True or False:

Brass corrodes less than Aluminum

Why TFT's Aluminum monitors
are as good as (or better) than
100 year old brass.

Task Force Tips Inc.
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As technology moves forward, TFT remains a leader:

- Latest CNC machine tools
- Materials, Coatings & Processes
  - ANSI 356-T6 aluminum
  - Highest grade lubricants
  - Hardcoat anodize treatment
  - Powdercoat surface finish on castings
  - 100% water & pressure test prior to shipping

ANSI 356-T6 aluminum:

The 356 alloy is lightweight, strong, considerably lower cost compared to brass and accepts hardcoat anodizing extremely well.

The 356 alloy also machines easily using CNC machine tools keeping cost and pricing lower than brass.

Lubrication:

The moving parts are protected with a silicone grease that is considerably more impervious to moisture than typical petroleum based greases. This excludes moisture from damaging hidden areas.

- Silicone grease is highly resistant to washout from foam compounds.
- Silicone grease does not evaporate for decades, even under heat.
- Silicone grease has extreme temperature ranges -40°C to +260°C

Hardcoat Anodizing:

Commonly referred to Type III anodizing, it is formed by using an electrolytic solution of sulfuric acid approximately 0°C and a current density of 23 to 37 Amps per square foot. The process will run for 20 to 120 minutes depending on the material and desired coating thickness. This process makes approximately 50% buildup on the material and penetrates 50% into the material.

Hardcoat anodizing is used for wear & corrosion resistance.

Powdercoat:

Powder coating is the process of coating a surface in which a powder material is applied using an electrostatic or compressed air method. The applied powder is then heated (cured) in an oven to its melting point, after which it flows into all the pours of the material to form a smooth film which dries to a firm, hard, durable finish very resistant to scratches, cracking, peeling, UV rays and corrosion.

Spray Booth – parts sprayed inside & outside

Oven – heated at 200°C

2

Powdercoat is applied and baked on for a permanently bonded corrosion resistant finish

1

Hardcoat anodizing creates an aluminum oxide barrier for incredible hardness and corrosion resistance

Salt Spray Testing:

The salt spray test is a standardized test method used to check corrosion resistance of coated samples. Since coatings can provide a high corrosion resistance through the intended life of the part in use, it is necessary to check corrosion resistance by other means. Salt spray test is an accelerated corrosion test that produces a corrosive attack to the coated samples in order to predict its suitability in use as a protective finish product.

The following monitor slides were tested against the accepted standard ASTM B117 salt spray tests, containing 5% salt concentration. 120 hours exposure is what is required by NFPA 1964 (certification for nozzles for freshwater service). As you will see, we chose to test up to 2000 hours.

Sample # 1
Bare Brass
New

Bare brass has been the standard of the industry since pumps were invented.
Brass has been used since its invention of the Bronze age.
It looks great when it’s new.

Sample # 1
Bare Brass
336 hours

Accelerated corrosion tests by independent laboratory shows corrosion begins after only a short exposure.

Sample # 1
Bare Brass
1000 hours

But exposure to fire water in refineries is more severe.

So it is important to test for longer periods.

Sample # 1
Bare Brass
2000 hours

2000 hours is equivalent to several years exposure to normal conditions of service in a refinery with fresh water:

- The brass has a green buildup of corrosion all over it.
- Operational controls are difficult to operate.
- The inside looks as bad as the outside.

Sample # 3
Bare Aluminum
New

Aluminum is a newer material.
It is strong, lightweight, smooth and tough.

But what about corrosion?

Sample # 3
Bare Aluminum
336 hours

Corrosion has already started.

Sample # 3
Bare Aluminum
1000 hours

Corrosion is moderate.

Sample # 3
Bare Aluminum
2000 hours

Corrosion is severe.

Operational controls are difficult to operate.

Bare Brass
2000 hours

Bare Aluminum
2000 hours

We conclude Brass corrodes less than Aluminum.

But who sells bare aluminum monitors? No one.
So the typical comment that we must use brass is not valid. It's only a hundred year old specification that has not kept up with modern technology.

Sample # 4
Aluminum
Hardcoated & Powdercoated
New

Aluminum monitors from TFT are hardcoat anodized to begin with.
Millions of aluminum oxide crystals are chemically grown on every surface.
The crystals are sealed together after anodizing.
Then polyester powder paint (powdercoat) is fused onto the surface permanently, interlocking into the microscopic structures. This is not paint and does not peel or chip like paint.

Sample # 4
Aluminum
Hardcoated & Powdercoated
336 hours

Powdercoat is impervious to salt.

So after 336 hours no salt has reached the aluminum.

Sample # 4
Aluminum
Hardcoated & Powdercoated
1000 hours

Some staining is visible from the stainless plug where it screws into the anodized casting. There was no powdercoat on the aluminum threads.

We learned that the stainless steel in close contact with anodized aluminum can cause the aluminum to be sacrificed. So we improved it even more.

Sample # 4
Aluminum
Hardcoated & Powdercoated
2000 hours

Horizontal

Surfaces

After 2000 hours more staining has accumulated on TOP of the powder coating.
Accumulations of salt compounds collect on horizontal surfaces and crevices.
But the powdercoat is INTACT, the aluminum is INTACT.
All controls are easily operational.

Bare Brass
2000 hours

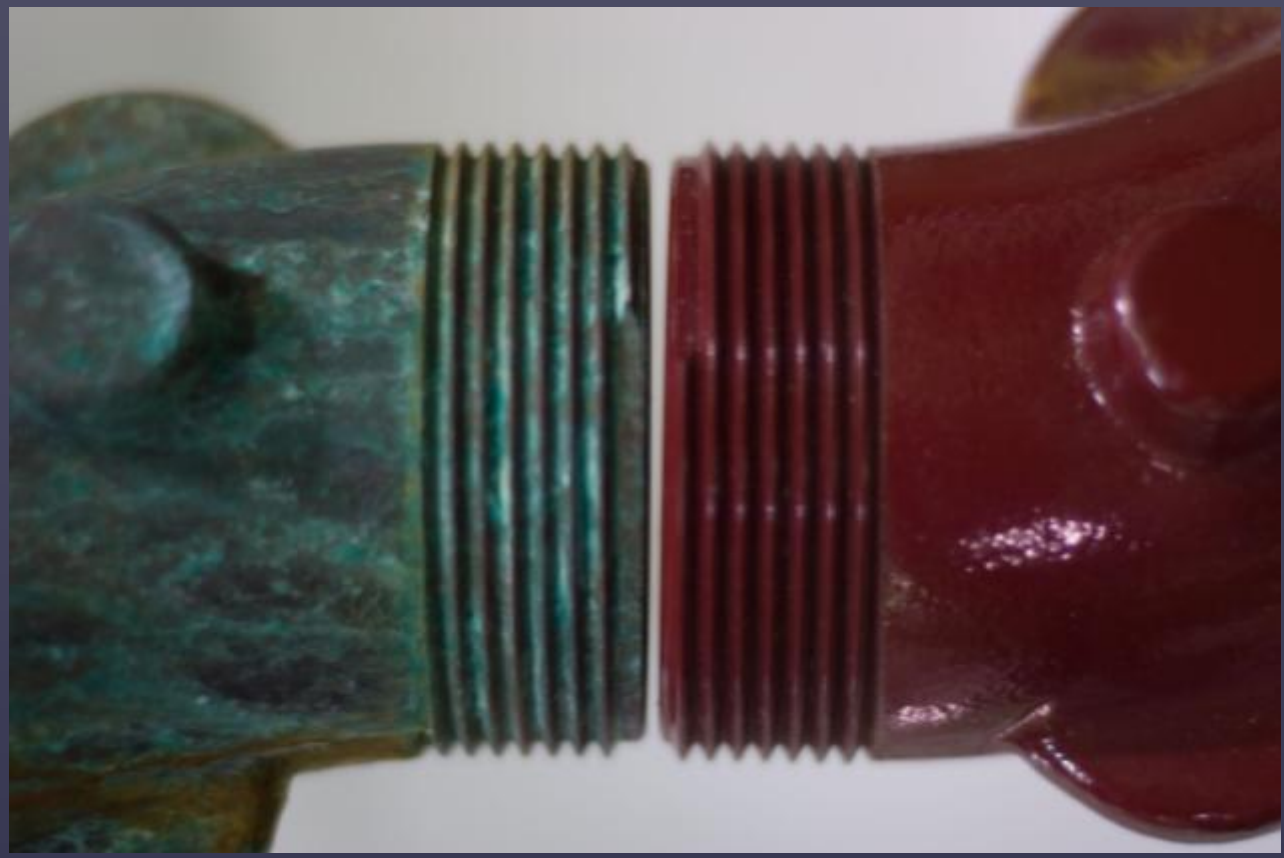
Aluminum with anodizing & powdercoat
2000 hours

Compare Brass with Aluminum:

Brass corrodes MORE than Aluminum.

Aluminum with anodizing and powdercoat is the winner.

2000 hours



Brass corrosion builds up on threads and between moving parts.

So the brass monitor does not operate easily, or not at all.

The anodized & powdercoat aluminum keeps working.

Sample # 2
Brass
Powdercoat
New

So why not make a powder coated BRASS monitor?

Corrosion on brass lifts up the powder coating. The powdercoat does not stick to the bare brass metal. But powdercoat interlocks and fuses extremely well to the aluminum hardcoat crystal structure.

Powdercoat has excellent resistance to sunlight, heat, and weather.
Powdercoat has excellent resistance to strong acids and alkali.

No problem with hydrogen sulfide when located next to sulfur recovery units. This unit was exposed continually for 12 days supplying a water curtain to suppress an Hf acid vapor cloud at a refinery in the U.S. This BlitzFire was sitting in 3-4 inches of water with a pH of 12 for 90 hours and never once failed. The blue powdercoat is clean.

So what have we discussed?

- Brass
- Aluminum
- Machinery
- Hardcoat Anodizing
- Lubrication
- Powdercoat

We all know and have used brass products for years. Since brass came way before
Aluminum, specifications were only written for brass.

As we have moved into the 20th & 21st centuries new technologies, materials, coatings and processes have made the necessary requirements for brass – unnecessary.

In fact, bare brass takes a back seat to hardcoat anodized and powder coated aluminum ,
as we have shown in this presentation.

New Technology

- Are you willing to participate in new technology, save money for your company, enjoy longer lasting monitors, schedule less maintenance?

- Don’t be considered old. Modern Professionals specify Modern Products.

- Show your company you strive to bring the best products into your facility.

Ask your TFT Sales Professional for a sample trial test.