

A rectangular area with a teal background featuring wavy, water-like patterns. The text is overlaid on this background.

Corrosion Protection for Fire Hydrants & Water Meters

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Development Manager – Lamons Manufacturing

A rectangular area with a solid dark teal background. The text is centered in this area.

Part 1 – Fire Hydrants

We can't guarantee fire hydrants & water meters won't corrode, but we can do something to prevent or prolong the occurrence of corrosion on them!



The corrosion of wet barrel fire hydrants

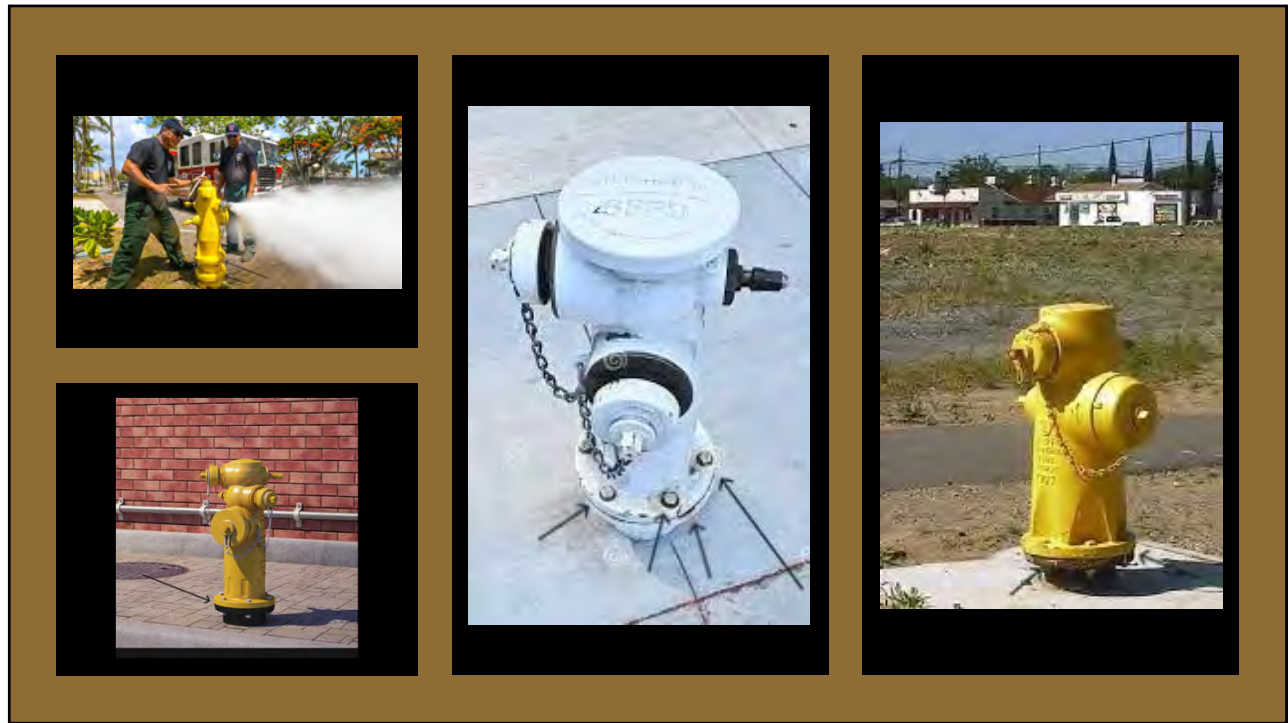


This typically occurs at the flange connection to the bury and in most cases there exists multiple metals at the connection from Bronze, to Ductile Iron, Cast, Iron, Stainless Steel, and others, which can increase the rate of the corrosion process. Not to mention that hydrants are exposed to the elements of the outdoors.

Fire Hydrant Corrosion









Galvanic Corrosion

Galvanic corrosion (dissimilar-metal corrosion) is an electrochemical process in which one metal corrodes preferentially, when in electrical contact with a different type of metal, and both metals are immersed in an electrolyte such as water. This can be increased when there are three or more metals.

Galvanic Series of Dissimilar Metals

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Protected End (cathodic or increasingly inert)

- Platinum
- Gold
- Graphite
- Titanium
- Silver
- Stainless Steel
- Bronzes (Cu-Sn alloys)
- Copper
- Brasses (Cu-Zn alloys)
- Tin
- Lead
- Iron and steel
- Aluminum 2024-T4
- Cadmium
- Aluminum 1100
- Zinc
- Magnesium and Magnesium alloys

+ Corroded End (anodic, or increasingly active)

JEFFREY SIMPSON

Electrolyte

(-) **Anode** Less Noble Metal

(+) **Cathode** More Noble Metal

Galvanic/Bimetallic Corrosion of dissimilar metals. © Poma Architectural Metals

Hydrant connections have multiple metals. Hydrants can be bronze, Cast Iron, Ductile Iron, and more

A typical Hydrant bury is Ductile Iron

The fasteners are everything from stainless steel to standard zinc and everything inbetween.

There is an easy solution to prolong this corrosion process or even prevent it.

Use a typical Flange Isolation Gasket Kit!!

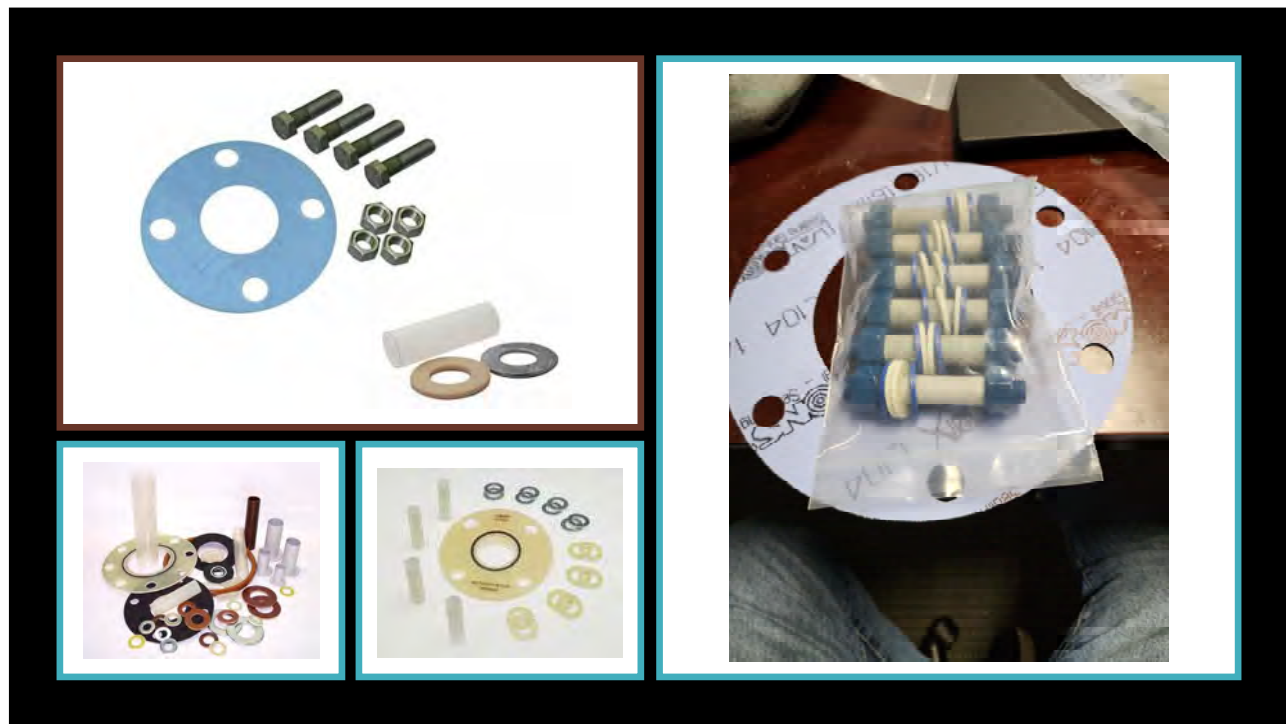
A kit consist of a gasket, bolt sleeves, and dielectric washers.

There are many combinations of these kits from economical to high end G10 materials. But what does it cost to repace a hydrant or the bury?

Many gaskets can be used for an isolating kit from, EPDM, Fiber, phenolic, red rubber, to GRE or G10 glass polymer.

Sleeves can be Mylar, Phenolic, PVC , Poly, and G10

Dielectric washers can be Phenolic or G10, in some cases they are a coated steel washer

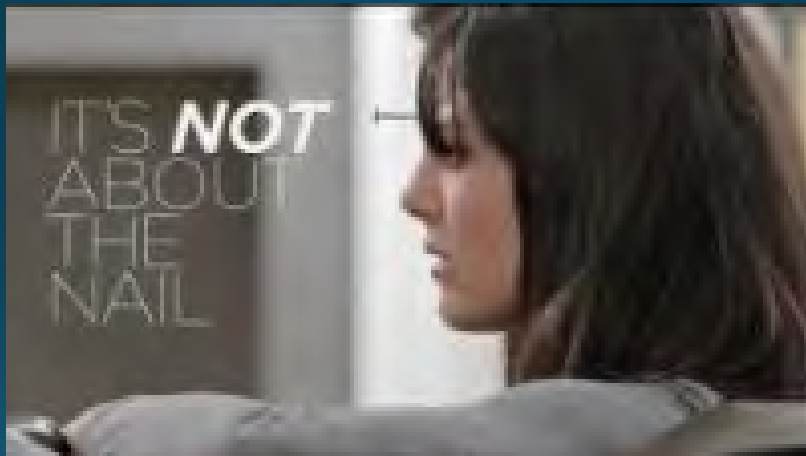


- The bottom line is, it is time to start protecting our nations water industry. There are many things being done to do this nationally. We can make a difference with something as simple using a product that has been around for many, many years and we use on other flanges in a water system. This is a flange isolation kit on a fire hydrant.

Part 2 – Water Meter Corrosion Protection

Its Not About The Meter!!!

Maybe we need to listen to the experts and not just assume!!!

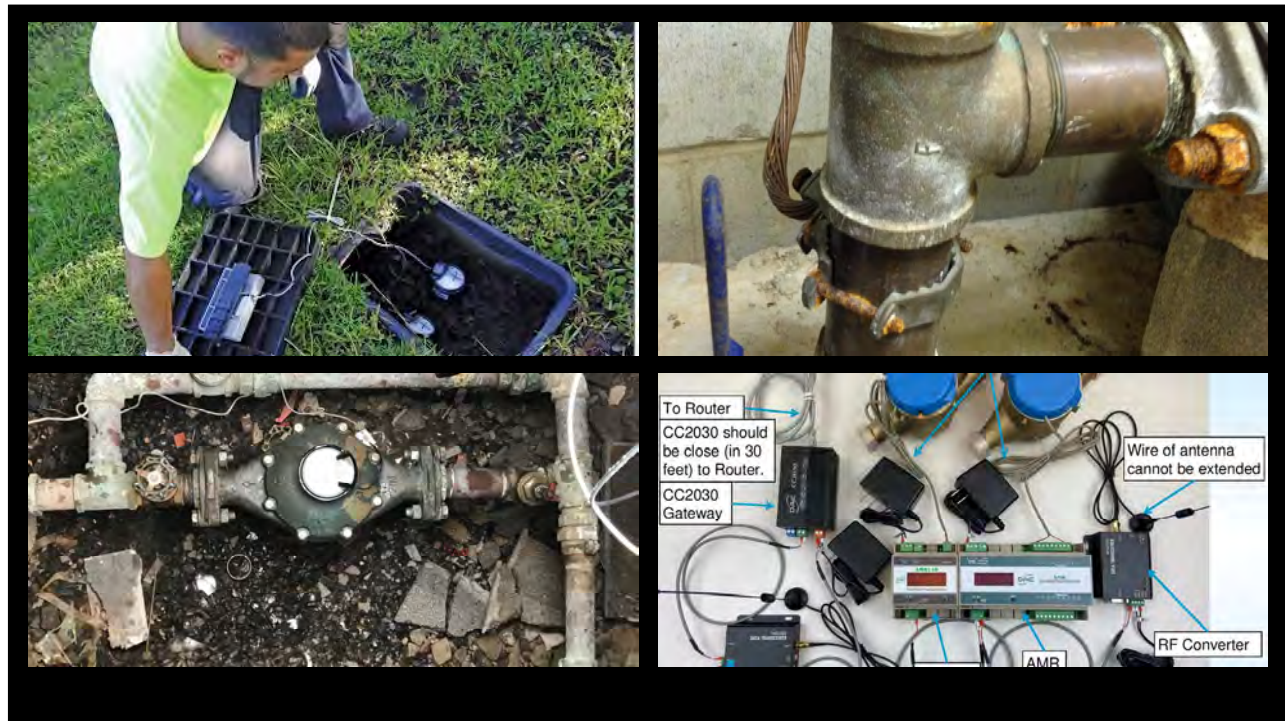


The experts will tell you that you will have major corrosion on a commercial and residential water meter, but it doesn't just corrode. The latest technology is affected too. Radio read or automatic reading meters are affected by an aspect of corrosion.



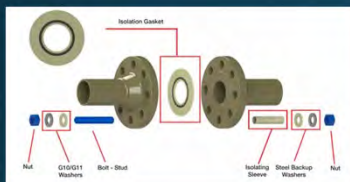
Electronic reading meters

- It is common practice to ground a buildings electrical system to the water pipelines that feed the very same structure.
- This is where the water meters need cathodic protection. Not only will it protect against corrosion it will protect the electronic reading meters from interference of an electrical current. The currents that the ground can produce can increase the rate of corrosion on the water meter metals. It also can disrupt the readings of the electronic meter as well as burn out batteries causing many issues for a utility and building owner. Most meters have a bypass to allow the meter to be replaced or removed for repair. This keeps the ground from being disrupted. So, the meter should be isolated from that ground. This can be done by simply using an isolating gasket kits (for flanged meters) or a Monolithic Isolating Joint (for threaded meters)

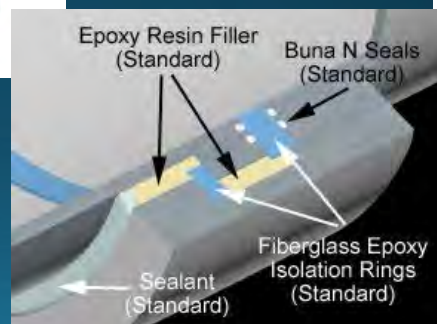


Solutions

Gasket Isolating Kits



Monolithic isolating joint



MODUMETAL

NanoGalv® | Water

Now offering best-in-class lead times after Houston production expansion completed in 2022

Extensive Specifications & Compliance

EgonMobil
DEP 30-48.00.32 GP 56 Q2 13

BLACK4 VALVE
M200

ConocoPhillips
PIM-S14-5300 CRS 47-100
B110 CCR-BP-001-10015

Key Benefits

- Up to 10x corrosion performance:** NanoGalv® at just 8µm significantly outperforms other systems that are coated at 14µm+
- Field-proven:** NanoGalv® fasteners have been deployed onshore and offshore worldwide with unmatched performance
- Improved asset integrity & safety:** NanoGalv® reduces failure risk, downtime, & dangerous manhours required by interventions
- Cost competitive:** even with far superior performance, NanoGalv® is a cost-effective solution across many applications
- Sustainability:** lower carbon footprint process that displaces harmful products such as cadmium, PFAS, & hex chromates

ASTM B117 Hours to 10% Red Rust

Coating	Thickness (µm)	Hours to 10% Red Rust
Cadmium	6	~1,000
ZnP + Xylan	32	~1,000
Hot Dip Galv	22	~1,000
NanoGalv	8	>4,000

Cyclic Testing: Cycles to 10% Red Rust

Coating	Thickness (µm)	Cycles to 10% Red Rust
Cadmium	6	~25
ZnP + Xylan	32	~25
Hot Dip Galv	22	~25
NanoGalv	8	>125

NanoGalv Performance Under Salt Spray Test (ASTM B117)

Coating	Thickness (µm)	Hours to Failure
Cadmium	6	Failed: 648
ZnP + Xylan	32	Failed: 912
Hot Dip Galv	22	Failed: 648
NanoGalv	8	>4,000 hours

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Fastener Red Rust Progression in Field Trial

Months in Service: 0, 7, 12, 18, 24, 30

4.5 years Offshore on Oil Platform

Cd/PiFE NanoGalv®

NanoGalv®, even at a 3.5 µm coating thickness, outperforms traditional ZnNi coatings at thicknesses of 12-14 µm

Hours to 10% Red Rust vs. Coating Thickness

Homogeneous ZnNi at 12-14 µm ~ 2k hours

Superior performance at lower coating thicknesses eliminates the need for overtopping of critical parts & enables coating of non-fastener parts with complicated geometries

NanoGalv® withstands all hydrogen embrittlement tests, as tested under ASTM F519-13

NanoGalv® provides significant sustainability benefits:

- Far less toxic:** eliminates the need for toxic cadmium & hex chrome systems
- Lower carbon footprint:** NanoGalv® plating is much less energy-intensive than other plating processes
- Increased asset life:** reduced industrial waste and strain on supply chains

NanoGalv® can be used to coat parts across Oil & Gas and beyond

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Thank You AMPP

