



## 20U • AWWA - Protective Fusion Bonded Epoxy

# SUBMITTAL

(Current Revisions for All Standards Apply)

Tyler Union Protective Fusion Bonded Epoxy Waterworks fittings are coated on the internal and external surfaces in accordance with all the applicable terms and conditions of the ANSI/AWWA C116/A21.16-09 standard. Section 4.3.2 of AWWA C116 provides that FBE mil thickness in the joint area shall not have a coating of less than 4 mil, and advises it may be necessary to establish a limit for the maximum applied thickness in the joint areas to maintain a leakproof joint. Tyler Union’s standard applied coating is \*6 to 8 mil.

Tyler Union can provide fittings with a 10-12 mil coating, but does not provide warranty for FBE lined fittings with greater than 8 mil thickness in the joint area. It has been determined that fittings with epoxy coating thickness greater than 8 mil in the joint area can prevent proper joint assembly (pipe will not insert properly and gasket will not seat fully).

The ANSI/AWWA C116/A21.16-09 standard describes the use of protective fusion-bonded epoxy coatings as being utilized for the interior and exterior surfaces of ductile-iron and gray-iron fittings supplied for “water systems”. Section 1.1 of the AWWA C116 standard specifically provides that the standard does not cover instances where coatings are agreed upon by purchaser and manufacturer for sewer or other special applications.

Though not always recommended for use in \*\*Sewer systems; Tyler Union Protective Fusion Bonded Epoxy fittings may be used in sewer applications within the parameters as provided. Tyler Union FBE has been tested to UL262 which involves immersing coated parts in four aqueous solutions at 158°F and evaluate the FBE coated parts for blistering during 90 day exposure. The four solutions are distilled water, 2% sodium chloride in distilled water, distilled water with a pH adjusted to 4.0 using potassium Hydrogen phthalate, and distilled water with pH adjusted to 10.0 using Sodium carbonate. During testing Tyler Union’s FBE was tested for blister resistance on immersion in acid, alkali, alcohol, and hydrocarbons at room temperature over 90 days. Additional test data and recommended exposures for our FBE is as provided in Chart 1, Chart 2, and Chart 3.

**Chart 1:**

TEST	METHOD	CONDITIONS	RESULT
Abrasion Resistance	ASTM D4060	CS-17 wheels, 1000 cycles, 1 kg load	32 mg loss
Adhesion	ASTM D3359 - Method A	X-cut and tape	5A
Adhesion	ASTM D3359 - Method B	Crosshatch and tape	5B
Gloss, 60°	ASTM D523		70-85
Humidity Resistance	ASTM D2247	1000 hours at 100°F	No blisters or rusting
Impact	ASTM D2794		Pass 40 inch-lbs. direct
Pencil hardness	ASTM D3363		Pass 4H
Salt Spray	ASTM B117	1000 hours	No blisters or face rust, no scoreline creepage
Water Resistance	AWWA C550	90 days immersion at 70°C	Pass
Weather Resistance	ASTM G154	UVA-340, cycle 4 hrs UV at 60°C, 4 hrs condensation at 50°C	Chalks after 200 hours exposure

11910 CR 492 • Tyler, Texas 75706 • (800) 527-8478  
 1501 W 17<sup>th</sup> St. • Anniston, Alabama 36201 • (800) 226-7601  
 1001 El Camino Ave. • Corona, California 92879 • (866) 527-8471  
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**Chart 2:**

Immersion Environments with the following chemicals (ambient temperature)	
Aliphatic Hydrocarbons	Fresh water
Calcium Chloride (10% solution)	Fuel Oil
Calcium Hydroxide (10% solution)	Hexane
Calcium Sulfate (saturated solution)	Kerosine
Calcium Carbonate (saturated solution)	Motor oil
Distilled water	Magnesium Sulfate (saturated solution)
Gasoline (unleaded)	Potassium Acetate (saturated solution)
Diesel Fuel	Soap solutions
Sodium Chloride (5% solution)	Sodium Nitrate (10% solution)
Sodium Hydroxide (5% solution)	Trisodium Phosphate (5% solution)

**Chart 3:**

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	

**\*NOTE:** Due to AWWA prescribed application methods of protective fusion bonded epoxy in conjunction with the varying diameters, recesses, raised lettering, bosses, bolt holes, and radiuses common to water works fittings. The applied thickness of the FBE coating or lining may vary 1 to 2 mils over the surfaces of a fitting.

**\*\*NOTE:** The suitability of this product for your application shall be determined by the end user.

Additional epoxy coatings are available upon special order. Please contact a Tyler Union Waterworks Customer Service representative to discuss the additional coating and lining options that are available.

This document is void if modified in any manner

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