



FUSION BONDED EPOXY (FBE) COATING

FOR UTILITY FITTINGS

FEATURES AND BENEFITS

Star Pipe Products fusion bonded epoxy (FBE) is a high-performance coating that exhibits excellent adhesion and provides a tough smooth finish that is resistant to abrasion and corrosion. FBE provides a thinner/lighter coating as compared to cement mortar lining, thus reducing fitting weight during handling and installation. The smooth hard coating surface reduces friction as compared to cement mortar lining resulting in more efficient flow. Star Pipe FBE coated fittings are NSF 61 and NSF 372 approved for potable water service.

APPLICABLE SPECIFICATIONS AND STANDARDS

- ANSI/AWWA C153/A21.53 American Water Works Association Standard for Ductile-Iron Compact Fittings
- ANSI/AWWA C110/A21.10 American Water Works Association Standard for Ductile-Iron and Gray-Iron Fittings
- ANSI/AWWA C116/A21.16 American Water Works Association Standard for Protective Fusion-Bonded Coatings for the Interior and Exterior Surfaces of Ductile-Iron and Gray-Iron Fittings
- ANSI/AWWA C550 American Water Works Association Standard for Protective Interior Coatings for Valves and Hydrants
- NSF/ANSI 61 Drinking Water System Components – Health Effects
- NSF/ANSI 372 Drinking Water System Components – Lead Content

PHYSICAL PROPERTIES

Color	Red Oxide
Specific Gravity	1.40 ± 0.05
Dry Film Thickness	6 to 10 mils

FILM PROPERTIES

TEST	METHOD	CONDITIONS	RESULT
Pencil Hardness	ASTM D3363		Pass 4H
Gloss 60°	ASTM D523		70-85
Direct Impact	ASTM D2794		40inch-lbs min.
Mandrel Bend	ASTM D522	0.125 @ 3mils	Pass
Adhesion	ASTM D3359 Method A	X-cut and Tape	5A
Adhesion	ASTM D3359 Method B	Crosshatch and Tape	5B
Abrasion Resistance	ASTM D4060	CS-17 Wheels, 1000 Cycles, 1kg Load	32 mg loss
Salt Spray	ASTM B117	1000 Hours	No blisters or face rust, no scoreline creepage
Water Resistance	AWWA C550	90 days immersion @ 70°C (158°F)	Pass
Weather Resistance	ASTM G154	UVA-340 cycle 4 hrs @ 60°C, 4 hrs condensation @ 50°C	Chalks after 200 hrs exposure

CHEMICAL RESISTANCE

Recommended for Immersion Environments with the following Chemicals	
Aliphatic Hydrocarbons	Kerosene
Calcium Carbonate (saturated solution)	Magnesium Sulfate (saturated solution)
Calcium Chloride (10% solution)	Motor Oil
Calcium Hydroxide (10% solution)	Potassium Acetate (saturated solution)
Calcium Sulfate (saturated solution)	Salt Water
Diesel Fuel	Sewage Water
Distilled Water	Soap Solutions
Fresh Water	Sodium Chloride (5% solution)
Fuel Oil	Sodium Hydroxide (5% solution)
Gasoline (unleaded)	Sodium Nitrate (10% solution)
Hexane	Trisodium Phosphate (5% solution)

Recommended for Splash and Spillage Environments against the following Chemicals
Aromatic Hydrocarbons
Butanol
Ethanol
Hydrochloric Acid (5% solution)
Isopropyl Alcohol
Methanol
Sulfuric Acid (5% solution)
Toluene
Xylene

These recommendations are intended as a guide only, and unless noted, temperatures are ambient. For compatibility with fluids not shown here, consult Star Pipe Products.

STAR® PIPE PRODUCTS