

Thermal Diffusion Galvanizing Comparative 1500 Hr B117 Salt Spray Results

# **Testing Background**

- Testing done at independent certified lab: Calcoast-ITL
- 683 Thornton Street
- San Leandro, CA 94577 USA
- ASTM B117 protocol
- Start Date 9/9/2013
- Complete as of 11/11/2013



### Definitions

- "HDG"-Hot Dip Galvanizing per ASTM 153
- "TDG"-Thermal Diffusion Galvanizing per ASTM 1059
- "ERX"-two samples have corrosion resistant paint applied on top of HDG or

**TDG.** (ERX intended for structural components. Applied to bolts for comparative corrosion purposes only. Not for use on field bolts)

- SS" stainless steel. Both grades 304 and 316
- "Zinc Electroplating" per ASTM F1941

#### **Bolts Tested-Pictured at 500 Hrs**



First row from left to right: ERX painted HDG, 316ss, 316ss, 304ss, 304ss, HDG silicate coated, HDG silicate coated, HDG, HDG, TDG

**Second row from left to right:** ERX painted TDG, Electroplated, Aluminum, TDG

### All @ 1500 Hrs



From left to right: TDG (2), 316 SS (2), 304 SS (2), Silicate Coated HDG (2), HDG (2), Aluminum( 1), electroplated (1), ERX TDG (1), ERX HDG (1)



#### TDG @ 1500 Hrs





#### 316 SS @ 1500 Hrs





### 304 SS @ 1500 Hrs





#### HDG @ 1500 Hrs





### HDG Silicate Coated @ 1500 Hrs





# Top-Electro Plated Coated Bottom-Aluminum @ 1500 Hrs





# Top-ERX painted on HDG, Bottom ERX painted on TDG @ 1500 Hrs





## All @ 1000 Hrs



#### TDG, HDG @ 1000 Hrs





#### Threads close up @ 1000 Hrs



#### Thread Status:

316 SS-one minor corrosionpoint. UsableHDG Silicate-corroded.UnusableHDG-Badly corroded. UnusableTDG-No corrosion. Usable



### HDG @ 500 Hrs







<u>Status:</u> Heavily corroded Frozen Threads Unusable



#### TDG @ 500 Hrs







<u>Status:</u> Zero corrosion head, body, chamfer. Free threads with zero corrosion.



### Silicate Coated HDG @ 500 Hrs



#### Status:

Heavy corrosion head, chamber, body, threads. Frozen Threads, unusable.



#### 304 and 316 SS @ 500 Hrs



<u>304 Status:</u> Minor corrosion point on head and chamfer. No body corrosion

Fully functional threads, one minor corrosion point.



**<u>316 Status:</u>** Minor corrosion point on head and chamfer. No body corrosion Fully functional threads, no corrosion



### Aluminum @ 500 Hrs





<u>Status:</u> Heavily corroded unusable



### Electroplated Zinc @ 500 Hrs





<u>Status:</u> Heavily corroded unusable



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