

SELECTION & SPECIFICATION DATA

Generic Type	Amine-adduct cured reinforced epoxy
Description	<p>This product is a solvent free, low temperature cure, high performance epoxy lining designed to handle common cargoes in the oil and gas industry including crude oil, gasoline, jet fuels, and diesel. It is resistant to NGL condensates, produced water, brines, industrial process water, waste water, and sewage. Ideal for Municipal wastewater and water treatment facilities.</p> <p>It can handle deionized water up to 180°F (82°C) and is applied at film thicknesses of 20-80 mils (500-1500 microns) in a non-blushing, single coat application. Tank Shield Plus has good elongation and proprietary reinforcement which enables it to bridge perforations which may occur from bottom side corrosion. Tank Shield Plus remains water tight over a hole in 2 atmospheres of head pressure.</p>
Features	<ul style="list-style-type: none"> • Excellent petrochemical resistance (fuels and crude) • High impact resistance • Superior adhesion to steel • Excellent hot water resistance • Excellent abrasion resistance • Can be applied as low as 35°F (2°C) • Tolerates low temperature excursions to 20°F (-7°C) during cure • Can be applied as a one-coat 20-80 mil system • Recommended as a petroleum tank bottom lining per API recommended practice 652. • Tank Shield Plus is a thick film reinforced lining proven to provide integrity at greater than 50 mils • Non-blushing, single or multi-coat system • Recommended as a petroleum tank bottom lining per API recommended practice 653.
Color	Blue (N100)
Finish	Gloss
Primer	Coating is normally applied direct to metal. May be applied over other primers as recommended by Carboline.
Dry Film Thickness	<p>20 - 80 mils (508 - 2032 microns) per coat</p> <p>Depends on service and existing condition of the substrate, product is typically applied in a one coat application with 20-40 mils for vertical applications and 20-80 mils for tank bottom applications. Higher film thicknesses are used for more aggressive or abrasive conditions. DFT checked in accordance to SSPC PA2.</p>
Solids Content	By Volume 100% +/- 0%
Theoretical Coverage Rate	<p>1604 ft²/gal at 1.0 mils (39.4 m²/l at 25 microns)</p> <p>80 ft²/gal at 20.0 mils (2.0 m²/l at 500 microns)</p> <p>20 ft²/gal at 80.0 mils (0.5 m²/l at 2000 microns)</p> <p>Allow for loss in mixing and application.</p>
VOC Values	As Supplied : 1 g/l

SUBSTRATES & SURFACE PREPARATION

General	Surfaces must be clean and dry. Employ adequate methods to remove dirt, dust, oil and all other contaminants that could interfere with adhesion of the coating
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Phenoline[®] Tank Shield Plus

PRODUCT DATA SHEET



SUBSTRATES & SURFACE PREPARATION

Steel	Cleanliness: Abrasive blast to SSPS-SP10 (minimum) Profile: Minimum 3 mil (75 micron) dense, sharp anchor profile free of peening, as measured by ASTM D 4417. Defects exposed by blasting must be repaired.
Stainless Steel	Prepare by abrasive blasting to SSPC-SP 17 Thorough Abrasive Blast to a minimum of 3 mils (75 microns) dense angular anchor profile.
Concrete	Concrete: Clean and dry. Remove all loose, unsound concrete. Do not apply coating unless concrete has cured at least 28 days @ 70°F (21°C) and 50% RH or equivalent. Prepare surfaces in accordance with ASTM D4258 Surface Cleaning of Concrete and ASTM D4259 Abrading Concrete. Voids in concrete may require filling/surfacing.

MIXING & THINNING

Mixing	This product requires heated plural component spray equipment with multi-stage static mixers. It is recommended that two separate static mixers be used to ensure complete mixing. Small batch mixing (for touch-up) may be used provided the material is warmed to 100°F/38°C to facilitate catalyzation and cure. Component Details for Colors: Blue: The Part A is blue (N100) and the Part B is white (0907)
Thinning	NO THINNER IS RECOMMENDED CLEANUP THINNER: Thinner #2
Ratio	1:1 by volume (Part A to Part B)
Pot Life	15-20 minutes @ 75°F(38°C)

APPLICATION EQUIPMENT GUIDELINES

Listed below are general equipment guidelines for the application of this product. Job site conditions may require modifications to these guidelines to achieve the desired results.

General	This is a high solids coating and may require adjustments in spray techniques. Wet film thickness is easily and quickly achieved. The following spray equipment has been found suitable and is available from equipment manufacturers.
Plural Component Airless Spray	The preferred application method utilizes a fixed ratio (1:1 by volume) plural component spray rig with heated hoppers, heated hoses to a mixer manifold through (at least two) static mixers to a 15 to 25 ft (¼" diameter) whip hose attached to an appropriate spray gun utilizing self-cleaning reverse-a-tips from 0.017-0.035 inches. Both the "A" and "B" side should be around 100-110°F/38-43°C. This will ensure proper catalyzation and spraying of product.

CURING SCHEDULE

Surface Temp.	Dry to Handle	Dry to Touch	Immersion Service, for crude oil, unblended gasoline, and fuel oils	Immersion Service; all other exposures	Maximum Recoat
35°F (2°C)	32 Hours	16 Hours	3 Days	14 Days	28 Days
55°F (13°C)	15 Hours	8 Hours	48 Hours	10 Days	21 Days
75°F (24°C)	7 Hours	4 Hours	24 Hours	7 Days	14 Days
90°F (32°C)	4 Hours	2 Hours	24 Hours	4 Days	7 Days

Cure for Service: Cure for service times are dependent on substrate surface temperatures and material temperatures. When the film passes a 25 solvent double-rub* (ex: ethanol or MEK); the lining is suitable for immersion service. Typically this can be from 24-72 hours or longer depending on the ambient temperatures. For recoating, if the product has exceeded the maximum recoat time, de-gloss and roughen by light sanding or mechanically abrade the surface and remove dust prior to topcoating.

*No significant color pick-up and some down-glossing is acceptable

Low Temperature Exposure: This product will tolerate drops in temperature to 20°F (-7°C) during its cure and will continue to cure when the temperature rises. Follow "Cure for Service" guideline listed above to determine when lining can be placed in service.

CLEANUP & SAFETY

Cleanup | Thinner #2 is recommended for clean up.

Safety | Read and follow all caution statements on this product data sheet and on the SDS for this product. Employ normal workmanlike safety precautions.

Ventilation | When used as a tank lining or in enclosed areas, thorough air circulation must be used during and after application until the coating is cured. The ventilation system should be capable of preventing the solvent vapor concentration from reaching the lower explosion limit for the solvents used. In addition to ensuring proper ventilation, appropriate respirators must be used by all application personnel.

PACKAGING, HANDLING & STORAGE

Packaging | Available in 10-gal (37.8-lit) kit

Shelf Life | 12 months

Storage Temperature & Humidity | 40° - 110°F (4°-43°C)
0-90% Relative Humidity

Shipping Weight (Approximate) | 12 lbs/gal (5.5 kg/gal)

Phenoline[®] Tank Shield Plus

PRODUCT DATA SHEET



WARRANTY

To the best of our knowledge the technical data contained herein is true and accurate on the date of publication and is subject to change without prior notice. User must contact Carboline to verify correctness before specifying or ordering. No guarantee of accuracy is given or implied. Carboline warrants our products to be free of manufacturing defects in accord with applicable Carboline quality control procedures. THIS WARRANTY IS NOT VALID WHEN THE PRODUCT IS NOT: (1) APPLIED IN ACCORDANCE WITH CARBOLINE'S SPECIFICATIONS, AND/OR (2) PROPERLY STORED, CURED, AND USED UNDER NORMAL OPERATING CONDITIONS. Carboline assumes no responsibility for coverage, performance, injuries, or damages resulting from use of the product. If this product is found not to perform as specified upon inspection by a Carboline representative during the warranty period, Carboline's sole obligation, if any, is to replace the Carboline product(s) proven to be defective or refund the purchase price thereof, at Carboline's sole option. Carboline shall not be liable for any other losses or damages. This warranty excludes (1) labor and costs of labor for the application or removal of any product, and (2) any incidental or consequential damages, whether based on breach of express or implied warranty, negligence, strict liability or any other legal theory. NO OTHER WARRANTY OR GUARANTEE OF ANY KIND IS MADE BY CARBOLINE, EXPRESS OR IMPLIED, STATUTORY, BY OPERATION OF LAW, OR OTHERWISE, INCLUDING MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. All of the trademarks referenced above are the property of Carboline International Corporation unless otherwise indicated. The whole text of this Product Data Sheet, as well as the documents derived from it, have been written in English, and for legal purposes the English version shall prevail.