

**Summary for Testing Requirements  
Limerick Generating Station - Unit #2  
SPEC NE-132 Rev 0**

**5.3.1 Radiation Resistance per ASTM 4082**

Expose test specimen to  $1 \times 10^6$  rads/hr

Accumulated dose =  $1 \times 10^9$  rads (ie 1000 hrs)

List presence/extent of chalking (ASTM D659)

List presence/extent of checking (ASTM D660)

List presence/extent of cracking (ASTM D661)

List presence/extent of blistering (ASTM D714)

List presence/extent of flaking (ASTM D772)

List presence/extent of delamination

List presence/extent of peeling

*Specification does not specify dose rate*

*Specification does not specify water or air environment*

*Specification does not specify acceptable extent*

**5.3.2 Atlas Cell per ASTM C868**

Reagent: Demineralized water @ 135F

Specimen: 8" x 24" x 0.125" carbon steel

Atlas cell diameter = 5-6"

Duration: 6 months exposure

Monthly interval tests:

Measure panel resistance (MO)

Determine corrosion potential (mV)

Measure mass of specimen  $\pm 0.01$  g.

Six month tests:

Measure panel resistance (must be < 3 MO)

Measure mass of specimen  $\pm 0.01$  g. (must be < 3 g. gain)

Outline exposed zone

Adhesion testing (2) per ASTM D4541

Vapor zone vs unexposed area (72 hr/72F recovery)

Adhesion > 750 psi

Adhesion (f) > 0.5 (Adhesion (i))

Section panel longitudinally without disruption

20X photomicrographs of interface along vapor/liquid line

No blistering, corrosion or disbondment

*Sectioning 0.125" steel w/ 0.200" coating will damage interface*

*Steel backing w/ 0.200" coating weighs > 4000 g. (  $\pm 0.01$  g incompatible)*

*Specification requires non-standard test configuration*

### **5.3.2.1 Flexural testing**

Use longitudinal section with liquid exposure region

Dry 7 d @ 135F (ramp per spec figure 5-1)

Load per spec figure 5-2

Deflect in 0.0625" increments with 1-2 minute pause between increments

Note increment that crack incidence occurs, report increment

*Specification requires non-standard test configuration*

*Specification does not declare passing value*

*Specification should stipulate test temperature*

### **5.3.2.2 Impact per ASTM D2794**

Use longitudinal section with vapor exposure region

Reverse impact, 0.5" diameter indenter

*Specification does not declare passing value*

*Specification should stipulate test temperature*

### **5.3.3 Permeability per ASTM E96**

Inverted water method (BW)

30 mil primer casting < 0.003 perm-in (or 0.10 perms)

30 mil build coat casting < 0.04 perm-in (or 1.33 perms)

### **5.3.4 Cathodic Disbondment per ASTM G-8**

Temp = 105F

(3) Double coated plates or (3) 2" diameter sch 40 pipe

Test at 30, 60 & 90 days, specimens 1,2, & 3 respectively

Dry 7 d @ 135F (ramp per spec figure 5-1)

Reverse impact per ASTM D2794 below immersion line

*Correct ASTM designation is G-42 for elevated temperature G-8*

*Specification should stipulate impact temperature*

*Specification does not declare passing value*

*Specification requires reverse impact of double side coated plate*

*Specification allows pipe but requires reverse impact*

*Specification requires 2" sch 40 pipe which is impractical & irrelevant*

### **5.3.5 Dielectric strength per ASTM D115**

Copper substrate

(1) on primer system & (1) on build system

Dielectric Strength > 300 V/mil

### **5.3.6 Mandrel bend per ASTM D1737**

Cure 7 d @ 135F (ramp per spec figure 5-1)

1.5" mandrel, 22 gage steel backing

No cracking allowed

*Specification does not specify a thickness*

### **5.3.7 HDT per ASTM D648**

200 mil specimen, report

*Specification does not declare passing value*

### **5.3.8 Cleaning resistance**

Demonstrate multiple iteration cleaning resistance

*Specification does not specify test procedure or*

*Specification does not specify OEM to cite case histories*

### **5.3.9 pH Swing Resistance**

Coating must withstand (3 pH-9 pH) for extended periods of time

*Specification does not specify test procedure or*

*Specification does not specify OEM to cite case histories*