## LSNReviews

**From:** Aladar Csontos
**Sent:** Wednesday, July 20, 2005 9:14 AM
**To:** Xihua He
**Subject:** Matrix
**Attachments:** LC Experiments.xls

Hi Xihua,

Here's the updated matrix. Please let me know what you think. Also, I've highlighted two experiments. One is regarding the area ratio of 1/5 for 316 to BA22 and I'm not sure if it's worthwhile. The second one is 316 to TG7 to evaluate how much Hydrogen could evolve from this galvanic couple. How do we do this one?

I'll be in around 9am. I'll stop by to go see Brian.

Thanks,
Al

Properties Page

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Novell_GroupWise; Wed,
20 Jul 2005 09:14:22 -0400
Date: Wed, 20 Jul 2005 09:14:09 -0400
From: Aladar Csontos <aac@nrc.gov>
Subject: Matrix
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Original-recipient: rfc822;xhe@cnwra.swri.edu

# Localized Corrosion Experiments

| Anode | Cathode | A/C Area Ratio | Measure | Temp | Solution | Measurement Type | Torque | Notes |
|---|---|---|---|---|---|---|---|---|
| BA22 | - | - | $E_{corr}$ | 95°C | 4M NaCl | Open Circuit Potential Test - Cylindrical Sample - No Crevice Sample | - | Completed Already |
| WA22 + SA | - | - | $E_{corr}$ | 95°C | 4M NaCl | Open Circuit Potential Test - Cylindrical Sample - No Crevice Sample | - | Completed Already |
| TG7 | - | - | $E_{corr}$ | 95°C | 4M NaCl | Open Circuit Potential Test - Cylindrical Sample - No Crevice Sample | - | Completed Already |
| 316 | - | - | $E_{corr}$ | 95°C | 4M NaCl | Open Circuit Potential Test - Cylindrical Sample - No Crevice Sample | - | Completed Already |
| BA22 | Teflon | - | $E_{corr}$ / $E_{repass}$ | 95°C | 4M NaCl | $E_{corr}$ open circuit potential galvanic corrosion test / Cyclic polarization for $E_{repass}$ | 50 in ounce | Completed Already |
| WA22 + SA | Teflon | - | $E_{corr}$ / $E_{repass}$ | 95°C | 4M NaCl | $E_{corr}$ open circuit potential galvanic corrosion test / Cyclic polarization for $E_{repass}$ | 50 in ounce | Completed Already |
| TG7 | Teflon | - | $E_{corr}$ / $E_{repass}$ | 95°C | 4M NaCl | $E_{corr}$ open circuit potential galvanic corrosion test / Cyclic polarization for $E_{repass}$ | 50 in ounce | See 2001-03 CNWRA Report |
| 316 | Teflon | - | $E_{corr}$ / $E_{repass}$ | 95°C | 4M NaCl | $E_{corr}$ open circuit potential galvanic corrosion test / Cyclic polarization for $E_{repass}$ | 50 in ounce | Completed Already |
| BA22 | BA22 | 1/1 | $E_{corr}$ / $E_{repass}$ | 95°C | 4M NaCl | $E_{corr}$ open circuit potential galvanic corrosion test / Cyclic polarization for $E_{repass}$ | 50 in ounce / 75 in lbs | |
| WA22 + SA | BA22 | 1/1 | $E_{corr}$ / $E_{repass}$ | 95°C | 4M NaCl | $E_{corr}$ open circuit potential galvanic corrosion test / Cyclic polarization for $E_{repass}$ | 50 in ounce / 75 in lbs | |
| WA22 + SA | BA22 | 1/5 | $E_{corr}$ / $E_{repass}$ | 95°C | 4M NaCl | $E_{corr}$ open circuit potential galvanic corrosion test / Cyclic polarization for $E_{repass}$ | 50 in ounce / 75 in lbs | |
| BA22 | TG7 | 1/1 | $E_{corr}$ / $E_{repass}$ | 95°C | 4M NaCl | $E_{corr}$ open circuit potential galvanic corrosion test / Cyclic polarization for $E_{repass}$ | 50 in ounce / 75 in lbs | |
| BA22 | TG7 | 1/10 | $E_{corr}$ / $E_{repass}$ | 95°C | 4M NaCl | $E_{corr}$ open circuit potential galvanic corrosion test / Cyclic polarization for $E_{repass}$ | 50 in ounce / 75 in lbs | |
| WA22 + SA | TG7 | 1/1 | $E_{corr}$ / $E_{repass}$ | 95°C | 4M NaCl | $E_{corr}$ open circuit potential galvanic corrosion test / Cyclic polarization for $E_{repass}$ | 50 in ounce / 75 in lbs | |
| WA22 + SA | TG7 | 1/10 | $E_{corr}$ / $E_{repass}$ | 95°C | 4M NaCl | $E_{corr}$ open circuit potential galvanic corrosion test / Cyclic polarization for $E_{repass}$ | 50 in ounce / 75 in lbs | |
| 316 | BA22 | 1/1 | $E_{corr}$ / $E_{repass}$ | 95°C | 4M NaCl | $E_{corr}$ open circuit potential galvanic corrosion test / Cyclic polarization for $E_{repass}$ | 50 in ounce / 75 in lbs | |
| 316 | BA22 | 1/5 | $E_{corr}$ / $E_{repass}$ | 95°C | 4M NaCl | $E_{corr}$ open circuit potential galvanic corrosion test / Cyclic polarization for $E_{repass}$ | 50 in ounce / 75 in lbs | |
| 316 | TG7 | 1/10 | $E_{corr}$ / $E_{repass}$ | 95°C | 4M NaCl | $E_{corr}$ open circuit potential galvanic corrosion test / Cyclic polarization for $E_{repass}$ | 50 in ounce / 75 in lbs | Hydrogen Evolution?? |
| BA22 | BA22 | 1/5 | Penetration Depth | 95°C | 5M NaCl | Penetration Rate on the Same $E_{corr}$ Test as a Function of Time | 50 in ounce / 75 in lbs | |
| WA22 + SA | BA22 | 1/5 | Penetration Depth | 95°C | 5M NaCl | Penetration Rate on the Same $E_{corr}$ Test as a Function of Time | 50 in ounce / 75 in lbs | |
| BA22 | TG7 | 1/10 | Penetration Depth | 95°C | 5M NaCl | Penetration Rate on the Same $E_{corr}$ Test as a Function of Time | 50 in ounce / 75 in lbs | |
| WA + SA | TG7 | 1/10 | Penetration Depth | 95°C | 5M NaCl | Penetration Rate on the Same $E_{corr}$ Test as a Function of Time | 50 in ounce / 75 in lbs | |
| 316 | BA22 | 1/5 | Penetration Depth | 95°C | 5M NaCl | Penetration Rate on the Same $E_{corr}$ Test as a Function of Time | 50 in ounce / 75 in lbs | |

**Legend**

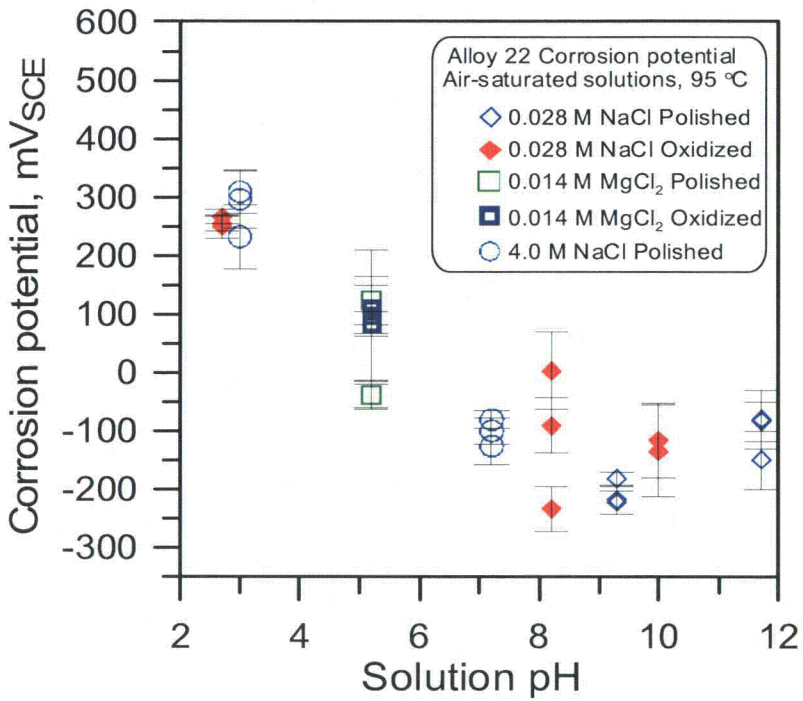
BA22 = Base Alloy 22
WA22 + SA = Welded Alloy 22 + 1125C 20Min
TG7 = Ti Grade 7
316 = Stainless Steel 316L

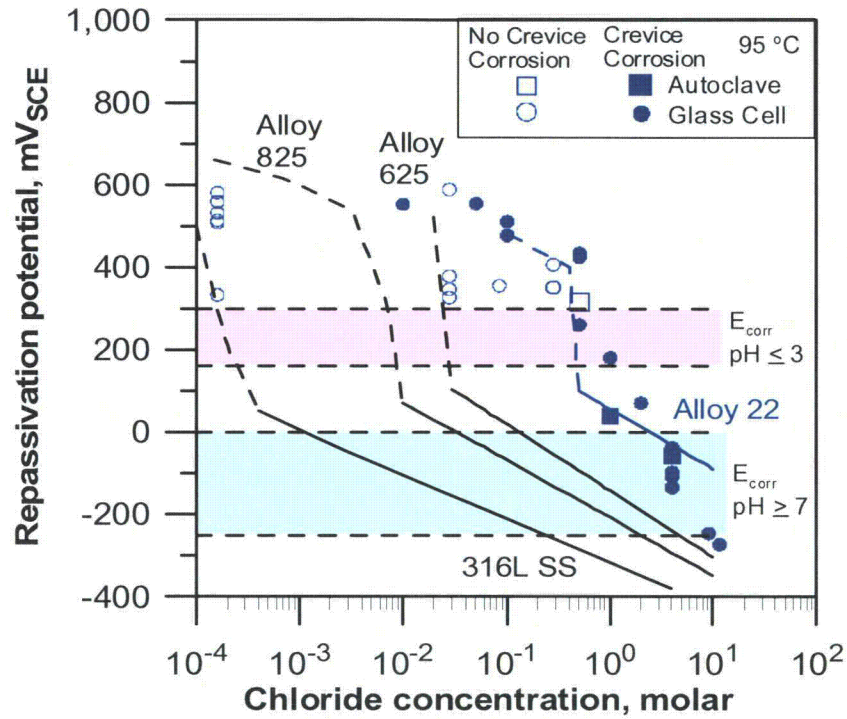
**As a function of:**

Area
Torque
Dissimilar Metals
Solution

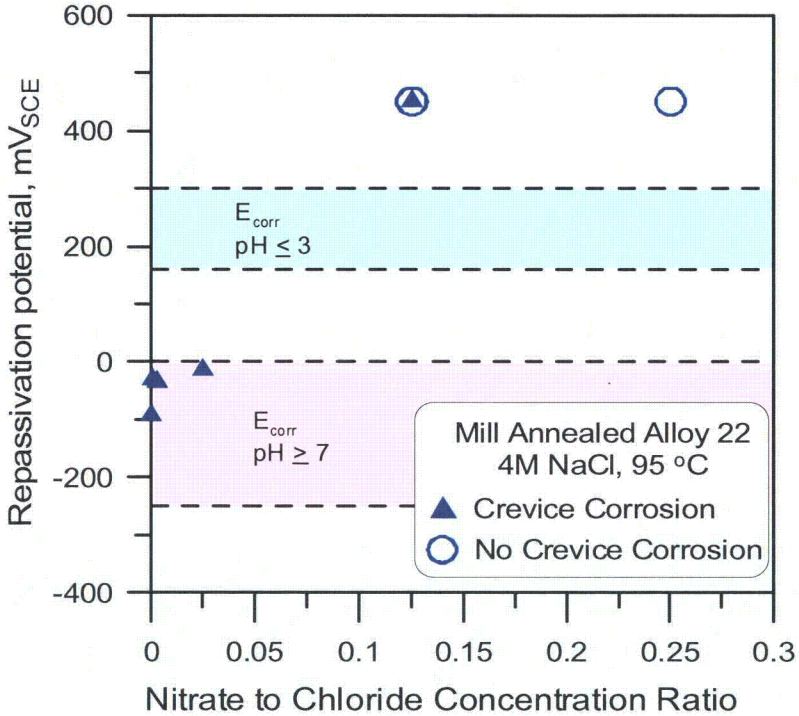
**Overall Notes**

Used ASTM Standard G78 for 40 in ounce and 75 in lbs
Teflon the bolt threads
Air Saturated for $E_{corr}$ Measurements
Dearated for $E_{repass}$




Xihua's Presentation
Welded Alloy 22 Ecorr & Erepass



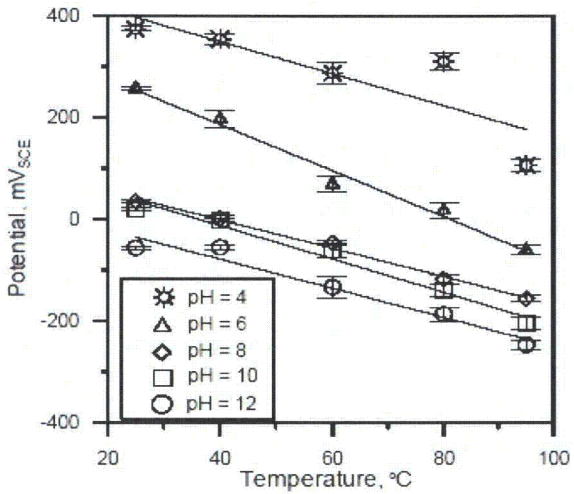




Figure 1. Corrosion potentials of Alloy 22 as a function of temperature. Potentials were measured in 4 M NaCl solution maintained at constant pH values.