Protecting Valves from Corrosion

WATTS®

Epoxy-coated cast and ductile iron valves are renowned for their robustness. However, when epoxy coating is breached, iron exposed to water corrodes and in some cases the water chemistry is just right for bacteria that can accelerate corrosion, known as microbial-induced corrosion (MIC).

MIC is a damaging process where microorganisms, like bacteria and fungi, thrive in an environment and produce corrosive byproducts that can harm your valves. These microorganisms create biofilms on your valve's surfaces, trapping corrosive substances and promoting localized corrosion. Over time, this weakens your valve, leading to leaks, poor performance, and potential failure. MIC poses a significant threat to valves and can compromise their reliability and functionality.

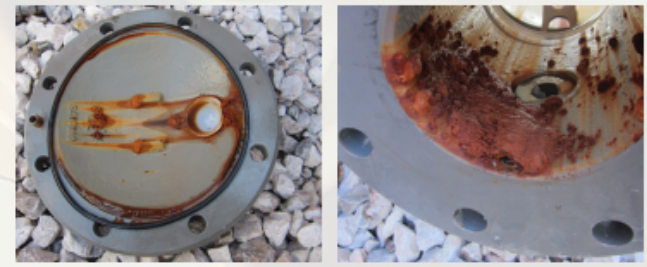
ArmorTek is a micro-composite coating with superior adhesion and abrasion resistance qualities which resists undercutting and aggressive water. Additionally, the ArmorTek coating features an antimicrobial agent to protect the valve against the adverse impacts of MIC.

A lab study in 2018 compared the corrosion results of cast and ductile iron valves coated with and without ArmorTek. The research involved subjecting coated parts to 10,032 hours of salt spray exposure to simulate corrosive conditions. The performance of each coating was assessed based on rust formation on the face and edges, the development of blisters, and the measurement of creep from scribe.

Evaluation Method / Part ID	ASTM D7091 DFT	ASTM 610 Degree of Rusting	ASTM D714 Degree of Blistering	*ASTM D1654 Degree of Corrosion (Method 1 – Scraping)
A	4.43 – 8.50 Avg. 6.70	General rust Grade 2-G 16-33% part face General rust Grade 1-G 33-50% part edge	Few field blisters size #6, 4 (1/32", 1/16")	***Part Pulled @ 10032h*** Rate: 1 13.62mm creep from scribe
B	4.70 – 10.1 Avg. 6.70	General rust Grade 4-G 3-5% part face General rust Grade 1-G 33-50% part edge	Few blisters size #2 (1/8")	***Part Pulled @ 10032*** Rate: 8 0.94mm creep from scribe

In a 2018 field study, a municipality was experiencing accelerated corrosion and failure of a valve that experienced low, infrequent flow. The local water supply was tested, and it was discovered to have low chlorine levels and significant MIC activity.

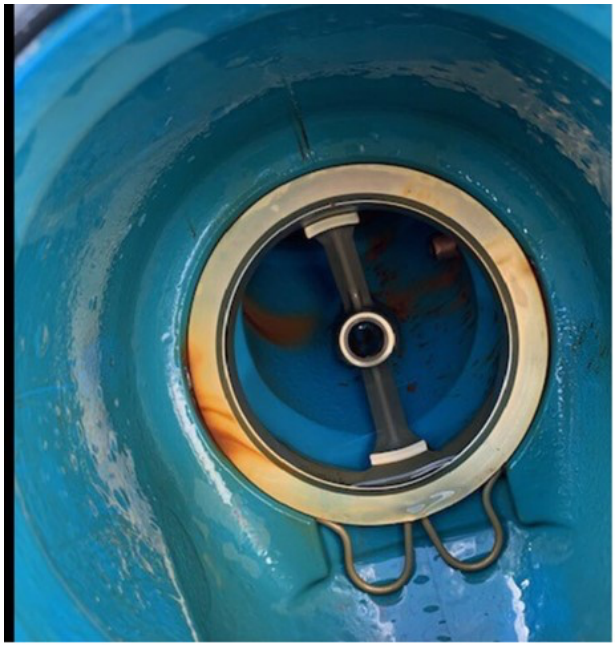
After only 14 months, a valve with standard epoxy coating was filled with corrosion indicative of MIC activity. The valve was swapped with one using ArmorTek technology, and after 16 months corrosion was extremely limited.



In these images taken 14 months after installation you can see many of the tubercles common to MIC and extensive corrosion.

These images taken after 16 months in the same application as above shows little to no corrosion. Any corrosion resulting from a breach in coating has not spread.

The results of a field study completed in 2022, show a comparison between the effects of corrosion after five years with a standard coating (left) versus the ArmorTek coating (right) on a backflow preventer.



The findings of these studies underscore the critical importance of advanced coating technologies in mitigating corrosion-related failures and enhancing the durability of industrial components.

Learn more about how reliable corrosion protection will protect your valve and extend its lifespan at www.watts.com/ArmorTek.

USA: T: (978) 689-6066 • F: (978) 975-8350 • Watts.com
Canada: T: (905) 332-4090 • F: (905) 332-7068 • Watts.ca
Latin America: T: (52) 81-1001-8600 • Watts.com