```

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CA5 Charge
Outputs:
< None >

Name: LO2 RPN1.DAT
Log Status: < disabled >
Sample Rate: 60.0 Seconds
Gate: < None >
Data Format:
Heading: < None >
File Path: C:\WB\DATA
File Name: RPN1.DAT
Date Stamp: enabled
Time Stamp: enabled
Inputs:
CA13 Invert TI2 Timer CA2 c.d. ch.2
CA10 Charge
Outputs:
< None >

Name: LO3 RPN3.DAT
Log Status: < disabled >
Sample Rate: 60.0 Seconds
Gate: < None >
Data Format:
Heading: < None >
File Path: C:\WB\DATA
File Name: RPN3.DAT
Date Stamp: enabled
Time Stamp: enabled
Inputs:
TI3 Timer CA26 Invert CA21 c.d. ch.4
CA24 Charge
Outputs:
< None >

Name: LO4 RPN4.DAT
Log Status: < disabled >
Sample Rate: 60.0 Seconds
Gate: < None >
Data Format:
Heading: < None >
File Path: C:\WB\DATA
File Name: RPN4.DAT
Date Stamp: enabled
Time Stamp: enabled
Inputs:
TI4 Timer CA37 Invert CA32 c.d. ch.5
CA35 Charge
Outputs:
< None >

Type: Meter

Name: MT1 C.d. Ch.3
Output Type: Exponential
Units: A/cm2
Integer: 8
Decimal: 1
Inputs:
CA1 c.d. ch.3
Outputs:
< None >

Name: MT2 Charge/cm2
Output Type: Exponential

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Units: Coul/cm2
Integer: 8
Decimal: 1
Inputs:
CA5 Charge
Outputs:
< None >

Name: MT3 Pot Ch.3
Output Type: Fixed Point
Units: Volt
Integer: 6
Decimal: 3
Inputs:
CA7 Invert
Outputs:
< None >

Name: MT4 c.d. ch.2
Output Type: Exponential
Units: A/cm2
Integer: 8
Decimal: 1
Inputs:
CA2 c.d. ch.2
Outputs:
< None >

Name: MT5 Charge/cm2
Output Type: Exponential
Units: Coul/cm2
Integer: 8
Decimal: 1
Inputs:
CA10 Charge
Outputs:
< None >

Name: MT6 Pot Ch.2
Output Type: Fixed Point
Units: Volt
Integer: 6
Decimal: 3
Inputs:
CA13 Invert
Outputs:
< None >

Name: MT7 ch3 time
Output Type: Fixed Point
Units: < None >
Integer: 9
Decimal: 0
Inputs:
TI1 Timer
Outputs:
< None >

Name: MT8 ch 2 time
Output Type: Fixed Point
Units: sec
Integer: 9
Decimal: 0
Inputs:
TI2 Timer
Outputs:

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< None >

Name: MT9 CH3 Vset
Output Type: Fixed Point
Units: < None >
Integer: 6
Decimal: 3
Inputs:
CA3 Set Pot
Outputs:
< None >

Name: MT10 CH2 Vset
Output Type: Fixed Point
Units: < None >
Integer: 6
Decimal: 3
Inputs:
< None >
Outputs:
< None >

Name: MT11 C.d. Ch.4
Output Type: Exponential
Units: A/cm2
Integer: 8
Decimal: 1
Inputs:
CA21 c.d. ch.4
Outputs:
< None >

Name: MT12 Charge/cm2
Output Type: Exponential
Units: Coul/cm2
Integer: 8
Decimal: 1
Inputs:
CA24 Charge
Outputs:
< None >

Name: MT13 Pot Ch.4
Output Type: Fixed Point
Units: Volt
Integer: 6
Decimal: 3
Inputs:
CA26 Invert
Outputs:
< None >

Name: MT14 ch4 time
Output Type: Fixed Point
Units: < None >
Integer: 9
Decimal: 0
Inputs:
TI3 Timer
Outputs:
< None >

Name: MT15 CH4 Vset
Output Type: Fixed Point
Units: < None >
Integer: 6

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Type: Chart

Name:	CH3 c.d. ch3
Chart Color:	White
X Axis Label:	Hours
X Axis Min:	0.0
X Axis Max:	24.0
Y Axis Label:	< None >
Y Axis Min:	0.00001
Y Axis Max:	0.005

Inputs:
CA1 c.d. ch.3
Outputs:
< None >

Name:	CH4 C D ch 2
Chart Color:	White
X Axis Label:	Hours
X Axis Min:	0.0
X Axis Max:	24.0
Y Axis Label:	< None >
Y Axis Min:	0.00001
Y Axis Max:	0.005

Inputs:
CA2 c.d. ch.2
Outputs:
< None >

Name:	CH5 set pot. ch.4
Chart Color:	White
X Axis Label:	Hours
X Axis Min:	0.0
X Axis Max:	24.0
Y Axis Label:	< None >
Y Axis Min:	0.5
Y Axis Max:	0.8

Inputs:
CA22 Set Pot
Outputs:
< None >

Name:	CH6 c.d. ch.4
Chart Color:	White
X Axis Label:	Hours
X Axis Min:	0.0
X Axis Max:	24.0
Y Axis Label:	< None >
Y Axis Min:	0.00001
Y Axis Max:	0.005

Inputs:
CA21 c.d. ch.4
Outputs:
< None >

Name:	CH7 set pot. ch.5
Chart Color:	White
X Axis Label:	Hours
X Axis Min:	0.0
X Axis Max:	24.0
Y Axis Label:	< None >
Y Axis Min:	0.5
Y Axis Max:	0.8

Inputs:
CA33 Set Pot
Outputs:
< None >

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Name: CH8 c.d. ch.5
Chart Color: White
X Axis Label: Hours
X Axis Min: 0.0
X Axis Max: 24.0
Y Axis Label: < None >
Y Axis Min: 0.00001
Y Axis Max: 0.005
Inputs:
CA32 c.d. ch.5
Outputs:
< None >

Type: Analog Output

Name: AO:2 pot ch 2
Card Type: STI ACAO-12
Channel Number: 2
Range: +¦- 5 Volts
Resolution: 0.024%
Inputs:
CA8 Set Pot
Outputs:
< None >

Name: AO:3 Set Pot Ch.3
Card Type: STI ACAO-12
Channel Number: 3
Range: +¦- 5 Volts
Resolution: 0.024%
Inputs:
< None >
Outputs:
< None >

Name: AO:4 Set Pot Ch.4
Card Type: STI ACAO-12
Channel Number: 4
Range: +¦- 5 Volts
Resolution: 0.024%
Inputs:
< None >
Outputs:
< None >

Name: AO:5 Set Pot Ch.5
Card Type: STI ACAO-12
Channel Number: 5
Range: +¦- 5 Volts
Resolution: 0.024%
Inputs:
< None >
Outputs:
< None >

Type: System

Name: SY1 System
Enabled: Yes
Run Commands:
Copy File ... C:\WB\DATA\RPN1.DAT
To ... B:\RPN1.DAT
Inputs:
PL5 Pulse
Outputs:

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```
    < None >

Name:                          SY2   System
Enabled:                       Yes
Run Commands:
          Copy File ...        C:\WB\DATA\RPN2.DAT
          To ...               B:\RPN2.DAT
Inputs:
    PL6   Pulse
Outputs:
    < None >

Name:                          SY3   System
Enabled:                       Yes
Run Commands:
          Copy File ...        C:\WB\DATA\RPN3.DAT
          To ...               B:\RPN3.DAT
Inputs:
    PL9   Pulse
Outputs:
    < None >

Name:                          SY4   System
Enabled:                       Yes
Run Commands:
          Copy File ...        C:\WB\DATA\RPN4.DAT
          To ...               B:\RPN4.DAT
Inputs:
    PL12  Pulse
Outputs:
    < None >
```

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Decimal: 3
Inputs:
CA22 Set Pot
Outputs:
< None >

Name: MT16 Cycle time
Output Type: Fixed Point
Units: msec
Integer: 9
Decimal: 0
Inputs:
CA31 Calculation
Outputs:
< None >

Name: MT17 C.d. Ch.5
Output Type: Exponential
Units: A/cm2
Integer: 8
Decimal: 1
Inputs:
CA32 c.d. ch.5
Outputs:
< None >

Name: MT18 Charge/cm2
Output Type: Exponential
Units: Coul/cm2
Integer: 8
Decimal: 1
Inputs:
CA35 Charge
Outputs:
< None >

Name: MT19 Pot Ch.5
Output Type: Fixed Point
Units: Volt
Integer: 6
Decimal: 3
Inputs:
CA37 Invert
Outputs:
< None >

Name: MT20 ch5 time
Output Type: Fixed Point
Units: < None >
Integer: 9
Decimal: 0
Inputs:
TI4 Timer
Outputs:
< None >

Name: MT21 ch5 Vset
Output Type: Fixed Point
Units: < None >
Integer: 6
Decimal: 3
Inputs:
CA33 Set Pot
Outputs:
< None >

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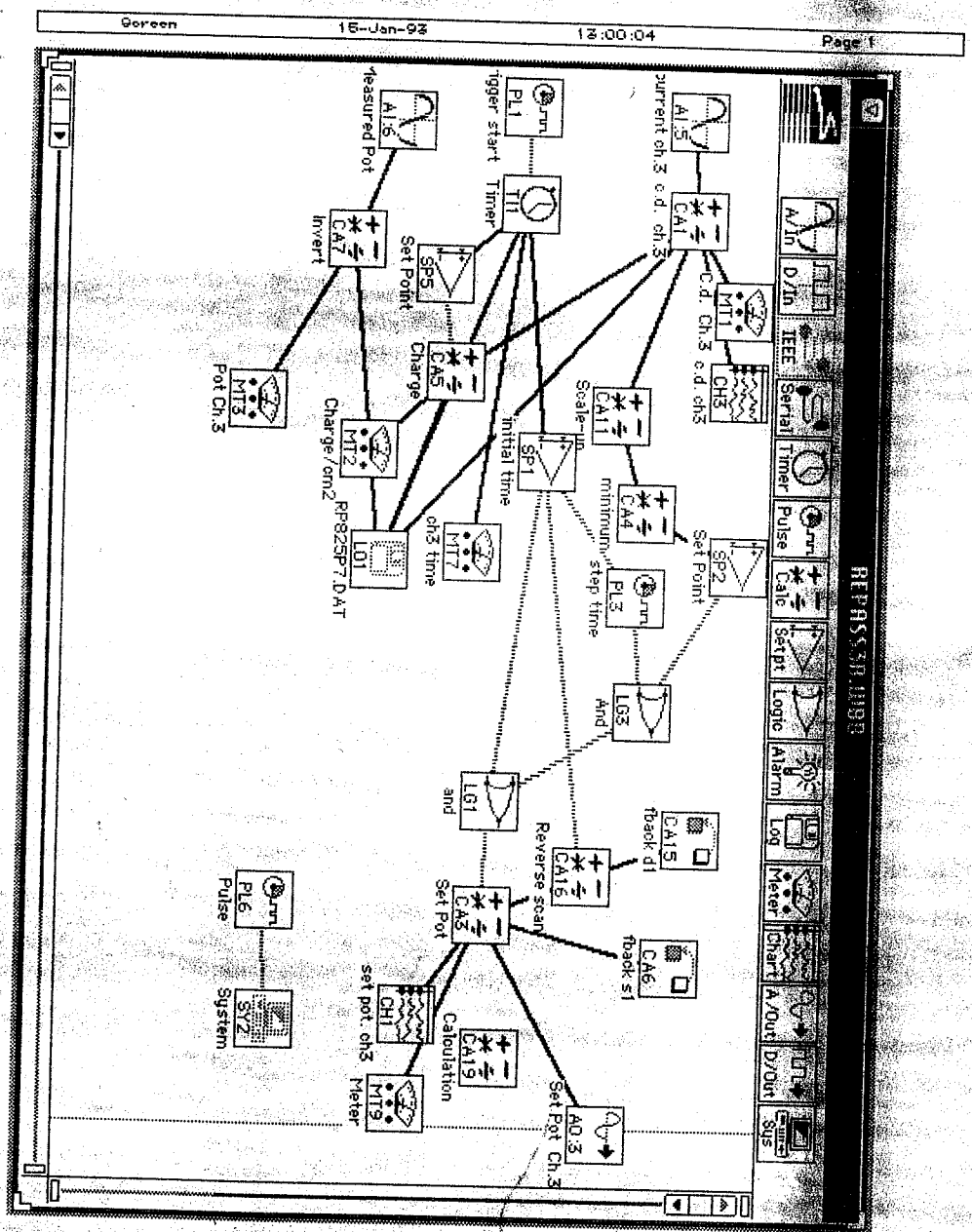

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Worksheet Name: REPASS3B.WBB
Hardware list:

Name	AIs	AOs	DIOs	CTs	DIs	DOs
STI ACPC-16	16	0	16	0	0	0
STI ACAO-12	0	6	8	0	0	0

Maximum icons: 608
Grid size: 16
Snap to grid: < disabled >
Report Unsynch: < disabled >
Fast Mode: enabled
Fast Mode samples: 1000
Fast Mode rate: 1.0 Kilohertz
Trigger level: -10.0
Trigger source: Positive
Trigger slope: Analog
Trigger mode: None
Pre-trigger samples: 0
Com ports: 2

Port: COM 1
Comment: Mouse connected

Port: COM 2
Baud rate: 9600
Data bits: 8
Stop bits: 1
Duplex: Half
Parity: None
XonXoff: < disabled >
Echo wait: < disabled >
Line delay: < disabled >

IEEE: < disabled >

Type: Analog Input

Name: AI:3 current ch. 2
Card Type: STI ACPC-16
Channel Number: 3
Range: +¦-Auto V
Resolution: Lo Noise (17ms)
Output Type: Voltage
Sample rate: 10.0 Hertz
Fast Mode: < disabled >
Inputs:
< None >
Outputs:
CA2 c.d. ch.2

Name: AI:4 Measured Pot
Card Type: STI ACPC-16
Channel Number: 4
Range: +¦-Auto V
Resolution: Lo Noise (17ms)
Output Type: Voltage
Sample rate: 10.0 Hertz
Fast Mode: < disabled >
Inputs:
< None >
Outputs:
CA13 Invert

Name: AI:5 current ch.3
Card Type: STI ACPC-16

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Channel Number:	5
Range:	+¦-Auto V
Resolution:	Lo Noise (17ms)
Output Type:	Voltage
Sample rate:	10.0 Hertz
Fast Mode:	< disabled >
Inputs:	
< None >	
Outputs:	
CA1 c.d. ch.3	

Name:	AI:6 Measured Pot
Card Type:	STI ACPC-16
Channel Number:	6
Range:	+¦-Auto V
Resolution:	Lo Noise (17ms)
Output Type:	Voltage
Sample rate:	10.0 Hertz
Fast Mode:	< disabled >
Inputs:	
< None >	
Outputs:	
CA7 Invert	

Type: Timer

Name:		TI1	Timer		
Inputs:					
PL1	Trigger start				
Outputs:					
SP1	initial time	SP5	Set Point	MT7	ch3 time
LO1	RP825P7.DAT				

Name:		TI2	Timer		
Inputs:					
PL2	Pulse				
Outputs:					
SP3	initial time	SP6	Set Point	MT8	ch 2 time

Type: Pulse

Name:	PL1 Trigger start
High Duration:	496.0 Hours
Low Duration:	0.1 Minutes
Start Value:	Low
Reset on exit	enabled
Inputs:	
< None >	
Outputs:	
TI1 Timer	

Name:	PL2 Pulse
High Duration:	496.0 Hours
Low Duration:	0.1 Minutes
Start Value:	Low
Reset on exit	enabled
Inputs:	
< None >	
Outputs:	
TI2 Timer	

Name:	PL3 step time
High Duration:	0.1 Seconds
Low Duration:	180.0 Seconds
Start Value:	Low
Reset on exit	enabled

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Inputs:
SP1 initial time
Outputs:
LG3 And

Name: PL4 Step time
High Duration: 0.1 Seconds
Low Duration: 180.0 Seconds
Start Value: Low
Reset on exit enabled
Inputs:
SP3 initial time
Outputs:
LG4 And

Name: PL5 Pulse
High Duration: 1.0 Minutes
Low Duration: 1.0 Hours
Start Value: Low
Reset on exit enabled
Inputs:
< None >
Outputs:
SY1 System

Name: PL6 Pulse
High Duration: 1.0 Minutes
Low Duration: 1.0 Hours
Start Value: Low
Reset on exit enabled
Inputs:
< None >
Outputs:
SY2 System

Type: Calculation

Name: CA1 c.d. ch.3
Function: aX / bY
X input: AI:5 current ch.3
Y input: 7.5
"a" constant: -1.0
"b" constant: 10.0
"c" constant: 0.0
Inputs:
AI:5 current ch.3
Outputs:
MT1 C.d. Ch.3 CH3 c.d. ch3 CA5 Charge
CA11 Scale-up LO1 RP825P7.DAT

Name: CA2 c.d. ch.2
Function: aX / bY
X input: AI:3 current ch. 2
Y input: 7.2
"a" constant: -1.0
"b" constant: 10.0
"c" constant: 0.0
Inputs:
AI:3 current ch. 2
Outputs:
CH4 C.D. ch.2 MT4 c.d. ch.2 CA10 Charge
CA14 Scale-up LO2 RP825P6.DAT

Name: CA3 Set Pot
Function: aX + bY + c
X input: LG1 and

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```
Y input:                    CA16  Reverse scan
"a" constant:               -0.01
"b" constant:               1.0
"c" constant:               0.2
Inputs:
    LG1   and               CA16  Reverse scan
Outputs:
    CH1   set pot. ch3      AO:3  Set Pot  Ch.3      CA6   fback s1
    MT9   Meter

Name:                       CA4   minimum
Function:                   Min(X) for last (a) seconds
X input:                    CA11  Scale-up
Y input:                    0.0
"a" constant:               180.0
"b" constant:               0.0
"c" constant:               0.0
Inputs:
    CA11  Scale-up
Outputs:
    SP2   Set Point

Name:                       CA5   Charge
Function:                   Integral X dt
X input:                    CA1   c.d.  ch.3
Y input:                    SP5   Set Point
"a" constant:               0.0
"b" constant:               0.0
"c" constant:               0.0
Inputs:
    CA1   c.d.  ch.3        SP5   Set Point
Outputs:
    MT2   Charge/cm2        LO1   RP825P7.DAT

Name:                       CA6   fback s1
Function:                   Global Feedback(a:address)
X input:                    CA3   Set Pot
Y input:                    0.0
"a" constant:               1.0
"b" constant:               0.0
"c" constant:               0.0
Inputs:
    CA3   Set Pot
Outputs:
    < None >

Name:                       CA7   Invert
Function:                   aX + bY
X input:                    AI:6  Measured Pot
Y input:                    0.0
"a" constant:               -1.0
"b" constant:               0.0
"c" constant:               0.0
Inputs:
    AI:6  Measured Pot
Outputs:
    MT3   Pot Ch.3          LO1   RP825P7.DAT

Name:                       CA8   Set Pot
Function:                   aX + bY + c
X input:                    LG2   and
Y input:                    CA16  Reverse scan
"a" constant:               -0.01
"b" constant:               1.0
"c" constant:               0.2
Inputs:
```

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```
    LG2   and                    CA18  Reverse scan
Outputs:
    CH2   Set Pot. Ch.2          AO:2  pot ch 2            MT10  Meter
    CA12  fback s1

Name:                            CA9   minimum
Function:                        Min(X) for last (a) seconds
X input:                         CA14  Scale-up
Y input:                         0.0
"a" constant:                    180.0
"b" constant:                    0.0
"c" constant:                    0.0
Inputs:
    CA14  Scale-up
Outputs:
    SP4   Set Point

Name:                            CA10  Charge
Function:                        Integral X dt
X input:                         CA2   c.d. ch.2
Y input:                         SP6   Set Point
"a" constant:                    0.0
"b" constant:                    0.0
"c" constant:                    0.0
Inputs:
    CA2   c.d. ch.2              SP6   Set Point
Outputs:
    MT5   Charge/cm2             LO2   RP825P8.DAT

Name:                            CA11  Scale-up
Function:                        aX + bY
X input:                         CA1   c.d.  ch.3
Y input:                         0.0
"a" constant:                    10000.0
"b" constant:                    0.0
"c" constant:                    0.0
Inputs:
    CA1   c.d.  ch.3
Outputs:
    CA4   minimum

Name:                            CA12  fback s1
Function:                        Global Feedback(a:address)
X input:                         CA8   Set Pot
Y input:                         0.0
"a" constant:                    2.0
"b" constant:                    0.0
"c" constant:                    0.0
Inputs:
    CA8   Set Pot
Outputs:
    < None >

Name:                            CA13  Invert
Function:                        aX + bY
X input:                         AI:4  Measured Pot
Y input:                         0.0
"a" constant:                    -1.0
"b" constant:                    0.0
"c" constant:                    0.0
Inputs:
    AI:4  Measured Pot
Outputs:
    MT8   Pot Ch.2               LO2   RP825P8.DAT

Name:                            CA14  Scale-up
```

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```
Function:                    aX + bY
X input:                     CA2   c.d. ch.2
Y input:                     0.0
"a" constant:                10000.0
"b" constant:                0.0
"c" constant:                0.0
Inputs:
    CA2   c.d. ch.2
Outputs:
    CA9   minimum

Name:                        CA15  fback d1
Function:                    Global Feedback(a:address)
X input:                     0.0
Y input:                     0.0
"a" constant:                1.0
"b" constant:                0.0
"c" constant:                0.0
Inputs:
    < None >
Outputs:
    CA16  Reverse scan

Name:                        CA16  Reverse scan
Function:                    c (X + a)(Y + b)
X input:                     CA15  fback d1
Y input:                     SP1   initial time
"a" constant:                -0.2
"b" constant:                0.0
"c" constant:                1.0
Inputs:
    CA15  fback d1           SP1   initial time
Outputs:
    CA3   Set Pot

Name:                        CA17  fback d1
Function:                    Global Feedback(a:address)
X input:                     0.0
Y input:                     0.0
"a" constant:                2.0
"b" constant:                0.0
"c" constant:                0.0
Inputs:
    < None >
Outputs:
    CA18  Reverse scan

Name:                        CA18  Reverse scan
Function:                    c (X + a)(Y + b)
X input:                     CA17  fback d1
Y input:                     SP3   initial time
"a" constant:                -0.2
"b" constant:                0.0
"c" constant:                1.0
Inputs:
    CA17  fback d1           SP3   initial time
Outputs:
    CA8   Set Pot

Name:                        CA19  Calculation
Function:                    X + Y
X input:                     -2.0
Y input:                     0.0
"a" constant:                0.0
"b" constant:                0.0
"c" constant:                0.0
```

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Inputs:
< None >
Outputs:
< None >

Name: CA20 Calculation
Function: X + Y
X input: 0.4
Y input: 0.0
"a" constant: 0.0
"b" constant: 0.0
"c" constant: 0.0
Inputs:
< None >
Outputs:
< None >

Type: Set Point

Name: SP1 initial time
Function: X > Y
X input: TI1 Timer
Y input: 1800.0
Dead Band: 0.0
Inputs:
TI1 Timer
Outputs:
LG1 and PL3 step time CA16 Reverse scan

Name: SP2 Set Point
Function: X > Y
X input: CA4 minimum
Y input: 0.5
Dead Band: 0.0
Inputs:
CA4 minimum
Outputs:
LG3 And

Name: SP3 initial time
Function: X > Y
X input: TI2 Timer
Y input: 45000.0
Dead Band: 0.0
Inputs:
TI2 Timer
Outputs:
LG2 and PL4 Step time CA18 Reverse scan

Name: SP4 Set Point
Function: X > Y
X input: CA9 minimum
Y input: 0.5
Dead Band: 0.01
Inputs:
CA9 minimum
Outputs:
LG4 And

Name: SP5 Set Point
Function: X < Y
X input: TI1 Timer
Y input: 2.0
Dead Band: 0.0
Inputs:
TI1 Timer

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Outputs:
CA5 Charge

Name: SP6 Set Point
Function: X < Y
X input: TI2 Timer
Y input: 2.0
Dead Band: 0.0
Inputs:
TI2 Timer
Outputs:
CA10 Charge

Type: Logic

Name: LG1 and
Function: X AND Y
X input: SP1 initial time
Y input: LG3 And
Inputs:
SP1 initial time LG3 And
Outputs:
CA3 Set Pot

Name: LG2 and
Function: X AND Y
X input: SP3 initial time
Y input: LG4 And
Inputs:
SP3 initial time LG4 And
Outputs:
CA8 Set Pot

Name: LG3 And
Function: X AND Y
X input: PL3 step time
Y input: SP2 Set Point
Inputs:
PL3 step time SP2 Set Point
Outputs:
LG1 and

Name: LG4 And
Function: X AND Y
X input: PL4 Step time
Y input: SP4 Set Point
Inputs:
PL4 Step time SP4 Set Point
Outputs:
LG2 and

Type: Log

Name: LO1 RP825P7.DAT
Log Status: < disabled >
Sample Rate: 1.0 Minutes
Gate: < None >
Data Format:
Heading: < None >
File Path: C:\WB\DATA
File Name: RP825P7.DAT
Date Stamp: enabled
Time Stamp: enabled
Inputs:
TI1 Timer CA7 Invert CA1 q.d. ch
CA5 Charge

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Outputs:
< None >

Name: LO2 RP825P8.DAT
Log Status: enabled
Sample Rate: 1.0 Minutes
Gate: < None >
Data Format:
Heading: < None >
File Path: C:\WB\WBB
File Name: RP825P8.DAT
Date Stamp: enabled
Time Stamp: enabled
Inputs:
CA13 Invert CA2 c.d. ch.2 CA10 Charge
Outputs:
< None >

Type: Meter

Name: MT1 C.d. Ch.3
Output Type: Exponential
Units: A/cm2
Integer: 8
Decimal: 1
Inputs:
CA1 c.d. ch.3
Outputs:
< None >

Name: MT2 Charge/cm2
Output Type: Exponential
Units: Coul/cm2
Integer: 8
Decimal: 1
Inputs:
CA5 Charge
Outputs:
< None >

Name: MT3 Pot Ch.3
Output Type: Fixed Point
Units: Volt
Integer: 6
Decimal: 3
Inputs:
CA7 Invert
Outputs:
< None >

Name: MT4 c.d. ch.2
Output Type: Exponential
Units: A/cm2
Integer: 8
Decimal: 1
Inputs:
CA2 c.d. ch.2
Outputs:
< None >

Name: MT5 Charge/cm2
Output Type: Exponential
Units: Coul/cm2
Integer: 8
Decimal: 1
Inputs:

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CA10 Charge
Outputs:
< None >

Name:	MT6 Pot Ch.2
Output Type:	Fixed Point
Units:	Volt
Integer:	6
Decimal:	3

Inputs:
CA13 Invert
Outputs:
< None >

Name:	MT7 ch3 time
Output Type:	Fixed Point
Units:	< None >
Integer:	9
Decimal:	0

Inputs:
TI1 Timer
Outputs:
< None >

Name:	MT8 ch 2 time
Output Type:	Fixed Point
Units:	sec
Integer:	9
Decimal:	0

Inputs:
TI2 Timer
Outputs:
< None >

Name:	MT9 Meter
Output Type:	Fixed Point
Units:	< None >
Integer:	6
Decimal:	3

Inputs:
CA3 Set Pot
Outputs:
< None >

Name:	MT10 Meter
Output Type:	Fixed Point
Units:	< None >
Integer:	6
Decimal:	3

Inputs:
CA8 Set Pot
Outputs:
< None >

Type: Chart

Name:	CH1 set pot. ch3
Chart Color:	White
X Axis Label:	Hours
X Axis Min:	0.0
X Axis Max:	24.0
Y Axis Label:	< None >
Y Axis Min:	0.5
Y Axis Max:	0.8

Inputs:
CA3 Set Pot

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Outputs:
< None >

Name:	CH2 Set Pot. Ch.2
Chart Color:	White
X Axis Label:	Hours
X Axis Min:	0.0
X Axis Max:	24.0
Y Axis Label:	< None >
Y Axis Min:	0.0
Y Axis Max:	0.8

Inputs:
CA8 Set Pot
Outputs:
< None >

Name:	CH3 c.d. ch3
Chart Color:	White
X Axis Label:	Hours
X Axis Min:	0.0
X Axis Max:	24.0
Y Axis Label:	< None >
Y Axis Min:	1.0e-07
Y Axis Max:	0.01

Inputs:
CA1 c.d. ch.3
Outputs:
< None >

Name:	CH4 C.D. ch.2
Chart Color:	White
X Axis Label:	Hours
X Axis Min:	0.0
X Axis Max:	24.0
Y Axis Label:	< None >
Y Axis Min:	1.0e-07
Y Axis Max:	0.01

Inputs:
CA2 c.d. ch.2
Outputs:
< None >

Type: Analog Output

Name:	AO:2 pot ch 2
Card Type:	STI ACAO-12
Channel Number:	2
Range:	+¦- 5 Volts
Resolution:	0.024%

Inputs:
CA8 Set Pot
Outputs:
< None >

Name:	AO:3 Set Pot Ch.3
Card Type:	STI ACAO-12
Channel Number:	3
Range:	+¦- 5 Volts
Resolution:	0.024%

Inputs:
CA3 Set Pot
Outputs:
< None >

Type: System

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```
Name:                          SY1   System
Enabled:                       Yes
Run Commands:
        Copy File ...          C:\WB\DATA\RP825P6.DAT
        To ...                 B:\RP825P6.DAT
Inputs:
   PL5   Pulse
Outputs:
   < None >

Name:                          SY2   System
Enabled:                       Yes
Run Commands:
        Copy File ...          C:\WB\DATA\RP825P7.DAT
        To ...                 B:\RP825P5.DAT
Inputs:
   PL6   Pulse
Outputs:
   < None >
```

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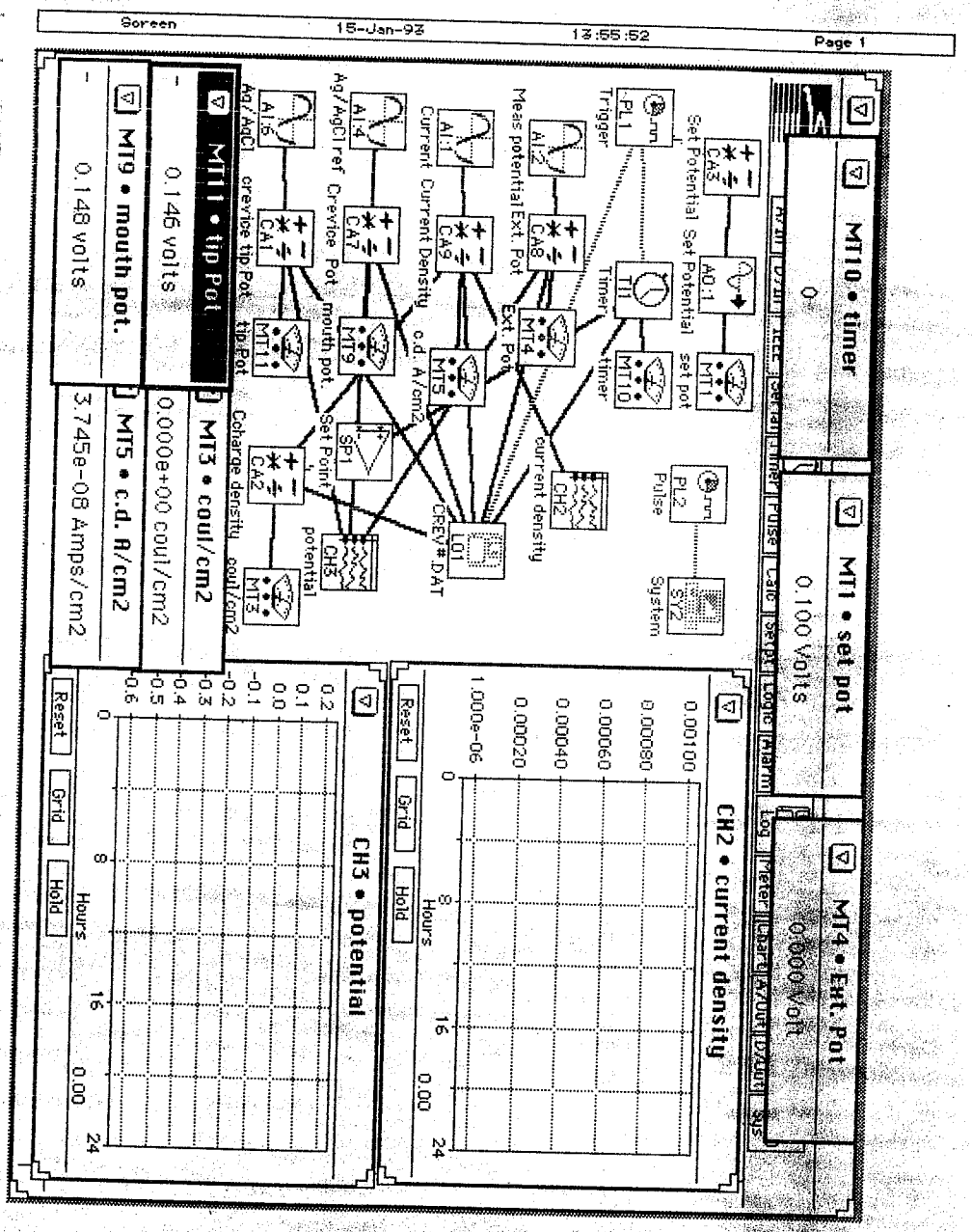

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Worksheet Name:	CREVICE.WBB
Hardware list:	

Name	AIs	AOs	DIOs	CTs	DIs	DOs
STI ACPC-16	16	0	16	0	0	0
STI ACAO-12	0	6	8	0	0	0

Maximum icons:	608
Grid size:	16
Snap to grid:	< disabled >
Report Unsynch:	< disabled >
Fast Mode:	< disabled >
Fast Mode samples:	1000
Fast Mode rate:	1.0 Kilohertz
Trigger level:	-10.0
Trigger source:	Positive
Trigger slope:	Analog
Trigger mode:	None
Pre-trigger samples:	0
Com ports:	2
Port:	COM 1
Comment:	Mouse connected
Port:	COM 2
Baud rate:	9600
Data bits:	8
Stop bits:	1
Duplex:	Half
Parity:	None
XonXoff:	< disabled >
Echo wait:	< disabled >
Line delay:	< disabled >
IEEE:	< disabled >

Type: Analog Input

Name:	AI:1 Current
Card Type:	STI ACPC-16
Channel Number:	1
Range:	+¦-Auto V
Resolution:	Lo Noise (17ms)
Output Type:	Voltage
Sample rate:	10.0 Hertz
Fast Mode:	< disabled >
Inputs:	
< None >	
Outputs:	
CA9 Current Density	

Name:	AI:2 Meas potential
Card Type:	STI ACPC-16
Channel Number:	2
Range:	+¦-Auto V
Resolution:	Lo Noise (17ms)
Output Type:	Voltage
Sample rate:	10.0 Hertz
Fast Mode:	< disabled >
Inputs:	
< None >	
Outputs:	
CA8 Ext. Pot	

Name:	AI:4 Ag/AgCl ref
Card Type:	STI ACPC-16

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Channel Number: 4
Range: +¦-Auto V
Resolution: Lo Noise (17ms)
Output Type: Voltage
Sample rate: 10.0 Hertz
Fast Mode: < disabled >
Inputs:
< None >
Outputs:
CA7 Crevice Pot

Name: AI:6 Ag/AgCl
Card Type: STI ACPC-16
Channel Number: 6
Range: +¦-Auto V
Resolution: Lo Noise (17ms)
Output Type: Voltage
Sample rate: 10.0 Hertz
Fast Mode: < disabled >
Inputs:
< None >
Outputs:
CA1 crevice tip Pot

Type: Timer

Name: TI1 Timer
Inputs:
PL1 Trigger
Outputs:
SP1 Set Point MT10 timer LO1 CREV#.DAT

Type: Pulse

Name: PL1 Trigger
High Duration: 10000.0 Hours
Low Duration: 0.1 Minutes
Start Value: Low
Reset on exit enabled
Inputs:
< None >
Outputs:
TI1 Timer CA3 Set Potential LO1 CREV#.DAT

Name: PL2 Pulse
High Duration: 1.0 Minutes
Low Duration: 2.0 Hours
Start Value: Low
Reset on exit enabled
Inputs:
< None >
Outputs:
SY2 System

Name: PL3 Pulse
High Duration: 1.0 Minutes
Low Duration: 1.0 Hours
Start Value: Low
Reset on exit enabled
Inputs:
< None >
Outputs:
SY1 copy to a:

Type: Calculation

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Name:	CA1 crevice tip Pot			
Function:	aX + bY			
X input:	AI:6 Ag/AgCl			
Y input:	0.0			
"a" constant:	-1.0			
"b" constant:	0.0			
"c" constant:	0.0			
Inputs:				
AI:6 Ag/AgCl				
Outputs:				
CH3 potential	MT11 tip Pot		LO1	CREV#.DAT

Name:	CA2 Ccharge density			
Function:	Integral X dt			
X input:	CA9 Current Density			
Y input:	SP1 Set Point			
"a" constant:	0.0			
"b" constant:	0.0			
"c" constant:	0.0			
Inputs:				
CA9 Current Density	SP1 Set Point			
Outputs:				
MT3 coul/cm2	LO1 CREV#.DAT			

Name:	CA3 Set Potential			
Function:	aX + bY			
X input:	PL1 Trigger			
Y input:	0.0			
"a" constant:	0.1			
"b" constant:	0.0			
"c" constant:	0.0			
Inputs:				
PL1 Trigger				
Outputs:				
AO:1 Set Potential				

Name:	CA7 Crevice Pot			
Function:	aX + bY			
X input:	AI:4 Ag/AgCl ref			
Y input:	0.0			
"a" constant:	-1.0			
"b" constant:	0.0			
"c" constant:	0.0			
Inputs:				
AI:4 Ag/AgCl ref				
Outputs:				
CH3 potential	MT9 mouth pot.		LO1	CREV#.DAT

Name:	CA8 Ext. Pot			
Function:	aX + bY			
X input:	AI:2 Meas potential			
Y input:	0.0			
"a" constant:	-1.0			
"b" constant:	0.0			
"c" constant:	0.0			
Inputs:				
AI:2 Meas potential				
Outputs:				
CH3 potential	MT4 Ext. Pot		LO1	CREV#.DAT

Name:	CA9 Current Density			
Function:	aX + bY			
X input:	AI:1 Current			
Y input:	20.689			
"a" constant:	-1.0			
"b" constant:	10.0			

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"c" constant: 0.0
Inputs:
AI:1 Current
Outputs:
CA2 Ccharge density CH2 current density MT5 c.d. A/cm2
LO1 CREV#.DAT

Type: Set Point

Name: SP1 Set Point
Function: X < Y
X input: TI1 Timer
Y input: 2.0
Dead Band: 0.0
Inputs:
TI1 Timer
Outputs:
CA2 Ccharge density

Type: Log

Name: LO1 CREV#.DAT
Log Status: < disabled >
Sample Rate: 15.0 Minutes
Gate: PL1 Trigger
Data Format:
Heading: < None >
File Path: C:\WB\DATA
File Name: CREV#.DAT
Date Stamp: enabled
Time Stamp: enabled
Inputs:
TI1 Timer CA8 Ext. Pot CA7 Crevice Pot
CA9 Current Density PL1 Trigger CA1 crevice tip Pot
CA2 Ccharge density
Outputs:
< None >

Type: Meter

Name: MT1 set pot
Output Type: Fixed Point
Units: Volts
Integer: 6
Decimal: 3
Inputs:
AO:1 Set Potential
Outputs:
< None >

Name: MT3 coul/cm2
Output Type: Exponential
Units: coul/cm2
Integer: 6
Decimal: 3
Inputs:
CA2 Ccharge density
Outputs:
< None >

Name: MT4 Ext. Pot
Output Type: Fixed Point
Units: Volt
Integer: 6
Decimal: 3
Inputs:

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CA8 Ext. Pot
Outputs:
< None >

Name: MT5 c.d. A/cm2
Output Type: Exponential
Units: Amps/cm2
Integer: 6
Decimal: 3
Inputs:
CA9 Current Density
Outputs:
< None >

Name: MT9 mouth pot.
Output Type: Fixed Point
Units: volts
Integer: 6
Decimal: 3
Inputs:
CA7 Crevice Pot
Outputs:
< None >

Name: MT10 timer
Output Type: Fixed Point
Units: < None >
Integer: 9
Decimal: 0
Inputs:
TI1 Timer
Outputs:
< None >

Name: MT11 tip Pot
Output Type: Fixed Point
Units: volts
Integer: 6
Decimal: 3
Inputs:
CA1 crevice tip Pot
Outputs:
< None >

Type: Chart

Name: CH2 current density
Chart Color: White
X Axis Label: Hours
X Axis Min: 0.0
X Axis Max: 24.0
Y Axis Label: < None >
Y Axis Min: 1.0e-06
Y Axis Max: 0.001
Inputs:
CA9 Current Density
Outputs:
< None >

Name: CH3 potential
Chart Color: White
X Axis Label: Hours
X Axis Min: 0.0
X Axis Max: 24.0
Y Axis Label: < None >
Y Axis Min: -0.6

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Y Axis Max: 0.2
Inputs:
CA7 Crevice Pot CA1 crevice tip Pot CA8 Ext. Pot
Outputs:
< None >

Type: Analog Output

Name: AO:1 Set Potential
Card Type: STI ACAO-12
Channel Number: 1
Range: +|- 5 Volts
Resolution: 0.024%
Inputs:
CA3 Set Potential
Outputs:
MT1 set pot

Type: System

Name: SY1 copy to a:
Enabled: Yes
Run Commands:
Copy File ... C:\WB\DATA\825-5.DAT
To ... A:\825-5.DAT
Inputs:
PL3 Pulse
Outputs:
< None >

Name: SY2 System
Enabled: Yes
Run Commands:
Copy File ... C:\WB\DATA\CREV#.DAT
To ... A:\CREV#.DAT
Inputs:
PL2 Pulse
Outputs:
< None >

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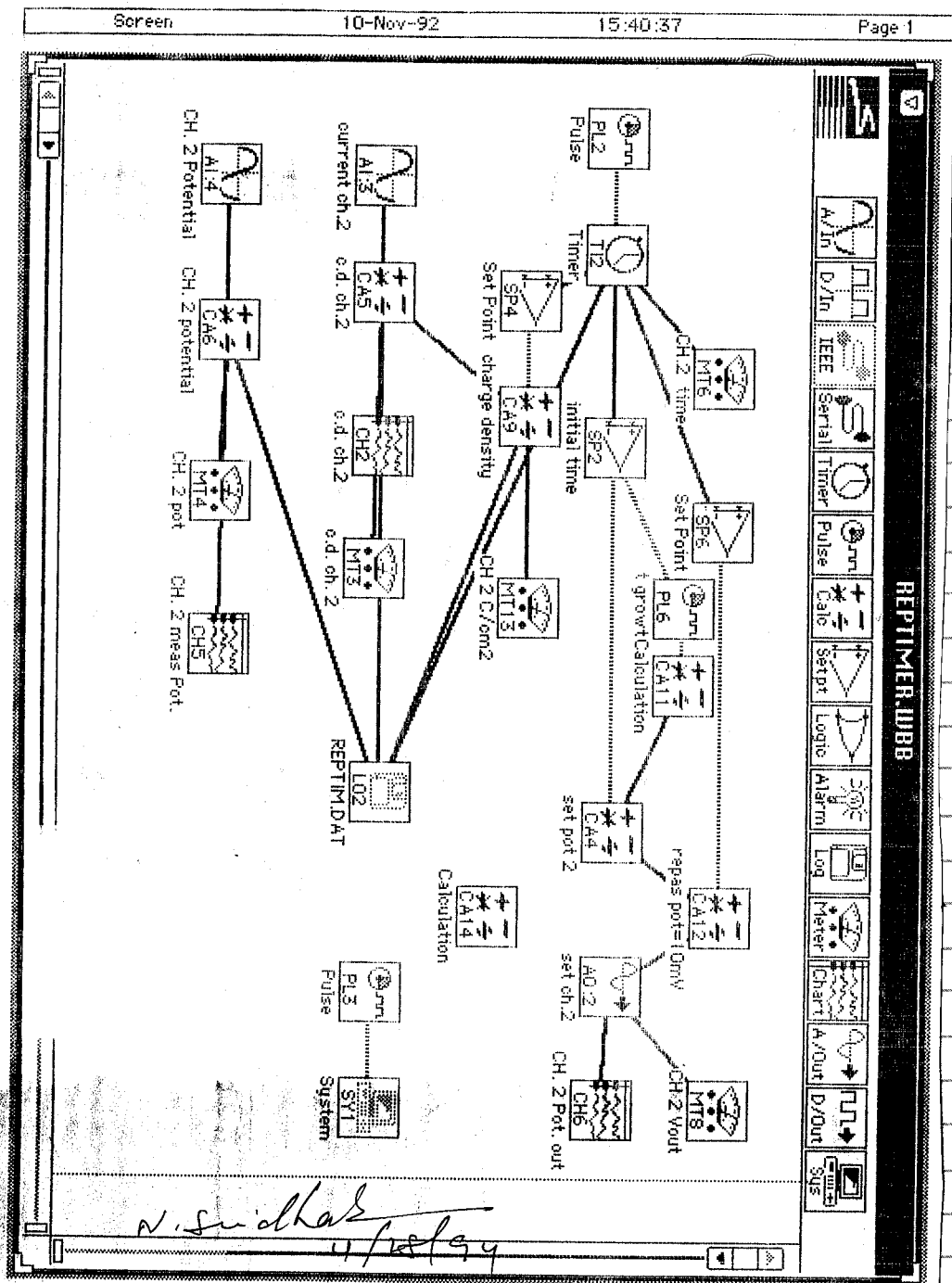

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Worksheet Name: REPTIMER.WBB
Hardware list:

Name	AIs	AOs	DIOs	CTs	DIs	DOs
STI ACPC-16	16	0	16	0	0	0
STI ACAO-12	0	6	8	0	0	0

Maximum icons: 496
Grid size: 20
Snap to grid: enabled
Report Unsynch: < disabled >
Fast Mode: < disabled >
Fast Mode samples: 1000
Fast Mode rate: 1.0 Kilohertz
Trigger level: -10.0
Trigger source: Positive
Trigger slope: Analog
Trigger mode: None
Pre-trigger samples: 0
Com ports: 2

Port: COM 1
Comment: Mouse connected

Port: COM 2
Baud rate: 9600
Data bits: 8
Stop bits: 1
Duplex: Half
Parity: None
XonXoff: < disabled >
Echo wait: < disabled >
Line delay: < disabled >

IEEE: < disabled >

Type: Analog Input

Name: AI:3 current ch.2
Card Type: STI ACPC-16
Channel Number: 3
Range: +¦-Auto V
Resolution: Lo Noise (17ms)
Output Type: Voltage
Sample rate: 10.0 Hertz
Fast Mode: < disabled >
Inputs:
< None >
Outputs:
CA5 c.d. ch.2

Name: AI:4 CH. 2 Potential
Card Type: STI ACPC-16
Channel Number: 4
Range: +¦-Auto V
Resolution: Lo Noise (17ms)
Output Type: Voltage
Sample rate: 10.0 Hertz
Fast Mode: < disabled >
Inputs:
< None >
Outputs:
CA6 CH. 2 potential

Name: AI:5 current ch. 3
Card Type: STI ACPC-16

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Channel Number:	5
Range:	+¦-Auto V
Resolution:	Lo Noise (17ms)
Output Type:	Voltage
Sample rate:	10.0 Hertz
Fast Mode:	< disabled >
Inputs:	
< None >	
Outputs:	
CA2 c.d. ch. 3	

Name:	AI:6 potential CH. 3
Card Type:	STI ACPC-16
Channel Number:	6
Range:	+¦-Auto V
Resolution:	Lo Noise (17ms)
Output Type:	Voltage
Sample rate:	10.0 Hertz
Fast Mode:	< disabled >
Inputs:	
< None >	
Outputs:	
CA3 potential CH. 3	

Name:	AI:7 current ch. 4
Card Type:	STI ACPC-16
Channel Number:	7
Range:	+¦-Auto V
Resolution:	Lo Noise (17ms)
Output Type:	Voltage
Sample rate:	10.0 Hertz
Fast Mode:	< disabled >
Inputs:	
< None >	
Outputs:	
CA16 c.d. ch. 4	

Name:	AI:8 potential CH. 4
Card Type:	STI ACPC-16
Channel Number:	8
Range:	+¦-Auto V
Resolution:	Lo Noise (17ms)
Output Type:	Voltage
Sample rate:	10.0 Hertz
Fast Mode:	< disabled >
Inputs:	
< None >	
Outputs:	
CA17 potential CH. 4	

Name:	AI:9 current ch. 5
Card Type:	STI ACPC-16
Channel Number:	9
Range:	+¦-Auto V
Resolution:	Lo Noise (17ms)
Output Type:	Voltage
Sample rate:	10.0 Hertz
Fast Mode:	< disabled >
Inputs:	
< None >	
Outputs:	
CA23 c.d. ch. 5	

Name:	AI:10 potential CH. 5
Card Type:	STI ACPC-16
Channel Number:	10

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Range: +|-Auto V
Resolution: Lo Noise (17ms)
Output Type: Voltage
Sample rate: 10.0 Hertz
Fast Mode: < disabled >
Inputs:
< None >
Outputs:
CA24 potential CH. 5

Type: Timer

Name: TI1 Timer
Inputs:
PL1 Pulse
Outputs:
SP1 Initial time SP3 Set Point SP5 Set Point
MT5 CH.3 time LO1 REPTIME.DAT

Name: TI2 Timer
Inputs:
PL2 Pulse
Outputs:
SP2 initial time SP4 Set Point SP6 Set Point
MT6 CH.2 time LO2 REPTIM.DAT

Name: TI3 Timer
Inputs:
PL7 Pulse
Outputs:
SP7 Initial time SP8 Set Point SP9 Set Point
MT11 CH.4 time LO3 REPTIMM.DAT

Name: TI4 Timer
Inputs:
PL10 Pulse
Outputs:
SP10 Initial time SP11 Set Point SP12 Set Point
MT18 CH.5 time LO4 REPTIM#.DAT

Type: Pulse

Name: PL1 Pulse
High Duration: 9600.0 Hours
Low Duration: 1.0 Seconds
Start Value: Low
Reset on exit enabled
Inputs:
< None >
Outputs:
TI1 Timer

Name: PL2 Pulse
High Duration: 9600.0 Hours
Low Duration: 1.0 Seconds
Start Value: Low
Reset on exit enabled
Inputs:
< None >
Outputs:
TI2 Timer

Name: PL3 Pulse
High Duration: 40.0 Seconds
Low Duration: 3.0 Hours

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Reset on exit enabled
Inputs:
< None >
Outputs:
SY1 System

Name: PL4 Pulse
High Duration: 40.0 Seconds
Low Duration: 3.0 Hours
Start Value: Low
Reset on exit enabled
Inputs:
< None >
Outputs:
SY2 System

Name: PL5 growth
High Duration: 1.188e+05 Seconds
Low Duration: 9600.0 Hours
Start Value: High
Reset on exit < disabled >
Inputs:
SP1 Initial time
Outputs:
CA7 Calculation

Name: PL6 t growth
High Duration: 1.188e+05 Seconds
Low Duration: 9600.0 Hours
Start Value: High
Reset on exit < disabled >
Inputs:
SP2 initial time
Outputs:
CA11 Calculation

Name: PL7 Pulse
High Duration: 9600.0 Hours
Low Duration: 1.0 Seconds
Start Value: Low
Reset on exit enabled
Inputs:
< None >
Outputs:
TI3 Timer

Name: PL8 growth
High Duration: 1.188e+05 Seconds
Low Duration: 9600.0 Hours
Start Value: High
Reset on exit < disabled >
Inputs:
SP7 Initial time
Outputs:
CA18 Calculation

Name: PL9 Pulse
High Duration: 40.0 Seconds
Low Duration: 3.0 Hours
Start Value: Low
Reset on exit enabled
Inputs:
< None >
Outputs:
SY3 System

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Name: PL10 Pulse
High Duration: 9600.0 Hours
Low Duration: 1.0 Seconds
Start Value: Low
Reset on exit enabled
Inputs:
< None >
Outputs:
TI4 Timer

Name: PL11 growth
High Duration: 1.188e+05 Seconds
Low Duration: 9600.0 Hours
Start Value: High
Reset on exit < disabled >
Inputs:
SP10 Initial time
Outputs:
CA25 Calculation

Name: PL12 Pulse
High Duration: 40.0 Seconds
Low Duration: 3.0 Hours
Start Value: Low
Reset on exit enabled
Inputs:
< None >
Outputs:
SY4 System

Type: Calculation

Name: CA1 Set Pot 1
Function: aX + bY + c
X input: SP1 Initial time
Y input: CA7 Calculation
"a" constant: -0.45
"b" constant: 0.25
"c" constant: 0.6
Inputs:
SP1 Initial time CA7 Calculation
Outputs:
CA10 repas pot =20mV

Name: CA2 c.d. ch. 3
Function: aX / bY
X input: AI:5 current ch. 3
Y input: 1.0
"a" constant: -0.1
"b" constant: 8.0
"c" constant: 0.0
Inputs:
AI:5 current ch. 3
Outputs:
MT1 c.d. ch 3 CH1 c.d. ch. 3 CA8 charge density
LO1 REPTIME.DAT

Name: CA3 potential CH. 3
Function: aX + bY
X input: AI:6 potential CH. 3
Y input: 0.0
"a" constant: -1.0
"b" constant: 0.0
"c" constant: 0.0
Inputs:
AI:6 potential CH. 3

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Outputs:
MT2 CH. 3 Pot. CH3 CH.3 meas pot. LO1 REPTIME.DAT

Name: CA4 set pot 2
Function: aX + bY + c
X input: SP2 initial time
Y input: CA11 Calculation
"a" constant: -0.45
"b" constant: 0.25
"c" constant: 0.6
Inputs:
SP2 initial time CA11 Calculation
Outputs:
CA12 repas pot=10mV

Name: CA5 c.d. ch.2
Function: aX / bY
X input: AI:3 current ch.2
Y input: 1.0
"a" constant: -0.1
"b" constant: 8.0
"c" constant: 0.0
Inputs:
AI:3 current ch.2
Outputs:
CH2 c.d. ch.2 MT3 c.d. ch. 2 CA9 charge density
LO2 REPTIM.DAT

Name: CA6 CH. 2 potential
Function: aX + bY
X input: AI:4 CH. 2 Potential
Y input: 0.0
"a" constant: -1.0
"b" constant: 0.0
"c" constant: 0.0
Inputs:
AI:4 CH. 2 Potential
Outputs:
MT4 CH. 2 pot CH5 CH. 2 meas Pot. LO2 REPTIM.DAT

Name: CA7 Calculation
Function: aX + bY
X input: PL5 growth
Y input: 0.0
"a" constant: 1.0
"b" constant: 0.0
"c" constant: 0.0
Inputs:
PL5 growth
Outputs:
CA1 Set Pot 1

Name: CA8 charge density
Function: Integral X dt
X input: CA2 c.d. ch. 3
Y input: SP3 Set Point
"a" constant: 0.0
"b" constant: 0.0
"c" constant: 0.0
Inputs:
CA2 c.d. ch. 3 SP3 Set Point
Outputs:
MT15 CH 3 C/cm2 LO1 REPTIME.DAT

Name: CA9 charge density

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X input:	CA5 c.d. ch.2
Y input:	SP4 Set Point
"a" constant:	0.0
"b" constant:	0.0
"c" constant:	0.0
Inputs:	
CA5 c.d. ch.2	SP4 Set Point
Outputs:	
MT13 CH 2 C/cm2	LO2 REPTIM.DAT

Name:	CA10 repas pot =20mV
Function:	aX + bY
X input:	CA1 Set Pot 1
Y input:	SP5 Set Point
"a" constant:	1.0
"b" constant:	-0.13
"c" constant:	0.0
Inputs:	
CA1 Set Pot 1	SP5 Set Point
Outputs:	
AO:3 Set CH. 3	

Name:	CA11 Calculation
Function:	aX + bY
X input:	PL6 t growth
Y input:	0.0
"a" constant:	1.0
"b" constant:	0.0
"c" constant:	0.0
Inputs:	
PL6 t growth	
Outputs:	
CA4 set pot 2	

Name:	CA12 repas pot=10mV
Function:	aX + bY
X input:	CA4 set pot 2
Y input:	SP6 Set Point
"a" constant:	1.0
"b" constant:	-0.14
"c" constant:	0.0
Inputs:	
CA4 set pot 2	SP6 Set Point
Outputs:	
< None >	

Name:	CA13 Calculation
Function:	a
X input:	0.0
Y input:	0.0
"a" constant:	-2.0
"b" constant:	0.0
"c" constant:	0.0
Inputs:	
< None >	
Outputs:	
< None >	

Name:	CA14 Calculation
Function:	a
X input:	0.0
Y input:	0.0
"a" constant:	-0.5
"b" constant:	0.0
"c" constant:	0.0
Inputs:	

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< None >
Outputs:
AO:2 set ch.2

Name: CA15 Set Pot 1
Function: aX + bY + c
X input: SP7 Initial time
Y input: CA18 Calculation
"a" constant: -0.45
"b" constant: 0.35
"c" constant: 0.6
Inputs:
SP7 Initial time CA18 Calculation
Outputs:
CA20 repas pot=25mV

Name: CA16 c.d. ch. 4
Function: aX / bY
X input: AI:7 current ch. 4
Y input: 1.0
"a" constant: -0.1
"b" constant: 8.0
"c" constant: 0.0
Inputs:
AI:7 current ch. 4
Outputs:
CH7 c.d. ch. 4 MT9 c.d. ch 4 CA19 charge density
LO3 REPTIMM.DAT

Name: CA17 potential CH. 4
Function: aX + bY
X input: AI:8 potential CH. 4
Y input: 0.0
"a" constant: -1.0
"b" constant: 0.0
"c" constant: 0.0
Inputs:
AI:8 potential CH. 4
Outputs:
CH8 CH.4 meas pot. MT10 CH. 4 Pot. LO3 REPTIMM.DAT

Name: CA18 Calculation
Function: aX + bY
X input: PL8 growth
Y input: 0.0
"a" constant: 1.0
"b" constant: 0.0
"c" constant: 0.0
Inputs:
PL8 growth
Outputs:
CA15 Set Pot 1

Name: CA19 charge density
Function: Integral X dt
X input: CA16 c.d. ch. 4
Y input: SP8 Set Point
"a" constant: 0.0
"b" constant: 0.0
"c" constant: 0.0
Inputs:
CA16 c.d. ch. 4 SP8 Set Point
Outputs:
MT14 CH 4 C/cm2 LO3 REPTIMM.DAT

Name: CA20 repas pot=25mV

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Function:	aX + bY
X input:	CA15 Set Pot 1
Y input:	SP9 Set Point
"a" constant:	1.0
"b" constant:	-0.125
"c" constant:	0.0
Inputs:	
CA15 Set Pot 1	SP9 Set Point
Outputs:	
AO:4 Set CH. 4	

Name:	CA21 Calculation
Function:	a
X input:	0.0
Y input:	0.0
"a" constant:	-2.0
"b" constant:	0.0
"c" constant:	0.0
Inputs:	
< None >	
Outputs:	
< None >	

Name:	CA22 Set Pot 1
Function:	aX + bY + c
X input:	SP10 Initial time
Y input:	CA25 Calculation
"a" constant:	-0.45
"b" constant:	0.35
"c" constant:	0.6
Inputs:	
SP10 Initial time	CA25 Calculation
Outputs:	
CA27 repas pot=50mV	

Name:	CA23 c.d. ch. 5
Function:	aX / bY
X input:	AI:9 current ch. 5
Y input:	1.0
"a" constant:	-0.1
"b" constant:	8.0
"c" constant:	0.0
Inputs:	
AI:9 current ch. 5	
Outputs:	
CH10 c.d. ch. 5	MT16 c.d. ch 5 CA26 charge density
LO4 REPTIM#.DAT	

Name:	CA24 potential CH. 5
Function:	aX + bY
X input:	AI:10 potential CH. 5
Y input:	0.0
"a" constant:	-1.0
"b" constant:	0.0
"c" constant:	0.0
Inputs:	
AI:10 potential CH. 5	
Outputs:	
CH11 CH.5 meas pot.	MT17 CH. 5 Pot. LO4 REPTIM#.DAT

Name:	CA25 Calculation
Function:	aX + bY
X input:	PL11 growth
Y input:	0.0
"a" constant:	1.0
"b" constant:	0.0

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"c" constant: 0.0
Inputs:
PL11 growth
Outputs:
CA22 Set Pot 1

Name: CA26 charge density
Function: Integral X dt
X input: CA23 c.d. ch. 5
Y input: SP11 Set Point
"a" constant: 0.0
"b" constant: 0.0
"c" constant: 0.0
Inputs:
CA23 c.d. ch. 5 SP11 Set Point
Outputs:
MT20 CH 5 C/cm2 LO4 REPTIM#.DAT

Name: CA27 repas pot=50mV
Function: aX + bY
X input: CA22 Set Pot 1
Y input: SP12 Set Point
"a" constant: 1.0
"b" constant: -0.1
"c" constant: 0.0
Inputs:
CA22 Set Pot 1 SP12 Set Point
Outputs:
AO:5 Set CH. 5

Name: CA28 Calculation
Function: a
X input: 0.0
Y input: 0.0
"a" constant: -2.0
"b" constant: 0.0
"c" constant: 0.0
Inputs:
< None >
Outputs:
< None >

Type: Set Point

Name: SP1 Initial time
Function: X > Y
X input: TI1 Timer
Y input: 1800.0
Dead Band: 0.0
Inputs:
TI1 Timer
Outputs:
CA1 Set Pot 1 PL5 growth

Name: SP2 initial time
Function: X > Y
X input: TI2 Timer
Y input: 1800.0
Dead Band: 0.0
Inputs:
TI2 Timer
Outputs:
CA4 set pot 2 PL6 t growth

Name: SP3 Set Point
Function: X < Y

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X input: TI1 Timer
Y input: 2.0
Dead Band: 0.0
Inputs:
TI1 Timer
Outputs:
CA8 charge density

Name: SP4 Set Point
Function: X < Y
X input: TI2 Timer
Y input: 2.0
Dead Band: 0.0
Inputs:
TI2 Timer
Outputs:
CA9 charge density

Name: SP5 Set Point
Function: X > Y
X input: TI1 Timer
Y input: 1.206e+05
Dead Band: 0.0
Inputs:
TI1 Timer
Outputs:
CA10 repas pot =20mV

Name: SP6 Set Point
Function: X > Y
X input: TI2 Timer
Y input: 1.206e+05
Dead Band: 0.0
Inputs:
TI2 Timer
Outputs:
CA12 repas pot=10mV

Name: SP7 Initial time
Function: X > Y
X input: TI3 Timer
Y input: 1800.0
Dead Band: 0.0
Inputs:
TI3 Timer
Outputs:
PL8 growth CA15 Set Pot 1

Name: SP8 Set Point
Function: X < Y
X input: TI3 Timer
Y input: 2.0
Dead Band: 0.0
Inputs:
TI3 Timer
Outputs:
CA19 charge density

Name: SP9 Set Point
Function: X > Y
X input: TI3 Timer
Y input: 1.206e+05
Dead Band: 0.0
Inputs:
TI3 Timer
Outputs:

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```
a" constant:                    0.0
  CA20  repas pot=25mV

me:                             SP10  Initial time
nction:                         X > Y
input:                          TI4   Timer
input:                          1800.0
ad Band:                        0.0
puts:
  TI4   Timer
tputs:
  PL11  growth                  CA22  Set Pot 1

me:                             SP11  Set Point
nction:                         X < Y
input:                          TI4   Timer
input:                          2.0
ad Band:                        0.0
puts:
  TI4   Timer
tputs:
  CA26  charge density

me:                             SP12  Set Point
nction:                         X > Y
input:                          TI4   Timer
input:                          1.206e+05
ad Band:                        0.0
puts:
  TI4   Timer
tputs:
  CA27  repas pot=50mV

pe: Log
____________________________________________________________________

me:                             LO1   REPTIME.DAT
g Status:                       < disabled >
mple Rate:                      60.0   Seconds
te:                             < None >
ta Format:
ading:                          < None >
le Path:                        C:\WB\DATA
le Name:                        REPTIME.DAT
te Stamp:                       enabled
me Stamp:                       enabled
puts:
  TI1   Timer                   CA3   potential CH. 3     CA2   c.d. ch. 3
  CA8   charge density
tputs:
  < None >

me:                             LO2   REPTIM.DAT
g Status:                       < disabled >
mple Rate:                      60.0   Seconds
te:                             < None >
ta Format:
ading:                          < None >
le Path:                        C:\WB\DATA
le Name:                        REPTIM.DAT
te Stamp:                       enabled
me Stamp:                       enabled
puts:
  TI2   Timer                   CA6   CH. 2 potential     CA5   c.d. ch.2
  CA9   charge density
tputs:
```

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Name: LO3^ REPTIMM.DAT
Log Status: < disabled >
Sample Rate: 60.0 Seconds
Gate: < None >
Data Format:
Heading: < None >
File Path: C:\WB\DATA
File Name: REPTIMM.DAT
Date Stamp: enabled
Time Stamp: enabled
Inputs:
TI3 Timer CA17 potential CH. 4 CA16 c.d. ch. 4
CA19 charge density
Outputs:
< None >

Name: LO4 REPTIM#.DAT
Log Status: < disabled >
Sample Rate: 60.0 Seconds
Gate: < None >
Data Format:
Heading: < None >
File Path: C:\WB\DATA
File Name: REPTIM#.DAT
Date Stamp: enabled
Time Stamp: enabled
Inputs:
TI4 Timer CA24 potential CH. 5 CA23 c.d. ch. 5
CA26 charge density
Outputs:
< None >

Type: Meter

Name: MT1 c.d. ch 3
Output Type: Exponential
Units: A/cm2
Integer: 6
Decimal: 3
Inputs:
CA2 c.d. ch. 3
Outputs:
< None >

Name: MT2 CH. 3 Pot.
Output Type: Fixed Point
Units: < None >
Integer: 6
Decimal: 3
Inputs:
CA3 potential CH. 3
Outputs:
< None >

Name: MT3 c.d. ch. 2
Output Type: Exponential
Units: A/cm2
Integer: 6
Decimal: 3
Inputs:
CA5 c.d. ch.2
Outputs:
< None >

Name: MT4 CH. 2 pot
Output Type: Fixed Point

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CA20 repas pot=25mV

Units: < None >
Integer: 6
Decimal: 3
Inputs:
CA6 CH. 2 potential
Outputs:
< None >

Name: MT5 CH.3 time
Output Type: Fixed Point
Units: sec
Integer: 9
Decimal: 0
Inputs:
TI1 Timer
Outputs:
< None >

Name: MT6 CH.2 time
Output Type: Fixed Point
Units: sec
Integer: 9
Decimal: 0
Inputs:
TI2 Timer
Outputs:
< None >

Name: MT7 CH. 3 Vout
Output Type: Fixed Point
Units: volts
Integer: 6
Decimal: 3
Inputs:
AO:3 Set CH. 3
Outputs:
< None >

Name: MT8 CH 2 Vout
Output Type: Fixed Point
Units: volts
Integer: 6
Decimal: 3
Inputs:
AO:2 set ch.2
Outputs:
< None >

Name: MT9 c.d. ch 4
Output Type: Exponential
Units: A/cm2
Integer: 6
Decimal: 3
Inputs:
CA16 c.d. ch. 4
Outputs:
< None >

Name: MT10 CH. 4 Pot.
Output Type: Fixed Point
Units: < None >
Integer: 6
Decimal: 3
Inputs:
CA17 potential CH. 4

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< None >

Name: MT11 CH.4 time
Output Type: Fixed Point
Units: sec
Integer: 9
Decimal: 0
Inputs:
TI3 Timer
Outputs:
< None >

Name: MT12 CH. 4 Vout
Output Type: Fixed Point
Units: volts
Integer: 6
Decimal: 3
Inputs:
AO:4 Set CH. 4
Outputs:
< None >

Name: MT13 CH 2 C/cm2
Output Type: Fixed Point
Units: C/cm2
Integer: 6
Decimal: 3
Inputs:
CA9 charge density
Outputs:
< None >

Name: MT14 CH 4 C/cm2
Output Type: Fixed Point
Units: C/cm2
Integer: 6
Decimal: 3
Inputs:
CA19 charge density
Outputs:
< None >

Name: MT15 CH 3 C/cm2
Output Type: Fixed Point
Units: C/cm2
Integer: 6
Decimal: 3
Inputs:
CA8 charge density
Outputs:
< None >

Name: MT16 c.d. ch 5
Output Type: Exponential
Units: A/cm2
Integer: 6
Decimal: 3
Inputs:
CA23 c.d. ch. 5
Outputs:
< None >

Name: MT17 CH. 5 Pot.
Output Type: Fixed Point
Units: < None >
Integer: 6

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Decimal: 3
Inputs:
CA24 potential CH. 5
Outputs:
< None >

Name: MT18 CH.5 time
Output Type: Fixed Point
Units: sec
Integer: 9
Decimal: 0
Inputs:
TI4 Timer
Outputs:
< None >

Name: MT19 CH. 5 Vout
Output Type: Fixed Point
Units: volts
Integer: 6
Decimal: 3
Inputs:
AO:5 Set CH. 5
Outputs:
< None >

Name: MT20 CH 5 C/cm2
Output Type: Fixed Point
Units: C/cm2
Integer: 6
Decimal: 3
Inputs:
CA26 charge density
Outputs:
< None >

Type: Chart

Name: CH1 c.d. ch. 3
Chart Color: White
X Axis Label: Hours
X Axis Min: 0.0
X Axis Max: 96.0
Y Axis Label: < None >
Y Axis Min: 0.0
Y Axis Max: 0.01
Inputs:
CA2 c.d. ch. 3
Outputs:
< None >

Name: CH2 c.d. ch.2
Chart Color: White
X Axis Label: Hours
X Axis Min: 0.0
X Axis Max: 96.0
Y Axis Label: < None >
Y Axis Min: 0.0
Y Axis Max: 0.01
Inputs:
CA5 c.d. ch.2
Outputs:
< None >

Name: CH3 CH.3 meas pot.

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X Axis Label:	Hours
X Axis Min:	0.0
X Axis Max:	24.0
Y Axis Label:	< None >
Y Axis Min:	0.0
Y Axis Max:	1.0

Inputs:
CA3 potential CH. 3
Outputs:
< None >

Name:	CH4 CH. 3 pot. out
Chart Color:	White
X Axis Label:	Hours
X Axis Min:	0.0
X Axis Max:	24.0
Y Axis Label:	< None >
Y Axis Min:	0.0
Y Axis Max:	1.0

Inputs:
AO:3 Set CH. 3
Outputs:
< None >

Name:	CH5 CH. 2 meas Pot.
Chart Color:	White
X Axis Label:	Hours
X Axis Min:	0.0
X Axis Max:	24.0
Y Axis Label:	< None >
Y Axis Min:	0.0
Y Axis Max:	1.0

Inputs:
CA6 CH. 2 potential
Outputs:
< None >

Name:	CH6 CH. 2 Pot. out
Chart Color:	White
X Axis Label:	Seconds
X Axis Min:	0.0
X Axis Max:	120.0
Y Axis Label:	< None >
Y Axis Min:	0.0
Y Axis Max:	1.0

Inputs:
AO:2 set ch.2
Outputs:
< None >

Name:	CH7 c.d. ch. 4
Chart Color:	White
X Axis Label:	Hours
X Axis Min:	0.0
X Axis Max:	96.0
Y Axis Label:	< None >
Y Axis Min:	0.0
Y Axis Max:	0.01

Inputs:
CA16 c.d. ch. 4
Outputs:
< None >

Name:	CH8 CH.4 meas pot.
Chart Color:	White
X Axis Label:	Hours
Start Value:	Low

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X Axis Min:	0.0
X Axis Max:	24.0
Y Axis Label:	< None >
Y Axis Min:	0.0
Y Axis Max:	1.0
Inputs:	
CA17 potential CH. 4	
Outputs:	
< None >	

Name:	CH9 CH. 4 pot. out
Chart Color:	White
X Axis Label:	Hours
X Axis Min:	0.0
X Axis Max:	24.0
Y Axis Label:	< None >
Y Axis Min:	0.0
Y Axis Max:	1.0
Inputs:	
AO:4 Set CH. 4	
Outputs:	
< None >	

Name:	CH10 c.d. ch. 5
Chart Color:	White
X Axis Label:	Hours
X Axis Min:	0.0
X Axis Max:	96.0
Y Axis Label:	< None >
Y Axis Min:	0.0
Y Axis Max:	0.01
Inputs:	
CA23 c.d. ch. 5	
Outputs:	
< None >	

Name:	CH11 CH.5 meas pot.
Chart Color:	White
X Axis Label:	Hours
X Axis Min:	0.0
X Axis Max:	24.0
Y Axis Label:	< None >
Y Axis Min:	0.0
Y Axis Max:	1.0
Inputs:	
CA24 potential CH. 5	
Outputs:	
< None >	

Name:	CH12 CH. 5 pot. out
Chart Color:	White
X Axis Label:	Hours
X Axis Min:	0.0
X Axis Max:	24.0
Y Axis Label:	< None >
Y Axis Min:	0.0
Y Axis Max:	1.0
Inputs:	
AO:5 Set CH. 5	
Outputs:	
< None >	

Type: Analog Output

Name:	AO:2 set ch.2
Card Type:	STI ACAO-12

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Range: +¦- 5 Volts
Resolution: 0.024%
Inputs:
CA14 Calculation
Outputs:
CH6 CH. 2 Pot. out MT8 CH 2 Vout

Name: AO:3 Set CH. 3
Card Type: STI ACAO-12
Channel Number: 3
Range: +¦- 5 Volts
Resolution: 0.024%
Inputs:
CA10 repas pot =20mV
Outputs:
CH4 CH. 3 pot. out MT7 CH. 3 Vout

Name: AO:4 Set CH. 4
Card Type: STI ACAO-12
Channel Number: 4
Range: +¦- 5 Volts
Resolution: 0.024%
Inputs:
CA20 repas pot=25mV
Outputs:
CH9 CH. 4 pot. out MT12 CH. 4 Vout

Name: AO:5 Set CH. 5
Card Type: STI ACAO-12
Channel Number: 5
Range: +¦- 5 Volts
Resolution: 0.024%
Inputs:
CA27 repas pot=50mV
Outputs:
CH12 CH. 5 pot. out MT19 CH. 5 Vout

Type: System

Name: SY1 System
Enabled: Yes
Run Commands:
Copy File ... C:\WB\DATA\REPTIM.DAT
To ... B:\REPTIM.DAT
Inputs:
PL3 Pulse
Outputs:
< None >

Name: SY2 System
Enabled: Yes
Run Commands:
Copy File ... C:\WB\DATA\REPTIME.DAT
To ... B:\REPTIME.DAT
Inputs:
PL4 Pulse
Outputs:
< None >

Name: SY3 System
Enabled: Yes
Run Commands:
Copy File ... C:\WB\DATA\REPTIMM.DAT
To ... B:\REPTIMM.DAT
Inputs:
Start Value: Low

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```
    PL9   Pulse
Outputs:
    < None >

Name:                                SY4   System
Enabled:                             Yes
Run Commands:
          Copy File ...              C:\WB\DATA\REPTIM#.DAT
          To ...                     B:\REPTIM#.DAT
Inputs:
    PL12  Pulse
Outputs:
    < None >
```

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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.

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2/14/97

The project has been closed & is limited in ~~scope~~ scope & ~~is~~ is limited in scientific note for storage on R-A. record.

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