

COATINGS AND LININGS

SCOPE

This section attempts to provide a concise review of the most commonly used types of coatings and linings specified for fabricated ductile iron pipe. Through this review we will identify some of the common misconceptions and make recommendations to assist industry professionals with the collective experience of our members who deal with these subjects on a daily basis.

Coatings, discussed first, are differentiated by their basic types, as qualified by our industry's applications, and by their specific use.

Linings are addressed by definition.

Due to the myriad number of coatings and linings available now, and those being developed for introduction, this review must not be considered to be complete.

EXTERIOR COATINGS

Tar Coating

This is a black coating and commonly applied to the exterior of underground ductile iron pipe (see mfgs. pipe stds. A2151 Section 51.8.1). It is properly designated as asphaltic coating.

Bituminous coating refers to similar coatings made from tar pitch. "Bitumastic" a registered manufacturers trademark, has been generally used within the industry to refer to bituminous coatings. Therefore the term "Bitumastic" without further definition is relatively meaningless.

Both asphaltic and bituminous coatings contain oils which may bleed through successively applied coatings. Accordingly, these materials should be removed (re. surface preparation) or sealed with a synthetic resin prior to the application of a finish coating.

Red Primer

Bare exterior pipe surfaces should be painted with a shop applied rust inhibitive primer prior to shipment. Primer should be compatible with the designated final coating. (Re. Surface Preparation).

Coal Tar Epoxy

The most common coal tar coating is coal tar epoxy. Coal tar epoxy is used primarily to protect metal surfaces from rust and corrosion in submerged exposures. Coal tar epoxy should not be confused with the asphaltic tar normally applied by ductile iron pipe manufacturers.

Although coal tar epoxy is self-priming it requires an appropriate surface preparation for adequate adhesion. (See page 5-03 Surface Preparation).

Special Coatings

Due to the complexities of service requirements many specialized coatings are available. These coatings are not covered by ANSI/AWWA Standards.

For further information check with paint manufacturer or your NAPF member.

INTERIOR LININGS

Cement Lining

Cement lining was first used in cast iron pipe in 1922 with the first standard being adopted in 1939. The primary purpose of cement lining is to provide a smooth flow surface.

An additional benefit is also the protection afforded to the interior pipe surface when subjected to corrosive liquids. See ANSI/AWWA C104 for further details.

Special Linings (Cold Applied)

With the omission of standard cement lining many other alternate lining systems are available and these include but are not limited to epoxy and coal tar epoxy.

These linings are not addressed by ANSI/AWWA standards. For specific design considerations contact coating manufacturer or your NAPF member.

Special Linings (Heat Applied)

Glass Lining

When design considerations require lubricity for sludge and scum lines, glass (ceramic) type linings have been widely accepted. This product offers excellent flow characteristics as well as superior corrosive protection from domestic sewage.

The glass is applied to specially prepared interior surfaces of ductile iron pipe and fittings by the use of extreme high temperature which creates a mechanical bond between the glass and the metal. This process assures maximum adhesion of glass to metal surfaces.

Due to the nature of the product, extreme care must be exercised when cutting and machining of pipe for fabrication. Since no AWWA standard exists for this product, consult your nearest NAPF member for particulars and availability.

Polyethylene

In this process, a blend of polyethylene powders (ASTM D-1248) and fillers are applied to a pre-heated ductile iron pipe or fittings. Residual heat then melts the powder and fuses it to the interior surface forming a smooth flexible film.

This product has been used to provide corrosion resistance against aggressive chemical wastes.

Since there is no AWWA standard for the application or performance of this product it is generally applied in 40 mils nominal thickness but varies widely depending on the applicators capabilities. Due to the process required to apply this product it has limited availability in sizes smaller than 12" diameter.

Consult your NAPF member for particulars and availability in your region of the country.

SURFACE PREPARATION

All surfaces must be clean and dry before coating or lining application. Industry experience confirms that the fundamental factor for a quality application of coating or linings is **proper surface preparation!**

According to the Steel Structures Painting Council steel should be sand blasted to a near white surface (SSPC-SP-10)*. This creates two conditions 1.) Removes all foreign matter from pipe surface, 2.) It "etches" the normally smooth surface of steel to provide profile for coating adherence. SSPC SP-10 near white metal blast is not an applicable standard for surface preparation on ductile iron pipe and fittings.

The process of manufacturing **ductile iron pipe and fittings** yields a rough surface profile, therefore removal of foreign matter is the only consideration required. SSPC SP-2 hand tool cleaning, SSPC SP-3 power tool cleaning, and SSPC SP-7 brush off blast are all commonly accepted methods of surface preparation for ductile iron pipe and fittings. Surface preparation required depends on the coating system selected and service exposure involved.

Surface preparation and subsequent coating applications should strictly follow manufacturers specific recommendations for ductile iron pipe and fittings to provide the highest quality coating or lining possible. Consult your NAPF member concerning specific applications and other considerations.

*Steel Structures Painting Council. "Guide to Visual Standard No. 1."

UNDERGROUND PROTECTION

The most common form of protection of underground pipe and fittings is through the use of polyethylene film.

It is available in flat sheet and tube form and is used to protect ductile iron pipe and fittings installed underground in hostile soils.

This product has been in use for many years and is considered excellent protection.