

AWWA Coating Standards for Water Pipe



Coal Tar Enamel

Strengths: Extensive and proven history for excellent corrosion protection.

Weaknesses: Applications requires suitable equipment to control fumes and volatiles.

Thickness: 125 mils

What You Need to Know: Only coating in service for over 100 years with wide use today. Major users include LADWP, MWD and California DWR.

Cost: \$\$



Hand Applied Tape for Fittings and Joints

Strengths: Long history in the water market. Easy application on all sizes and shapes of pipe and pipe appurtenances.

Weaknesses: Polyethylene outer layer is made softer (lower density) for hand application and requires additional care during installation.

Thickness: 50-100 mils

What You Need to Know: Tape systems are easy to apply. They use multiple layers of tapes to form a corrosion barrier followed by a mechanical protection layer to prevent a corrosion cell from forming on the surface of steel.

Cost: \$\$



Fusion Bonded Epoxy

Strengths: Dominant presence in Oil & Gas market. Inexpensive coating on straight runs of pipe.

Weaknesses: Limited application to large diameter water pipe. High water permeability.

Thickness: 12-16 mils

What You Need to Know: The quality of application and preparation is the key to a successful product.

Cost: \$\$



Extruded Polyolefin

Strengths: Flexible coating utilizing a shop extruded butyl adhesive and polyethylene outer layer.

Weaknesses: Coating tends to shrink back from pipe ends. Limited number of applicators.

Thickness: 45-80 mils

What You Need to Know: Pellets are melted at the applicator for extrusion, once applied the system will shrink back due to the cooling and contraction of the polyolefin in the system.

Cost: \$\$\$\$



Polyurethane

Strengths: Versatile thermoset plastic coating that can be used on both interior and exterior pipe and fittings.

Weaknesses: Polyurethanes will not perform well in soils with high levels of hydrocarbons.

Thickness: 20-60 mils

What You Need to Know: Extensive use on large diameter pipe due to excellent corrosion resistance, abrasion resistance, toughness, and chemical resistance.

Cost: \$\$\$




Cement Mortar Lining and Coating

Strengths: Inexpensive lining system for pipe and fittings, with a long history of use in the water industry.

Weakness: Can be prone to cracking if not handled properly or kept moist.

Thickness: 1/4"-3/4"

What You Need to Know: Dominant lining system for water pipelines. Unlike a bonded coating, CML passivates the iron or steel surface to prevent a corrosion cell from forming.

Cost: \$



Liquid Epoxy

Strengths: Epoxies can be formulated for use for many different service conditions. Formulation flexibility allows for use as both a lining and coating.

Weakness: Highly variable cost depending on coating formulation selection.

Thickness: 16-40 mils

What You Need to Know: Advancements in epoxy chemistry have evolved these coatings tremendously over the past 20 years. Most are 100% solids and can cover a wide range of applications in the water industry.

Cost: \$\$\$



Machine Applied Tape

Strengths: High throughput systems allow coaters to wrap pipe at high production rates.

Weaknesses: Polyethylene outer layer (high density) has limited UV resistance which limits outdoor storage to 12-18 months, but tougher coating during installation.

Thickness: 50-100 mils

What You Need to Know: Tape systems are easy to apply and use a system of tape layers to form a corrosion barrier and mechanical protection layer to prevent a corrosion cell from forming on the surface of steel.

Cost: \$\$



Exterior Coating for Above Ground Pipe & Fittings

Strengths: UV stable, applied as a multi coat paint system utilizing various zinc coatings, epoxies, and a urethane topcoats.

Weaknesses: Thin film systems cannot be submerged and have limited chemical and mechanical durability.

Thickness: 5-15 mils

What You Need to Know: Many of these "paint systems" use a sacrificial coating principal for corrosion protection where the zinc gives up electrons sacrificially rather than the steel substrate. Similar to cathodic protection.

Cost: \$\$



Fused Polyethylene

Strengths: Applied on a conveyor system that allows precise quality control. Has a tough exterior of polyethylene. High flexibility.

Weaknesses: Because of high adhesion values, removal can be difficult without proper training.

Thickness: 50 mils

What You Need to Know: Heat fusion results in very high adhesion and mechanical toughness. Long and successful history in the Oil & Gas market.

Cost: \$\$

