Metallic Zinc Coated Pipe
Active Corrosion Protection for Ductile Iron Pipe

Zinc metallizing with a high purity zinc wire has been utilized for external corrosion control of iron pipe for over 50 years. Initially used in Europe, zinc coating is now becoming more widely used in the United States with many municipalities and water works boards standardizing on ductile iron with metallic zinc coating.

Metallic zinc coating on ductile iron pipe is applied using an arc spray process in which metallic zinc is heated to a molten state and projected in small droplets by spray guns onto the pipe surface. In the arc spray system, two high purity zinc wires are brought together under a high electrical potential which results in the wires being melted at the point of contact. The molten zinc droplets are then propelled to the surface by clean compressed atomizing air.

Numerous studies and publications from around the world over the last 50 years have demonstrated that both arc sprayed metallic zinc with topcoat and enhanced polyethylene encasement are economical and effective methods of external corrosion control for iron pipe. In environments where neither zinc nor enhanced polyethylene encasement are recommended individually, additional studies in Europe and the USA have shown that combining arc spray metallic zinc coating with polyethylene encasement produces a synergistic corrosion protection system.

FEATURES & BENEFITS

- Furnished by U.S. Pipe for over 25 years
- Uniform cathodic protection of the iron pipe surface.
- Thicknesses compatible with critical joint tolerances.
- No special considerations with respect to field cuts, tapping saddles, or corporation stops.
- No special handling or installation procedures required.
- Ability to “self-heal” in many environments.
- For extremely corrosive environments, it is recommended to be utilized in conjunction with V-BIO™ polyethylene encasement.
HISTORY & STUDIES

In Europe, the primary method of corrosion control for iron pipe since 1958 has been an external coating of arc spray metallic zinc plus topcoat. Paris reported the following concerning the development and use of metallic zinc on iron pipe in Europe at the First International Conference on the Internal and External Protection of Pipes (Paris 1975):

- Zinc coating on iron pipe first evaluated in 1938.
- Zinc coatings on iron pipe started to be commercially available in 1958-59.
- Between 1959 and 1975, over 13 million iron pipes had been protected with this method of protection.
- In 1975, over 3,000 iron pipe per day were being coated with metallic zinc.

Metallic zinc coating with topcoat on iron pipe has been also been used extensively for external corrosion protection of ductile iron pipe by China, India, the Middle East, Latin America, Africa, Korea, Japan, and others. In 1985, the first international standard on metallic zinc coating was issued as ISO 8179-1, Ductile Iron Pipes-External Zinc-based Coating-Part 1: Metallic Zinc with Finishing Layer (ISO 2004).

Additional studies in Europe have confirmed that combining metallic zinc coating with polyethylene encasement produces a synergistic corrosion protection system. The zinc will protect the pipe at unrepaired damage to the encasement, and the encasement will extend the life of the zinc, enhance the development of zinc corrosion products as the zinc sacrifices itself, create a homogeneous environment around the pipe with some biocidal characteristics, and allow the zinc to be utilized in some severe environments where it is otherwise not recommended.

STANDARDS

- ASTM A746-03 Standard specification for Ductile Iron Gravity Sewer Pipe.