

TITAN

METAL FABRICATORS INC.

Corrosion Coupon Testing Guidelines

- Record the alloy grade and sample number.
- Degrease in 5% to 10% aqueous ammonia. Use a nylon brush if necessary. An ultrasonic device can be used if available.
- Rinse in running water for about 5 minutes and dry.
- Measure and weigh the clean, dry specimens. Dimensions determined to an accuracy of 0.1 mg are suggested.
- Place samples in the test environment.
- In laboratory testing, the supporting device and container should not cause contamination of the test solution. The method of supporting samples should be designed to avoid electrical contact between the samples or between any sample and metallic container. Test samples should NOT be placed in the same container with samples of other metals.
- In field-testing, a PTFE rope can be used for hanging samples. The following procedures should be followed.
 - a. Specimens should be placed first from the inlet of the process solution when other metals are also tested.
 - b. Hold specimen firmly in place.
 - c. Eliminate the possibility of galvanic effects resulting from metal-to-metal contact. Polytetrafluoroethylene tape and tube can be used for this purpose.
- Remove specimens after test.
- Before specimens are cleaned, their appearance should be observed and recorded.
- Clean specimens in water.
- Reweigh specimens after cleaning and drying.
- The corrosion rate of the samples can be calculated as follows:

$$\text{Corrosion Rate in mpy (mils per year)} = 534.6 \times \frac{\Delta W}{D \times A \times T}$$

ΔW = weight loss in milligrams (Mg)

D = Density (Mg / Cm³)

A = The sample area in square inches (In²)

T = Exposure time in hours (Hr)

Density of Various Materials ((Mg / Cm³))			
Material	Density (Mg / Cm³)	Material	Density (Mg / Cm³)
Titanium Gr. 2	4.51	Tantalum	16.60
Titanium Gr. 7	4.51	Niobium	8.55
Zirconium 702	6.49	Hastelloy C-276	8.94
Hastelloy B	9.24	Hastelloy C-22	8.94
316L Stainless Steel	8.02	304 Stainless Steel	8.02



Corrosion Testing Log

Coupon Label	Material	Corrosive Solution (% Wt)	Sample Area (In ²)	Test Duration (Hr)	Initial Coupon Wt (Mg)	Final Coupon Wt (Mg)	Δ Wt. (Mg)	Corrosion Rate (mpy)

Testing Comments: _____

