



# FBE MARINE PROTECT

## fusion bonded epoxy

## MIL-PRF-23236 qualification testing

### 1. Cathodic Disbonding – ASTM G8

**Test Device**  
Glass tank with set up conforming to ASTM G8

**Description**  
Two steel panels were prepared as specified in 4.5.2 and electrically connected to a commercial magnesium anode conforming to ASTM G8 and had a 0.25-inch (nominal) hole drilled through the coating to the metal at the center of the test panel.

The electrical resistance between a point on the surface of the anode and the metal in the drilled hole of the test panel shall be less than 0.01 ohms, when checked with an ohm meter. Connecting points on the test panel were coated with an epoxy compound for insulation. The test panel was then installed in a modified ASTM G8 test in such a manner as to separate the test panel from the magnesium anode by 2 feet for a period of 3 months.

**Requirements**  
Cannot Peel, Flake, Blister, Dissolve, or Fail. Peeling shall not exceed 4% of test panel area and all undercutting and peeling should be located within 1/2 " of holiday.

**Results**  
**R23-6**  
No blistering flaking, peeling less than 1% of test panel area, peeling is located within 1 inch of holiday

**R23-7**  
No peeling, flaking, blistering or dissolving.

**Pass/Fail**  
Pass



### 2. Synthetic Seawater Immersion

**Test Device**  
ASTM D4541 Type II tester

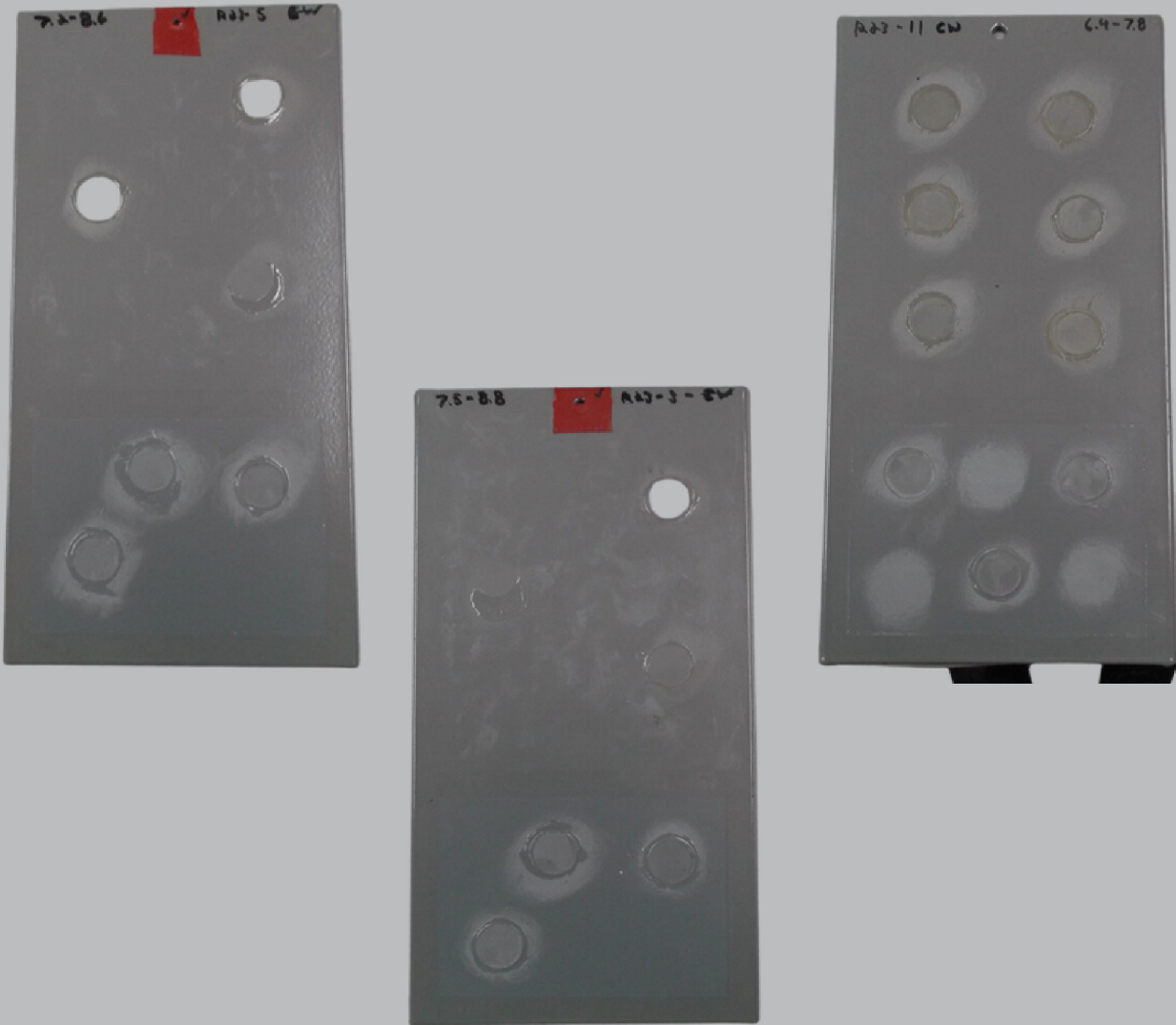
**Description**  
Two test panels, prepared as specified in 4.5.2 were tested in accordance with 4.5.2.2.1 Cycle A.  
a. Salt water immersion for 5 days: Immersed panels completely for 1 week in either ASTM D1141, substitute ocean water solution at a temperature of 27±6 °C (80±10 °F).  
b. Remove panels from test and allow to dry for 2 days.  
c. Hot water immersion for 2 hours: Following the drying period, immerse the panels totally in hot, synthetic seawater for 2 hours at 80 °C (175 °F)  
Operations (a) to (c) constitute one complete test cycle. The cycle is repeated and coating deterioration recorded after each complete cycle. If coating is still satisfactory after twenty-five cycles, wipe lightly with a soft cloth and freshwater, allow 48 hours to thoroughly dry, and recoat the upper one third of one side of each panel, masking the portion from the edge to 13 millimeters (0.5 inch) inward, with one coat of the finish coat of the coating system (or primer coat and finish coat if appropriate). Allow a 1-week dry time and complete immersion test with twenty-five additional test cycles.

**Requirements**  
Coating system shall be evaluated for pinhole rusting, ASTM D4541, Type II tester, adhesion of both original and recoated surfaces, blistering larger than 1.5 millimeters (0.0625 inch) in diameter, and surface imperfections larger than 1.5 millimeters (0.0625 inch)

**Results**  
**R23-1**  
No pinhole rusting, no blistering, no surface imperfections, adhesion to the original and recoated surface is less than 50% of original coating before test

**R23-2**  
No pinhole rusting, no blistering, no surface imperfections, adhesion to the original and recoated surface is less than 50% of original coating before test

**Pass/Fail**  
Pass



### 3. Resistance to Condensing Water

**Test Device**  
Condensing cabinet as specified in ASTM D 4585  
ASTM D4541 Type II tester

**Description**  
Panels shall be prepared as specified in 4.5.2. Expose test panels in a condensing cabinet as specified in ASTM D4585 for 2000 hours at 38 °C (100 °F). Coating system shall be evaluated for pinhole corrosion, ASTM D4541, Type II tester, adhesion of both original and recoated surfaces, blistering and surface imperfections larger than 1.5 millimeters (0.0625 inch) in diameter. Coating systems shall be evaluated for edge rusting. Test results shall be as specified in 3.17.

**Requirements**  
When tested as specified in 4.5.14, the coating system shall have no pinhole rusting. The ASTM D4541, Type II tester, adhesion values of the tested system to itself and the substrate shall be at least 50 percent of the values for adhesion of the untested original coating before testing. There shall be no blistering rated in excess of ASTM D714, blister size number 4, Few. There shall be no surface imperfections (including peeling) larger than 1.5 millimeters (0.0625 inch), and any blistering shall be unbroken.

**Results**  
**R23- 3**  
No pinhole rusting, no blistering, no surface imperfections, no adhesion loss between system to itself and the substrate

**R23-5**  
No pinhole rusting, no blistering, no surface imperfections, no adhesion loss between system to itself and the substrate

**R23- 11**  
No pinhole rusting, no blistering, no surface imperfections, no adhesion loss between system to substrate and less than 50% between system to itself

**Pass/Fail**  
Pass