Underwater Coatings Testing for INEEL Fuel Basin Applications

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<th>Abbreviation</th>
<th>Full Form</th>
</tr>
</thead>
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<tr>
<td>CFA</td>
<td>Central Facilities Area</td>
</tr>
<tr>
<td>INEEL</td>
<td>Idaho National Engineering and Environmental Laboratory</td>
</tr>
<tr>
<td>INTEC</td>
<td>Idaho Nuclear Technology and Engineering Center</td>
</tr>
<tr>
<td>JSA</td>
<td>Job Safety Analysis</td>
</tr>
<tr>
<td>MSDS</td>
<td>Material Safety Data Sheet</td>
</tr>
<tr>
<td>MTR</td>
<td>Materials Test Reactor</td>
</tr>
<tr>
<td>NBA</td>
<td>North Boulevard Annex</td>
</tr>
<tr>
<td>PBF</td>
<td>Power Burst Facility</td>
</tr>
<tr>
<td>PPE</td>
<td>Personal Protective Equipment</td>
</tr>
<tr>
<td>TAN</td>
<td>Test Area North</td>
</tr>
</tbody>
</table>
Underwater Coatings Testing for INEEL Fuel Basin Applications

1. INTRODUCTION

The Idaho National Engineering and Environmental Laboratory (INEEL) is deactivating several fuel storage basins. Airborne contamination is a concern when the sides of the basins are exposed and allowed to dry during water removal. One way of controlling this airborne contamination is to fix the contamination in place while the pool walls are still submerged. There are many underwater coatings available on the market that are used in marine, naval and other applications. A series of tests were run to determine whether the candidate underwater fixatives are easily applied and adhere well to the substrates (pool wall materials) found in INEEL fuel pools.

The four pools considered included 1) Test Area North (TAN-607) with epoxy painted concrete walls; 2) Idaho Nuclear Technology and Engineering Center (INTEC) (CPP-603) with bare concrete walls; 3) Materials Test Reactor (MTR) Canal with stainless steel lined concrete walls; and 4) Power Burst Facility (PBF-620) with stainless steel lined concrete walls on the bottom and epoxy painted carbon steel lined walls on the upper portions. Therefore, the four materials chosen for testing included bare concrete, epoxy painted concrete, epoxy painted carbon steel, and stainless steel. The typical water temperature of the pools varies from 55°F to 80°F dependent on the pool and the season. These tests were done at room temperature.
2. CANDIDATE COATINGS

Through the use of internet searches, phone calls, and email, thirteen candidate underwater coatings were determined. Originally, EKOR coating (from Eurotech) was going to be tested, however, due to an inability to obtain required information and samples, this test was cancelled. An additional coating (UT-15) was added to the list tested based on a vendor response to a request for proposals for coating the pool walls underwater.

Table 1. Underwater Coatings Evaluated

<table>
<thead>
<tr>
<th>Product Name</th>
<th>Vendor</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wet/Dry 700 Epoxy</td>
<td>Progressive Epoxy Polymers, Inc.</td>
<td>[<a href="http://www.epoxyproducts.com">www.epoxyproducts.com</a>]</td>
</tr>
<tr>
<td>Ultra Phix-UW</td>
<td>Ultra Polymers, Inc.</td>
<td>[<a href="http://www.ultraploymersinc.com">www.ultraploymersinc.com</a>]</td>
</tr>
<tr>
<td>NMP 1710 Epoxy</td>
<td>National Maintenance Products</td>
<td>Australia</td>
</tr>
<tr>
<td>NMP 1720 Epoxy</td>
<td>National Maintenance Products</td>
<td>Australia</td>
</tr>
<tr>
<td>Corro-Coat FC 2100 Epoxy</td>
<td>Progressive Epoxy Polymers, Inc.</td>
<td>[<a href="http://www.epoxyproducts.com">www.epoxyproducts.com</a>]</td>
</tr>
<tr>
<td>Alocit 28.15 Epoxy</td>
<td>Alocit Systems</td>
<td>UK/Europe</td>
</tr>
<tr>
<td>Carboguard Mastic A-788</td>
<td>Somay Product</td>
<td></td>
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<tr>
<td>Diver-cote RA 500UW-HV</td>
<td>Chemco International</td>
<td>Scotland</td>
</tr>
<tr>
<td>Diver-cote RA 500UW-LV</td>
<td>Chemco International</td>
<td>Scotland</td>
</tr>
<tr>
<td>Marine-Flex 570</td>
<td>Edison Coatings Inc.</td>
<td>[<a href="http://www.edisoncoatings.com">www.edisoncoatings.com</a>]</td>
</tr>
<tr>
<td>Euro-vinyl CV02</td>
<td>Euronavv</td>
<td>Portugal</td>
</tr>
<tr>
<td>Euro-paste 326</td>
<td>Euronavv</td>
<td>Portugal</td>
</tr>
<tr>
<td>Euro-diver 1 323 Epoxy</td>
<td>Euronavv</td>
<td>Portugal</td>
</tr>
<tr>
<td>UT-15 Underwater Epoxy</td>
<td>Picco Coatings Co.</td>
<td>Texas</td>
</tr>
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</table>

The following criteria were used during this evaluation. The underwater coating must:

- Be easy to apply
- Adhere well to the four surfaces of interest
- Not change or have a negative impact on water chemistry or clarity
- Not be hazardous in final applied form
- Be proven in other underwater applications.

In addition, it is desirable for the coating to have a high pigment or high cross-link density to prevent radiation from penetrating.
3. TEST PROCEDURE

3.1 Test Description

The coatings were applied underwater in a non-radioactive test at the North Boulevard Annex (NBA). Each coating was applied to four different substrates: epoxy-painted concrete; bare concrete; epoxy-painted carbon steel; and stainless steel. The test equipment included clear plastic containers (1.5 feet deep, 2.5 feet long, 1.5 feet wide), brushes, rollers, trowels, stirring sticks, and small containers for mixing up the coatings. Before use, the test containers were washed with soap to remove any manufacturing residue. Personal protective equipment (PPE) consisting of nitrile gloves and safety glasses, as identified by the Industrial Hygienist, were used for all mixing and application of all coatings. Also per the Industrial Hygienist’s recommendations, an eyewash was obtained and installed.

A set of four test coupons was used for each of the coatings. The stainless steel and carbon steel test coupons were cut (8” squares) from stock material. The carbon steel plates were then painted with epoxy paint and allowed to cure according to manufacturer’s recommendations. Standard concrete bricks (6000 psi concrete – 4” wide X 8” long X 2” deep) were also used and half of these bricks were coated with epoxy paint. Before placing the steel coupons in the water, they were washed to remove any machine oil residue. The metal test coupons were glued with silicone in a vertical orientation to the sides of the clear plastic containers. A separate container was used for each coating to avoid cross-contamination among different fixatives. Concrete test coupons were placed in water to soak for at least 48 hours before the start of testing then transferred to the test container with the metal samples and the test container was filled with water. To avoid excessive rusting of the carbon steel coupons, the test containers were filled with water on the test day. Before and during testing, the water temperature was monitored with a thermocouple since water temperature can have a significant impact on product performance and on epoxy coating pot life (the length of time between mixing and hardening).

Each coating was mixed according to the supplier’s instructions. Careful attention was paid to the expected pot life; to ensure that the coating was applied to all four test coupons before hardening. The coating was applied underwater to the vertical surface of each of four test coupons; one of each type of substrate material. The applicator (brush, roller, trowel) was selected based on the supplier’s recommendation and discretion of the person completing the application. During application of the fixatives, observations were recorded, including the following:

- Ease of application
- Viscosity (subjective assessment)
- Effectiveness of application method
- Workability
- Applied thickness
- Product control
  - Mixing
  - Pot time
  - Runny, bubbles, lumpy
- Underwater transport of mixed product
  - Impact on water clarity
  - Chunks or drops that float or settle to bottom
- Film on water

- Coverage
- Adhesion

After curing, the samples were analyzed visually for adhesion, surface roughness, cracking, and any other visually notable characteristics. In addition, an attempt to peel the fixative from the test coupon by hand, scratching with a scraper (screwdriver) at about 45 degrees, and striking with a hammer were completed. The results were documented and compared to determine which coatings displayed the best adhesion to the test coupons. This information, combined with the observations taken during application, was analyzed and the three most promising fixatives selected. Still and video photos were taken of test set-up, fixative application, cured fixative, and adhesion testing.

Upon completion of the analysis, the water was disposed of in the floor drain (after straining to remove any chunks of cured coating that could have plugged the drain). The test equipment was disassembled and the test coupons were stored for future reference. The unused fixatives were disposed of or stored in approved locations.

3.2 Safety Documentation

All Material Safety Data Sheets (MSDSs) and product descriptions (Appendix A) were obtained from the suppliers. INEEL form 442.10, “Agent Request Hazard Evaluation” was completed and approved for each product. Through this process, the NBA facility chemical custodian (Craig Robb), the Industrial Hygienist (Saul Chessin), Safety (Doug Ardary), and Environmental (Chris Kent) were all informed of the upcoming use of these chemicals. Once these approvals were in place, free samples of each fixative were requested from the suppliers. The fixatives were shipped to the INEEL Central Facilities Area (CFA) warehouse, and then transported to the NBA for storage and use.

The existing Job Safety Analysis (JSA) for the NBA includes mixing and applying epoxy-type materials. An analysis by the Safety Representative and Chemical Custodian showed that the existing JSA encompassed the planned work, so an additional JSA was not required.

3.3 Quality Level

A form 414.A06 (Appendix B) was completed to determine and document the Quality Level for this work. The testing at the NBA was a Quality Level 4 as it was a simple scoping test.

Procurement verified that suppliers do not need to be on the Qualified Supplier List to obtain free samples for research and development testing. If the products test successfully and procurement is planned, the supplier will need to be evaluated, based on the Quality Level, for approval as a Qualified Supplier.
### 3.4 INEEL Personnel Contact Information

<table>
<thead>
<tr>
<th>Project Specific Title</th>
<th>Name</th>
<th>Phone Number</th>
<th>E mail</th>
</tr>
</thead>
<tbody>
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</tr>
</tbody>
</table>
4. TEST RESULTS

4.1 Wet/Dry 700

Color and Apparent Viscosity of Coating: Part A was a lumpy white paste. Part B was tan, smooth and slightly runny. After mixing together in a ratio of 1:1 with a wooden stick it was a cream-colored high viscosity paste.

Application Method Used: Both a gloved hand and a trowel were used to apply the mixed coating. It was too thick for brush application.

Pot Life: 80 minutes at 75°F

Applied Thickness: Varied from 1/32 to 1/16 inch.

Impact on Water Clarity: During application, water was clear. After 15 minutes of curing, water turned a faint yellow. The excess fixative settled on the bottom of the container. There was no apparent film on the water during or after curing.

Adhesion during Application: Covered the painted brick and painted carbon steel coupons with ease. However, the coating seemed to tear away from the stainless steel and bare concrete surfaces as it was applied. After application, there was no slumping of the coating.

Cure Time and Temperature: A seven-day cure was used (only 2 days required according to manufacturer’s information) at about 57°F.

Appearance after Curing: The surface was cream-colored and rough but no cracking was observed. 100% of the surfaces were covered.

Adhesion after Curing: The coating was very well adhered to all surfaces. The material overhanging the edge of the coupon could be broken off (taking the epoxy paint with it on the painted coupons).
Applying Wet-Dry 700 to stainless steel with trowel.

Overhanging edge of Wet-Dry 700 can be broken off brick.

Scraping Wet-Dry 700 has no affect.

Overhanging edge of Wet-Dry 700 can be broken off of carbon steel plate taking epoxy paint with it.
4.2 Ultra Phix-UW

Color and Apparent Viscosity of Coating: Both parts of the coating were contained inside a caulking type tube. After application, in a ratio of 2:1 as automatically fed through an in line mixing tube with the caulking gun it was a cream-colored high viscosity paste.

Application Method Used: The vendor provided the caulking gun with a mixing tip was used to squirt the coating out on the coupons surfaces underwater. Then a trowel was used to smooth the coating over the entire surface. This was very time consuming as each squeeze provided just a little coating and the resulting coating was not well mixed (in full scale application it is assumed this would not be an issue).

Pot Life: Since the coating is mixed as it is applied, pot life is not an issue.

Applied Thickness: Varied from 1/32 to 1/16 inch

Impact on Water Clarity: During application, water was clear. After 15 minutes of curing, water turned a faint yellow. A small amount of coating floated on the water surface (probably due to the application method). There was no apparent film on the water during or after curing.

Adhesion during Application: Covered the painted brick and painted carbon steel coupons with ease. However, the coating seemed to tear away from the stainless steel and bare concrete surfaces as it was applied. After application there was no slumping of the coating.

Cure Time and Temperature: A seven-day cure was used (only 3 days required according to manufacturer’s information) at about 57°F.

Appearance after Curing: The surface was cream-colored and rough but no cracking was observed. 100% of the surfaces were covered.

Adhesion after Curing: The coating would not peel away from the coupon surfaces but it could be scratched off with a screwdriver held at a 45° angle. The material overhanging the edge of the coupon could be broken off (taking the epoxy paint with it on the painted coupons).

Applying Ultra Phix-UW to the epoxy coated brick with special mixing gun.  
Spreading Ultra Phix-UW on brick after application.
Applying Ultra Phix-UW to the stainless steel with special mixing gun.

Overhanging edges of Ultra Phix-UW will break off.

Scraping Ultra Phix-UW will remove some coating.
4.3 NMP 1710

Color and Apparent Viscosity of Coating: Part A was a white and runny. Part B was grey and a sticky paste. After mixing together in a ratio of 1:1 with a wooden stick, it was a grey-colored medium viscosity paste.

Application Method Used: This material was applied using a plastic trowel.

Pot Life: 45 minutes at 75°F

Applied Thickness: Varied from 1/32 to 1/16 inch

Impact on Water Clarity: Water remained clear at all times. No visible effects.

Adhesion during Application: Easily covered all coupon surfaces with no tearing and no slumping.

Cure Time and Temperature: A seven-day cure was used (only 2 days required according to manufacturer’s information) at about 57°F.

Appearance after Curing: The surface was light grey-colored and semi rough but no cracking was observed. 100% of the surfaces were covered.

Adhesion after Curing: The coating was very well adhered to all surfaces. The material overhanging the edge of the coupon could be broken off.
NMP 1710 application on epoxy coated brick.

A little of the overhanging edge of NMP 1710 could be broken off but coating is well adhered to all surfaces.
4.4 NMP 1720

Color and Apparent Viscosity of Coating: Part A was a white and taffy-like. Part B was tan and paste-like. After mixing together in a ratio of 1:1 with a wooden stick, it was a white-colored high viscosity paste.

Application Method Used: This material was applied using a plastic trowel.

Pot Life: 45 minutes at 75°F

Applied Thickness: Varied from 1/32 to 1/16 inch

Impact on Water Clarity: Water remained clear at all times. No visible effects.

Adhesion during Application: Easily covered all coupon surfaces. Some tearing was observed when applying the coating to the bare concrete coupon. No slumping of the coating was observed.

Cure Time and Temperature: A seven-day cure was used (only 2 days required according to manufacturer’s information) at about 59°F.

Appearance after Curing: The surface was white-colored and rough but no cracking was observed. 100% of the surfaces were covered.

Adhesion after Curing: The coating was very well adhered to all surfaces. The material overhanging the edge of the coupon could be broken off.

NMP 1720 was a high-viscosity paste.

NMP 1720 application on epoxy coated carbon steel.
Some tearing occurred when applying NMP 1720 application to bare brick.

NMP 1720 could not be scrapped off the bare brick.

A little of the overhanging edge of NMP 1720 could be broken off but coating is well adhered to all surfaces.
4.5 Corro-Coat FC-2100

Color and Apparent Viscosity of Coating: Part A was a silver paste. Part B was gold with a varnish-like consistency. After mixing together in a ratio of 2:1 with a wooden stick, it was a grey-colored honey-like consistency (low-medium viscosity).

Application Method Used: This material was applied using a paintbrush.

Pot Life: 55-75 minutes at 75°F

Applied Thickness: Varied from 1/32 to 1/16 inch. It was easier to control the thickness and apply an even coating with this coating than with most of the others.

Impact on Water Clarity: Water remained clear at all times. No visible effects.

Adhesion during Application: Easily covered all coupon surfaces with no tearing and no slumping.

Cure Time and Temperature: A seven-day cure was used (only 8-10 hrs required according to manufacturer’s information) at about 56°F.

Appearance after Curing: The surface was grey-colored with a light roughness but no cracking was observed. 100% of the surfaces were covered with a thin coat.

Adhesion after Curing: The coating was very well adhered to all surfaces. The material overhanging the edge of the coupon could be broken off. When scraping with a screwdriver and applying higher pressure the outer surface of the fixative can be removed. Several weeks after the original adhesion test, some of the coating on the stainless steel coupon had fallen off, but was still tightly adhered to the other coupons (these coupons had been transported around to allow others to observe them).
Corro-Coat FC 2100 applied without tearing or slumping.

The overhanging edge of the cured Corro-Coat FC 2100 could be broken off.

Corro-Coat FC 2100 adhered well to all surfaces during initial adhesion testing but later came off the stainless steel coupon.
4.6 Alocit 28.15

Color and Apparent Viscosity of Coating: Part A was a brown paint-like material. Part B was clear with a consistency of varnish. After mixing together in a ratio of 5:1 with a wooden stick, it was tan-colored with a low-medium viscosity (like latex paint).

Application Method Used: This material was applied using a paintbrush.

Pot Life: 45/60 minutes to one hour at 68°F.

Applied Thickness: Varied from 1/32 to 1/16 inch. It was easier to control the thickness and apply an even coating with this coating than with most of the others.

Impact on Water Clarity: Water remained clear during application. A small amount of floating coating was observed. After curing, a small amount of oil-like film appeared on the water surface.

Adhesion during Application: Easily covered all but the unpainted brick. It would tear away from the unpainted brick making it extremely hard to cover. Thirty minutes after the coating had been applied to the unpainted brick only about 60% of the coating remained on the brick with the rest slumping off onto the bottom of the container. After one hour of cure time, some slumping had occurred on all of the different coupons.

Cure Time and Temperature: A seven-day cure was used at about 57°F.

Appearance after Curing: The surface was brown and smooth with no cracking was observed. 100% of the surfaces of the stainless steel, painted carbon steel and painted concrete were covered with a thin coat. Only 60% of the bare concrete was coated.

Adhesion after Curing: The coating was very well adhered to all surfaces. The material overhanging the edge of the coupon could be broken off. When scrapping with a screwdriver and applying pressure greater than 5 psi the outer surface of the fixative can be removed.

Alocit 28.15 mixed easily and covered the metal plates well.
Alocit 28.15 did not adhere well to the bare brick when coating but the coating that did cure on the surface was well adhered.

Alocit 28.15 adhered well to the metal coupons.
4.7 Carboguard Mastic A-788

Color and Apparent Viscosity of Coating: Hard paste that was too difficult to mix by hand (broke two wooden sticks trying to mix).

Application Method Used: Unable to apply due to mixing difficulties and short pot life.

Pot Life: 40 minutes at 75°F for golf ball size amount, 15 minutes for ½ gallon

Applied Thickness: Not applicable

Impact on Water Clarity: Not applicable

Adhesion during Application: Not applicable

Cure Time and Temperature: Not applicable

Appearance after Curing: Not applicable

Adhesion after Curing: Not applicable

Carboguard Mastic A-788 was not tested as it was too difficult to mix and had a very short pot life.
4.8 Diver-cote RA 500UW-HV

Color and Apparent Viscosity of Coating: Part A was a clear and runny. Part B was black and lumpy paste. After mixing together in a ratio of 3:1 with a wooden stick, it was a black-colored high-viscosity paste.

Application Method Used: This material was applied using a putty knife to the painted carbon steel and half the stainless steel coupons. Application method was changed to a paintbrush after noting ease of application.

Pot Life: 80 minutes at 68°F

Applied Thickness: Varied from 1/32 to 1/16 inch.

Impact on Water Clarity: Water remained clear with a small amount of floating coating. Some excess coating settled to the bottom of the container. No film on the water when it was first applied but after application complete a small amount of oil-like film appeared on the water surface.

Adhesion during Application: Easily covered the painted brick, stainless steel and painted carbon steel. Did not adhere well to the bare concrete – tearing away from the surface. When smoothing out the coating on all surfaces the coating was stringy (thus the floating and settling coating noted above).

Cure Time and Temperature: A seven-day cure was used (only 3 days required according to manufacturer’s information) at about 56°F.

Appearance after Curing: The surface was black and smooth with no cracking observed. 100% of the surfaces were covered with a thin coat.

Adhesion after Curing: The coating was adhered to the epoxy coated brick and epoxy coated carbon steel. The coating on the bare brick and the stainless steel could be peeled off. The material overhanging the edge of the coupons could be broken off and much of the stringy material remained adhered to the coupons. When scrapping with a screwdriver and applying pressure greater than 5 psi the outer surface of the fixative can be removed.
Diver cote formed “strings” in the water.

Diver-cote peeled off the bare brick after curing.

Diver-cote peeled off the stainless steel after curing.
4.9 Diver-cote RA 500UW-LV

Color and Apparent Viscosity of Coating: Part A was a silver paste. Part B was gold with a varnish like consistency. After mixing together in a ratio of 3:1 with a wooden stick, it was a grey-colored honey-like consistency (low-medium viscosity).

Application Method Used: This material was applied using a paintbrush.

Pot Life: 80 minutes at 68°F

Applied Thickness: Varied from 1/32 to 1/16 inch. It was easier to control the thickness and apply an even coating with this coating than with most of the others.

Impact on Water Clarity: Water remained clear at all times. No visible effects.

Adhesion during Application: Easily covered all coupon surfaces except the unpainted brick where a larger amount of pressure had to be applied to make it adhere. The fixative slumped off all surfaces but on all but the bare brick the slumping still left a coating on the coupon.

Cure Time and Temperature: A seven-day cure was used (only 3 days required according to manufacturer’s information) at about 56°F.

Appearance after Curing: The surface was blue with a light roughness and very porous (popped air bubbles). 100% of the surfaces were covered with a thin coat except for the bare brick which was only about 1/8 covered.

Adhesion after Curing: On the painted carbon steel the coating could not be peeled off but a small amount could be scrapped off with a screwdriver. The coating easily peel away from the surface of the stainless steel and the bare brick. On the painted brick small pieces of coating would peel from the edge but the majority was well adhered.

Diver-cote LV was easy to mix and apply but did not adhere well.
Diver-cote LV slumped off all coupons and almost completely off the bare brick.

Diver-cote LV was adhered to the epoxy coated brick.

Diver-cote LV peeled off the stainless steel after curing.
4.10 Marine-Flex 570

Color and Apparent Viscosity of Coating: Part A was grey with a consistency of latex paint. Part B was yellow-brown with a honey-like consistency. After mixing together in a ratio of 1.5:1 with a wooden stick, it was a grey paint-like consistency (low-medium viscosity).

Application Method Used: This material was applied using a paintbrush.

Pot Life: 20 minutes at 77°F

Applied Thickness: Varied from 1/32 to 1/16 inch.

Impact on Water Clarity: Water remained clear at all times. No visible effects.

Adhesion during Application: Easily covered all coupon surfaces with no tearing and no slumping. However, more pressure was required when applying to the painted brick to get it to adhere.

Cure Time and Temperature: A four-day cure was used at about 56°F.

Appearance after Curing: The surface was grey-colored and smooth but no cracking was observed. 100% of the surfaces were covered.

Adhesion after Curing: The coating was not well adhered to any surfaces and was easily peeled or scrapped off. On the epoxy coated carbon steel the epoxy paint peeled off with the coating.

Marine Flex 570 mixed easily and was applied with a paintbrush.
Marine Flex 570 was easily peeled from all surfaces after curing.
4.11 Euro-vinyl CVO2

Color and Apparent Viscosity of Coating: All in one container, stirred with wooden stick to a white medium viscosity paste.

Application Method Used: This material was applied to the painted carbon steel and the stainless steel using a paintbrush and to the painted concrete and bare concrete using a plastic trowel.

Pot Life: NA

Applied Thickness: Varied from 1/32 to 1/16 inch.

Impact on Water Clarity: Water remained clear with a small amount of floating coating pieces.

Adhesion during Application: Easily covered all coupon surfaces, however some tearing occurred when applying with the paintbrush to the concrete bricks. Therefore, a trowel was used on these bricks with no tearing. More pressure needed to get coating to adhere to the bare brick.

Cure Time and Temperature: A four-day cure was used at about 56°F (only 16 hours required to overcoat at 73°F according to manufacturer’s information).

Appearance after Curing: The surface was white with a non-uniform application but no cracking was observed. 100% of the surfaces were covered.

Adhesion after Curing: The coating was not well adhered to any surfaces and was easily peeled or scrapped off, it appeared very glue-like (seemed like uncured).
Euro-vinyl CVO2 was more difficult to apply to the bare brick and a trowel was used to apply more pressure.

Euro-vinyl CVO2 did not adhere well to any surfaces after curing and in some cases did not seem to be fully cured despite adequate lapsed time.
4.12 Euro-paste 326

Color and Apparent Viscosity of Coating: Part A was a white paste. Part B was white with a latex paint-like consistency. After mixing together in a ratio of 5:1 with a wooden stick, it was a white paste (medium viscosity).

Application Method Used: This material was applied using a plastic trowel.

Pot Life: 30 minutes at 73°F.

Applied Thickness: Varied from 1/32 to 1/16 inch.

Impact on Water Clarity: Water remained clear at all times. Some coating pieces floated on the surface of the water.

Adhesion during Application: Easily covered all coupon surfaces with no tearing and no slumping. However, more pressure was required when applying to the unpainted brick to get it to adhere.

Cure Time and Temperature: A four-day cure was used at about 56°F (only 1 day required at 73°F according to manufacturer’s information).

Appearance after Curing: The surface was off-white with non-uniform thickness of coating. 100% of the surfaces were covered.

Adhesion after Curing: The coating was very well adhered to the painted carbon steel and the stainless steel. On the stainless steel, when putting a screwdriver under the edge could peel a small amount off. On the painted brick, the entire coating could be peeled off (taking 50% of the paint with it) by pulling on the overhanging edge. However, a screwdriver could not break through the coating surface. On the unpainted brick, the coating easily peeled off the entire brick surface in one big piece.
Euro-paste 326 applied easily to the stainless steel.

Euro-paste 326 adhered well to the stainless steel and painted carbon steel but not to the bricks.
4.13 Euro-diver 1323

Color and Apparent Viscosity of Coating: Part A was a white paste. Part B was clear with a honey-like consistency. After mixing together in a ratio of 5:1 with a wooden stick, it was a white with a latex paint consistency (low viscosity).

Application Method Used: This material was applied using a paintbrush and a trowel.

Pot Life: 40 minutes at 73°F.

Applied Thickness: Varied from 1/32 to 1/16 inch.

Impact on Water Clarity: Water remained clear at all times. Some coating pieces floated on the water surface.

Adhesion during Application: Easily applied to all metal surfaces (stainless steel and painted carbon steel). However, a large amount of pressure was required when applying to the unpainted brick to get it to adhere. The painted brick was extremely hard to cover. Approximately 10 minutes after applying, the coating began to slump off the unpainted and painted brick.

Cure Time and Temperature: A four-day cure was used at about 56°F (only 1 day required at 73°F according to manufacturer’s information).

Appearance after Curing: The surface was off-white colored with an uneven texture. All surfaces were covered except for the unpainted brick, which was only 30%, covered. There was significant rusting of the carbon steel.

Adhesion after Curing: The coating was easily peeled off the painted carbon steel taking the paint with it. It also peeled easily off of the stainless steel. It was more difficult to remove from the painted brick. The remaining fixative on the unpainted brick peeled off very easily (still had an odor).
Euro-diver 1 323 did not stick to the painted and bare bricks well when applying.

Euro-diver 1 323 peeled off of all surfaces after curing.
4.14 UT-15 Underwater Epoxy

Color and Apparent Viscosity of Coating: Part A was a clear syrup. Part B was tan and paint-like. After mixing together in a ratio of 1:1 with a wooden stick, it was off-white with a latex paint consistency (low-medium viscosity).

Application Method Used: This material was applied using a paintbrush.

Pot Life: 65 minutes at 77°F.

Applied Thickness: Varied from 1/32 to 1/16 inch.

Impact on Water Clarity: Water remained clear during application but turned a yellowish green the day after the coating was applied. A light film appeared on the surface of the water (could be due to incomplete cure of the silicon holding the coupons to the container wall). Analysis of the water found no chemicals of concern.

Adhesion during Application: Very easily covered all coupon surfaces with no tearing and no slumping.

Cure Time and Temperature: A four-day cure was used at about 56-67°F (1.5 days required at 70°F and 4 days required at 33°F according to manufacturer’s information).

Appearance after Curing: The surface was pale green-colored, uniform and smooth with no cracking observed. 100% of the surfaces were covered.

Adhesion after Curing: The coating was very well adhered to all surfaces and could not be removed. If there is an overhang of the coating on the edge it could be broken off but did not take it off the coupon surface.

UT-15 applied easily to all surfaces using a paintbrush.
UT-15 adhered well to all surfaces.
5. RECOMMENDATIONS

The three coatings that were the easiest to apply and adhered well were the NMP 1710, Corro-Coat FC 2100 Epoxy, and the UT-15 Underwater Epoxy. However, there is some concern on the Corro-Coat FC 2100 since after several weeks it broke off the stainless steel surface. Many of these coatings require a roughed up surface to adhere well according to manufacturers instructions and this may be why this coating came off.

In several cases, applied coatings bonded well to the epoxy painted surfaces but caused the bond of the epoxy paint to the surface of the coupon to weaken. Some literature suggests that the coating over the epoxy paint actually softens the paint to allow this to happen.

Water samples were analyzed for the UT-15 coating and the Corro-coat FC 2100 coating to determine the presence of any undesirable organic compounds. The samples were analyzed using a carboxen SPME (solid phase micro extraction) technique. The SPME is sensitive to organics in the part per billion and high range. The SPME was adsorbed in the sample for approximately 15 minutes. The SPMEs were then desorbed in the injector of a Shimadzu GCMS. The results for both samples (Appendix C) indicated that there were no hazardous agents present. The compounds that were picked up were not hazardous.

The ratio of surface area to pool volume was calculated for the test coupons (Table 2). This showed that the concentration of any chemicals coming from the coating as it cures should have been higher in the test case than it will be in any of the actual pools.

Table 2. Surface area to pool volume ratios.

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Based on these results, use of the UT-15 and the NMP 1710 coatings are recommended for larger scale testing in the actual fuel basins.
Appendix A

MSDS’s and Product Information
Appendix B

Quality Assurance Documentation
QUALITY LEVEL AND REQUIREMENTS DETERMINATION

For R&D work with multiple components, which have different quality levels assigned, attach a list of items by name with their assigned quality levels to this form.

If the work scope is complex and cannot be evaluated on a single form, or if there are activities that multiple quality levels, then a separate form shall be completed for each activity.

Review and Approvals for Quality Level Assignment and Quality Requirement selection:

Quality Level Assigned: 4

Date: 11/13/03

Julia Tripp
Quality Level Selection Made By
Print/Type Name

Julia Tripp
Principal Investigator, Approval
Print/Type Name

Randall Bargelt
Manager Approval
Print/Type Name

Mona Huffaker
Quality Engineer (if Reviewed)
Print/Type Name

CONVERSION TABLE

This table shall be used to convert a safety category to an equivalent quality level.

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<td>Low Safety Consequence - LSC</td>
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<td>4</td>
<td>Consumer Grade - CG</td>
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Note 1: Quality Level may be applied to each individual item or activity and can vary based on the material or process verification requirements. For example an overall process may be assigned Quality Level 2, while some subcomponents of the process may be considered Quality Level 3 or Quality Level 4.

Note 2: Quality requirements are additive as you go from Quality Level 4 to Quality Level 1.
## QUALITY LEVEL AND REQUIREMENTS DETERMINATION

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<th>Quality Level 3</th>
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Note 1: Quality Level may be applied to each individual item or activity and can vary based on the material or process verification requirements. For example an overall process may be assigned Quality Level 2, while some subcomponents of the process may be considered Quality Level 3 or Quality Level 4.

Note 2: Quality requirements are additives as you go from Quality Level 4 to Quality Level 1.
Appendix C

Water Sample Analysis
### Chromatogram

**VT-15 Vapor Water Epoxy Coating - 1/15/04**

![Chromatogram Image]

### Sample Information

- **Sample Type**: Unknown
- **Sample Name**: VT-15 Vapor Water Epoxy Coating - 1/15/04
- **Injection Volume**: 100.00
- **Data File**: C:\GCMSolution\Data\Kip\VT-15_011504.QGD
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- **Method File**: C:\GCMSolution\Data\Currency\currency_SPME_agnm
- **Org Method File**: C:\GCMSolution\Data\Currency\currency_SPME_agnm
- **Report File**: C:\GCMSolution\Data\Chris\Chris.qgr
- **Tuning File**: C:\GCMSolution\System\Tunc\1011904eri.qgt
- **Modified by**: Admin
- **Modified**: 01/19/2004 2:25:14 PM

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- **Admin**: Analyzed by Admin on 01/19/2004 1:50:14 PM
- **1.507**: Time in minutes
- **1.00**: TIC value for reference

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42
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Appendix 1
MSDS’s and Product Information
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Product Name: We-Cry 700 A Resin
Chemical Family: Epoxy Resin
Product Code: ER100-A

2. Composition/Information on Ingredients

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Specific information on the product is withheld and considered a trade secret.

3. Health Hazards
Eye Contact: May cause irritation and swelling.
Skin Contact: May cause irritation and sensitization. Symptoms can be immediate or delayed several hours.
Inhalation: May cause irritation and irritation of the respiratory system. Inhalation: May cause irritation. Other: Pre-existing skin sensitization may be aggravated by exposure to this product.

4. First Aid Measures
Eyes: Flush eyes thoroughly with water for at least 15 minutes while holding eyelids open. Seek medical attention.
Skin: Remove contaminated clothing. Wash skin from splash and wash the affected area thoroughly with soap and water, keep clothing contaminated clothing thoroughly before reuse.
Inhalation: Remove to fresh air, provide oxygen or artificial respiration if needed. Obtain medical attention; symptoms can be delayed up to several hours.
Ingestion: DO NOT induce vomiting. Give 1-2 tablespoons of water or milk unless the person is drowsy, convulsing, or unconscious. Get medical attention.

5. Fire Fighting Measures
Flammable Properties: Flash Point: >200°F (closed cup) Explosive Limits: Not available Auto-Ignition Temperature: Not available
Hazardous Decomposition Products: Carbon monoxide, carbon dioxide, oxides of other organic substances
Extinguishing Media and Fire Fighting Instructions: When sufficient large quantities are present, fire fighters should be equipped with self-contained breathing apparatus, other extreme heat or water consumption may cause closed containers to explode.
Extinguishing Media: Use carbon dioxide, dry chemical, or appropriate foam

6. Accidental Release Measures
Ventilate the spill area and evacuate if necessary. Remove all ignitable sources. Disperse and contain large spills. Clean-up personnel should use adequate protective equipment.

7. Handling and Storage
Store in a cool, dry place, in closed containers at room temperature. Avoid contact with incompatible materials. Wear protective eyewear, chemical-resistant gloves, and other protective clothing as appropriate.

8. Exposure Control and Personal Protection
Engineering Controls: Effective engineering controls should be used whenever possible to eliminate and reduce worker exposure to all respiratory hazards. General ventilation, local ventilation, or isolation may prove adequate to keep airborne concentrations below exposure limits.
Respiratory Protection: If exposure limits are exceeded and local ventilation is unavailable, a fire-rated respirator or a self-contained breathing apparatus is required. Use Protection: Impervious gloves and protective clothing should be worn as necessary. Eye Protection: Chemical splash goggles or safety glasses with side shields should be worn as appropriate.

9. Stability and Reactivity
Chemical Stability: Stable under normal conditions and use. Conditions and Materials to Avoid: React with amine and strong oxidizing agents.
Hazardous Polymerization: Will not occur.

10. Physical and Chemical Properties
Appearance/Color: Thiolene gel, light to odorless
Boiling Point: Not determined
Vapor Pressure (mm Hg): < 1 @ 25°C
Vapor Density (air=1): > 1
Specific Gravity: 1.06
Solubility In Water: None

11. Toxicological Information
This section provides toxicological information with regard to the pure form of the component ingredient. It is suggested that persons trained in its evaluation interpret this information.
Epoxy Resins: Acute Oral LD50 (Rat): 11.4 g/kg Acute Oral LD50 (mice): >20 g/kg

12. Disposal Considerations
Keros out of surface water, waste, and waterways entering or leading to surface water. Notify authorities if any exposure to the environment occurs or is likely to occur. Utilize an appropriate disposal facility, in compliance with applicable federal, state, and local environmental control regulations.

13. Transportation Information and Regulatory Information

OSH Act: Hazard Class: Health, 2 - Flammability, 0
NRC: Health, 2 - Flammability, 0
HMIS: Health, 2 - Flammability, 0

Data of Print: 9/26/02
Manufactured by: ERG in RI
Distributed by: Progressive Geocay Polymers - 48 Willow Drive - Pittsfield, NH 03263 - Tel: 603-435-7199 Fax: 603-435-7182

Note: This material is a product of progressive geocay polymers and is not intended to be used as a substitute for professional advice. Always consult a professional before using this material. This material is intended for use in the United States only. The information provided is subject to change without notice. The manufacturer assumes no responsibility for any loss or damage resulting from the use of this material.
# Wet/Dry 700 Epoxy

## Technical Data

**SOLVENT-FREE EPOXY COATING**

<table>
<thead>
<tr>
<th>Protective Coating</th>
<th>Solvent-Free</th>
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</thead>
<tbody>
<tr>
<td>Sealant</td>
<td>Easy 1:1 Mixing Ratio</td>
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<tr>
<td>Patching</td>
<td>Works Underwater</td>
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<tr>
<td></td>
<td>Kevlar™ Reinforced</td>
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</table>

### STANDARD PRODUCT DESCRIPTION

Wet/Dry 700 epoxy is a 100% solids, non-regulated, non-hazmat, Kevlar™ reinforced epoxy coating system designed for coating surfaces that may be subjected to constant immersion in water. Wet/Dry 700 will bond to water saturated concrete, and is resistant to sewer gasses, sulfur based chemicals, dilute acids and most caustics.

### USES

- Marine environments
- Docks, fiberglass and wood boats
- Sewers, tunnels, dams, spillways
- Underground concrete structures
- Steel and concrete piping

### FEATURES

- Excellent chemical resistance
- Convenient 1:1 ratio by volume or 1:0.83 by weight (bake/cure)
- Superior adhesion to cold, damp surfaces
- Nonhazmat to ship

### VISCOSITY

- Viscosity at 72°F:
  - Part A: gel
  - Part B: gel
  - Mixed: gel

### PHYSICAL PROPERTIES

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<tr>
<th>Property</th>
<th>Standard</th>
<th>Value</th>
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<tbody>
<tr>
<td>Compressive Strength</td>
<td>ASTM D695</td>
<td>10,500 psi</td>
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<tr>
<td>Tensile Strength</td>
<td>ASTM D638</td>
<td>5,200 psi</td>
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<tr>
<td>Abrasion Resistance</td>
<td>ASTM D4060</td>
<td>0.20 gm loss</td>
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<tr>
<td>Water Absorption</td>
<td>ASTM D570</td>
<td>0.10%</td>
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<td>(2 hour boil)</td>
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<tr>
<td>Flexural Strength</td>
<td>ASTM D290</td>
<td>4,900 psi</td>
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<tr>
<td>Shore D Hardness</td>
<td>ASTM D2240</td>
<td>88</td>
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<tr>
<td>Heat Distortion</td>
<td>ASTM D649</td>
<td>122°F</td>
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<tr>
<td>Temperature</td>
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<tr>
<td>Bond Strength to Concrete</td>
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<td>100% concrete failure</td>
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</table>

## Solvent-Free Coatings for Tough Environments
## Wet/Dry 700 Epoxy TECHNICAL DATA

### Cure Schedule

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<tr>
<th>POT LIFE @ 75°F</th>
<th>70-90 minutes</th>
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<tr>
<td>TACK FREE</td>
<td>6 hours</td>
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<tr>
<td>RECOAT</td>
<td>6 to 48 hours</td>
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### Surface Preparation

Surface to be topcoated must be clean and free of oils, grease and loose contamination.

### Application

Mix Wet/Dry 700 epoxy base with the Wet/Dry 700 curing agent. Use a mechanical mixer if possible to ensure thorough mixing. The mixing ratio is 1/3 (base:curing agent) by volume or 110:83 by weight. Wet/Dry 700 does not require a 'swear-in' or induction time and the mixed components should be used immediately.

Potlife is approximately 70-90 minutes at 75°F, so mix only the amount of epoxy that can be easily applied within that time limit. Apply using a squeegee.

Wet/Dry 700 is suitable for horizontal surfaces and vertical surfaces.

### Notes

Unless top-coated with a UV absorber, this epoxy will yellow in sunlight.

### Transport

Nonregulated by USDOT, IATA & IMO.

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SAFETY: This is a hazardous material if mixed. Read and understand the Material Safety Data Sheet (MSDS) before use.

WARRANTY DISCLAIMER: The information given herein has been compiled for your help and guidance and is based upon our experience and knowledge. However, as we have no control over the use to which this information is put, no warranty, express or implied is intended or given except that these goods shall be of new, first quality and Buyer assumes all risk and liability for results obtained by the use of the materials covered in this data sheet, whether used alone or in combination with other products. We assume no responsibility whatsoever for coverage, performance or damage, including injuries resulting from use of this information or of products recommended herein. The sale and use of this product is governed by Progressive Products, Inc.'s Warranty Disclaimer and Return Policy.

Manufactured by:  
ERG in RI

Distributed by:  
Progressive Epoxy Polymers, Inc.  
40 Wildwood Dr.  
Pittsfield, NH 03263-3405

Tel: 603-435-7159  
Fax: 603-435-7182  
www.epoxyproducts.com  
info@epoxyproducts.com
MATERIAL SAFETY DATA SHEET

SECTION I: IDENTIFICATION INFORMATION
IDENTITY (TRADENAME): ULTRA PRIX UW - PART A

FAMILY/ChemICAL NAME: Epoxy Resin

PRODUCT TYPE: Coating/painting

SECTION II: HAZARDOUS INGREDIENTS
SPECIFIC CHEMICAL NAME: Proprietary

CAS #: 1263-07-1

EXPOSURE LIMITS:
OSHA PEL: Not established
ACGIH TLV: Not established

CARCINOGENICITY:
IARC: NO
NTP: NO
OSHA: NO
ACGIH: NO
OTHER: NO

SPECIFIC CHEMICAL NAME: Titanium dioxide (TiO2)

CAS #: 13463-67-1

EXPOSURE LIMITS:
OSHA PEL: 15 mg/m3 (total dust)
ACGIH TLV: 15 mg/m3 (total dust) Not established

CARCINOGENICITY:
IARC: NO
NTP: NO
OSHA: NO
ACGIH: NO
OTHER: NO

SPECIFIC CHEMICAL NAME: Aluminum Oxide

CAS #: 1334-21-1

EXPOSURE LIMITS:
OSHA PEL: 15 mg/m3 (total dust)
ACGIH TLV: Not established

CARCINOGENICITY:
IARC: NO
NTP: NO
OSHA: NO
ACGIH: NO
OTHER: NO

SECTION III: PHYSICAL DATA
APPEARANCE AND ODOR: Thin. No odor.

SPECIFIC GRAVITY: 1.25

SOLUBILITY IN WATER: Insoluble

FREEZING POINT: N/A

BOILING POINT: 760 mm Hg: N/A

% VOLATILE BY VOL.: N/A

MELTING POINT: Not Applicable

VISCOSEITY: Pasty

SECTION IV: FIRE AND EXPLOSION HAZARD DATA
FLASH POINT: >300 F
EXTINGUISHING MEDIA: Water spray, CO2, dry chemical, foam.

FIRE FIGHTING PROCEDURES - SPECIAL: Firefighters should wear goggles and self-contained breathing apparatus.

UNUSUAL FIRE AND EXPLOSION HAZARDS: None known.

SECTION V: REACTIVITY DATA
STABILITY: Stable

CONDITIONS TO AVOID: Elevated temperatures.

INCOMPATIBILITY: Strong oxidizing agents.

HAZARDOUS DECOMPOSITION PRODUCTS: Silica will dissolve in Hydrofluoric acid and produce a corrosive gas silicon fluoride.

HAZARDOUS POLYMERIZATION: None known.
SECTION VI: HEALTH HAZARD DATA

PRIMARY ROUTES OF EXPOSURE: Inhalation, ingestion, skin and eye contact.

EYE: May cause slight transient (temporary) eye irritation. Corneal injury is unlikely.

CONTACT: Prolonged exposure is not likely to cause significant skin irritation. Repeated exposure may cause skin irritation.

SKIN: Chemical skin irritation is unlikely. No allergic skin reaction in humans.

SKIN ABSORPTION: A single prolonged exposure is not likely to result in the material being absorbed through skin in harmful amounts. The LD₅₀ for skin absorption in rabbits is 20,000 mg/kg.

INGESTION: Single dose oral toxicity is low. The oral LD₅₀ for rats is >5,000 mg/kg. No hazards anticipated from swallowing small amounts incidental to normal handling operations.

INHALATION: Vapors are unlikely due to physical properties.

SYSTEMIC (OTHER TARGET ORGANS) EFFECTS: Except for skin sensitization, repeated exposure to low molecular weight diglycidyl ether of biphenyl A are not anticipated to cause any significant adverse effects.

CANCER INFORMATION: A poorly characterized sample of low molecular weight diglycidyl ether of biphenyl A has been reported to produce skin cancer in a highly sensitive strain of mice. However, higher levels of impurities (including a known animal skin carcinogen) compromise the validity of the findings. Diglycidyl ether of biphenyl A that is representative of current manufacturing processes is not believed to be a cancer hazard to humans.

TERATOLOGY (BIRTH DEFECTS): Did not cause birth defects or other adverse effects on the fetus when pregnant rabbits were exposed by skin contact, the most likely route of exposure.

EMERGENCY AND FIRST AID PROCEDURES:

EYES: Immediately flush eyes with water for 10 min.

SKIN: Wash with mild soap and water.

INGESTION: If conscious, give large quantities of water.

Induce vomiting. No known antidote.

INHALATION: Remove to fresh air.

OTHER: Remove contaminated clothing.

SECTION VII: SPILL OR LEAK PROCEDURES

SPILL PROCEDURES: Avoid all personal contact. Take up with absorbent material. Use closed containers. Flash area with EXPOSURE DISPOSAL METHODS: Dispose in accordance with federal, state, and local regulations.

SECTION VIII: SPECIAL PROTECTION INFORMATION

VENTILATION: Good general mechanical ventilation and local exhaust.

PROTECTIVE GLOVES: Wear impervious gloves.

EYE PROTECTION: Wear splash-proof chemical goggles.

RESPIRATORY PROTECTION: Use NIOSH approved respirator for organic vapors. IF REQUIRED.

OTHER PROTECTIVE EQUIPMENT: It is preferable to use disposable protective clothing and gloves. Use equipment necessary to prevent skin or eye contact.

SECTION IX: SPECIAL PRECAUTIONS AND PROTECTION HANDLING, SHIPPING AND STORING PRECAUTIONS:

Avoid contact with skin, eyes, and clothing.

Store above freezing (32 F)

Do not taste. Avoid breathing mist or vapors.

Wash thoroughly after handling.

Keep container closed when not in use.

Use with adequate ventilation.

SECTION X: REGULATORY INFORMATION

DOT CLASS: Not regulated.

SARA: Health: 1 Fire: 1 Reactivity: 1

RCRA STATUS: Not a hazardous waste.

CERCLA STATUS: Not listed

FOR FURTHER INFORMATION, PLEASE CONTACT LEE A. ANNA.
MATERIAL SAFETY DATA SHEET

SECTION I: IDENTIFICATION INFORMATION
IDENTITY (TRADENAME): ULTRA PROX ULW - PART D
FAMILY/ChemICAL NAME: ALIPHATIC POLYAMINES/AMINO POLYAMINES
PRODUCT TYPE: COATINGS - CONCRETE REPAIR

SECTION II: HAZARDOUS INGREDIENTS
SPECIFIC CHEMICAL NAME: Aliphatic polyamine
CAS #: Not available
EXPOSURE LIMITS: OSHA PEL: Not established ACGIH TLV: Not established
CARCINOGENICITY: IARC: NO NTP: NO OSHA NO ACGIH: NO OTHER: NO
SPECIFIC CHEMICAL NAME: Anilopolyamine
CAS #: 68410231
EXPOSURE LIMITS: OSHA PEL: Not established ACGIH TLV: Not established
CARCINOGENICITY: IARC: NO NTP: NO OSHA NO ACGIH: NO OTHER: NO

SECTION III: PHYSICAL DATA
APPEARANCE AND ODOR: Amber liquid SPECIFIC GRAVITY: 1.10
SOLUBILITY IN WATER: Slightly FREEZING POINT: N/A
BOILING POINT (760 mm Hg): Not available VOLATILES BY VOL: Zero
MELTING POINT: Not applicable VISCOSITY: 3,000 - 5,000 cps

SECTION IV: FIRE AND EXPLOSION HAZARD DATA
FLASH POINT: Not available
EXTINGUISHING MEDIA: Water spray, CO2, dry chemical
FIRE FIGHTING PROCEDURES - SPECIAL: Cool exposed containers with water spray. Self-contained breathing apparatus in contained area.

SECTION V: REACTIVITY DATA
STABILITY: Stable
CONDITIONS TO AVOID: High temperatures INCOMPATIBILITY: Strong oxidizing agents
HAZARDOUS DECOMPOSITION PRODUCTS: None known
HAZARDOUS POLYMERIZATION: None known

SECTION VI: HEALTH HAZARD DATA
PRIMARY ROUTES OF EXPOSURE: Inhalation, ingestion, skin and eye contact.
EYE: May cause slight transient (temporary) eye irritation. Corneal injury is unlikely.
SKIN: The skin is generally resistant to the effects of contact with this material. Skin contact is unlikely to result in skin irritation.
INHALATION: May cause respiratory irritation. Prolonged exposure is not likely to result in lung irritation.
ABSORPTION: A single prolonged exposure is not likely to result in the material being absorbed through skin in harmful amounts. The LD50 for skin absorption in rabbits is 20,000 mg/kg.

SECTION VI: ENVIRONMENTAL INFORMATION
CONTAMINATION: None known
ENVIRONMENTAL HAZARD: None known

SECTION VII: DISPOSAL CONSIDERATIONS
DISPOSAL METHOD: None known

SECTION VIII: REPRODUCTION EFFECTS
Neither animal nor human reproduction studies have been done with this chemical.

SECTION IX: OTHER INFORMATION
OTHER INFORMATION: None known

SECTION X: ROUTINE HANDLING CONSIDERATIONS
HANDLING: None known

SECTION XI: OTHER HUMAN HEALTH CONSIDERATIONS
OTHER HUMAN HEALTH CONSIDERATIONS: None known

SECTION XII: TOXICOLOGICAL INFORMATION
TOXICOLOGICAL INFORMATION: None known

SECTION XIII: DISCREPANCIES
DISCREPANCIES: None known

SECTION XIV: TRANSPORT INFORMATION
TRANSPORT INFORMATION: None known

SECTION XV: REGULATORY INFORMATION
REGULATORY INFORMATION: None known

SECTION XVI: ADDITIONAL INFORMATION
ADDITIONAL INFORMATION: None known

SECTION XVII: SUPPLEMENTARY INFORMATION
SUPPLEMENTARY INFORMATION: None known
INGESTION: Single dose oral toxicity is low. The oral LD50 for rats is >5,000 mg/kg. No hazards anticipated from swallowing small amounts incidental to normal handling operations.

INHALATION: Vapors are unlikely due to physical properties.

SYSTEMATIC (OTHER TARGET ORGANS) EFFECTS: Except for skin sensitization, repeated exposures to low molecular weight diglycolyl ether of biphenol A are not anticipated to cause any significant adverse effects.

CANCER INFORMATION: A poorly characterized sample of low molecular weight diglycolyl ether of biphenol A has been reported to produce skin cancer in a highly sensitive strain of mice. However, high levels of impurities (including a known animal skin carcinogen) compromise the validity of the findings. Diglycolyl ether of biphenol A that is representative of current manufacturing processes is not believed to be a cancer hazard to humans.

TERATOLOGY (BIRTH DEFECTS): Did not cause birth defects or other adverse effects on the fetus when pregnant rabbits were exposed by skin contact, the most likely route of exposure.

EMERGENCY AND FIRST AID PROCEDURES:

SKIN: Wash with mild soap and water.

INGESTION: If conscious, give large quantities of water.

Other: Remove to fresh air.

OTHER: Remove contaminating clothing.

SECTION VII: SPILL OR LEAK PROCEDURES

SPILL PROCEDURES: Avoid all personal contact. Take up with absorbent material. Use disposable containers. Flush area with water. For large spills, contain material, take up with absorbent material. Avoid use of water.

WASTE DISPOSAL METHODS: Dispose in accordance with federal, state and local regulations.

SECTION VIII: SPECIAL PROTECTION INFORMATION

VENTILATION: Good general mechanical ventilation and local exhaust.

PROTECTIVE GLOVES: Wear impervious gloves, such as nitrile rubber gloves.

EYE PROTECTION: Wear splash-proof chemical goggles.

RESPIRATORY PROTECTION: Use NIOSH approved respirator for organic vapors. IF REQUIRED.

FURTHER PROTECTIVE EQUIPMENT: It is suggested that disposable protective gloves and clothing are used. Use equipment necessary to prevent skin or eye contact. Wash before eating, smoking or using the toilet.

SECTION IX: SPECIAL PRECAUTIONS AND PROTECTION

HANDLING, SHIPPING AND STORING PRECAUTIONS: Avoid contact with skin, eyes and clothing. Do not taste. Avoid breathing mists or vapors. Wash thoroughly after handling. Keep containers closed when not in use. Use with adequate ventilation.

SECTION X: REGULATORY INFORMATION

DOT CLASS: Not regulated

OSHA: Corrosive

Reportable Quantities: NA

Shipping Class: Corrosive liquid

SARA: No toxic chemicals subject to reporting requirements.

Health: 2 Bile: 1 Reactivity: 0

RCRA STATUS: Not a hazardous waste

CERCLA STATUS: Not listed

FOR FURTHER INFORMATION, PLEASE CONTACT LEO A. ANNA

THE INFORMATION AND RECOMMENDATIONS IN THIS DATA SHEET ARE BASED UPON DATA BELIEVED TO BE CORRECT. NO GUARANTEE OR WARRANTY OF ANY KIND IS EXPRESSED OR IMPLIED IS MADE WITH RESPECT TO THE ABOVE INFORMATION

XUPHZ.doc
NEW PRODUCTS! STELLAR with KEVLAR now available. Ultracoat Underwater for under water mi
ULTRACOAT UNDERWATER® Mix under water! Apply under water!

- ULTRACOAT UNDERWATER
  A breakthrough in epoxy coating, ULTRACOAT UNDERWATER lets you apply our superior epoxy coating to surfaces that are completely submerged. Add impact and chemical resistance to damp, wet or even submerged areas in an easy, inexpensive way.

- MIX UNDER WATER!
  Using cartridges of pre-measured material and a hand-off mixing system, (see the ULTRAPHIX system) ULTRACOAT UNDERWATER is mixed and dispensed right where you want it. NO MESS!

  There are some materials that can be applied under water, but they must be mixed in a dry environment first. This limits the time you have to complete repairs and results in expensive wasted material.

- APPLY TO WET SURFACES
  ULTRACOAT UNDERWATER is specially formulated to adhere directly to wet surfaces without floating away.

  Thorough surface preparation yields optimum performance, but surfaces that are corroded or otherwise compromised also can be coated or repaired with excellent results!

- SAVE MONEY! SAVE TIME!
  Because you only mix exactly the amount you need, when you need it, waste is avoided entirely. It won’t cure before you can use it. Unlike most epoxies, small amounts can be used without mixing an entire kit.

  ATTENTION DIVERS - it won’t ruin your wetsuit!

http://www.ultrapolymersinc.com/Web_Pages/water.htm

9/10/2003
MATERIAL SAFETY DATA SHEET

NMP 1710 EPOXY BASE AND CURE
NATIONAL MAINTENANCE PRODUCTS Pty Ltd

Page 1 of 1

IDENTIFICATION

Product Name: NMP 1710 (Base and Cure)
Other Names: NMP 1710
Manufacturer Prod-uct Code: NMP 1710
Pack Size: 5L Pack

UN Number: None Assigned
Hazard Code: None Assigned
Process Schedule Number: None Assigned

PHYSICAL DESCRIPTION/PROPERTIES:

BASE:
Appearance: Coloured paste with characteristic epoxy odor.
Packaging: Package in 5L or 20L metal or plastic container with pour spout.
Boiling Point: Not applicable.
Melting Point: Not applicable.
Vapour Density: Not applicable.
Solubility in Water: Not soluble.
Density @ 20°C: 1.365g/L.

CURE:
Appearance: White paste with very slight aromatic odor.
Packaging: Package in 5L or 20L metal or plastic container with pour spout.
Boiling Point: Not applicable.
Melting Point: Not applicable.
Vapour Density: Not applicable.
Solubility in Water: Insoluble.
Density @ 20°C: 1.080g/L.

OTHER PROPERTIES:

Curing Time: Touch dry 4hr @ 27°C. Hard 4hr @ 27°C. Viscosity of temperature up or down will vary by rule of thumb half of these times per every 10°C variation.
Storage Life: Minimum 24 months.
Flash Point: 194°F or 90°C.
Pot Life: Approx. 60min @ 27°C.
Minimum Cure Temperature: 3°C.
VOC: Non-CNS, Voc.
VOC: 0.3% max.

INGREDIENTS:

BASE:

INGREDIENT | CAS NUMBER | PROPORTION %
--- | --- | ---
Epoxy resin liquid (mixture) | 50806-35-6 | 55 - 75
p-toluene sulfonic acid  | 3101-03-8 | 5 - 10
Curing accelerator | 50185-41-1 | 2 - 5

CURE:

INGREDIENT | CAS NUMBER | PROPORTION %
--- | --- | ---
Aromatic Amine | 100-51-6 | 12 - 24

HEALTH HAZARD INFORMATION

HEALTH EFFECTS:

BASE:
Slight Irritation - Slight irritant, possible sensitizer
Owl, Cautiously - Not corrosive
Owl Toxicity - Unknown - Do not ingest

Cure:
Owl Toxicity - Unknown - Do not ingest

REACH: Toxicity - Unknown, see below
Eye Irritation - Slight irritant
Dermal Toxicity - Unknown
EMERGENCY PHONE NUMBERS: 1-800-727-4857

HAZARDS TO PREVENTION:

1. Avoid contact with eyes, skin, and clothing.
2. Do not get liquid on the skin or clothing.
3. Do not inhale the vapors.
4. Do not breathe vapors or fumes.
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NMP 1710
HEAVY DUTY SUPERIOR COATING

PRODUCT DATA SHEET

NMP 1710 is a brushable version of our superior NMP 1720. It is a premium performance epoxy, especially formulated to provide superior protection to pipes, splash zones, tanks, pits, sumps, sumps, walls, floors, pipes, hulls and decks, above or below water. This superior protective coating can be likened to "case hardening" the surface it is protecting, with a tensile strength of 5 times, flexural strength of 3 times, and chip and wear resistance up to 6 times other readily available epoxies, even those which are thick films.

It is formulated on the highest quality, pure epoxy polymers and curing agents. Pigmentation is selected for hardness and durability in order to obtain the best possible properties when cured. Kevlar™ fibres are also incorporated to enhance the coatings’ unique properties. It employs no solvents, is non-hazardous and is so tolerant of wet conditions it makes an excellent anti-corrosive for underwater application to steel, concrete and similar surfaces. Constant immersion in fresh or salt water, seawater, flushes and oils, hydrocarbons, mineral acids or many other industrial waste products has no detrimental effect on its life span.

NMP 1710 can be applied by brush, spatula or trowel, without the need for a primer. The cured film is hard and glossy with a slight texture resulting from the fibre reinforcement. The solvent-free nature means it is non-corrosive, non-flammable, odourless and is perfectly safe for use in confined spaces, has no shrinkage and is environmentally safe with absolutely no effect on the surrounding plant or marine life.

NMP 1710 is formulated to be "non-regulated", by IATA, IMO, DOT and USDOT for uncomplicated shipment by land, sea or air.

RECOMMENDED USES

- HEAVY DUTY PROTECTIVE COATING FOR STEEL AND CONCRETE
- EXCELLENT CHEMICAL AND IMPACT RESISTANCE FOR TANKS, PITS, BLIND WALLS AND FLOORS, SEA WALLS ETC.
- SUPERIOR PHYSICAL STRENGTH UP TO 6 TIMES STRONGER THAN OTHER EPOXIES – FOR SURFACE REINFORCEMENT
- HEAVY-DUTY MAINTENANCE FOR DECKS AND TANKS
- ANTI-CORROSIVE COATING FOR SPOTTING PIPS OR UNDER INSULATION TO NEGATE CLUE
- IDEAL FOR POWER GENERATION APPLICATIONS – DRAFT TUBES, PIVETOCKS, WATER BOXES, TUBE SHEETS, DAM WALLS ETC.
- REINFORCING, REPAIRING AND PROTECTING CONCRETE AND STEEL TANKS DAMAGED BY EXPOSURE TO CORROSIVE CHEMICAL AND MUNICIPAL WASTE SYSTEMS
- ADD CARBON/CONUM GROUT FOR AN EXTREMELY LONG LIFE NON-SLIP SURFACE, FLOORING IN HARSH ENVIRONMENTS

TECHNICAL INFORMATION

VEHICLE TYPE........................................... 2-pack epoxy/polyurethane.

PIGMENTATION............................................ Colours/tints/chroma reinforcing.
COLOURS: Grey, white, other on request.
FINISH: Glossy with slight texture from the fibers.
CLEANER: MEK or lacquer thinner.
MIXING RATIO: 1:1 v/c
POT SIZE: 8L
INDUCTION TIME: Not required.
POT LIFE: Approx. 40min @ 25°C.
FLASH POINT: Over 100°C.
SOLIDS BY VOLUME: 100%
SPREAD RATE: 1.5 sq. m per litre @ 600 microns.
SURFACE TYPE: Concrete, brick, wood, fibreglass, rooital, polystyrene.
DRY TIME: 6 hours @ 25°C touch, 15 hours hard. Full: 7 days.
VOC: Zero.
LIFE SPAN: Very long life, even in adverse conditions.

APPLICATION NOTES

Surface Preparation:
New Concrete - should be left for 28 days (minimum) before coating. Weak surface laiqance must be removed by water blasting, acid etching or abrasive sweeping.
Existing Concrete - coated or bare - sound surfaces should be well cleaned by degreasing, water blasting or grit blasting as appropriate. Small areas can be cleaned by grinder but that is not practical for large areas.
Repair holes or scribed areas by travelling in a mix of NMP 1710 and clean fine grain sand at about a 2:1 mix of sand to epoxy. Solvent free - apply over coating well-adhered, close coatings.

Application:
Mix desired amount well at a 1:1 ratio. Ensure the two components are well mixed to a uniform colour.
You do not need to mix the entire product at once. Shelf life of unused product is almost indefinite. Mix well to ensure complete mixing. NMP products do not require an induction time as you can use immediately. Apply by spatula or trowel at about 600 microns.
Underwater - take the mixed product underwater in a bucket. Apply within 30-40 min of mixing by brush, spatula, trowel or hand mix on difficult shaped such as risers. It is much easier to apply than traditional "splash zone" compositions, and is substantially less messy than lower viscosity underwater "paste".

CHEMICAL RESISTANCE: Resistant to all fluids, oils, skydrol, hydraulic fluid, alcalies, 50% caustic soda, 70% Sulphuric acid.

TRANSPORTATION: Unregulated.

THIS INFORMATION SHOULD BE READ IN CONJUNCTION WITH MATERIAL SAFERy DATA SHEETS.

NATIONAL MAINTENANCE PRODUCTS Pty Ltd
Unit 19, 10 Millrad St, Acacia Ridge, Qld 4110, Australia
Ph + 61 7 3216 7388, Fax +61 7 3216 7488

For Coating Solution... www.NMP.com

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MATERIAL SAFETY DATA SHEET
NMP 1720 EPOXY BASE AND CURE
NATIONAL MAINTENANCE PRODUCTS Pty Ltd

STATEMENT OF HAZARDOUS NATURE
Considered toxic according to criteria of WorkSafe Australia. Not considered hazardous if used as per instructions.
DOES NOT CONTAIN CARCINOGENS

COMPANY DETAILS
Company: National Maintenance Products Pty Ltd. ACN 097 467 637
Address: Unit 19, 10 McIvor St, Ascot Hill Qld 4110
Phone/Fax: Ph: +61 7 3216 7488; Fax: + 61 7 3216 7498
Emergency Telephone No: + 61 7 3216 7198

IDENTIFICATION
Product Name: NMP 1720 (Base and Cure)  UN Number: Natrium Acetate
Other Name: NMP 1720
Manufacturer/Product Code: NMP71720
Pack Size: EL Pack

PHYSICAL DESCRIPTION/PROPERTIES:
BASE:
Appearance: Coloured paste with characteristic epoxy odour.
Packaging: Package in its own metal or plastic container with gross flt.3d.
Melting Point: Not applicable.
Vapour Density: Not applicable.
Solubility in Water: Negligible.
Density @ 20°C: 1.54g/L.
Auto Ignition Temp/Not applicable.

CURE:
Appearance: Coloured paste with slight ammonia odour.
Packaging: Package in its own metal or plastic container with gross flt.3d.
Melting Point: Not applicable.
Vapour Density: Not applicable.
Solubility in Water: Negligible.
Density @ 20°C: 1.35g/L.
Auto Ignition Temp/Not applicable.

OTHER PROPERTIES:
Curing Time: Touch dry dries @ 27°C. Hard wires @ 23°C. Variations of temperature up or down will by rule of thumb half or double these times per approx each 10°C variation.
Storage Life: Minimum 24 months.
Spread Rate: 110g, m²/4.8mm.
Pot Life: Approx 2 hours @ 27°C.
Minimum Cure Temperature: 5°C.
Corrosiveness: Non-Corrosive.
VOC: 0.2%max.

INGREDIENTS:
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<th>INGREDIENT</th>
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<td>Epoxy Resin/Epoxide Polymer</td>
<td>24008-33-6</td>
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<td>p-terphenyl/penthal phenyl ether</td>
<td>31101-60-8</td>
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<td>28023-60-1</td>
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<td>Microsilica Silica</td>
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CURE:
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<th>PROPORTION %</th>
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<td>Products determined not to be hazardous</td>
<td>100-21-6</td>
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HEALTH HAZARD INFORMATION
Skin Irritation – Slight ointment, possible sensitiser
Eye Irritation – Slight irritation
Inhalation Toxicity – Unknown, see below.
Oral Toxicity – Unknown – Do not ingest.
Dermal Toxicity – Unknown.

Health Effects:

DATA SHEET REVIEWED DATE: 2/7/2009
V2.1.0.0

Page 1 of 10
**Skin and Eye Contact** — Slightly irritating, possible sensitiser.

**Ingestion** — Considered slightly toxic.

**Inhalation** — Overexposure to mist may cause irritations of respiratory tract. Prolonged or repeated exposure may cause anaphylactic reaction.

**First Aid Recommendations**

**Skin and Eye Contact** — Immediately flush eyes with fresh water holding lid apart for 15 minutes, washing within one minute is essential to achieve maximum effectiveness. Remove frayed skin using soap and water. Remove contamination shoes and clothing. Call a physician.

**Inhalation** — Do not induce vomiting. Prevent aspiration (breathing) liquid into lungs. Get medical attention.

**Ingestion** — Immediately move to fresh air. If breathing is difficult, give oxygen. Call a physician.

**CARE**

**Inhalation** — Overexposure to harmful concentrations of vapour is extremely unlikely to normal breath or other applications. Inhalation of spray mist might cause irritation of the respiratory tract. Prolonged or repeated exposure may cause anaphylactic reaction in susceptible persons.

**Eye and Skin Contact** — Danger! Causes severe skin and eye irritation or burns. May cause permanent visual impairment. Not considered toxic by skin absorption but prolonged exposure may cause absorption of harmful amounts. Wear protective clothing and goggles.

**Ingestion** — Pre-existing eye, skin and respiratory disorders may be aggravated by exposure to the product, exercise caution in handling. Remove from skin using liquid soap or detergent — always avoid using acids to remove skin contamination.

**First Aid Recommendations**

**Skin and Eye Contact** — Immediately flush eyes with fresh water holding lid apart for 15 minutes, washing within one minute is essential to achieve maximum effectiveness. Remove frayed skin using soap and water. Remove contaminated shoes and clothing. Call a physician.

**Inhalation** — Danger! Do not take internally. May cause permanent visual or auditory damage. May cause burns of mouth and throat. Do not induce vomiting.

Give a large quantity of milk or water. Do not give foods to an unconscious person. Call a physician.

**Ingestion** — Immediately move to fresh air. If symptoms persist, call a physician.

**PRECAUTIONS FOR USE**

**Exposure Hazards:**
None assigned.

**Engineering Controls:**
None required during normal use.

**Personal Protection:**
- Mechanical local exhaust or type of ventilation system if conditions warrant. Wear impervious gloves, protective clothing, safety goggles and/or face mask.
- Prolonged or repeated exposure may cause anaphylactic reaction in susceptible persons when handled improperly. It is extremely unlikely that harmful concentrations of volatile materials will be released during normal applications by operators, users, or similar tools in open area. Wear organic vapour cartridge respirator or flash air hood if working for extended periods in and closely spaced with minimal ventilation.

**SAFE HANDLING INFORMATION**

**Storage and Transport:**
General good practice required. Store at ambient conditions. Avoid extremes. Transport as non-hazardous.

**Spills and Disposal:**
- Spill: Scrape up and place in suitable container for disposal. Wash area with solvent of thinner.
- Disposal: Dispose in industrial disposal. Observe local regulations for chemical waste disposal.

**Fire or Explosion Hazard:**
Generation of toxic products. Use water spray, foam or dry chemical as fire fighting material. Not susceptible to explosion.

**OTHER INFORMATION**

**Reactivity:**
- No known reactivity. Avoid contact with strong acids, bases and oxidising agents.
- Reactivity data: None known.
- Toxicological Information: None known.
- Stability: Stable.
- Environmental Data: None known.
- Hazardous Decomposition: CO, CO2, unspotted others.
- Hazardous Polymerisation: Will not occur.

**CONDITIONS TO AVOID:**
- Mixing large volumes of base and cure — expect a significant exotherm within 20-25 minutes at 23°C.

**CONTACT POINTS**

**Technical Services Information Officer:**
- Local 1 3256 3335

**DISCLAIMER:**
To the best of our knowledge, the information contained herein is accurate. However, National Maintenance Products Pty Ltd assumes no liability for the accuracy and completeness of the information contained herein. Final determination of suitability of this material is the sole responsibility of the user. All materials present safety hazards and should be used with caution. Although certain hazards are described herein, it cannot guarantee that these are the only hazards that exist.
NMP 1720
HEAVY DUTY SUPERIOR COATING

PRODUCT DATA SHEET

Date of Issue: Feb 03

NMP 1720 is the undisputed leader in premium performance epoxy pastes, especially formulated to provide superior protection to pier, splash zones, tanks, pits, basins, walls, floors, pipes, hulls and decks, above or below water. This unique protective coating can be likened to "case hardening" the surface it is protecting, with a tensile strength of 5 times, flexural strength of 3 times, and chip and wear resistance up to 6 times other readily available epoxies, even thick film.

It is formulated on the highest quality pure epoxy polymers and curing agents. Pigmentation is selected for hardness and durability in order to obtain the best possible properties when cured. Kevlar® fibres are also incorporated to enhance the coatings' unique properties. It employs no solvents, is non-hazardous and is so tolerant of wet conditions it makes an excellent anti-corrosive for underwater application to steel, concrete and similar surfaces. Constant immersion in fresh or salt water, seawage, fuel/oils, hydrocarbons, mineral oils has no detrimental effect.

NMP 1720 can be applied under or above water by sprays or trowel, without the need for a primer. The cured film is hard and glossy with a slight texture resulting from the fibre reinforcement. The solvent-free nature means it is non-corrosive, non-flammable, odourless and is perfectly safe for use in confined spaces, has no shrinkage and is environmentally safe with absolutely no effect on the surrounding plant or marine life. It is approved for use in potable under AS4000(03).

NMP 1720 is formulated to be "non-regulated", by IATA, IMO, DOT and USDOT for uncomplicated shipment by land, sea or air.

RECOMMENDED USES

- APPROVED FOR USE IN ALL DRINKING MATERIAL TANKS
- HEAVY DUTY ANTI-CORROSIVE PROTECTIVE COATING FOR STEEL AND CONCRETE
- USE IN SPLASH ZONES – PIER, WONT WASH OFF BY WAVE ACTION, EVEN DURING CURING
- EXCELLENT CHEMICAL AND IMPACT RESISTANCE FOR SECONDARY CONTAINMENT – TANKS, PITS, BUND WALLS AND FLOORS, SEA WALLS ETC.
- SUPERIOR PHYSICAL PROPERTIES UP TO 5 TIMES STRONGER THAN OTHER EPOXIES
- HEAVY DUTY MAINTENANCE FOR MARINE AND OFFSHORE PRODUCTS – DECKS, TANKS
- ANTI-CORROSION COATING FOR USE ON SWEATING PIPES OR UNDER INSULATION TO NEGATE CU IN PETROCHEMICAL APPLICATIONS
- IDEAL FOR POWER GENERATION APPLICATIONS – DRAFT TUNNELS, PONTS, BOXES, WATER BOXES, TUBE SHEETS, DAM WALLS ETC.
- REINFORCING, REPAIRING AND PROTECTING CONCRETE AND STEEL TANKS DAMAGED BY EXPOSURE TO THE CORROPTIVE CHEMICAL AND MUNICIPAL WASTE SYSTEMS
- REPAIR AND FAIRING – PATCHING, LEAK SEALING, ROUGH STEEL, CONCRETE REBUILD
- ADHESIVE MORTAR – ADD SAND TO CREATE MORTAR.

TECHNICAL INFORMATION

VEHICLE TYPE ........................................ 2-pack epoxy/polyamines.

PIGMENTATION ......................................... Colourant/fibres reinforcing.
COLOURS: Grey, white, other on request.
FINISH: Glossy with slight texture from the fibre.
CLEANER: MEK or lacquer thinner.
MIXING RATIO: 1:1 by
POT SIZE: XL
INDUCTION TIME: Not required.
POT LIFE: Approx 40mins @ 2°C
FLASH POINT: Over 100°C
SOLIDS BY VOLUME: 100%
SPREAD RATE: 1.5 sq. m per ltr @ 800 microns.
SURFACE TYPE: Concrete, brick, wood, fibreglass, metal, polystyrene
DRY TIME: 6 hours @ 25°C touch, 15 hours hard. Full: 7 days.
VOC: Zero.
LIFE SPAN: Very long life, even in adverse conditions.

APPLICATION NOTES

Surface Preparation:
New Concrete - should be left for 28 days (minimum) before coating. Weak surface tension must be removed by water blasting, acid-etching or abrasive sweeping.
Existing Concrete - coated or bare - sound surfaces should be well cleaned by degreasing, water blasting or grit blasting. Small areas cleaned by grinder, but not practical for large areas. Repair holes or scarred areas by trolling in a mix of NMP 1170 and clean fine grain sand at about a 1:1 mix of sand to epoxy. Solvent-free - apply over existing well-adhered, clean coatings.
Metal - High-pressure water abrasive blasting or grinding. Can be applied over tight rust.
Underwater - Marine growth with high pressure water abrasive blasting or grinding.

Application:
Mix desired amount well at a 1:1 ratio. Ensure the two components are well mixed to a uniform colour.
You do not need to mix the entire product at once. Shelf life of unused product is almost indefinite. Mix well to ensure complete mixing. NMP products do not require an induction time as you can use immediately. Apply by sprays or trowel at about 800 microns.
Underwater - take the mixed product underwater in a bucket. Apply within 30-40mins of mixing by sprays or trowel or hand matt on difficult shapes such as risers. It is resistant to effects of wave movement during curing. It is much easier to apply than traditional "splash zone" compositions, and is substantially less money than lower viscosity underwater "paints".

CHEMICAL RESISTANCE - Resistant to all fuels, oils, styrene, hydraulic fluid, alkalis, 50% caustic soda, 70% Sulphuric acid.
TRANSPORTATION - Unregulated.

THIS INFORMATION SHOULD BE READ IN CONJUNCTION WITH MATERIAL SAFETY DATA SHEETS

NATIONAL MAINTENANCE PRODUCTS Pty Ltd
Unit 19, 10 Millfield St, Anakie Ridge, Qld 4110, Australia
Ph: +61 7 3316 7388, Fax: +61 7 3316 7488
For Coating Solutions... askNMP.com

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1. Product Information

Product Name: Corrosol FC 2600 Fertilizer Part B
Chemical Family: Cycloalkanic Amine
Product Code: ER440-B

2. GHS Pictorial/Information on Ingredients

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<td>R22</td>
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3. Health Hazards

Eye & Skin Contact: Causes severe irritation and severe burns. Inhalation: Causes respiratory tract irritation. Ingestion: Causes nausea, headache, and gastrointestinal irritation. Other: Predisposing skin sensitization may be aggravated by exposure to this product.

4. First Aid Measures

Eyes: Flush eyes thoroughly with water for at least 15 minutes while holding eyelids open. Seek medical attention.
Skin: Remove contaminated clothing. Wash skin from affected area thoroughly with soap and water. Wash contaminated clothing thoroughly before reuse.
Inhalation: Remove to fresh air and provide oxygen or artificial respiration if needed. Obtain medical attention if symptoms or nausea developed up to several hours after exposure. Ingestion: DO NOT induce vomiting. Give 1-2 cups of water or milk unless the person is drowsy, convulsing, or unconscious. Get medical attention.

5. Fire Fighting Measures

Flash Point: >200°F (93°C)
Explosive Limits: Not applicable
Auto-ignition Temperature: Not applicable
Hazardous Decomposition Products: Oxides of nitrogen, carbon monoxide, carbon dioxide and other organic materials
Battling Extinguishing Media: Use carbon dioxide, dry chemical, or water spray.

6. Accidental Release Measures

Ventilate the spill area and evacuate if necessary. Remove all ignition sources. Dike and contain large spills. Flush area with water spray. Clean-up personnel should use adequate protective equipment.

7. Handling and Storage

Store in a cool, dry place, in closed containers at room temperature. Avoid contact with incompatible materials. Wipe protective eyewear, chemical-resistant gloves, and other protective clothing as appropriate.

8. Exposure Control and Personal Protection

Engineering Controls: Local exhaust ventilation should be used whenever possible to minimize and/or reduce worker exposure to all hazardous hazards. General ventilation, local ventilation, or isolation may prove adequate to keep airborne concentrations below exposure limits. Respiratory Protection: If exposure limits are exceeded and local ventilation is unavailable, a supplied-air respirator or a self-contained breathing apparatus is required.
Skin Protection: Impervious gloves and protective clothing should be worn as necessary. Eye Protection: Chemical splash goggles or safety glasses with side shields should be worn as appropriate.

9. Stability and Reactivity

Chemical Stability: Stable under normal conditions and use.
Conditions to Avoid: Reacts with acids and strong oxidizing agents.
Hazardous Decomposition: Will not occur.

10. Physical and Chemical Properties

Appearance/Odor: Gray Gel, Slight amine odor
Boiling Point: Not determined
Vapor Pressure (mm Hg): < 7 @ 25°C
Vapor Density (air): >1
Specific Gravity: 1.18
Solubility in Water: Slightly soluble

11. Toxicological Information

Acute Toxicity Data: Not available
Chronic Toxicity Data: Not available

12. Disposal Considerations

Keep out of surface waters, sewers, and any waterways discharging or discharging to surface waters. Notify authorities if any exposure to the environment occurs or is likely to occur. Follow appropriate disposal procedure in compliance with applicable federal, state, and local environmental control regulations.

13. Transportation and Regulatory Information

DOT/ICAO Proper Shipping Name: Non-Corrosive, Not Regulated
Hazardous Labels: Non-CORROSIVE

14. Regulatory Information

TSCA: The chemical components of this product are included in the TSCA Chemical Substance Inventory, as required. 54 FR 664, 1989. Section 303 - Toxic Chemicals: None
IGWRS Hazard: Health - 2, Flammability - 0, Reactivity - 0

Date of report: 12/31/98
Manufactured by: ERC in RI
Distributed by: Progressive Epoxy Polymers - 48 W'wood Drive, Pittsfield, MA 01201 - Tel: 413-435-7180 - Fax: 413-435-7182
# Corro-Coat FC 2100 Epoxy

**TECHNICAL DATA**

## SOLVENT-FREE EPOXY COATING SYSTEM

Mix and Match Corro-Coat FC 2100 Bases and Curing Agents

### Protective Coating
- Marine Barrier Coat
- Corrosion Protection
- Apply/Cures Underwater

## Standard Product Description

### Uses
- Most corrosive environments
- Marine, chemical, pulp and paper
- Spillways, piping, pilings, columns
- Excellent as a finish epoxy coat

### Features
- Solvent-Free with long pot life
- Non-Sag at thicknesses up to 30-35 mils
- High Gloss
- Conventional 2 to 1 ratio by volume (1:0.37 by weight)
- Non-blushing and non-water spotting
- Non-corrosive and Non-hazardous
- Kevlar™ microfibers reinforce against brittle cracking and chipping
- Feldspar (ceramic pellets/te SOLDERS) provides extreme abrasive resistance
- Apply by brush, roller (at the upper limits of roller applicator) or sprayer

### Viscosity
- Viscosity at 72°F:
  - Part A: 25,000 cps
  - Part B: 4,500 cps
  - Mixed: 1,200 cps

### Physical Properties
- Color: Light gray, other colors in 15 gallon units
- Compressive Strength: ASTM D696, 10,000 psi
- Tensile Strength: ASTM D638, 4,000 psi
- Elongation at Break: 40%
- Abrasion Resistance
- Cs-17 Wheel, 1 lb Load: ASTM D4060, 0.10 gms loss
- Water Absorption: ASTM D570, 0.10%
- Flexural Strength: ASTM D790, 6,600 psi
- Shore D Hardness: ASTM D2240, 91
- Heat Distortion: ASTM D699, 124°F
- Temperature
- Bond Strength: Concrete, 100% concrete failure
- Film Thickness: 10-35 mils (average: 100 sq ft/gallon @ 16 mils)

## Multi-Vendor Epoxy Solutions
## Corro Coat FC 2100 Epoxy TECHNICAL DATA

### CURE SCHEDULE

<table>
<thead>
<tr>
<th>POT LIFE</th>
<th>50 gram @ 70°F</th>
<th>approx. 90+ minutes</th>
</tr>
</thead>
<tbody>
<tr>
<td>FINISH</td>
<td>50 gram @ 70°F</td>
<td>8 - 10 hours</td>
</tr>
</tbody>
</table>

### CHEMICAL RESISTANCE

<table>
<thead>
<tr>
<th>REAGENT ACIDS</th>
<th>RATING</th>
<th>REAGENT ALKALIES</th>
<th>RATING</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acetic</td>
<td>1-6%</td>
<td>Ammonium Hydroxide</td>
<td>1-6%</td>
</tr>
<tr>
<td>Chronic</td>
<td>1-6%</td>
<td>Calcium Chloride</td>
<td>All</td>
</tr>
<tr>
<td>Chloric</td>
<td>All</td>
<td>Calcium Hypochlorite</td>
<td>1-15%</td>
</tr>
<tr>
<td>Hydrochloric</td>
<td>All</td>
<td>Caustic Soda</td>
<td>2</td>
</tr>
<tr>
<td>Lactic</td>
<td>1-10%</td>
<td>Caustic Potash</td>
<td>2</td>
</tr>
<tr>
<td>Nitric</td>
<td>1-6%</td>
<td>Sodium Hydroxide</td>
<td>All</td>
</tr>
<tr>
<td>Oxalic</td>
<td>1-20%</td>
<td>Sodium Sulfate</td>
<td>1-30%</td>
</tr>
<tr>
<td>Phosphoric</td>
<td>All</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>Sulfuric</td>
<td>1-75%</td>
<td></td>
<td>2</td>
</tr>
</tbody>
</table>

2 = intermittent immersion. 8 hours with 8 hours dry time.

### SURFACE PREPARATION

Surface to be topcoated must be clean and free of oils, grease and loose contamination.

### APPLICATION

Mix Corro Coat FC 2100 epoxy base with the Corro Coat FC 2100 curing agent. Use a mechanical mixer if possible to ensure thorough mixing. The mixing ratio is 2:1 (base:curing agent) by volume or 10:37 by weight. Corro Coat FC 2100 does not require a 'stand-still' or induction time and the mixed components should be used immediately.

Pot life is approximately 55-75 minutes at 75°F, so mix only the amount of epoxy that can be easily applied within this time limit. Apply using a brush, roller (product is at the upper limits of rollability), or squeegee. This product can be thinned for improved rollability or thickened to past like viscosity.

### TEMPERATURE

Corro Coat-FC2100 may be applied in temperatures as low as 45°F (7°C) -curing will be slow, however the viscosity of the material will still be workable. Temperature will exert a considerable influence on the rate of curing. In broad terms expect each 10°F (5°C), rise or fall in temperature to half or double dry time and pot lives.

### TRANSPORT

Corro-Coat FC2100 and Novacote version is nonregulated by USDOT, IATA & IMO. Corro-Coat FC2100 HT (High Temperature) is hazardous for shipping:

UN2735, Packing Group III, Class 8, Corrosive

---

**SAFETY:** This is a hazardous material if misused. Read and understand the Material Safety Data Sheet (MSDS) before use.

**WARRANTY DISCLAIMER:** The technical data given herein has been compiled for your help and guidance and is based upon our experience and knowledge. However, as we have no control over the use to which this information is put, no warranty, express or implied is intended or given except that these goods shall be of merchantable quality and Buyer assumes all risk and liability for results obtained by the use of the materials covered in this data sheet, whether used singly or in combination with other products. We assume no responsibility whatsoever for coverage, performance or damages, including injuries resulting from use of this information or of products recommended herein. The sale and use of this product is governed by Progressive Products, Inc.'s Warranty Disclaimer and Return Policy.

**Manufactured by:**
**ERCI in RI**

**Distributed by:**
Progressive Epoxy Polymers, Inc.  
48 Wildwood Dr.  
Pittsfield, NH 03263-3406

**Tel:** 803-435-7199  
**Fax:** 803-435-7182  
**www.epoxyproducts.com**

**info@epoxyproducts.com**
SAFETY DATA SHEET: ALOCIT 28.15 STANDARD

1. IDENTIFICATION OF THE PREPARATION, SUBSTANCE AND COMPANY

Product name: Alocit 28.15 Standard Grade
Alocit Systems Limited, Milltown Street, Radcliffe, Manchester, United Kingdom, M26 1WE.
Tel: +44 (0)1612694916 Fax: +44 (0)1612696160 Email:hq@alocit.co.uk

2. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical characterization: Preparation
Bisphenol A epoxy resin containing reactive diluent

<table>
<thead>
<tr>
<th>Ingredients</th>
<th>CAS-no.</th>
<th>Hazard Symbols</th>
<th>H-phrases</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reaction product: Bisphenol A (epichlorhydrin); epoxy resin (number average molecular weight &lt;700)</td>
<td>25068-38-6</td>
<td>Xi, N</td>
<td>R36/38, R43, R51/53, R68</td>
<td>30-35 %</td>
</tr>
<tr>
<td>O-cresyl glycidyl ether</td>
<td>2210-79-9</td>
<td>Xi, N</td>
<td>R38-R43-R51/53</td>
<td>5 - 10%</td>
</tr>
</tbody>
</table>

(See full text of phrases under chapter 15)

3. HAZARDS IDENTIFICATION

Most important hazards: Irritating to eyes and skin. May cause sensitization by skin contact.

4. FIRST AID MEASURES

General: In all cases of doubt, or when symptoms persist, seek medical attention.
Information: Never give anything by mouth to an unconscious person.

Inhalation: Consult a physician if necessary.
Skin Contact: Wash off with soap and plenty of water. Do not use organic solvents.
Eye Contact: Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.
Ingestion: Drink plenty of water. Do not induce vomiting without medical advice. Consult a physician.
5. FIRE-FIGHTING MEASURES

Suitable extinguishing media: Extinguish with carbon dioxide, dry chemical, foam or waterspray

Extinguishing media which must not be used for safety reasons: Do not use water jet

Specific hazards: Do not allow material to contaminate ground water system. Disposit of rinse water in accordance with local and national regulations.

Special protective equipment for firefighters: Self-contained breathing apparatus

6. ACCIDENTAL RELEASE MEASURES

Environmental precautions: Do not contaminate surface water. If this does occur, contact authorities immediately.

Methods for cleaning up: Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust). Dispose of as special waste in compliance with local and national regulations.

7. HANDLING AND STORAGE

Handling: Avoid contact with skin, eyes and clothing. Keep away from food and drink. Wash hands and face before breaks and immediately after handling the product.

Storage: Keep container tightly closed in a dry and well-ventilated place. If stored in plastic containers, stack no more than 2 high.

8. EXPOSURE CONTROL/PERSONAL PROTECTION

Personal protective equipment:
- Respiratory protection: Provide adequate ventilation
- Hand protection: PVC or other plastic material gloves
- Eye protection: Safety glasses with side-shields
- Skin and body protection: Protective suit

9. PHYSICAL AND CHEMICAL PROPERTIES

Odour: Slight

10. STABILITY AND REACTIVITY

Stability: This product is chemically stable and generally compatible with other substances

Materials to avoid: Avoid contact with strong acids and bases and strong oxidizing agents.
11. TOXICOLOGICAL INFORMATION

Acute toxicity: \( LD_{50}/oral/rat = 5000 \text{ mg/kg} \)

Sensitization: Prolonged/repeated contact may cause skin irritation and cause defatting thus rendering the skin more susceptible to damage by other substances.

12. ECOLOGICAL INFORMATION

Degradability: Avoid subsoil penetration. Prevent product from entering drains. Do not contaminate surface water.

Waste code number: in accordance with Federal Law Gazette [BGBI.] II No. 227/1997 (determination regulation) 55903 residual epoxy, not hardened

13. DISPOSAL CONSIDERATIONS

Product: Must be incinerated, when in compliance with local regulations.

Container: Empty containers can be landfilled after thorough cleaning, when in compliance with the Environmental Protection (Duty of Care) Regulations 1991.

14. TRANSPORT INFORMATION

Road Transport

ADR/ID: Information applies to: product
GGVS: Class: 9
GGVE: Hazard no: 90
UN No: 3082
TREM-CARD: 90GM6-III
Proper shipping name: Environmentally hazardous substance, liquid, N.O.S.
Additional information Bisphenol A-epoxy Resin and 1,2-cresyl-glycidylether.

Maritime transport

UN 3082
Environmentally hazardous substance, liquid, N.O.S. (Bisphenol A-epoxy Resin mixture)
Class 9
Packing Group III
EMS F-A, S-F
Marine Pollutant: No

Air transport

UN 3082
Environmentally hazardous substance, liquid, N.O.S. (Bisphenol A-epoxy Resin mixture)
Class 9
Packing Group III

SAFETY DATA SHEET: ALOCIT 2811 STANDARD
15. REGULATORY INFORMATION

Classification according to EC directives
Contains: BISPHENOLA-EPICHLORHYDRIN (REACTION PRODUCT)
O-CRESYL GLYCIDYL ETHER

Symbol(s)

Xi - Irritant  N - Hazardous to the Environment

Classification: Labelling required
Hazard labels: Xi - Irritant  N - Hazardous to the Environment

R36/38 Irritating to eyes and skin.
R43 May cause sensitization by skin contact.
R51/53 Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
R68 Possible risk of irreversible effects.
P5 Contains epoxy constituents. See information supplied by the manufacturer.
S24/25 Avoid contact with skin and eyes.
S36/37 Wear suitable protective clothing and gloves.
S51 Use only in well ventilated areas.
S7 Use appropriate containment to avoid environmental contamination.
S60 This material and/or its container must be disposed of as hazardous waste.
S61 Avoid release to the environment. Refer to special instructions/Safety data sheets

Contains Epoxy Resin

UNNO 3082 Environmentally Hazardous Substance, Liquid, N.O.S.
(Epoxy Resin Mixture (Number average MW <= 750))

N.B. THIS MATERIAL IS NOT HAZARDOUS WHEN MIXED & CURED

16. OTHER INFORMATION

The provision of Safety Data Sheets comes under Regulation 6 of CHIP (CHIP is the recognised abbreviation for the Chemicals (Hazard Information and Packaging (Regulations). This is an addition to the Health and safety at Work Act 1974. Users of products supplied by Alasco Systems Ltd should take appropriate measures to ensure working practices are in accordance with the Control of Substances Hazardous to Health Regulations (COSHH).

All information is based on results gained from experience and tests and is believed to be accurate but is given without acceptance of liability for loss or damage attributable to reliance thereon as conditions of use lie outside our control. Users should always carry out sufficient tests to establish the suitability of any products for their intended applications. No statement shall be incorporated in any contract unless expressly agreed in writing nor construed as recommending the use of any product in conflict of any patent. All goods are supplied subject to Alasco Systems Ltd General Conditions of Sale.

SAFETY DATA SHEET: ALOCIT 28.15 STANDARD  Page 4 of 4 - Rev 04/03
ALOCIT 28.15 EPOXY COATING FINISH

STANDARD GRADE (All temps above water - underwater below 17°C/63°F)

- Outstanding adhesion, on oily surfaces & underwater
- Environmentally friendly - solvent free and no heavy metals
- Proven protection against corrosion, including ALW/C.
- An inexpensive solution to problem coating needs
- Abrasion resistant

USAGE

As a hygienic, easily cleaned finish for concrete, steel, ironwork providing a hard wearing attractive surface. For preservation of steel structures, industrial floors, cellars, bund areas, laundries, sheet pilings, locks and channels, docks, harbours, oil rigs, oil tanks, ships hulls and bilges, bridges, conduits, caverns, industrial plants for wet or oily surfaces, railway and subway tunnels, underpasses, swimming pools etc. Can also be used as self-priming coat on minimal surface prep.

- A protective coating resistant to many alkalis, some acids, oils, sewage, mechanical wear and chemical attack
- A coating that can be applied on dry, wet, or even on underwater surfaces
- A high build (200 - 400 microns/0.16 mil) per coat

TECHNICAL DETAILS

Product Description: Two component/epoxy resin based/pigmented/solvent free
Volume Solids: 100%
Mixing Ratio (by weight): 5 parts resin - 1 part hardener
Specific Gravity (mixed): 1.35
Dilution: Do not dilute
Brush/Tool Cleaner: Immediately after use. Acetone
Theoretical Coverage Rate*: @ 400gal/16 mil (Maximum WFT) = 1.35m²/mixed Kg @ 300gal/12 mil (Optimum WFT) = 1.8m²/mixed Kg @ 200gal/8 mil (Minimum WFT) = 2.7m²/mixed Kg
1 US gallon @ 25ºF/1 mil = 1600 ft²
Number of Coats: Two coats
Working Life**: @ +20°C/68°F 45/60 minutes
Drying Times: @ +20°C/68°F Touch dry 6-8 hours
Min Practical Cure Temp.***: +2°C/35°F
Resistant to: Water, sea water, oils, petroleum, some solvents, alkalis and a certain range of acids.
Flash Point: Above +200°C/+392°F
Shell Life: Maximum 1 year in original container
Storage: Moderate room temperature 15-30°C/59-86°F
Colours: White, Black, Grey - others on request - min quantity may apply
Pack Size: UK/Europe
3 KG (2.5 kilo resin/0.5 kilo hardener)
US
1 Quart, 1 Gallon, 5 Gallon (Pack includes both components)

Notes:
* Underwater application can result in reduced coverage rates.
** Working life is dependent on unit size, ambient/product temperature, mixing method and time, application speed relative to reduction in vol. of mixed product.
*** Curing will take place at lower temperatures but over an extended period.
SURFACE PREPARATION

A) NEW STEEL

All millscale to be removed by abrasive blasting, check for rogue peaks and laminations, take remedial action. Remove dust and other contaminations. A blast profile of between 50 and 100μ (2-4 mil) is the aim, based on Swedish Pictorial Standards / ISO-8501-1/SSPC/NACE. We recommend SA2 (SP4, NACE 3) as a minimum, and SA 2.5 (SP10, NACE 2) as the optimum. A secondary choice for surface preparation is mechanical abrading to remove surface contamination before coating application.

B) WEATHERED/EXPOSED/CORRODED STEEL

Our basic aim is to remove surface contamination such as corrosion deposits, marine growths, chemical compounds etc., by revealing a clean steel substrate with a surface profile of a minimum 25 microns/1 mil (50 microns/2 mil underwater), various options are:

1) Abrasive blasting, dry, in areas of low chemical contamination followed by optional high pressure water blast (15-20,000psi).
2) UHP hydroblasting (30/40,000psi) to remove all previous coatings etc and reveal original profile. Especially suitable for wet environments such as ships tanks, piers, jetties etc. Clean to an agreed standard and check soluble salts level.
3) UHP and High Pressure water blasting may sometimes be employed with added abrasive.
4) Mechanical cleaning (power) i.e. needle gunning, rotary wire brushing etc to remove oil contamination/dust etc.

Notes:

1) Stains of rust, paint or mill scale remaining on the surface do not present a problem providing minimum surface profile criteria are met.
2) Alcoa product range can be applied to both dry, wet and underwater surfaces, however whilst clean steel in saltwater is acceptable, steel heavily contaminated with salt and/or other chemicals above water is not acceptable. This type of steel requires decontamination, with chemical levels measured before and after.

C) CONCRETE

The substrate should be free from high levels of laitence, dust, oil contamination, large surface voids etc. Sometimes brush blasting (dry) or UHP hydroblasting are appropriate methods, especially for large areas, large cracks/surface voids should be repaired prior to coating.

D) NON-FERROUS METALS

Light surface abrading, remove dust etc. If there are any queries re surface preparation prior to applying the Alcoa coating system, please contact our technical dept, for further advice.

E) NON METALLIC

If possible, surface abrading, then remove dust etc if in doubt, apply a test patch before coating.

Alcoa Technical Data Sheet - 2B.15 Standard Grade - Page 2 of 3

ALCOA INTERNATIONAL - USA - PHONE WAVEFIELD COMPANY ON 610 328 9440 - UK/EUROPE - PHONE +44 (0)1362 694915

Revised 05/02
PRODUCT APPLICATION - Methods

Atmospheric: Brush & Roller
Airless spray - minimum 68:1, Tip size 21-23 thou.

Sweating, damp or underwater: Alcoit brushes - use vigorous circular motion.
Alcoit K1 underwater pump with round brush - use vigorous circular motion.

Notes:
1) Please contact our technical dept for specific details or if any doubt.
2) All equipment should be cleaned immediately after use with acetone.
3) Airless spray is not suitable for wet/damp surfaces

PRODUCT APPLICATION - COATING SYSTEMS

STEEL
Atmospheric and Underwater:
Minimum - 1 coat Alcoit 28.14 primer plus 1 coat Alcoit 28.15.
Optimum - 1 coat Alcoit 28.14 primer plus 2 coats Alcoit 28.15
OR 2 coats Alcoit 28.15

CONCRETE
Atmospheric: 1 coat Alcoit 28.95 sealer plus 1 coat Alcoit 28.15
OR 1 coat Alcoit 28.95 sealer plus 2 coats Alcoit 28.15
OR 2 coats Alcoit 28.15

Underwater: 2 coats Alcoit 28.15

Notes:
1) Use Alcoit 28.15 of different colours in a multi-coat system.
2) Alcoit 28.14 zinc primer is specially designed for application onto clean, rust-free profiled steel.
3) Alcoit 28.95 primer sealer is for application onto wet, oily, concrete etc - not underwater.

PRECAUTIONS

Always use up the entire can. Product cannot be reused after working life expires.

Always empty the entire amount of hardener into the epoxy, because the proper mixing ratio must be maintained. Containers are pre-measured with most epoxy containers oversized to allow adding and mixing of the hardener.

Never dilute Alcoit 28.15 with thinners.

Mix thoroughly by hand or with a mechanical mixer - avoid separation of mixed product. Make sure that material is mixed well around the walls and the bottom of the can before mixing with hardener.

IMPORTANT

Alcoit 28.15 must be brushed onto the surface with circular motions, using pressure on moist, wet, submerged, or oily surfaces. 2nd coat must be applied as soon as the first coat is touch dry - not later.

ALL INFORMATION IS GIVEN IN GOOD FAITH BUT WITHOUT WARRANTY

Alcoit Technical Data Sheet - 28.15 Standard Grade - Page 3 of 3

ALCOIT INTERNATIONAL - USA - PHONE WARFIELD COMPANY ON US 328 9440 - LUX/EUROPE - PHONE +44 12345 678910

Revised 08/02
CARHOLDS CO. MATERIAL SAFETY DATA SHEET

SECTION I - PRODUCT: A-788 SPLASH ZONE COMPOUND PTFB (9999MOL)

Date: 12/18/91 Replaced 11/18/99

CHEMTEC TRANSPORTATION EMERGENCY PHONE NO.: 800-424-9290

PITTSBURGH POLICE CONTROL CENTER HEALTH EMERGENCY NO.: 412-691-6669

SECTION II - HAZARDOUS INGREDIENTS EXPOSURE LIMITS

CHEMICAL NAME | (A) | (B) | (C) | (D)
--- | --- | --- | --- | ---
TALC | 14807-96-6 | 40% 2MEO/H3 | NE | NE
POLYAMIDE | 68062-29-1 | 35% NE | NE | NE
SILICA | 14808-69-7 | 30% 0.3MEO/H3 | NE | NE
TMAM PHENOL | | | | |
90-72-2 | 5% NE | NE | NE

HAZARDOUS INGREDIENTS ADDITIONAL DATA

CHEMICAL NAME | (F)
--- | ---
TALC | NOT AVAILABLE
POLYAMIDE | >2000 MG/KG ORAL, RAT
SILICA | NOT AVAILABLE
TMAM PHENOL | 2143 MG/KG ORAL

TABLE (A) CAS NUMBER (B) LESS THAN WT (C) TLV-DWA (D) STEL (E) CEILING (F)

TOXICITY DATA (LD50/Route,LC50/Route) (G) SARA 332/SARA 313/ SARA 311-312
CATEGORIES/CERCLA. NE = not established, NR = not required, NO = no. Color
Pigment mixture may contains Iron Oxides, Titanium Dioxide, Carbon Black,
and other particulates not otherwise regulated in varying amounts depending
on color of product.

WHMIS CLASSIFICATION: DSA -- DSB

NMIS/NFPA CLASSIFICATION: HEALTH 3, FLAMMABILITY 1, REACTIVITY 1,
PERSONAL PROTECTION CODE G, NFPA FIRE FIGHTING PHASE 4

SECTION III - PHYSICAL DATA:

BOILING RANGE: N/A. VAPOR DENSITY: N/A EVAPORATION RATE: N/A VOLATILE BY
WEIGHT 0 %, VOLATILE BY VOLUME: 0 %, PRODUCT WT/GAL: 13.7 LBS/U.S. GAL.
1.64 sp. gr.

SECTION IV - FIRE AND EXPLOSION HAZARD DATA:

FLAMMABILITY CLASSIFICATION: FLASH POINT: 201 F(3sc) (Setaflash) LEL: N/A
UBL: N/A.

OSHA-COMPARABLE LIQUID/OSHA/CLASS/IIIB, DOT-PAINT, NOT REGULATED, CANADIAN
TDGA: NOT REGULATED

EXTINGUISHING MEDIA: Dry Chemical, Foam, Carbon Dioxide, Water Fog.

FIRE AND EXPLOSION HAZARDS: Vapors are heavier than air and will accumulate.
Vapors will form explosive concentrations with air. Vapors travel long
distances and will flash back. Use mechanical ventilation when necessary to
keep pent per cent vapor below the "Lower Explosion Level" (LEL). Eliminate all
ignition sources. Keep away from sparks, open flames and heat sources. All
electric equipment and installations should be made and grounded in
accordance with the National Electrical Codes. In areas where explosion
hazards exist, workers should be required to use nonferrous tools and to wear conductive and non-sparking shoes.

SPECIAL FIRE FIGHTING PROCEDURES: Evaluate hazard area of unprotected personnel. Use a body protection. Cool surrounding containers with water in case of fire exposure.

SECTION V - HEALTH HAZARD DATA:

INHALATION: May cause nose and throat irritation. May cause lung irritation. May cause allergic respiratory reaction, effects may be permanent.

CONTACT: May cause eye burns. May be harmful if absorbed through the skin. May cause skin burns. May cause allergic skin reaction.

NOTICE: Contains SILICA which can cause cancer. Risk of cancer depends on duration and level of exposure.

MEDICAL CONDITIONS AFFECTED:amine, epoxies or polyurethanes membrane condition exists.

PRIMARY ROUTE(S) OF ENTRY: Inhalation, Dermal, Ingestion.

EMERGENCY FIRST AID PROCEDURES: When exposed always get medical attention.

EYE CONTACT: Flush with water for 15 minutes.

SKIN CONTACT: Wash with soap and water. Remove contaminated clothing and clean before reuse.

INHALATION: Remove to fresh air. Provide oxygen if breathing is difficult. Use artificial respiration if not breathing. Get medical attention. IF SWALLOWED: Do NOT induce vomiting!! Always get medical attention.

SECTION VI - REACTIVITY DATA:

STABILITY: This product is stable under normal storage conditions.

HAZARDOUS DECOMPOSITION PRODUCTS: Carbon monoxide, nitrogen oxides, and unidentified organic compounds. Consider all smoke and fumes from burning material as very hazardous. Welding, cutting or abrasive grinding can create oxygen and fumes. Do not breathe any fumes or smoke from these operations.

CONDITIONS TO AVOID: Heat, sparks, and open flames.

INCOMPATIBILITY: Avoid contact with strong oxidizing agents.

SECTION VII - SPILL OR LEAK PROCEDURES:

STEPS TO BE TAKEN IN CASE OF SPILL: Eliminate all ignition sources. Handling equipment must be grounded to prevent sparking. Evacuate the area of unprotected personnel. Wear appropriate personal protection clothing and equipment. Follow safe handling and use guidelines in Section VIII. Contain and soak up residual with an absorbent (clay or sand). Take up absorbent material and seal tightly for proper disposal. Dispose of in accordance with local, state and federal regulations. Refer to Section II for Sara Title III and CERCLA information.
SECTION VIII - SAFE HANDLING AND USE INFORMATION:

RESPIRATORY PROTECTION: Use only with ventilation to keep levels below exposure guidelines. (Section II). User should test and monitor exposure levels to ensure all personnel are below guidelines. If not sure, or not able to monitor, use NIOSH/MSHA approved supplied air respirator. Follow all current OSHA requirements for respirator use.

VENTILATION: Use explosion-proof ventilation when required to keep below health exposure guidelines and Lower Explosion Limit (LEL).

SKIN AND EYE PROTECTION: Recommend impervious gloves, clothing and safety glasses with side shields or chemical goggles to avoid skin and eye contact. If material penetrates to skin, change gloves and clothing. Hypersensitive persons should wear gloves or use protective cream.

HYGIENIC PRACTICES: Wash with soap and water before eating, drinking, applying cosmetics, or using toilet facilities. Use of a hand cleaner is recommended. Launder contaminated clothing before reuse. Leather shoes can absorb and pass through hazardous materials. Check shoes carefully after soaking before reuse.

APPLICATION: Use only in accordance with Carboline application instructions, container label and Product Data Sheet.

SECTION IX - SPECIAL PRECAUTIONS:

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE: Keep away from heat, sparks, open flame, and strong oxidizing agents. Keep containers closed. Store in cool, dry place with adequate ventilation. If pouring or transferring materials, ground all containers and tools.

OTHER PRECAUTIONS: Do not weld, heat, cut or drill on full or empty containers.

The information contained herein is, to the best of our knowledge and belief accurate. However, since the conditions of handling and use are beyond our control, we make no guarantee of results, and assume no liability for damages incurred by use of this material. It is the responsibility of the user to comply with all applicable federal, state, and local laws and regulations.

Carboline Company 350 Hanley Rd. St. Louis, MO 63144
PHONE NO. 314-644-1000 FOR INDUSTRIAL USE ONLY
CARBOLINE CO. MATERIAL SAFETY DATA SHEET
PRODUCT: X-766 SLASH ZONE COMPOUND PTF
Date: 12/18/01 Replaces 11/19/99

SPECIFIC STATE REGULATORY INFORMATION

NEW JERSEY
PENNSYLVANIA
Non-Hazardous Materials above 1 Percent:
Name      CAS      Put
----------  --------  ------

No materials meet this criteria

CALIFORNIA

WARNING: This product contains a chemical(s)
known to the State of California to cause
cancer, and birth defects or other reproductive harm.
SECTION I - PRODUCT: A-788 SPLASH ZONE COMPOUND PTA  (9696ASNL)

Date: 12/18/91  Replaces 11/18/99
( aka A-788 SPLASH ZONE MASTIC PT A )

PITTSBURGH PAINT CONTROL CENTER HEALTH EMERGENCY NO.: 412-681-6669

SECTION II - HAZARDOUS INGREDIENTS  EXPOSURE LIMITS

<table>
<thead>
<tr>
<th>CHEMICAL NAME</th>
<th>(A)</th>
<th>(B)</th>
<th>(C)</th>
<th>(D)</th>
<th>(E)</th>
</tr>
</thead>
<tbody>
<tr>
<td>EPOXY RESIN</td>
<td>25068-38-6</td>
<td>45% NE</td>
<td>NE</td>
<td>NE</td>
<td>NE</td>
</tr>
<tr>
<td>TALC</td>
<td>14807-86-6</td>
<td>35% 2MOS/M3</td>
<td>NE</td>
<td>NE</td>
<td>NE</td>
</tr>
<tr>
<td>SILICA</td>
<td>14880-60-7</td>
<td>25% 0.3MOS/M3</td>
<td>NE</td>
<td>NE</td>
<td>NE</td>
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<tr>
<td>COLOR PIGMENT</td>
<td>Mixture</td>
<td>5% 1.5MOS/M3</td>
<td>NE</td>
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<td>NE</td>
</tr>
</tbody>
</table>

TABLE (A) CAS NUMBER  (B) LESS THAN WT  (C) TLV-TWA  (D) STEL  (E) CEILING

<table>
<thead>
<tr>
<th>TOXICITY DATA (LD50)</th>
<th>Route</th>
<th>LC50/Route</th>
<th>STEL</th>
<th>CEILING</th>
</tr>
</thead>
<tbody>
<tr>
<td>NE = not established, NR = not required, ND = no. Color Pigment Mixture may contain Iron Oxides, Titanium Dioxide, Carbon Black, and other particulates not otherwise regulated in varying amounts depending on color of product.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

WHMIS CLASSIFICATION: D2A -- D2B

MSDS/INFP CLASSIFICATION: HEALTH 2, FLAMMABILITY 1, REACTIVITY 0, PROTECTION CODE B, INFP FIRE FIGHTING PHASE 4

SECTION III - PHYSICAL DATA:

<table>
<thead>
<tr>
<th>PROPERTIES</th>
<th>VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>DENSITY</td>
<td>N/A</td>
</tr>
<tr>
<td>EVAPORATION RATE</td>
<td>N/A</td>
</tr>
<tr>
<td>VOLATILE BY WEIGHT</td>
<td>0 %</td>
</tr>
<tr>
<td>VOLATILE BY VOLUME</td>
<td>0 %</td>
</tr>
<tr>
<td>PRODUCT WT/GAL</td>
<td>24.8 lbs/U.S.Gal</td>
</tr>
<tr>
<td>1.78 sp gr.</td>
<td></td>
</tr>
</tbody>
</table>

SECTION IV - FIRE AND EXPLOSION HAZARD DATA:

<table>
<thead>
<tr>
<th>PROPERTY</th>
<th>VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>FLASH POINT</td>
<td>221 F(63C) (Geflash)</td>
</tr>
<tr>
<td>UEL</td>
<td>N/A</td>
</tr>
<tr>
<td>OSHA-COMPATIBLE LIMIT/OSHA/CLASS/ITLB</td>
<td>DOT/PAINT, NOT REGULATED, CANADIAN TDATA, NOT REGULATED</td>
</tr>
</tbody>
</table>

EXTINGUISHING MEDIA: Dry Chemical, Foam, Carbon Dioxide, Water Fog.

HAZARDS: Vapors are heavier than air and will accumulate. Vapors will form explosive concentrations with air. Vapors travel long distances and will flashback. Use mechanical ventilation when necessary to keep percent vapor below the "Lower Explosion Level" (LEL). Eliminate all ignition sources. Keep away from sparks, open flames and heat sources. All electrical equipment and installations should be made and grounded in
CAROLINE CO. MATERIAL SAFETY DATA SHEET

PRODUCT: A-788 SPLASH ZONE COMPOUND PTF
(0969ASNL)

Date: 12/28/91 Updated 11/18/99

ACCORDING with the National Electrical Code. In areas where explosion hazards exist, workers should be required to use nonferrous tools and to wear conductive and non-sparking shoes.

SPECIAL FIRE FIGHTING PROCEDURES: Evacuate hazard area of unprotected personnel. Use a HIGH approved self-contained breathing unit and complete body protection. Cool surrounding containers with water in case of fire exposure.

SECTION V - HEALTH HAZARD DATA:

INHALATION: May cause nose and throat irritation.

CONTACT: May cause eye irritation. May cause skin irritation. May cause allergic skin reaction.

NOTICE: Contains SILICA which can cause cancer. Risk of cancer depends on duration and level of exposure.

MEDICAL CONDITIONS EXACERBATED BY EXPOSURE: If sensitized to amines, epoxies or other chemicals do not use. See a physician if a medical condition exists.

PRIMARY ROUTE(S) OF ENTRY: Inhalation, Dermal, Ingestion.

EMERGENCY FIRST AID PROCEDURES: When exposed always get medical attention.

EYE CONTACT: Flush with water for 15 minutes.

SKIN CONTACT: Wash with soap and water. Remove contaminated clothing and clean before reuse.

INHALATION: Remove to fresh air. Provide oxygen if breathing is difficult. Use artificial respiration if not breathing. Get medical attention.

IF SWALLOWED: DO NOT INDUCE VOMITING! Always get medical attention.

SECTION VI - REACTIVITY DATA:

STABILITY: This product is stable under normal storage conditions.

HAZARDOUS POLYMORPHIZATION: Will not occur under normal conditions.

HAZARDOUS DECOMPOSITION PRODUCTS: Carbon monoxide, nitrogen oxides, and unidentified organic compounds. Consider all smoke and fumes from burning material as very hazardous. Welding, cutting or abrasive grinding can create smoke and fumes. Do not breathe any fumes or smoke from these operations.

CONDITIONS TO AVOID: Heat, sparks, and open flames.

INCOMPATIBILITY: Avoid contact with strong oxidizing agents.

SECTION VII - SPILL OR LEAK PROCEDURES:

STEPS TO BE TAKEN IN CASE OF SPILL: Eliminate all ignition sources. Handling equipment must be grounded to prevent sparking. Evacuate the area of unprotected personnel. Wear appropriate personal protection clothing and equipment. Follow safe handling and use guidelines in section VIII. Contain and soak up residual with an absorbent (clay or sand). Take up absorbent material and seal tightly for proper disposal. Dispose of in accordance with local, state and federal regulations. Refer to Section II for SARA Title III and CERCLA information.
SECTION VIII - SAFE HANDLING AND USE INFORMATION:

RESPIRATORY PROTECTION: Use only with ventilation to keep levels below exposure guidelines. (Section II). User should test and monitor exposure levels to ensure all personnel are below guidelines. If not sure, or not able to monitor, use MSHA/NIOSH approved supplied air respirator. Follow all current OSHA requirements for respirator use.

VENTILATION: Use explosion-proof ventilation when required to keep below health exposure guidelines and Lower Explosion Limit (LEL).

SKIN AND EYE PROTECTION: Recommend impervious gloves, clothing and safety glasses with side shields or chemical goggles to avoid skin and eye contact. If material penetrates to skin, change gloves and clothing. Hypersensitive persons should wear gloves or use protective cream.

HYGIENIC PRACTICES: Wash with soap and water before eating, drinking, applying cosmetics, or using rest facilities. Use of a hand cleanser is recommended. Launder contaminated clothing before reuse. Leather shoes can absorb and pass through hazardous materials. Check shoes carefully after soaking before use.

APPLICATION: Use only in accordance with Carboline application instructions, container label and Product Data Sheet.

SECTION IX - SPECIAL PRECAUTIONS:

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE: Keep away from heat, sparks, open flame, and strong oxidizing agents. Keep containers closed. Store in cool, dry place with adequate ventilation. If pouring or transferring materials, ground all containers and tools.

OTHER PRECAUTIONS: Do not weld, heat, cut or drill on full or empty containers.

The information contained herein is, to the best of our knowledge and belief accurate. However, since the conditions of handling and use are beyond our control, we make no guarantee of results, and assume no liability for damages incurred by use of this material. It is the responsibility of the user to comply with all applicable federal, state, and local laws and regulations.

Carboline Company
330 Hanley Ind. Ct. St. Louis, MO 63144
PHONE NO. 314-444-9000 FOR INDUSTRIAL USE ONLY
CARBOLINE CO. MATERIAL SAFETY DATA SHEET
PRODUCT: A-788 SPLASH ZONE COMPOUND ZZA
Date: 12/18/01 Replaces 11/18/99

SPECIFIC STATE REGULATORY INFORMATION

NEW JERSEY

Non-Hazardous Materials above 1 Percent:
Name       CAS     Pct

No materials meet this criteria

NEW YORK

No materials meet this criteria

CALIFORNIA

WARNING: This product contains a chemical(s) known to the State of California to cause cancer, and birth defects or other reproductive harm.
Selection & Specification Data

Generic Type: Epoxy Polyamide

Description: Solvent-free, priming compound used for repairing sites, cracks, and voids in steel, concrete, wood, and other surfaces. Has the unique ability to be mixed, applied, and cured underwater.

Features:
- Designed for underwater and other wet applications.
- Can be applied up to 2" in thickness.
- Self-priming on most surfaces and over most parent types of coatings.
- Rapid cure characteristics.
- VOC compliant to current AIMG regulations.

Color: Olive Green

Finish: Flat

Primers: Self-priming

Topcoats: Epoxies, Polyurethanes if required

Dry Film Thickness:
- 1/8" - 2" (3.1-50 mm) for most applications.
- 1/4" (6.4 mm) as practical maximum thickness for vertical and overhead applications.

Solids Content: By Volume.
- 99% ± 1%

Theoretical Coverage Rate:
- 1604 ml ft² (24.5 L/m²) at 20 microns.

VOC Values:
- As supplied: 0.30 lb/gal (0 g/L)
- These are nominal values.

Dry Temp. Resistance:
- Continuous: 200°F (93°C)
- Non-Continuous: 250°F (121°C)

Substrates & Surface Preparation

General:
- Remove all oil or grease from the surface with Carboguard Surface Cleaner 3 in accordance with B/0PC/0H.
- Remove all dirt, loose paint, spalling concrete, rotted wood, marine growth and other contaminants by abrasive blasting at high pressure water blast. The abrasive blasting can be done underwater. The initial blast will clear a path through the water for the abrasive/water mixture.
- When working at the splash zone or in water, coat cleaned metal surfaces as fast as possible to minimize new corrosion.

February 2000 replaces November 1999

To the best of our knowledge the technical data presented herein is true and accurate as the date of publication and is subject to change without prior notice. User must ensure that Composite Coatings are used in accordance with and subject to the requirements of Section 8 (Conformance), also in accordance with the guidance in Section 7 (Selection) and Sections 9 (Use) and 10 (Maintenance) of the current edition of the instructions for use. Liability, if any, is limited to replacement of products. NO OTHER WARRANTY OR REMEDY IS GRANTED. FOR MORE INFORMATION WRITE TO CARGILL.
Carboguard® A-788

Application Equipment

General

Apply by hand, brush, or broad knife. Spread material uniformly onto the surface. It is a 1/8" to 1/4" (3.2 to 6.4 mm) thick layer using enough pressure to displace water and air bubbles. Smooth out the area by rolling or "rubbing off" the excess. When starting another coat, allow spreading and dry away from the previous applied coat. This will help prevent trapped air bubbles or leaving a film uncoated.

If applying to dry surfaces in dry air, apply sufficiently wet hands or brush with water to keep the product from sticking.

When used as a patch or joint, form the material into the joint and press it into place. For larger areas you can use a heavier pressure than K (17.7 mm). Use a tool or applicator plate for added support. Apply A-788 to the substrate, then smooth with a support plate (cut larger than the patch) and apply A-788 over it.

When applied in-situ or when wetted with water during application the surface of A-788 will form a semitransparent primer "lacquer" layer. This layer is normal and facilitates application. The film under the "primer" layer remains uncoated and will cure properly. The "primer" layer will cure and become part of the finish when 4.5/s is cured above water; however, the layer will remain soft and uncoated when the A-788 is kept underwater under curing.

Mixing & Thinning

Mix in a Part A to one Part B by volume. Mix by hand for 1 minute or more, then "rub out" the same quantity of the A-component from the can into the calm, and stir the mixture for 1 minute. Add water to make a uniform flowable, green color. Apply this mixture immediately after mixing to avoid air entrainment. Fill in the groove, using the gloved hands and the margin of wet water holding the applicator plate. Apply the mixture to the surface using the applicator plate.

Thinning

Not recommended. Use of thinned or other than these called or recommended by Somay may adversely affect material performance and product warranty, whether expressed or implied.

Pan Life

Working time at 77°F (25°C), Below and above limits:
Softened mix: 45 minutes
Grouted mix: 15 minutes
Working times are reduced by one-half at temperatures below 60°F (20°C).

Do not use more material than can be applied in the working time limit. The material mix will appear to the wettable after the time limit is exceeded, but it will not properly adhere to the substrates after spotting and curing.

Cleanup & Safety

Clean-Up

Use 82% Thinner Aceone.

Safety

Read and follow all caution statements on the product data sheet and on the MSDS for this product. Safety goggles, rubber gloves, and other protective clothing should be worn when handling the material. Some products may be harmful to the eyes and respiratory system. When using the product or any other similar products, use all necessary precautions to protect the applicator. Use of a mask or, if possible, a respirator is recommended. This product should be kept in a cool, dry area. Do not dispose of product in the usual manner. Do not dispose of carboguard in solution.

February 1999 replaces November 1999

APPENDIX

Application Conditions

<table>
<thead>
<tr>
<th>Condition</th>
<th>Material</th>
<th>Surface</th>
<th>Ambient</th>
<th>Materiality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>90°F(32°C)</td>
<td>90°F (32°C)</td>
<td>90°F (32°C)</td>
<td>90°F (32°C)</td>
</tr>
<tr>
<td>Minimum</td>
<td>70°F (21°C)</td>
<td>70°F (21°C)</td>
<td>70°F (21°C)</td>
<td>70°F (21°C)</td>
</tr>
<tr>
<td>Maximum</td>
<td>100°F (38°C)</td>
<td>100°F (38°C)</td>
<td>100°F (38°C)</td>
<td>100°F (38°C)</td>
</tr>
</tbody>
</table>

Special application techniques may be required above or below normal application conditions. Do not apply or store in additive or additive water (pH less than 8 or greater than 10) or in solution containing additives.

Curing Schedule

<table>
<thead>
<tr>
<th>Surface</th>
<th>Temp. &amp; Amp.</th>
<th>Dry to Touch</th>
<th>Dry to Handle</th>
<th>Maximum</th>
<th>Reaction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mip 1in. (25mm)</td>
<td>1 hour</td>
<td>1 hour</td>
<td>24 hours</td>
<td>24 hours</td>
<td>24 hours</td>
</tr>
<tr>
<td>Mip 2in. (50mm)</td>
<td>2 hours</td>
<td>2 hours</td>
<td>48 hours</td>
<td>48 hours</td>
<td>48 hours</td>
</tr>
<tr>
<td>Mip 3in. (75mm)</td>
<td>3 hours</td>
<td>3 hours</td>
<td>72 hours</td>
<td>72 hours</td>
<td>72 hours</td>
</tr>
<tr>
<td>Mip 6in. (150mm)</td>
<td>6 hours</td>
<td>6 hours</td>
<td>120 hours</td>
<td>120 hours</td>
<td>120 hours</td>
</tr>
</tbody>
</table>

These times are based on a 70°F (21°C), 100% Relative Humidity. Higher humidity or colder temperatures will require longer cure times. If the maximum cure times have been exceeded, the surface must be sanded by overblasting or sending to produce a rough surface and to remove the "lacquer" layer. Delay the application of any finish coatings.

Packaging, Handling & Storage

Shipping Weight (Approximate)

| 6 Gal. Sx | 10 Gal. Sx | 20 Gal. Sx |
| 15 lb (6.8 kg) | 25 lb (11.3 kg) | 50 lb (22.7 kg) |

Flash Point (Still Flash)

| Part A | Part B |
| 200°F (93°C) | 200°F (93°C) |

Storage Temperature

4°F to 70°F (2°C to 21°C)

Shelf Life

90% Relative Humidity

24 months at 77°F (25°C)

SOMAY PRODUCTS, INC.

4301 N.W. 35th Avenue

Miami, FL 33142-4382

Tel.: (305) 635-6335

Fax: (305) 635-5524

SOMAY SINCE 1926

PAGE 83
1. IDENTIFICATION OF PREPARATION & OF COMPANY

- **Product:** Epoxy Resin.
- **Manufacturer:** Chemco International Ltd
  East Sheenhead Industrial Estate
  Coatbridge. ML3 4XD
  Scotland
- **Telephone No:** +44 (0) 1236 806060
- **Email:** sales@chemcoint.com
- **Web Site:** www.chemcoint.com

2. COMPOSITION INFORMATION ON INGREDIENTS

   Blend of epoxy resin and reactive diluents.

<table>
<thead>
<tr>
<th>Chemicals</th>
<th>Classification</th>
<th>Risk phrases</th>
</tr>
</thead>
<tbody>
<tr>
<td>diophenol A</td>
<td>X, N</td>
<td>R36/38-43-51/53</td>
</tr>
<tr>
<td>diophenol F</td>
<td>X, N</td>
<td>R39/38-43-51/53</td>
</tr>
<tr>
<td>Aliphatic diglycidylether</td>
<td>X</td>
<td>R36/38-43</td>
</tr>
</tbody>
</table>

   The remaining 30% of the composition is a blend of proprietary, non-hazardous chemicals that are trade secrets.

3. HAZARDS IDENTIFICATION

   - **Irritating to eyes and skin.** May cause sensitisation by skin contact.
   - **Toxic to aquatic organisms,** may cause long term adverse effects in the aquatic environment.

4. FIRST AID MEASURES

   - **Inhalation:** Remove to fresh air if effects occur. Seek medical attention. The decision of whether to induce vomiting or not should be made by an attending physician.
   - **Eye:** Irrigate with flowing water immediately and continually for 15 minutes. Consult medical personnel.
   - **Skin:** Immediately flush with flowing water for at least 15 minutes while removing contaminated clothing. Removes residues with soap and water. Seek medical attention if irritation persists.

5. FIRE-FIGHTING MEASURES

   - **Extinguishing media:** Carbon dioxide, dry chemical powder, alcohol foam.
   - **Hazardous combustion products:** Under conditions for incomplete combustion or pyrolysis, phenolics and carbon oxides may evolve. The thermal decomposition products therefore should be treated as potentially hazardous substances and appropriate.
   - **Non-flammable product:** Non-flammable.
   - **Special fire-fighting protection:** Wear positive pressure self-contained breathing apparatus and protective fire fighting clothing (includes fire-fighting helmet, coat, pants, boots and gloves).
6. ACCIDENTAL RELEASE MEASURES

Personal precautions: Wear adequate personal protective equipment.
Environmental precautions: Prevent from entering soil, waterways and groundwater. Flushings and wash waters must be confined and prevented from entering into soil, waterways and ground water. Contain large spills with a dike.
Methods for cleaning up: Soak up with absorbent material such as sand and collect in suitable, labelled containers. Solvents are not recommended for clean up unless the recommended exposure guidelines and safe handling procedures for the specific solvent is followed. Residual product may be removed using steam or hot soapy water.

7. HANDLING & STORAGE

Handling: Practice care and caution to avoid skin and eye contact. Avoid breathing vapours of heated material.
Storage: Store in a cool, dry ventilated storage and in closed containers. Keep away from oxidisers, heat or flames.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering controls: Adequate ventilation should be sufficient for most conditions. Local exhaust ventilation may be necessary for some operations.
Exposure controls: Not established.
Respiratory protection: Normally not required. If respiratory irritation is experienced, use an approved air purifying respirator. In many atmospheres, use an approved dust respirator.
Eye protection: Chemical safety glasses, splash-proof eye goggles with a full face shield. Contact lenses should not be worn.
Skin protection: Use protective clothing impervious to this material. Selection of specific items will depend on operation. Use impervious gloves when prolonged or frequent contact could occur. Remove contaminated clothing no later than at the end of the work period and launder before reuse.
Hand protection: Nitrile rubber gloves or butyl rubber gloves, gruntlet type.

9. PHYSICAL & CHEMICAL PROPERTIES

Physical state: Liquid.
Colour: Pale yellow.
Odour: None.
Specific gravity: 1.33 – 1.51 g/cm³ @ 25°C
pH: Not applicable.
Boiling point: Decomposes prior to boiling.
Flash point: 200°C (DIN 51758)
Water solubility: > 1% wt (25°C)
Viscosity: 25 – 47 Pasa @ 25°C
10. **STABILITY & REACTIVITY**

    Chemical stability: Stable under normal storage conditions.
    Materials to avoid: Acids, amines, bases and oxidising agents.
    Conditions to avoid: Excessive heating over long periods of time degrades the product (causes discoloration).
    Hazardous polymerisation: Will not occur by itself, but masses of more than 0.5kg of product, plus an aliphatic amine will cause irreversible polymerisation with considerable heat build up.

11. **TOXICOLOGICAL INFORMATION**

    **Acute toxicity**
    **Ingestion:** Single dose oral toxicity is low. Small amounts swallowed incidentally to normal handling operations are not likely to cause injury.
    **Skin contact:** Oral LD50 (rats) = > 2,000mg/kg
    **Inhalation:** Single prolonged exposure is not likely to result in material being absorbed through the skin in harmful amounts.
    **Irritation:** At room temperature, exposures to vapours may generate vapour levels sufficient to cause adverse effects.
    **Sensitisation:** Skin - Prolonged or repeated exposure may cause slight skin irritation.
    **Eyes:** May cause eye irritation (temporary corneal injury).
     Has caused allergic skin reactions in humans.

12. **ECOLOGICAL INFORMATION**

    **Mobility and bioaccumulation potential:** Partitioning from water to octanol is not applicable.
    **Degradation:** Below detectable limits under aerobic conditions.
    **Aquatic toxicity:** LC50 (fathead minnow - pimephales promelas) = 3.3mg/l

13. **DISPOSAL CONSIDERATIONS**

    **Product:** Recommended procedure for disposing of waste products is burning under carefully controlled conditions. Burn in adequate incinerator or bury in an approved landfill site.
    **Contaminated packaging:** Empty container disposed of as hazardous waste unless all remaining product adhering to container wall has been removed. Washings must be disposed of safely in accordance with local regulations.
14. TRANSPORT INFORMATION

Proper shipping name: Environmentally hazardous substance, liquid, n.o.s. (Epispher A - epoxy resin)

ADR/RID Class: 9
ADR/RID Item No: 11c
UN No: 3092

Trem Card: 90001

Sea
IMDG Class: 9
UN No: 3092
Packing Group: III

Air
IATA/ICAO: DGR
UN No: 3092
Packing Group: III

Packing Instruction (Pass & Cargo): 914

15. REGULATORY INFORMATION

Chemical name: Contains hexamethyldiglycol ether, epoxy resin.

Labelling: According to Chemical Hazard Information and Packaging for Supply (DGP) legislation.

Symbols: (K) Irritant

Risk phrases: R36/38, irritates eyes and skin.
R43, May cause sensitisation by skin contact.
R51/53, Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Safety phrases: Please note that in the final cured film, the product is non-hazardous and does not affect aquatic organisms.
828, After contact with skin, wash immediately with plenty of water.
837/39, Wear suitable gloves and eye/face protection.

16. OTHER INFORMATION

The information contained in this data sheet is based on present state of knowledge and current national legislation, it provides guidance on health, safety and environmental aspects of the product and should not be construed as any guarantee of technical performance or suitability for the particular applications.
1. IDENTIFICATION OF PREPARATION & OF COMPANY

Product: Epoxy Resin
Manufacturer: Chemco International Ltd
East Showcard Industrial Estate
Catterton ML8 4XD
Scotland
Telephone No: +44 (0) 1236-500060
Email: sales@chemcointl.com
Web Site: www.chemcointl.com

2. COMPOSITION INFORMATION ON INGREDIENTS

Blend of epoxy resin and reactive diluents.

<table>
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<tr>
<th>Chemicals</th>
<th>Classification</th>
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<tbody>
<tr>
<td>Bisphenol A</td>
<td>XL N</td>
<td>R50/58-43-61/53</td>
</tr>
<tr>
<td>Bisphenol F</td>
<td>XL N</td>
<td>R50/58-43-61/53</td>
</tr>
<tr>
<td>Aliphatic diglycidylether</td>
<td>XI</td>
<td>R50/58-43</td>
</tr>
</tbody>
</table>

The remaining 30% of the composition is a blend of proprietary, non-hazardous chemicals that are trade secret.

3. HAZARDS IDENTIFICATION

Inhaling: May cause sensitisation by skin contact.
Toxic to aquatic organisms, may cause long term adverse effects in the aquatic environment.

4. FIRST AID MEASURES

Inhalation: Remove to fresh air if effects occur. Seek medical attention.
Ingestion: The decision of whether to induce vomiting or not should be made by an attending physician.
Eyes: Irrigate with flowing water immediately and continuously for 15 minutes. Consult medical personnel.
Skin: Immediately flush with flowing water for at least 15 minutes while removing contaminated clothing. Removes residues with soap and water. Seek medical attention if irritation persists.

5. FIRE-FIGHTING MEASURES

Extinguishing media: Carbon dioxide, dry chemical powder, alcohol foam.
Hazardous combustion products: Under conditions for incomplete combustion or pyrolysis, phenolics and carbon oxides may evolve. The thermal decomposition products therefore should be treated as
Specific fire or explosion hazards: Potentially hazardous substances and appropriate.
Special fire-fighting protection: Non-flammable product.

6. ACCIDENTAL RELEASE MEASURES
Personal precautions: Wear adequate personal protective equipment.
Environmental precautions: Prevent rain entering soil, waterways and groundwater. Surfaces and wash waters must be confined and prevented from entering into soil, waterways and ground water. Contain large spills with a dike.
Methods for cleaning up: Suck up with absorbent material such as sand and collect in suitable, labelled containers. Solvents are not recommended for clean up unless the recommended exposure guidelines and safe handling procedures for the specific solvent is followed. Residual product may be removed using steam or hot soapy water.

7. HANDLING & STORAGE
Handling: Practice care and caution to avoid skin and eye contact. Avoid breathing vapours of heated material.
Storage: Store in a cool, dry, ventilated storage and in closed containers. Keep away from oxidisers, heat or flames.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION
Engineering controls: Adequate ventilation should be sufficient for most conditions. Local exhaust ventilation may be necessary for some operations.
Exposure controls: Not established.
Respiratory protection: Normally not required. If respiratory irritation is experienced, use an approved air purifying respirator in clean atmospheres, use an approved mist respirator.
Eye protection: Chemical safety glasses, splash-proof eye goggles with a full face shield. Contact lenses should not be worn.
Skin protection: Use protective clothing impervious to the material. Selection of specific items will depend on operation. Use impervious gloves when prolonged or frequent contact could occur. Remove contaminated clothing no later than at the end of the work period and launder before reuse.
Hand protection: Nitrile rubber gloves or butyl rubber gloves, gauntlet type.

9. PHYSICAL & CHEMICAL PROPERTIES
Physical state: Liquid.
Colour: Pale yellow.
Odour: None.
10. STABILITY & REACTIVITY

Chemical stability: Stable under normal storage conditions.
Materials to avoid: Acids, amines, bases and oxidizing agents.
Conditions to avoid: Excessive heating over long periods of time degrades the product (causes discoloration).
Hazardous polymerisation: Will not occur by itself, but masses of more than 0.5kg of product, plus an aliphatic amine will cause irreversible polymerisation with considerable heat build up.

11. TOXICOLOGICAL INFORMATION

Acute toxicity
Ingestion: Single dose oral toxicity is low. Small amounts swallowed incidental to normal handling operations are not likely to cause injury.
Skin contact: Oral LD50 (rats) = > 2,000mg/kg
Inhalation: Single prolonged exposure is not likely to result in material being absorbed through the skin in harmful amounts.
Inhalation: At room temperature, exposures to vapours may generate vapour levels sufficient to cause adverse effects.
Irritation: Skin - Prolonged or repeated exposure may cause slight skin irritation. Eyes - May cause eye irritation (temporary corneal injury).
Sensitisation: Has caused allergic skin reactions in humans.

12. ECOLOGICAL INFORMATION

Mobility and bioaccumulation potential: Partitioning from water to octanol is not applicable.
Degradation: Below detectable limits under aerobic conditions.
Aquatic toxicity: LC50 (fathead minnow - phox phox) = 3.1mg/l

13. DISPOSAL CONSIDERATIONS

Product: Recommended procedure for disposing of waste products is burning under carefully controlled conditions. Burn in an adequate incinerator or bury in an approved landfill site.
Contaminated packaging: Empty container disposed of as hazardous waste unless all remaining product adhering to container wall has been removed. Washings must be disposed of safely in accordance with local regulations.
14. TRANSPORT INFORMATION

Proper shipping name: Environmentally hazardous substance, liquid, n.o.s. (Bisphenol A - epoxy resin)

Road/rail
ADR/RID Class: 9
Hazard No: 90
UN No: 3082

Sea
IMDG Class: 9
UN No: 3082

Air
IATA/ICAO: DGR
UN No: 3082

Packing Instruction (Pack & Cargo): 914

ADR/RID Item No: 11c
Trem Card: 90G01
Packing Group: III
Class: 9
Packing Group: III
Packing Instruction (Cargo): 914

15. REGULATORY INFORMATION

Chemical name: Contains hexaneadi diglycidyl ether, epoxy resin.
Labelling: According to Chemical Hazard Information and Packaging for Supply (CHIP) legislation.
Symbols: (X) Irritant.
Risk phrases: (H) Dangerous for the environment.
R36/38, irritating to eyes and skin.
R43, May cause sensitisation by skin contact.
R61/53, Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
Please note that in the final cured film, the product is non-hazardous and does not affect aquatic organisms.
S28, After contact with skin, wash immediately with plenty of water.
S37/39, Wear suitable gloves and eye/face protection.

16. OTHER INFORMATION

The information contained in this data sheet is based on present state of knowledge and current national legislation. It provides guidance on health, safety and environmental aspects of the product and should not be construed as any guarantee of technical performance or suitability for the particular applications.
**PRODUCT DESCRIPTION & CHARACTERISTICS**

**Diver-cote™** is recommended for a wide range of applications including the protection of risers, pipes and structures below the splash zone. Repairs holes, leaks, cracks, chips and defects with minimum effort and downtime.

Specifically designed for application underwater or in very wet areas as a protective coating for poorly prepared metal and concrete substrates. Ideal for use on wet and saturated metal and concrete and for hand prepared or hydro-blasted surfaces. Compared to other underwater coating systems, the product offers minimal dispersion during application which in turn:

- reduces potential contamination of the environment
- helps to keep expensive diving suits and equipment clean
- improves the controllability and accuracy of application as the diver’s vision is clearer for a longer period of time.

It will help reduce the risk of M.I.C. (Microbiological Induced Corrosion) and S.R.B. (Sulphate Reducing Bacteria) because it does not contain the food ingredients contained in traditional solvent-borne systems that the bacteria thrive on.

Exhibits long-term resistance to the marine environment, ideal product for use with other underwater application products such as:-

- Diver-stick™
- Diver-filter™

Material can be supplied in two forms:-

- **Diver-cote™** RA 500UV-LV as a low viscosity coating for use on submerged or wet surfaces to produce a high gloss finish. Ideal for large areas to give an aesthetically pleasing finish.
- **Diver-cote™** RA 800UV-iV as a high viscosity coating for use on deep cracks, holes and large defects. Ideal as a repair compound for damaged surfaces.

**TECHNICAL FEATURES & BENEFITS**

Unique coating system formulated for above and underwater applications (by incorporating COR-SAN™ fibre technology). Ideal for protecting large areas under water. There is less paint film dispersion (a common problem with this type of application) instead, the coating forms a smooth, paint-like finish, enabling very high application rates to be achieved. The system exhibits excellent abrasion resistance and is able to withstand severe physical stresses caused by wave action.

**PRODUCT INFORMATION**

Typical applications:

- Structural steelwork, GRP, splash zone (above and below tide level) tank repairs (internal and external).
- Ideal for underwater repairs (metal and concrete).
- Ship repair work, swimming pools and ponds etc.
- Repair of cracks, including worn, damaged and old concrete.

Colour:

- Standard white & blue (other colours available on request).

Volume solids:

- 100%

**DISCLAIMER** The information contained herein is to the best of our knowledge accurate and current and is given in good faith without warranty. Users are deemed to have satisfied themselves independently as to the suitability of our products for their particular purpose. In no event shall Chemco International be liable for consequential or incidental damages.
Density: 1.21 ± 0.1g/cm³ @ 20°C
Mix part A (resin RA 800UW) and part B (hardener HF 500) in proportionate weights as supplied.
No thinning agents required.

Thinner: SLA
Cure:
Porosity:
Top dry: 10 hrs
Hard dry: 24 hrs
Full cure: 14 days

PRODUCT INFORMATION (cont’d)
Recoating interval: Minimum: 4 – 6 hrs (touch dry).
Maximum: unlimited.

Typical thickness range
(RA 500UW-LV): 200 - 400 microns per coat.
(RA 500UW-HV): 1.0 - 5.0mm

Theoretical coverage
(RA 500UW-LV): 3.1m²/lit @ 250 microns.
(RA 500UW-HV): 0.67m²/lit @ 1.0mm

Theoretical coverage
(RA 500UW-LV): 6.7m²/lit @ 1.0mm

Temperature resistance:
Maximum 60°C (immersed).

Method:
Above water: Airless spray, roller, brush or trowel.
Below water: (Powder) Brush and roller, syringes, trowel, spreading knife, spatula, etc.

Airless spray application: Pump (minimum 45:1 ratio) with a fluid twist tip: RA 500UW-LV (23 – 31 thou.)

SURFACE PREPARATION

Underwater repairs:
Remove all loose contamination by wire brushing or scraping.
Remove any scale, dirt, grease with water-proof abrasive paper (wet & dry paper).

Above waterline:
Remove all loose contamination by wire brushing or scraping.
For small areas the gouging area with mechanical abrader.
For larger areas a suitable angular metallic or non-metallic abrasive should be chosen to give a minimum profile of 50 microns. Abrasive blast the surface to ISO 8501-1 SA2.5

LIMITATIONS

Pot life:
Vigilant care and attention to pot life is required during application. If gelling has started, do not apply.

SAFETY PRECAUTIONS

It is the policy of CHMCO INTERNATIONAL (C.I.) to ensure that its products are handled and applied by professionally approved and skilled applicators. Application shall be carried out in accordance with instructions contained in this data sheet and referenced to C.I. TECHNICAL SPECIFICATION MANUAL.

The CHMCO INTERNATIONAL management are intent on ensuring all work is carried out in accordance with company HEALTH & SAFETY procedures and all materials are handled with due care to COSHH regulations and instructions.

Disclaimer: The information contained herein is to the best of our knowledge accurate and current and is given in good faith without warranty.
Users are deemed to have satisfied themselves independently as to the suitability of our products for their particular purpose. In no event shall Chemo International be liable for consequential or incidental damages.
STORAGE

Store in cool, dry conditions (between 2 - 20°C). Keep away from direct heat source and sunlight. When not using the material, always replace the lid on the container.

SHELF LIFE

At least 12 months when stored in sealed containers at temperatures of 20°C or below. At temperatures above, refer to manufacturer for advice.

DISCLAIMER: The information contained herein is to the best of our knowledge accurate and current and is given in good faith without warranty. Users are deemed to have satisfied themselves independently as to the suitability of our products for their particular purpose. In no event shall Chemco International be liable for consequential or incidental damages.
1. IDENTIFICATION OF PREPARATION & OF COMPANY

Product: Epoxy Resin
Manufacturer: Chemico International Ltd
            East Shawhead Industrial Estate
            Coatbridge ML5 4NQ
            Scotland
            Telephone No: +44 (0) 1234 567890
            Fax: sales@chemico.com
            Web Site: www.chemico.com

2. COMPOSITION INFORMATION ON INGREDIENTS

Blend of epoxy resin and reactive diluents.

<table>
<thead>
<tr>
<th>Chemicals</th>
<th>Classification</th>
<th>Risk phrases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bisphenol A</td>
<td>Xi, N</td>
<td>R36/38-43-51/53</td>
</tr>
<tr>
<td>Bisphenol F</td>
<td>Xi</td>
<td>R36/38-43-51/53</td>
</tr>
<tr>
<td>Aliphatic diglycol ether</td>
<td>Xi</td>
<td>R36/38-43</td>
</tr>
</tbody>
</table>

The remaining 30% of the composition is a blend of proprietary, non-hazardous chemicals that are each present at

3. HAZARDS IDENTIFICATION

Inhaling can cause eye and skin irritation. May cause sensitisation by skin contact. Toxic to aquatic organisms, may cause long term adverse effects in the aquatic environment.

4. FIRST AID MEASURES

Inhalation: Remove to fresh air if effects occur. Seek medical attention. The decision of whether to induce vomiting or not should be made by an experienced physician.

Ingestion: Irrigate with flowing water immediately and continuously for 15 minutes. Consult medical personnel.

Eyes: Immediately flush with flowing water for at least 15 minutes while removing contaminated clothing. Remove all residues with soap and water. Seek medical attention if irritation persists.

Skin: 

5. FIRE-FIGHTING MEASURES

Extinguishing media: Carbon dioxide, dry chemical powder, alcohol foam.

Hazardous combustion products: Under conditions for incomplete combustion or pyrolysis, phthalates and carbon oxides may evolve. The thermal decomposition products therefore should be treated as potentially hazardous substances and appropriate, non-flammable product.

Specific fire or explosion hazards: Wear positive pressure self-contained breathing apparatus and protective fire fighting clothing (includes fire fighting helmet, coat, pants, boots and gloves).
6. ACCIDENTAL RELEASE MEASURES

Personal precautions: Wear adequate personal protective equipment.
Environmental precautions: Prevent from entering soil, waterways and groundwater. Flushing and wash waters must be confined and prevented from entering into soil, waterways and ground water. Contain large spills with a dikes.
Methods for cleaning up: Soak up with absorbent material such as sand and collect in suitable, labelled containers. Solvents are not recommended for clean up unless the recommended exposure guidelines and safe handling procedures for the specific solvent is followed. Residual product may be removed using steam or hot soapy water.

7. HANDLING & STORAGE

Handling: Practice care and caution to avoid skin and eye contact. Avoid breathing vapours of heated material.
Storage: Store in a cool, dry ventilated storage and in closed containers. Keep away from oxidisers, heat or flames.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering controls: Adequate ventilation should be sufficient for most conditions. Local exhaust ventilation may be necessary for some operations.
Exposure controls: Not established.
Respiratory protection: Normally not required. If respiratory irritation is experienced, use an approved air purifying respirator.
Eye protection: Chemical safety glasses, splash-proof eye goggles with a full face shield. Contact lenses should not be worn.
Skin protection: Use protective clothing impervious to this material. Selection of specific items will depend on operation. Use impervious gloves when prolonged or frequently contact could occur. Remove contaminated clothing no later than at the end of the work period and launder before reuse.
Hand protection: Nitrile rubber gloves or butyl rubber gloves, gauntlet type.

9. PHYSICAL & CHEMICAL PROPERTIES

Physical state: Liquid.
Colour: Pale yellow.
Odour: None.
Specific gravity: 1.28 - 1.35g.cm⁻³ @ 20°C
pH: Not applicable.
Boiling point: Decomposes prior to boiling.
Flash point: 100°C (212°F)
Water solubility: > 1% wt (25°C)
Viscosity: 1.4 - 35 Pa.s @ 25°C
10. **STABILITY & REACTIVITY**

- **Chemical stability:** Stable under normal storage conditions.
- **Materials to avoid:** Acids, amines, bases and oxidising agents.
- **Conditions to avoid:** Excessive heating over long periods of time degrades the product (causes discoloration).
- **Hazardous polymerisation:** Will not occur by itself, but masses of more than 0.5ug of product, plus an aliphatic amine will cause irreversible polymerisation with considerable heat build up.

11. **TOXICOLOGICAL INFORMATION**

- **Acute toxicity**
  - **Ingestion:** Single dose oral toxicity is low. Small amounts swallowed (accidental to normal handling operations) are not likely to cause injury.
  - **Oral LD₅₀ (data) = > 2,000mg/kg**
  - **Skin contact:** Prolonged or repeated exposure may cause slight skin irritation.
  - **Inhalation:**
    - **Inhalation:** At room temperature, exposures to vapours may generate vapour levels sufficient to cause adverse effects.
    - **Skin:** Prolonged or repeated exposure may cause slight skin irritation.
    - **Eyes:** May cause eye irritation (temporary corneal injury).

12. **ECOLOGICAL INFORMATION**

- **Mobility and bioaccumulation potential:** Partitioning from water to octanol is not applicable.
- **Degradation:** Below detectable limits under aerobic conditions.
- **Aquatic toxicity:** LOEC (fish/effect - pimephales promelas) = 3.7mg/l

13. **DISPOSAL CONSIDERATIONS**

- **Product:** Recommended procedure for disposing of waste products is burning under carefully controlled conditions. Burn in adequate incinerator or bury in an approved landfill site.
- **Contaminated packaging:** Empty container disposed of as hazardous waste unless all remaining contents adhering to container wall has been removed. Washings must be disposed of safely in accordance with local regulations.
14. TRANSPORT INFORMATION

Proper shipping name: Environmentally hazardous substance, liquid, n.o.s. (Biphenol A - epoxy resin)

Road/rail
ADR/RID Class: 9
Hazard No: 9000
UN No: 3082

Sea
IMDG Class: 9
UN No: 3082

Air
IATA/ICAO: DGR
UN No: 3082
Packing Instruction (Pass & Cargo): 9.4

ADR/RID Item No: 110
Tier Card: 90001
Packing Group: III
Class: 9
Packing Instruction (Cargo): 9.14

15. REGULATORY INFORMATION

Chemical name: Contains hexanedioi diglycol ether, epoxy resin.

Labeling:
Contains hexanedioi diglycol ether, epoxy resin.

Symbols:
00/11 (V/vent).

Risk phrases:
(R) Dangerous for the environment.
R36/38, Irritating to eyes and skin.
R43, May cause sensitisation by skin contact.
R50/53, Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Safety phrases:
S28, After contact with skin, wash immediately with plenty of water.
S37/39, Wear suitable gloves and eye/face protection.

16. OTHER INFORMATION

The information contained in this data sheet is based on present state of knowledge and current national legislation. It provides guidance on health, safety and environmental aspects of the product and should not be construed as any guarantee of technical performance or suitability for the particular applications.
1. IDENTIFICATION OF PREPARATION & OF COMPANY

Product: Epoxy Resin.
Manufacturer: Chemco International Ltd
East Shawhead Industrial Estate
Coatbridge M76 4XO
Scotland.
Telephone No: +44 (0) 1236 606000
Email: sales@chemcointl.com
Website: www.chemcointl.com

2. COMPOSITION INFORMATION ON INGREDIENTS

Blend of epoxy resin and reactive diluents.

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<td>Aliphatic diglycidylether</td>
<td>XI</td>
<td>R36/38-43</td>
</tr>
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The remaining 30% of the composition is a blend of proprietary, non-hazardous chemicals that are trade secrets.

3. HAZARDS IDENTIFICATION

Irritating to eyes and skin.
May cause sensitisation by skin contact.
Toxic to aquatic organisms, may cause long term adverse effects in the aquatic environment.

4. FIRST AID MEASURES

**Inhalation:** Remove to fresh air if effects occur. Seek medical attention.

**Ingestion:** The decision of whether to induce vomiting or not should be made by an attending physician.

**Eyes:** Irrigate with flowing water immediately and continuously for 15 minutes. Consult medical personnel.

**Skin:** Immediately flush with flowing water for at least 15 minutes while removing contaminated clothing. Remove residues with soap and water. Seek medical attention if irritation persists.

5. FIRE-FIGHTING MEASURES

**Extinguishing media:** Carbon dioxide, dry chemical powder, alcohol foam.

**Hazardous combustion products:** Under conditions for incomplete combustion or pyrolysis, phenolics and carbon oxides may evolve. The thermal decomposition products therefore should be treated as
6. ACCIDENTAL RELEASE MEASURES

Personal precautions: Wear adequate personal protective equipment.
Environmental precautions: Prevent from entering soil, waterways and groundwater. Flushings and wash waters must be confined and prevented from entering into soil, waterways and ground water. Contain large spills with a dike.
Methods for cleaning up: Soak up with absorbent material such as sand and collect in suitable, labelled containers. Solvents are not recommended for clean up unless the recommended exposure guidelines and safe handling procedures for the specific solvent is followed. Residual product may be removed using steam or hot soapy water.

7. HANDLING & STORAGE

Handling: Practice care and caution to avoid skin and eye contact. Avoid breathing vapours of heated material.
Storage: Store in a cool, dry ventilated storage and in closed containers. Keep away from oxidisers, heat or flames.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering controls: Adequate ventilation should be sufficient for most conditions. Local exhaust ventilation may be necessary for some operations.
Exposure controls: Not established.
Respiratory protection: Normally not required. If respiratory irritation is experienced, use an approved air purifying respirator. In mity atmospheres, use an approved mist respirator.
Eye protection: Chemical safety glasses, splash-proof eye goggles with a full face shield. Contact lenses should not be worn.
Skin protection: Use protective clothing impervious to this material. Selection of specific items will depend on operation. Use impervious gloves when prolonged or frequently contact could occur. Remove contaminated clothing no later than at the end of the work period and launder before reuse.
Hand protection: Nitrile rubber gloves or butyl rubber gloves, gauntlet type.

9. PHYSICAL & CHEMICAL PROPERTIES

Physical state: Liquid.
Colour: Pale yellow.
Odour: None.
10. STABILITY & REACTIVITY
Chemical stability: Stable under normal storage conditions.
Materials to avoid: Acids, amines, bases and oxidising agents.
Conditions to avoid: Excessive heating over long periods of time degrades the product (causes discoloration).
Hazardous polymerisation: Will not occur by itself, but masses of more than 0.5 kg of product, plus an alkaline amine will cause irreversible polymerisation with considerable heat build up.

11. TOXICOLOGICAL INFORMATION
Acute toxicity
Ingestion: Single dose oral toxicity is low. Small amounts swallowed incidentally to normal handling operations are not likely to cause injury.
Skin contact: Oral LD50 (rats) = > 2,000 mg/kg
Inhalation: Single prolonged exposure is not likely to result in material being absorbed through the skin in harmful amounts.
Irritation: At room temperature, exposure to vapours may generate vapour levels sufficient to cause adverse effects.
Stabilization: Skin - Prolonged or repeated exposure may cause slight skin irritation.
Ocular - May cause eye irritation (temporary corneal injury).
Sensitisation: Has caused allergic skin reactions in humans.

12. ECOLOGICAL INFORMATION
Mobility and bioaccumulation potential: Partitioning from water to octanol is not applicable.
Degradation: Below detectable limits under aerobic conditions.
Aquatic toxicity: LC50 (fathead minnow - pimephales promelas) = 3.1 mg/l

13. DISPOSAL CONSIDERATIONS
Product: Recommended procedure for disposing of waste products is burning under carefully controlled conditions. Burn in adequate incinerator or bury in an approved landfill site.
Contaminated packaging: Empty container disposed of as hazardous waste unless all remaining product adhering to container wall
14. TRANSPORT INFORMATION

Proper shipping name: Environmentally hazardous substance, liquid, n.o.s. (bisphenol A - epoxy resin)

Road/rail
ADR/RID Class: 9
Hazard No: 90
UN No: 3002

Sea
IMDG Class: 9
UN No: 3092

Air
IATA/ICAO: DGR
UN No: 3092

Packing Instruction (Packing & Cargo): 914

ADR/RID Item No: 11c
Tren Card: 90G01

Packing Group: III

Class: 9
Packing Group: III

15. REGULATORY INFORMATION

Chemical name: Contains hexanediol diglycidyl ether, epoxy resin.
Labelling: According to Chemical Hazard Information and Packaging for Supply (CHIP) legislation.
Symbols: (X) Irritant.
Risk phrases: (N) Dangerous for the environment, R36/38, Irritating to eyes and skin.
R43, May cause sensitisation by skin contact.
R51/53, Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Please note that in the final cured film, the product is non-hazardous and does not affect aquatic organisms.

Safety phrases: S28. After contact with skin, wash immediately with plenty of water.
S37/39. Wear suitable gloves and eye/face protection.

16. OTHER INFORMATION

The information contained in this data sheet is based on present state of knowledge and current national legislation. It provides guidance on health, safety and environmental aspects of the product and should not be construed as any guarantee of technical performance or suitability for the particular applications.
MATERIAL SAFETY DATA SHEET

Product Name: EPSON/Critical Systems, Inc.

Percent Volatile by Volume: <1.0

Boiling Range: >202 F

Vapor Density: No data

Weight Per Gallon: 8.1 lb

Vapor Pressure at 20 C: <0.00 mm Hg

Solubility In Water: Partially Soluble

Appearance and Odor: Clear light yellow viscous liquid with amine odor

II. HAZARDOUS INGREDIENTS

<table>
<thead>
<tr>
<th>CAS #</th>
<th>WT. %</th>
<th>OSHA TWA ppm</th>
<th>ACGIH TWA ppm</th>
<th>ACGIH STEL ppm</th>
</tr>
</thead>
<tbody>
<tr>
<td>000140-26-6</td>
<td>***</td>
<td>***</td>
<td>***</td>
<td>***</td>
</tr>
<tr>
<td>084262-19-3</td>
<td>***</td>
<td>***</td>
<td>***</td>
<td>***</td>
</tr>
</tbody>
</table>

--- Not established

*** The specific chemical identity and/or weight percent is being withheld as a trade secret.

III. FIRE & EXPLOSION DATA

Flashpoint: >207 °C

Extinguishing Media:

Use carbon dioxide or dry chemical for small fires; aqueous foam or water for large fires.

Unusual Fire & Explosion Hazards:

Closed containers may explode due to buildup of pressure when exposed to extreme heat.

Special Fire Fighting Procedures:

Remove all ignition sources. Wear self-contained breathing apparatus and complete personal protective equipment when entering confined areas where potential for exposure to vapors or products of combustion exists.

IV. REACTIVITY DATA

Stability: Stable

Hazardous Polymerization: Will not occur

Materials to Avoid:

Combustion with strong oxidizers, bases, epoxies resins, or polyesters can cause polymerization.

Hazardous Decomposition Products:

Fumes produced when heated to decomposition may include: carbon monoxide, carbon dioxide, oxides of nitrogen.

For information on this sheet, the information contained herein is accurate. However, no liability whatsoever is served for the accuracy or completeness of the information contained herein. The determination of suitability of any material is the sole responsibility of the user. All materials may present unknown health hazards and should be used with caution.

When hazards are described herein, we cannot guarantee that these are the only hazards that exist.
HAZARD DATA

Effect of Overexposure:
- No specific information available.

Inhalation: No specific information available.
- Irritation to eyes, respiratory tract, headache, nausea, dizziness, and respiratory irritation. A sanitizer may cause allergic reaction to the respiratory tract.

Absorption: No specific information available.
- Contains materials that may cause chemical irritation to skin, eyes, and respiratory tract. A sanitizer may cause allergic reaction to the respiratory tract.

Contact:
- Contains materials that may cause chemical burns on skin and eyes. Sanitizer may cause allergic reaction which can be severe in certain individuals.

Inhalation:
- Contains materials that may cause chemical burns on skin and eyes. Sanitizer may cause allergic reaction which can be severe in certain individuals.

Ingestion:
- Contains materials that may cause chemical burns on skin and eyes. Sanitizer may cause allergic reaction which can be severe in certain individuals.

Effects of Overexposure:
- No specific information available.

EMERGENCY & FIRST AID PROCEDURES:

Inhalation:
- If exposed to high concentrations of vapors or mist, remove person to fresh air. If breathing has stopped, administer artificial respiration and seek medical attention.

Ingestion:
- Contains non-human derived materials. Seek medical attention.

Skin:
- Contains non-human derived materials. Seek medical attention.

Eye:
- Contains non-human derived materials. Seek medical attention.

FIRST AID:

Inhalation:
- If exposed to high concentrations of vapors or mist, remove person to fresh air. If breathing has stopped, administer artificial respiration and seek medical attention.

Ingestion:
- Contains non-human derived materials. Seek medical attention.

Skin:
- Contains non-human derived materials. Seek medical attention.

Eye:
- Contains non-human derived materials. Seek medical attention.

PILL OR LEAK PROCEDURES:

Inhalation:
- If exposed to high concentrations of vapors or mist, remove person to fresh air. If breathing has stopped, administer artificial respiration and seek medical attention.

Ingestion:
- Contains non-human derived materials. Seek medical attention.

Skin:
- Contains non-human derived materials. Seek medical attention.

Eye:
- Contains non-human derived materials. Seek medical attention.

PROTECTION INFORMATION:

Symptoms:
- Contains non-human derived materials. Seek medical attention.

FIRST AID:

Inhalation:
- If exposed to high concentrations of vapors or mist, remove person to fresh air. If breathing has stopped, administer artificial respiration and seek medical attention.

Ingestion:
- Contains non-human derived materials. Seek medical attention.

Skin:
- Contains non-human derived materials. Seek medical attention.

Eye:
- Contains non-human derived materials. Seek medical attention.

PILL OR LEAK PROCEDURES:

Inhalation:
- If exposed to high concentrations of vapors or mist, remove person to fresh air. If breathing has stopped, administer artificial respiration and seek medical attention.

Ingestion:
- Contains non-human derived materials. Seek medical attention.

Skin:
- Contains non-human derived materials. Seek medical attention.

Eye:
- Contains non-human derived materials. Seek medical attention.

PROTECTION INFORMATION:

Personal Protection:
- Use a properly fitted NIOSH/NIOSH approved respirator whenever exposure to vapors/mist is likely unless it is below applicable limits.

Antidote:
- Contains non-human derived materials.
VIII. SPECIAL PRECAUTIONS
Avoid contamination of site. Remove and thoroughly launder contaminated clothing before reuse. Discard contaminated clothing.

IX. RECOMMENDED SAFETY AND HEALTH PRACTICES

A. Personal Protective Equipment
When handling this material, it is recommended that you:
1. Wear protective eyewear or a face shield.
2. Wear laboratory gloves.
3. Wear a laboratory coat.
4. Wear a respiratory protection device if the material is a hazardous waste.

B. Institutional Controls
In institutional settings, it is recommended that you:
1. Keep the material in a designated area.
2. Provide adequate ventilation.
3. Limit access to the area.

C. Emergency Response
In case of an emergency, it is recommended that you:
1. Call for medical assistance immediately.
2. Evacuate the area.
3. Notify the appropriate authorities.

D. Disposal
When disposing of this material, it is recommended that you:
1. Follow the local regulations for hazardous waste disposal.
2. Use a certified hazardous waste transporter.

E. Transportation Information
This material is classified as a hazardous waste and is subject to the transportation regulations.

F. Other Information
This material is a hazardous waste and should be handled with care.

X. REGULATORY INFORMATION

A. OSHA Hazard Communications
This material is labeled as a hazardous waste.

B. Transportation
This material is subject to the hazardous waste transportation regulations.

C. Disposal
This material must be disposed of in accordance with local hazardous waste disposal regulations.

D. Recycling
This material is not recyclable.

E. Handling
This material must be handled with care.

F. Storage
This material must be stored in a designated area.

G. Labeling
This material must be labeled as a hazardous waste.

H. Warning
This material is a hazardous waste and presents a risk to human health and the environment.

I. Contact Information
For more information, contact [insert contact information].

J. Revision Status
Revised: [insert revision date]
MARINE-FLEX 570
Underwater Grade Epoxy Coatings

DESCRIPTION:

Marine-FLEX 570 is a 100% solids, medium viscosity moisture insensitive epoxy coating intended for heavy marine and wet industrial exposures.

Marine-FLEX 570 CAN BE APPLIED UNDERWATER, as well as on wet, damp or dry surface: concrete or steel exposed to air.

PROPERTIES:

| Solids Content: | 100% |
| Composition:    | Epoxy/Amine |
| Mix Ratio:      | 1.5:1 |
| Pot Life (77°F):| 20 min. |
| Tack-Free Time: | 4-10 hrs. |
| VOC Content:    | 0 |

CHEMICAL RESISTANCE:

| Sea Water | Distilled Water |
| Ethanol   | Detergent |
| NaOH      | H₂SO₄ |
| HCl       | HNO₃ |

Not recommended for use in contact with strong organic solvents, acetic acid, or Skydrol.

APPLICATION:

Marine-FLEX 570 is supplied in proportioned units. Mix the two components thoroughly using a speed paddle mixer, mixing for at least 4 minutes and avoiding incorporation of excess air.

Once blended the two surfaces will not separate or bleed if submerged, and application can be performed in calm, clean water or salt water. Note that pot life is reduced and reaction is accelerated underwater.

Product may also be applied in air, as with other 100% solids epoxy coatings. Submersion is acceptable at any point in the cure regime, but protect from mechanical damages until cured.

http://edisoncoatings.com/html/Marine-Flex 570 100 Solids U/marine-flex 570 100 s... 1/12/04
Surface Preparation is comparable to other high quality, moisture insensitive epoxy coatings. Surfaces should be clean, sound, free of dirt, oil, grease, coatings or other contaminants which interfere with adhesion. Loose rust and scale should be removed by mechanical means from surfaces. Abrasive blasting is not required, but will aid in maximizing system durability. Concrete surfaces should be free of laitance, loose surface material or other contaminants.

Apply by brush or roller as required to provide a uniform, continuous coating. In hot weather, or vertical surfaces, incorporation of up to 3% fumed silica is acceptable, if required to prevent sag or maintain high film build. Do not apply when air, surface and/or water temperature is below 5°C.

A second coat may be applied, if desired, at any time after the first coat has cured to a tack-free state. Aged surfaces may be recoated by simply cleaning the existing coating surface and reapplying.

SAFETY AND HANDLING:

Read and observe the safety and handling guidelines as detailed in the Material Safety Data sheets supplied with this product. Avoid skin and eye contact.

Marine-FLEX 570 is non-flammable. Store at moderate temperatures, between 50 and 85°F. Keep partially used containers tightly closed.

Shelf life is a minimum of 2 years from date of factory shipment in unopened, properly stored containers.

Used applicators may be disposed of upon curing of the residual coating as non-hazardous waste. Alternatively, clean up solvent is Xylene or SYSTEM 100. Read and observe the Material Safety Data Sheets for solvents, as supplied by their manufacturers.

FOR COMMERCIAL AND INDUSTRIAL USE ONLY.

For additional information, contact EDISON COATINGS, INC. or your Edison Technical Service Representative.

---

**Better Technology. Better Results.**

Last Updated: Sunday, January 11, 2004

http://edisoncoatings.com/html/Marine-Flex 570 100 Solids Umarine-flex 570 100 s... 1/12/04
1. IDENTIFICATION OF THE SUBSTANCE/COMPANY

Product Name: EURO-viny CV02
Company Name: Euronavy Marinas e Industrias S.A.
Address: Estrada da Milhassa, Quinta do S. Francisco, 2914-516 Senhora do Porto
Phone: 351 265 739480
Fax: 351 265 739404
Emergency Contact: 265 265 739404

2. COMPOSITION/INFORMATION ON INGREDIENTS

Preparation Description: Underwater primer.

HAZARDOUS INGREDIENTS

<table>
<thead>
<tr>
<th>Ingredient name</th>
<th>CAS number</th>
<th>Concentration</th>
<th>EC Symbol</th>
<th>EC R-phrase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Butyl acetate</td>
<td>123-85-4</td>
<td>18% - 23% (v/v)</td>
<td></td>
<td>R10, R66, R67</td>
</tr>
</tbody>
</table>

3. HAZARDS IDENTIFICATION

Flammable.

Irritating to respiratory system.

May cause skin dryness or cracking.

Vapors inhalation may cause dizziness.
4. FIRST AID MEASURES

EYE CONTACT: For direct contact, immediately flush eyes for 15 minutes, occasionally lifting eyelids. If victim wears contact lenses, remove lenses and continue rinsing. Clear contact before reuse. If irritation or redness persists, seek medical attention.

SKIN CONTACT: Remove contaminated clothing. Wash affected area with mild soap and water. If irritation or redness develops and persists, seek medical attention.

INGESTION: Do not induce vomiting and get medical attention.

INHALATION: Remove victim from affected area, if problem persists, get medical attention.

5. FIRE-FIGHTING MEASURES

Extinguishing Media: Dry chemical powder, carbon dioxide, foam, sand. Do not use water jet.

Fire Fight Procedure: The use of self-contained breathing apparatus is recommended for fire fighters.

Unusual Fire/Explosion Hazards: Keep adjacent containers cool by spraying water.

6. ACCIDENTAL RELEASE MEASURES

Personal Protection: Use suitable personal protection equipment. Remove all ignition sources, do not produce sparks. Assure ventilation in affected area. Avoid contact with skin.

Environmental Precautions: Avoid the contamination of rivers, lakes and sea, abrasives or contain with earth, sand or other suitable material. Sweep up and wash area clean with water.

7. HANDLING AND STORAGEd

Handling: Do not breathe the vapors, use ventilation, use personal protective equipment.

Keep containers closed and use only with adequate ventilation when not in use. Do not use or store near heat, sparks or flame. Use non-sparking tools. Ground and bond all containers when transferring liquid.

Storage: Keep away from heat and flames.

Keep the containers closed in a dry place.

EURO-viny CV02, last revised 24-09-2003

Mod 6001  2/4
8. **EXPOSURE CONTROLS/PERSONAL PROTECTION**

- Butyl acetate:
  - TLV/TWA: 710 mg/m³
- Eye protection: Safety glasses and available eye bath.
- Respiratory protection: Mask or self breathing apparatus for high vapor concentration.
- Hand protection: Rubber gloves.

9. **PHYSICAL AND CHEMICAL PROPERTIES**

- Physical state: Liquid
- Flash Point: -73°C (Alpha)
- Density: 1.23 g/cm³
- Solubility in water: Not soluble

10. **STABILITY AND REACTIVITY**

- Stable under normal conditions

11. **TOXICOLOGICAL INFORMATION**

- There are no information about the preparation.

12. **ECOLOGICAL INFORMATION**

- There are no information about the preparation.

13. **DISPOSAL CONSIDERATIONS**

- Depending on the extent of the contamination reclamation or incineration of the product by an officially authorized enterprise.
14. TRANSPORT INFORMATION

INN No  1203
ADR/BDP
  Class  3
  Item  31°C
IMOMIDOC
  Class  33
  IMDG CODE PAGE  3945
IACARITA
  Class  3

15. REGULATORY INFORMATION

EC R5 phrases
  R10 - Flammable.
  R27 - Imitating to respiratory system.
  R66 - May cause skin dryness or cracking.
  R67 - Vapors inhalation may cause dizziness.
EC Subphrases
  S20 - Do not breathe vapors.
  S24 - Avoid contact with skin.
  S25 - Avoid contact with eyes.

16. OTHER INFORMATION

This Material Safety Data Sheet is in compliance with ESC 91/155/EEC directives. Above informations have been made very carefully based on existing literature. EURONAVY does not accept any liability whatsoever arising out of the use of this information.
Application guide

SURFACE PREPARATION

EURO-vinyl CV02 is unsuitable for direct application on poorly prepared surfaces. Gently clean surface with pneumatic rotating brushes (may even need to be treated). Remove all loose material, dusting, grease and loose coating. Before application of EURO-vinyl CV02 you MUST gently clean surface if any filleting or debris has settled on surface with rotating disc of SCOTCH BRITE or similar material. NOTE: If surface has oil or grease contamination point will bead and not adhere. Apply soap or degreaser to cleaning pad and clean surface. Contact your local Euroseawy agent for recommendation.

MIXING AND THINNING

EURO-vinyl CV02 is a one pack product. Mix coating to obtain an uniform consistency. The mixing should not take more than 2 to 3 minutes. The use of a speed adjustable mixer is recommended.

APPLICATION

EURO-vinyl CV02 can be applied by conventional, brush or roller. A power roller is recommended for ease and speed. Use contrasting colours for each coat and strip coating. However a regular solvent resistant brush or roller should be used. Use short brush or brush or medium nap roller working the material into all irregularities. Brush or lay coats may be visible. Be sure but proper film thickness is achieved by working the material. On sharp edges, bellhorns, flanges, etc. a second coat would be better in “edge” or ‘bevels’. Product may be immersed in water during application on kept tidy for power roller application.

Before any recoat application is undertaken a small area should be tested and inspected for lifting, wrinkling or softening of the underwater.

DO NOT THIN THIS PRODUCT

SAFETY

WARNING: Caution eye and skin irritation. The solvent may cause respiratory irritation in sensitive individuals. May cause allergic skin reaction. Avoid breathing the solvent. Do not get in eyes or on skin or inhale. Cover eyes and skin with protective equipment. Use appropriate equipment, if so recommended to avoid potential respiratory irritation. Wash skin thoroughly after use and water. Call a physician. Launder clothing before reuse. If any21 brushing glove with rubber inner coating, preferably not neoprene, and rubber gloves. FIRST AID: In case of eye contact immediately flush with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash skin contact area with soap.

DISCLAIMER: This is not a specification and all information is given in good faith. Every precaution was taken in Thier sided explanation for the product formula, which otherwise confidential, and can derive from laboratory measurements using standard methods that may be copyrightable, giving the names of the product. If requested, Euroseawy can inform any known measurement method used to determine any or other value presented. The Euroseawy Data Sheet Content cannot be changed without previous notice. Since conditions of use and performance cannot be controlled, all information is without warranty, implied or otherwise, and final determination of the suitability of any product or service for the use accomplished, the manner of use and whether there is any infringement of patents is the sole responsibility of the user. The product is intended for professional use only. Euroseawy does not guarantee any liability in connection with the use of this product relative to accuracy, performance or injury. For application in special conditions please consult Euroseawy for detailed recommendation.

EURO-vinyl CV02 last tested 31/07/2002

Mod 44/03 - Pag.20

Manufactured by EUROSEAWAY - Timo Mattimies Abastimento, S.A. - www.euroseaway.net

E-mail: sales@euroseaway.net

Tel. +351.265.794449. Fax: +351.265.782511.
**GENERAL**

EURO-vinyl CV02 is a high-performance one-pack pre-thickened, designed for application underwater with conventional tools.

EURO-vinyl CV02 complies with modern environmental regulations, and can be applied, directly over on ruined and fibre glass surfaces free of green and loose matter.

**FEATURES**

EXCELLENT ANTI-CORRUGATIVE PROPERTIES

LOW TEMPERATURE APPLICATION.

Can be applied in any temperature with a thin layer of 15/30°C (59/F) requires slightly longer to dry.

EASY UNDERWATER APPLICATION WITH CONVENTIONAL TOOLS.

SINGLE PACK PRODUCT.

EXCELLENT ADHESION ON POORLY TREATED SURFACES.

**SPECIFICATION DATA**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bladder Type / Pigment Type</td>
<td>Modified acrylic, Antioxidative pigment.</td>
</tr>
<tr>
<td>Colors</td>
<td>CV0202 (grey), CV0209 (white), CV0209 (White).</td>
</tr>
<tr>
<td>Finish</td>
<td>Matte</td>
</tr>
<tr>
<td>Mixing ratio</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Specific gravity</td>
<td>1.52 g/L (0.99 Kg/cm³)</td>
</tr>
<tr>
<td>Sag by Volume</td>
<td>62 % (theoretical)</td>
</tr>
<tr>
<td>Flash point (second)</td>
<td>&gt;23°C (73°F)</td>
</tr>
<tr>
<td>Theoretical covering capacity</td>
<td>4.1 Sq m/L (167 Sq.Ft. gal.) at 150 g/m² (8 mils)</td>
</tr>
<tr>
<td>Typical film thickness per coat</td>
<td>250 microns (9.7 mils) – Dry: 150 microns (6 mils)</td>
</tr>
<tr>
<td>Application method</td>
<td>Brush, Roller</td>
</tr>
<tr>
<td>Thinner</td>
<td>Mastic mate - Clearcoat - EURO-thinner TBS</td>
</tr>
<tr>
<td>VOC (Volatile Organic Compound)</td>
<td>295 grams/L</td>
</tr>
<tr>
<td>Drying time</td>
<td>Surface dry: approx. 2 hours at 21°C (70°F) and 50% relative humidity.</td>
</tr>
<tr>
<td></td>
<td>Min. 16 hours at 27°C (77°F).</td>
</tr>
<tr>
<td>Overcoating time</td>
<td>72°F</td>
</tr>
<tr>
<td>Recommended primes</td>
<td>Application below 5°C (41°F) requires slightly longer to dry. In case of any doubt, check your local Euronavy agent.</td>
</tr>
<tr>
<td>Ambient temperature</td>
<td>Min. (5°C (41°F) – Max. 50°C (122°F))</td>
</tr>
<tr>
<td>Substrate temperature</td>
<td>Single pack product, available in 1, 3 L.</td>
</tr>
<tr>
<td>Packing</td>
<td>The product must be stored in accordance with national regulations. The product should be kept in a cool and well-ventilated place protected from high temperatures. Containers MUST BE kept tightly closed. Shelf life: 1 year.</td>
</tr>
<tr>
<td>Storage and Shelf life</td>
<td>Euronavy Laboratory</td>
</tr>
</tbody>
</table>

**RECOMMENDED USES**

SHIPS, OFFSHORE & MARINE STRUCTURES

Great for protection of water lines areas.

STRUCTURAL STEEL EQUIPMENT

Provides anticorrosive protection for steel structures underwater, since coating is removable this protection can be renewed with periodic renewing.

PIPE COATINGS

Provides anticorrosive protection, for industrial water intake lines.

NOT SUITABLE FOR DIRECT APPLICATION ON INTERIOR POTABLE WATER PIPE LINES

EURO-vinyl CV02, last revised 3/07/2002

Manufactured by EURONAVY - Times Maritime s Horvath, S.A. – www.euronavy.com

Eurona Vape e Materials, Quinta de Santa Prisca, 700-510 – Setubal, Portugal

Tel: +351 265 398 440, Fax: +351 265 76 2711, E-mail: sales@euronavy.net
1. **IDENTIFICATION OF THE SUBSTANCE/COMPANY**

   **Product Name:** EURO-paste ES326(Base)
   **Company Name:** EUKONAVY
   **Address:** Estrada Vale de Muitos, Quinta de S. Francisco, 2914-516 Setúbal Portugal
   **Phone:** 351 265 739400
   **Fax:** 351 265 792771
   **Emergency Contact:** 351 265 792740

2. **COMPOSITION/INFORMATION ON INGREDIENTS**

   **Preparation Description:** 100% Solids Underwater Epoxy Filler.

   **HAZARDOUS INGREDIENTS**

<table>
<thead>
<tr>
<th>Ingredient name</th>
<th>CAS number</th>
<th>Concentration</th>
<th>EC Symbol</th>
<th>EC P-phrase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liquid epoxy resin</td>
<td>25068-38-4</td>
<td>38% - 48% (m/m)</td>
<td>Xi</td>
<td>R36/R37, R43</td>
</tr>
<tr>
<td>Benzyl alcohol</td>
<td>100-51-6</td>
<td>19% - 30% (m/m)</td>
<td>Xn</td>
<td>R20/R22</td>
</tr>
<tr>
<td>Polymer with branched not available</td>
<td></td>
<td>29% - 30% (m/m)</td>
<td>Xi</td>
<td>——</td>
</tr>
<tr>
<td>branched ether and urethane groups</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

3. **HAZARDS IDENTIFICATION**

   **EYES:**
   - Causes irritation.

   **SKIN:**
   - Causes irritation.
4. FIRST AID MEASURES

EYE CONTACT: For direct contact. Immediately flush eyes for 15 minutes, occasionally lifting eye-lids. If victim wears contact lenses, remove lenses and continue rinsing. Clean contact before reuse. If irritation or redness persists, seek medical attention.

SKIN CONTACT: Remove contaminated clothing. Wash affected area with mild soap and water. If irritation or redness develops and persists, seek medical attention.

INGESTION: Do not induce vomiting, if victim is conscious and able. Give immediate medical attention.

INHALATION: No specific measures.

5. FIRE-FIGHTING MEASURES

Extinguishing Media: Dry chemical powder, carbon dioxide, foam, sand. Do not use water.

Fire Fight Procedure: The use of self-contained breathing apparatus is recommended for fire fighters.

Unusual Fire Explosion Hazards: Keep adjacent container cool by spraying water.

6. ACCIDENTAL RELEASE MEASURES

Personal Protection: Use personal protection equipment.

Environmental Precautions: Prevent contamination of soil and water, prevent from spreading or entering into drains, ditches or rivers by using sand, earth, or other appropriate barriers. If material enters drains, it should be pumped out into an open vent.

7. HANDLING AND STORAGE

Handling: Avoid contact with skin, eyes and clothing.

Storage: Keep containers tightly closed, in warm and dry conditions.
8. **EXPOSURE CONTROLS/PERSONAL PROTECTION**

   *Not established*
   
   **Eye protection:** Safety glasses and available eye bath.
   
   **Respiratory protection:** Not normally required.
   
   **Hand protection:** Use chemical resistant type gloves.

9. **PHYSICAL AND CHEMICAL PROPERTIES**

   **Physical state:** Liquid.
   
   **Flash Point:** > 100°C (212°F) (Abe)
   
   **Density:** 1,34 g/l
   
   **Solubility in water:** Not soluble

10. **STABILITY AND REACTIVITY**

    Reacts with strong oxidizing agents, polymers to exothermally with amines, mercaptans and lewis acids at ambient temperature and above.

11. **TOXICOLOGICAL INFORMATION**

    There are no information about the preparation.

12. **ECOLOGICAL INFORMATION**

    There are no information about the preparation.

13. **DISPOSAL CONSIDERATIONS**
14. TRANSPORT INFORMATION

Not dangerous according to IMO, ADR/RID and IATA/ICAO.

15. REGULATORY INFORMATION

Contents: Liquid epoxy resin.

EEC Symbol: X1 - Irritant.

EEC Hazard: R36/R37 - Irritating to eyes and skin.

EEC-Symbols:

R37/R38 - May cause sensitisation by skin contact.

S37 - Keep container tightly closed in a cool place.

S9 - Keep container in a well ventilated place.

S26 - In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S25 - In case of contact with skin, rinse immediately with plenty of water.

S27 - Wear suitable protective clothing, gloves and eyewear protection.

16. OTHER INFORMATION

This Material Safety Data Sheet is in compliance with EEC 90/156/EC directives.

Above information has been made very carefully based on existing literature. EUNONAVY does not accept any liability whatsoever arising out of the use of this information.
1. IDENTIFICATION OF THE SUBSTANCE/COMPANY

Product Name: 326C01
Company Name: EURONAVY, Turma Marítimas e Industriais S.A.
Address: Estrada Vale de Moliças, Quinta de S. Francisco, 2914-516 Setúbal Portugal
Phone: 351 265 739440
Fax: 351 265 702711
Emergency Contact: 351 265 739440

2. COMPOSITION/INFORMATION ON INGREDIENTS

Preparation Description: Contains cycloaliphatic polyamine
Curing agent for ES326.

HAZARDOUS INGREDIENTS

<table>
<thead>
<tr>
<th>Ingredient name</th>
<th>CAS number</th>
<th>Concentration</th>
<th>EC Symbol</th>
<th>EC R-phrase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Isophoronediamine</td>
<td>2855-13-2</td>
<td>40% - 50% (min)</td>
<td>C</td>
<td>R21/22, R34, R43</td>
</tr>
<tr>
<td>Benzyl alcohol</td>
<td>100-51-6</td>
<td>10% - 15% (min)</td>
<td>Xn</td>
<td>R36/38, R22</td>
</tr>
</tbody>
</table>

3. HAZARDS IDENTIFICATION

Harmful in contact with skin and by ingestion.
May cause burns.
May cause sensitization by skin contact.

4. FIRST AID MEASURES

EYE CONTACT: For direct contact: Immediately flush eyes for 15 minutes, occasionally lifting eyelids. If victim wears contact lenses, remove lenses and continue rinsing. Clean contact lenses before reuse. If irritation or redness persists, seek medical attention.

SKIN CONTACT: Remove contaminated clothing. Wash affected area with plenty of water and soap. If you feel unwell, seek medical attention.

INGESTION: Do not induce vomiting. Show this document where possible.
5. **FIRE-FIGHTING MEASURES**

   **Extinguishing Media:**  Flame, dry chemical or water spray. Do not use water jet.

   **Special Fire Fight Procedure:** The use of self-contained breathing apparatus is recommended for fire fighters. Water may be helpful in keeping adjacent containers cool. Avoid spreading burning liquid with water used for cooling purpose.

6. **ACCIDENTAL RELEASE MEASURES**

   **Personal protection:** Use suitable personal protection equipment.

   **Environmental precautions:** Avoid the contamination of rivers, lakes and sea, absorb or contain with earth, sawdust or other suitable material. Sweep up and wash area clean with water.

7. **HANDLING AND STORAGE**

   **Handling:** Avoid contact with skin and eyes. Provide good ventilation.

   **Storage:** Keep the containers in a cool, dry place.

8. **EXPOSURE CONTROLS/PERSOANL PROTECTION**

   **Eye protection:** Safety glasses and available eye bath.

   **Hand protection:** Use suitable gloves.

   **Skin protection:** Wear boot and industrial overalls, preferably disposable, of the impervious, multilayer type.

9. **PHYSICAL AND CHEMICAL PROPERTIES**

   **Physical state:** Liquid

   **Flash Point:** > 100°C (212°F)

   **Density:** 1.0 g/cm³

   **Solubility in water:** Not soluble
11. TOXICOLOGICAL INFORMATION

There are no information about the preparation.

12. ECOLOGICAL INFORMATION

There are no information about the preparation.

13. DISPOSAL CONSIDERATIONS

Depending the extend of the contamination reclaiming or incineration of the product by an officially authorized enterprise.

14. TRANSPORT INFORMATION

UN-No 2735

ADR/RID
Class 8
Item 3.2 p.v.

IMDG/IDU
Class 8

ICAO/IATA
Class 8

3/4/03, cared agent for ES528, last revised 03-11-2003

Mod 6/01
15. **REGULATORY INFORMATION**

Contains: Isophorone diamine

**EEC Symbol:** C - Corrosive.

**EEC R-phrases:**
- R22 - Harmful by skin contact and ingestion.
- R34 - Causes burns
- R43 - May cause sensitization by skin contact.

**EEC S-phrases:**
- S1/2 - Keep locked up and out of reach of children.
- S26 - In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
- S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection.
- S45 - In case of accident or if you feel unwell, seek medical advice immediately.

(Show the label where possible.)

16. **OTHER INFORMATION**

This Material Safety Data Sheet is in compliance with EEC 91/155/EEC directives. Above information has been made very carefully based on existing literatures, EURONAVY does not accept any liability whatsoever arising out of the use of this information.

330COI, Owen agt. for ES326, last revised 03-11-2003

Mod 55/01  4/1
## Specification Data

<table>
<thead>
<tr>
<th>Binder Type / Pigment Type</th>
<th>Modified epoxy - Chemical resistant pigments and extenders.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colors</td>
<td>White</td>
</tr>
<tr>
<td>Finish</td>
<td>Semi-Gloss</td>
</tr>
<tr>
<td>Mixing ratio</td>
<td>5 (base) to 1 (curing agent) by weight</td>
</tr>
<tr>
<td>Curing agent</td>
<td>4.6 (base) to 1 (curing agent) by weight</td>
</tr>
<tr>
<td>Specific gravity (mixture)</td>
<td>1.250 ± 0.04 Kg/L</td>
</tr>
<tr>
<td>Solids by Volume</td>
<td>100%, theoretical.</td>
</tr>
<tr>
<td>Pot Life</td>
<td>50 minutes at 23°C (73°F), (outside from the water).</td>
</tr>
<tr>
<td>Flash point (Abel)</td>
<td>Base &gt; 100°C (112°F), Curing Agent: &gt; 100°C (221°F).</td>
</tr>
<tr>
<td>Theoretical covering capacity</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Tysitized film thickness per coat</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Application method</td>
<td>Sprays</td>
</tr>
<tr>
<td>Thinner</td>
<td>Mineral: white - Cleaning: EURO-dimers T800.</td>
</tr>
<tr>
<td>VOC (Volatile Organic Compound)</td>
<td>Does not contain.</td>
</tr>
<tr>
<td>Drying time</td>
<td>Self</td>
</tr>
<tr>
<td>Overcoating time</td>
<td>Mins: 24 hours at 23°C (73°F), Max: 7 days. If maximum overcoat time period exceeded, rough up surface.</td>
</tr>
<tr>
<td>Recommended primers</td>
<td>Self</td>
</tr>
<tr>
<td>Ambient temperature</td>
<td>Mins: 7°C (41°F), Max: 50°C (122°F).</td>
</tr>
<tr>
<td>Substrate temperature</td>
<td>Mins: 7°C (41°F), Max: 50°C (122°F).</td>
</tr>
<tr>
<td>Packing</td>
<td>Two pack product, available in 1 and 5 Kg, packs.</td>
</tr>
<tr>
<td>Storage and Shelf life</td>
<td>The product must be stored in accordance with national regulations. The product should be kept in a cool well ventilated place protected from high temperatures. Containers MUST BE kept tightly closed. Shelf life: 1 year</td>
</tr>
<tr>
<td>Approvals</td>
<td>EuroNawy Laboratory.</td>
</tr>
</tbody>
</table>

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**EURO-paste ES326**, last revised 31/07/2002

Manufactured by EURONAVY - Tintas Martim e Incorporada, S.A. – www.euronavy.net

Tel: +351.265.794400. Fax: +351.265.792711. E-mail: sales@euronavy.net
EURO-paste ES326 is engineered for direct application on poorly prepared surfaces. Gently clean surface with pneumatic rotating grinding pads prior to use to be treated. Remove all dust, debris, and debris from the surface with a vacuum cleaner. Before application of EURO-paste ES326, you MUST gently clean surface if any dusting or debris has settled on surface with dusting cloth. Note: if surface has oil or grime contamination, water will bond and not adhere. Apply soap or detergent to cleaning pad and clean surface. Contact your local Euro-Navy agent for recommendations.

**MIXING AND THINNING**

EURO-paste ES326 is a two-pack 100% epoxy product, which contains the proper ratio of components. Mix the product to obtain an uniform consistency. The mixing should not take more than 2 to 3 minutes. The use of a speed adjustable power mixer is recommended. The entire contents of each container must be mixed together to ensure that the two base react to form a smooth, homogenous condition not longer than 2 minutes. After obtaining a uniform base, add the curing agent slowly to the base under continuous stirring for 3 minutes. The use of a speed adjustable power mixer is recommended. Do not over agitate as this will accelerate cure and lower life of product.

**DO NOT USE THIS MATERIAL**

Higher temperatures will reduce pot life of the minimum. Lower temperatures will increase it.

**APPLICATION**

EURO-paste ES326 can be applied by spatulas. Care should be taken that proper and uniform film thickness are obtained.

**SAFETY**

WARNING: Chase eye and skin irritation. Do not get in eyes or on skin or clothing. Use careful handling after mixing product. Use gloves.

FIRST AID: In case of eye contact immediately flush with plenty of water for at least 15 minutes, call a physician. Wash skin contact areas with soap.
1. **IDENTIFICATION OF THE SUBSTANCE/COMPANY**

   **Product Name:** EUROW-IVER ES323(Base)
   **Company Name:** EURONAVY
   **Address:** Estrada Vale de Matalas, Quinta de S. Franciso, 2814-516 Setubal Portugal
   **Phone:** 351-265 739460
   **Fax:** 351-265 702711
   **Emergency Contact:** 351-265 739460

2. **COMPOSITION/INFORMATION ON INGREDIENTS**

   **Preparation Description:** 100% Solids Underwater Epoxy Coating.

   **HAZARDOUS INGREDIENTS**

<table>
<thead>
<tr>
<th>Ingredient name</th>
<th>CAS number</th>
<th>Concentration</th>
<th>EC Symbol</th>
<th>EC R-phrase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liquid epoxy resin</td>
<td>25068-88-6</td>
<td>30% - 40% (m/m)</td>
<td>Xi</td>
<td>R35/R36; R43</td>
</tr>
<tr>
<td>Bisaryl alcohol</td>
<td>100-51-6</td>
<td>2% - 5% (m/m)</td>
<td>Xn</td>
<td>R20/R22</td>
</tr>
<tr>
<td>Polymer with branched</td>
<td>not available</td>
<td>20% - 30% (m/m)</td>
<td>Xi</td>
<td>——</td>
</tr>
<tr>
<td>branches and unsaturated</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>groups</td>
<td>Glycidyl ester of</td>
<td>5% - 10% (m/m)</td>
<td>Xi</td>
<td>R36/R37; R43</td>
</tr>
<tr>
<td>Neodecanoic acid</td>
<td>26761-49-5</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

3. **HAZARDS IDENTIFICATION**

   **EYES** : Causes irritation.
   **SKIN** : Causes irritation.
4. **FIRST AID MEASURES**

**EYE CONTACT**
- For direct contact: Immediately flush eyes for 15 minutes, occasionally lifting eye-lids. If victim wears contact lenses, remove lenses and continue rinsing. Clean contact before reuse. If irritation or redness persists, seek medical attention.

**SKIN CONTACT**
- Remove contaminated clothing. Wash affected area with mild soap and water. If irritation or redness develops and persists, seek medical attention.

**INGESTION**
- Do not induce vomiting. If victim is conscious and able, get immediate medical attention.

**INHALATION**
- No specific measures.

5. **FIRE-FIGHTING MEASURES**

- **Extinguishing Media**: Dry chemical powder, carbon dioxide, foam, sand. Do not use water.

- **Fire Fight Procedure**: The use of self-contained breathing apparatus is recommended for fire fighters.

- **Unusual Fire/Explosion Hazards**: Keep adjacent containers cool by spraying water.

6. **ACCIDENTAL RELEASE MEASURES**

- **Personal protection**: Use personal protection equipment.

- **Environmental precautions**: Prevent contamination of soil and water, prevent from spreading or entering into drains, ditches or rivers by using sand, earth, or other appropriate barriers. If material enters drains, it should be pumped out into an open vessel.

7. **HANDLING AND STORAGE**

- **Handling**: Avoid contact with skin, eyes and clothing.

- **Storage**: Keep containers tightly closed, in warm and dry conditions.
8. EXPOSURE CONTROL/PERSONAL PROTECTION

Not established.

Eye protection: Safety glasses and available eye bath.
Respiratory protection: Not normally required.
Hand protection: Use chemical resistant type gloves.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state: Liquid.
Flash Point: > 200°C - 392°F (Abel).
Viscosity: 104 Kc (mixture).
Density: 1.3 g/cm³.
Solubility in water: Not soluble.

10. STABILITY AND REACTIVITY

Reacts with strong oxidizing agent, polymerizes exothermically with amines, mercuric and Lewis acids at ambient temperature and above.

11. TOXICOLOGICAL INFORMATION

There are no information about the preparation.

12. ECOLOGICAL INFORMATION

There are no information about the preparation.

13. DISPOSAL CONSIDERATIONS

Depending the extend of the contamination reclaiming or incineration of the product by an officially authorized enterprise.
14. TRANSPORT INFORMATION

Not dangerous according to IMO, ADR/RID and IATA/ICAO

15. REGULATORY INFORMATION

Contains:
- Liquid epoxy resin and glycidyl ester of neodecanoic acid

EEC Symbol: XI - Fertile.

EEC R-phrases:
- R36/38 - Irritating to eyes and skin.
- R43 - May cause sensitization by skin contact.

EEC S-phrases:
- S24 - Avoid contact with skin.
- S26 - In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
- S28 - After contact with skin, wash immediately with plenty of soap and water.
- S37/39 - Wear suitable gloves and eye/face protection.

Contains:
- Benzyl Alcohol

EEC Symbol: Xn - Harmful

EEC R-phrases:
- R20/R22 - Harmful by inhalation and ingestion.

EEC S-phrases:
- S2 - Keep out of reach of children.
- S26 - In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

16. OTHER INFORMATION

This Material Safety Data Sheet is in compliance with EEC 91/155/EEC directives.

Above information has been made very carefully based on existing literature. EURONAVY does not accept any liability whatsoever arising out of the use of this information.
1. IDENTIFICATION OF THE SUBSTANCE/COMPANY

Product Name: 323C01
Company Name: EURONAVY, Tintas Maritimas e Industriais S.A.
Address: Estrada Vale de Malias, Quinta de S. Francisco, 2914-516 Setubal Portugal
Phone: 351 265 739440
Fax: 351 265 702711
Emergency Contact: 351 265 739440

2. COMPOSITION/INFORMATION ON INGREDIENTS

Preparation Description: Contains cycloaliphatic polymer
Curing agent for ES323.

HAZARDOUS INGREDIENTS

<table>
<thead>
<tr>
<th>Ingredient name</th>
<th>CAS number</th>
<th>Concentration</th>
<th>EC Symbol</th>
<th>EC Re-phrase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cycloaliphatic polymerine</td>
<td>2855-13-2</td>
<td>40% - 50% (vol)</td>
<td>C</td>
<td>R21/22; R34; R43</td>
</tr>
<tr>
<td>Benzyl alcohol</td>
<td>100-51-6</td>
<td>10% - 15% (vol)</td>
<td>Xn</td>
<td>R20/22</td>
</tr>
</tbody>
</table>

3. HAZARDS IDENTIFICATION

Harmful in contact with skin and by ingestion.
May cause burns.
May cause sensitization by skin contact.
4. FIRST AID MEASURES

EYE CONTACT: For direct contact: Immediately flush eyes for 15 minutes, occasionally lifting eyelids. If victim wears contact lenses, remove lenses and continue rinsing. Clean contact lenses before reuse. If irritation or redness persists, seek medical attention.

SKIN CONTACT: Remove contaminated clothing. Wash affected area with plenty of water and soap. If you feel unwell, seek medical attention.

INGESTION: Do not induce vomiting. Show this document where possible.

5. FIRE-FIGHTING MEASURES

Extinguishing Media: Foam, dry chemical or water spray. Do not use water jet.

Special Fire Fight Procedure: The use of self-contained breathing apparatus’s recommended for fire fighters. Water may be helpful in keeping adjacent containers cool. Avoid spreading burning liquid with after being used for cooling purposes.

6. ACCIDENTAL RELEASE MEASURES

Personal protection: Use suitable personal protection equipment.

Environmental precautions: Avoid the contamination of rivers, lakes and sea, absorb or contain with earth, sand or other suitable material. Sweep up and wash area clean with water.

7. HANDLING AND STORAGE

Handling: Avoid contact with skin and eyes. Provide good ventilation.

Storage: Keep the containers in a cool, dry place.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Eye protection: Safety glasses and available eye bath.

Hand protection: Use suitable gloves.

Skin protection: Wear boot and industrial overalls, preferably disposable, of the impervious, multilayer type.
9. **PHYSICAL AND CHEMICAL PROPERTIES**

- **Physical state**: Liquid
- **Flash Point**: > 100°C (Abel)
- **Viscosity**: > 140 KU.
- **Density**: 1.0 g/cm³.
- **Solubility in water**: Not soluble

10. **STABILITY AND REACTIVITY**

- Reacts with acids.
- It decomposes at temperatures above 250°C, it produces ammonia as decomposition product.

11. **TOXICOLOGICAL INFORMATION**

There are no information about the preparation.

12. **ECOLOGICAL INFORMATION**

There are no information about the preparation.

13. **DISPOSAL CONSIDERATIONS**

Depending on the extend of the contamination reclaiming or incineration of the product by an officially authorized enterprise.

14. **TRANSPORT INFORMATION**

<table>
<thead>
<tr>
<th>Hazard Class</th>
<th>UN No.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2715</td>
</tr>
</tbody>
</table>

3310/01, coding agent for ES323, last revised 20-06-2002

Med 60/01 34
15. REGULATORY INFORMATION

Contains: Cyclodextrin basic polymer
HSE Symbol: C. Corrosive.
HSE Regulations: R21/R22 - Harmful by skin contact and ingestion.
R34 - Causes burns
R43 - May cause sensitisation by skin contact.
EC Classification: S26 - In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S43/3959 - Wear suitable protective clothing, gloves and eyewash protection.

Contains: Benzyl Alcohol
HSE Symbol: Xs - Harmful.
HSE Regulations: R20/R22 - Harmful by inhalation and ingestion.
EC Classification: S2 - Keep out of reach of children.
S26 - In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

16. OTHER INFORMATION

This Material Safety Data Sheet is in compliance with EEC 91/155/ECC directives.

Above information has been made very carefully based on existing literature, EURONAVY does not accept any liability whatsoever related to the use of this information.
**Euronavyy**

**EURO-diver 1 ES323**

100% solids underwater epoxy coating

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**SPECIFICATION DATA**

**Binder Type / Pigment Type**
- Modified epoxy/amine composites - Chemical resistant pigments.

**Cures**
- ES323: 00 White, or custom request.

**Flash**
- Max.

**Mixing ratio**
- 5 (base) to 1 (curing agent) by weight.

**Curing agent**
- 4 (base) to 1 (curing agent) by volume.

**Solids by Volume**
- 1.36% 0.04 kg/dm³

**Pour Life**
- 60 minutes at 23°C (73°F), (outside of the water).

**Flashpoint (closed cup)**
- 110°C (230°F)

**Theoretical covering capacity**
- 1.04 Sq m/1L (1.15 Sq ft/Gallon) at 200 microns (8 mils).

**Typical film thickness per coat**
- Wet: 200 microns (8 mils); Dry: 200 microns (8 mils)

**Applicator method**
- Brush, Roller. A power roller is recommended for quick application.

**Thinner**
- Not applicable. Curing: EURO-diver TH3.

**VOC (Volatile Organic Compound)**
- Does not contain. It is a 100% solids epoxy product.

**Drying time**
- Surface dry: 4 hours, 2 hours (underwater application, 23°C air temp.)

**Overcoating time**
- Max: 24 hours at 30°C (86°F). Max: 7 days. If maximum overcoating time exceeded, rough up surface.

**Recommended primers**
- Note.

**Ambient temperature**
- Min.: 5°C (41°F). Max.: 50°C (122°F).

**Substrate temperature**
- Min.: 7°C (45°F). Max.: 50°C (122°F).

**Packaging**
- Two pack, available in 1 and 5 kg packs.

**Storage and Shelf Life**
- The product must be stored in accordance with national regulations. The product should be kept in a cool and ventilated place protected from high temperatures. Containers MUST BE kept tightly closed. Shelf life 1 year.

**Appraisals**
- Euronavyy Laboratory.

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**GENERAL**

EURO-diver 1 ES323 is a 100% solids high performance two pack epoxy product, designed for application underwater with conventional tools. EURO-diver 1 ES323 complies with most environmental regulations (Note: not compliant with VOC's), and can be applied directly to steel.

**FEATURES**

- EXCELLENT ANTI-CORROSION PROPERTIES.
- EASY UNDERWATER APPLICATION WITH CONVENTIONAL TOOLS.
- COMPATIBLE WITH CATHODIC PROTECTION.
- EXCELLENT ADHESION ON POORLY TREATED SURFACES.
- EXCELLENT RESISTANCE TO WATER.

**RECOMMENDED USES**

SHIPS, OFFSHORE & MARINE STRUCTURES
- Great for protection of splash zones.

PIPE COATINGS
- Provides anticorrosive protection for industrial water intakes lines.

STEEL WATER TANKS

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EURO-diver 1 ES323, last revised 3/07/2002

Manufactured by EURONAVY, Vara de Mombela, 43060, Spain. Tel: +34 940 27 60 97 Fax: +34 940 27 60 97 E-mail: sales@euronavy.net
Application guide

SURFACE PREPARATION

EURO-diver 1 ES323 is engineered for direct application on properly prepared surfaces. Gently clean surface with a compatible solvent and make sure all oil, dirt, dust, and loose coating. Before application of EUR0-diver 1 ES323, you MUST ensure cleanliness is so that the product may be poured or wiped onto the surface. Presently, products are designed to maintain a clean surface. Contact your local Euro Navy agent for recommendations.

MIXING AND THINNING

EURO-diver 1 ES323 is a two-part 100% epoxy product that requires the proper ratio of ingredients. Mix the product to obtain a uniform consistency. The mixing should not take more than 2 to 3 minutes. The use of a speed-adjustable power mixer is recommended. The entire contents of each container must be mixed together in supplied 1:2. Use bars first to obtain smooth homogeneous mixture, not longer than 3 minutes. After obtaining a uniform bar, add the curing agent slowly into the base under continuous stirring for 3 minutes. The use of a speed-adjustable power mixer is recommended. Do not over agitate as this will accelerate cure and lower life of the mixture. Higher temperatures will reduce pot life of the mixture. Lower temperatures will increase it.

APPLICATION

EURO-diver 1 ES323, can be applied by brush or roller. A power roller is recommended for ease and speed. Use concentrating caution for each coat and wipe coating. However, it will be a consistent and uniform brush or roller. Use short broad brush or medium-tip roller for greater working distances. Brush or roll marks may be visible. Be sure that proper film thickness is achieved by working the material. On sharp edges, bevels, grooves, etc., a second coat would be better to "skim" or the holidays. Product may be immersed in water during application on top of the power roller application.

SAFETY

WARNING: Cause eye and skin irritation. Do not get in eyes or on skin or clothing. Be careful handling after mixing product. Use gloves.

FIRST AID: In case of eye contact immediately flush with plenty of water for at least 15 minutes, call a physician. Wash skin contact areas with soap.

DECLARATION: This is not a specification and all information is given in good faith. Every person associated with the product formula, unless otherwise noted, and we accept liability for losses or damages caused by the use of the product. Prior to application, Euro Navy may provide any additional information required. The user must be aware of the risks involved and the importance of following the directions. The product may be used in conditions that are unsuitable for the product as the product may cause and injury. For application in special conditions, please consult Euro Navy for detailed recommendations.

EURO-diver 1 ES323, last revised 3/05/2002

Manufactured by EUR0-NAVY, Tornas Martins Lda, 5850 195, Portugal

Tel: +351 265 799440, Fax: +351 265 70 2711, E-mail: sales@euronavy.net

Mod 4/03 - Page 2/2
MATERIAL SAFETY DATA SHEET
(For Coatings and Related Materials)

DATE: 06/15/98

PICCO COATINGS CO. INC.
11601 McKinley
Houston, Texas 77036

Section I -- PRODUCT IDENTIFICATION

Product Class: EPOXY PRODUCTS
Manufacturers Code: UT-15 A
Trade Name: UNDERWATER EPOXY RESIN

Emergency Tel. #: (800) 633-8252
Information #: (281) 447-8877

Section II -- HAZARDOUS INGREDIENTS

Ingredients: 
CAS #: 
Percent: 
TLV: 

BISPHENOL A/EPICHLOREHYDRIN: 25068-38-6: 100: NE.

1. Residual levels of Epichlorohydrin are controlled to 1 PPM maximum.

Section III -- PHYSICAL DATA

Melting Point: >500 deg. F
Flash Point: >480 Deg. F
Evaporation Rate: N/A
% Volatile by Vol.: 0%
Appearance and Odor: THICK CLEAR LIQUID
Solubility in Water: NEGLIGIBLE

Section IV -- FIRE AND EXPLOSION HAZARD DATA

Flammability Classification: OSHA-CLASS III-A
Extinguishing Media: Use National Fire Protection Association (NFPA) Class B
Fire Extinguisher or dry chemical, foam or carbon dioxide. Water fog may also be used.

Unusual Fire and Explosion Hazards: Keep containers tightly closed and away from heat, sparks, electrical equipment and open flame. Closed containers may explode when exposed to extreme heat and resultant pressure build up.

Section V -- HEALTH AND HAZARD DATA

Threshold Limit Value: N.E.

Effects of Over Exposure
Acute: Inhalation- Because of its low volatility, this product is not likely to be an inhalation hazard.
Chronic: Repeated contact may cause dermatitis.

Emergency and First Aid Procedures:
Ingestion: Keep person warm and quiet. Do not induce vomiting. Call physician immediately.

Inhalation: Because of its low volatility, this product is not likely to be an inhalation hazard.

Contact with skin: Wash skin thoroughly and remove saturated clothing. If symptoms persist, seek medical attention.

Eye Contact: Flush eyes with clean water for 15 minutes. Wash skin thoroughly and remove saturated clothing. If symptoms persist, seek medical attention.

Ingestion: Keep person warm and quiet. Do not induce vomiting. Call physician immediately.
DATE: 06/15/98
UT-15 A

PAGE 2 of 2

Section VI -- REACTIVITY DATA

Stability: Stable

Incompatibility (Materials to Avoid): Avoid contact with strong oxidizing agents.

Hazardous Decomposition Products: Usual products of combustion - CO, CO2 and possibly acrolein.

Hazardous Polymerizations: [ ] May Occur [X] Will Not Occur

Conditions to Avoid: Reaction with some curing agents may produce considerable heat. Run-away reactions may char and decompose the resin system, generating unidentified fumes and vapors which may be toxic.

Section VII -- SPILL OR LEAK PROCEDURES

Steps to be Taken in Case Material is Released or Spilled: Remove sources of ignition and provide ventilation. Large spills may be scooped up with flatblade shovels. Provide personal protection. Small quantities may be picked up with absorbent material. See disposal precautions below.

Waste Disposal Method: Place in closed containers. See other precautions below. Dispose of in accordance with local, state and federal regulations.

Section VIII -- SPECIAL PROTECTION INFORMATION

Ventilation: Not ordinarily required.

Protective Gloves: Neoprene rubber gloves.

Eye Protection: Goggles or side shield spectacles.

Other Protective Equipment: Eye wash station and safety showers should be available.

Section IX -- SPECIAL PRECAUTIONS

Precautions to be Taken in Handling and Storage: Store in cool, dry place. Keep away from open flames and high temperatures. Containers, even those that have been emptied, can contain hazardous product residues. Handle in accordance with the hazard potential of curing agent(s) used.

Transport Information: DOT: Resin Compound, Not Regulated

While PICCO COATINGS CO. believes that the data herein is accurate and derived from qualified sources, this data is not to be taken as a warranty or representation of fact for which PICCO COATINGS CO. assumes legal responsibility. They are offered solely for your consideration, and investigation and verification.
**MATERIAL SAFETY DATA SHEET**

(For Coatings and Related Materials)

**DATE:** 10/21/98

**PICCO COATINGS CO., INC.**

11601 McKinley

Houston, Texas 77030

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**Section I -- PRODUCT IDENTIFICATION**

- **Product Class:** EPOXY PRODUCTS
- **Manufacturers Code:** UT-158
- **Trade Name:** UNDERWATER EPOXY SYSTEM - HARDENER COMPOUND

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**Section II -- HAZARDOUS INGREDIENTS**

<table>
<thead>
<tr>
<th>Ingredients</th>
<th>CAS</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>AROMATIC AMINE w/MDA*</td>
<td>101-77-8</td>
<td>33</td>
</tr>
<tr>
<td>DIBUTYL PHthalATE</td>
<td>84-76-2</td>
<td>19</td>
</tr>
<tr>
<td>DIMETHYLAMINOMETHYL PHENOL</td>
<td>90-72-2</td>
<td>24</td>
</tr>
<tr>
<td>FILLER</td>
<td>1314-94-1</td>
<td>44</td>
</tr>
</tbody>
</table>

* skin contact: This product contains trace quantities of Methylenediamine, which is a suspected carcinogen, and is therefore classified as "Extremely Hazardous Substance" under SARA Title III.

**Section III -- PHYSICAL DATA**

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flash Point</td>
<td>&gt;250 deg. C</td>
</tr>
<tr>
<td>Evaporation Rate</td>
<td>N/A</td>
</tr>
<tr>
<td>Appearance and Odor</td>
<td>THICK WHITE LIQUID</td>
</tr>
<tr>
<td>Solubility in Water</td>
<td>SLIGHTLY SOLUBLE</td>
</tr>
</tbody>
</table>

---

**Section IV -- FIRE AND EXPLOSION HAZARD DATA**

- **Flash Point:** >250 deg. C

---

**Section V -- HEALTH AND HAZARD DATA**

**EMERGENCY AND FIRST AID PROCEDURES:**

**SKIN:** Wash thoroughly with mild soap and water.

**EYES:** Immediately flush eyes with water for at least 15 minutes. Call a physician.

**INGESTION:** If conscious, give large quantities of water. Induce vomiting. Call a physician.

**INHALATION:** Remove to fresh air. Give oxygen if breathing difficult. Promptly remove contaminated clothing and wash before reuse. Destroy contaminated leather and absorbent shoes.

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**FOR FURTHER INFORMATION:**

- **Emergency Tel.**: (800) 633-825
- **Information**: (281) 447-887
Section VI — REACTIVITY DATA

Stability: Stable

Hazardous Decomposition Products: Usual products of combustion — CO, CO₂ and possibly acrolein.

Hazardous Polymerizations: [ ] MAY OCCUR [X] WILL NOT OCCUR

Conditions to Avoid: Reaction with some resin bases may produce considerable heat. Run-away reactions may char and decompose the resin system, generating unidentified fumes and vapors which may be toxic.

Section VII — SPILL OR LEAK PROCEDURES

Steps to Be Taken in Case Material Is Released or Spilled: Remove sources of ignition and provide ventilation. Large spills may be scooped up with nonsparking tools. Provide respiratory protection if required. Small quantities may be picked up with absorbent material. See disposal precautions below.

Waste Disposal Method: Place in closed containers. See other precautions below. Dispose of in accordance with local, state and federal regulations.

Section VIII — SPECIAL PROTECTION INFORMATION

Respiratory Protection: NIOSH or MSHA approved mask or respirator for organic vapors.

Irritation: Designed and maintained to provide fresh air volume and pattern to prevent vapor concentration in excess of Threshold Limit Value (TLV) or lower explosive limit (LEL).

Protective Gloves: Neoprene rubber gloves.

Eye Protection: Goggles or side shield spectacles.

Other Protective Equipment: Eye wash station and safety showers should be available.

Section IX — SPECIAL PRECAUTIONS

Warning! Harmful if absorbed through the skin, swallowed or inhaled. May cause irritation and sensitization.

Keep containers tightly closed when not in use. Store away from food, food containers and clothing. Use clean clothing daily.

A shower after work is recommended.

Transport Information: DOT: Environmentally Hazardous Substance, Liquid, Corrosive, n.o.s. (Polyaromatic Amines), 9, UN-3082, PG III

PEN: Environmentally Hazardous Substance, Liquid, n.o.s.

IMDG: Class 9 PA 09028 UN-3082 PGC III

Note: This product is made exclusively for S.G. Pinney and Associates, Port St. Lucie, Fl.

PICO COATINGS CO. believes that the data herein is accurate and derived on qualified sources, this data is not to be taken as a warrantee or representation of fact for which PICO COATINGS CO. assumes legal responsibility. They are offered solely for your consideration, and investigation and verification.
DESCRIPTION:
PICCO COATINGS CO., INC. UT-15 coating is a two component epoxy system designed to be applied in underwater/splash zone environments. It chemically displaces water on the surface being coated, effecting an excellent bond to the substrate.

RECOMMENDED APPLICATIONS:
UT-15 Epoxy Coating is especially suited as a protective coating for use on offshore oil rigs, dock pilings, concrete reservoirs, cooling towers, sewage treatment areas, and processing plant floors. UT-15 not only lowers maintenance costs, but extends the expected service life of equipment and structures. It provides a durable waterproof surface on a variety of materials such as metal, wood, concrete, and fiberglass.

FEATURES:
*100% Solids
*Will not emulsify or float away during application.
*Lowers maintenance costs.
*Easily applied with a paint brush.
*Pre-measured kits.
*Excellent resistance to most acids, solvents, caustics, and oils.

PRODUCT CHARACTERISTICS:
COLOR (MIXED): Off White
VISCOITY (MIXED): Heavy Paint
MIXED RATIO: 1 Part Resin to 1 Part Hardener by volume
RACK LIFE (AT 77 F): 65 Minutes
REC. STORAGE TEMP: 40-110 deg. F. (store indoors)
SHELF LIFE: Two years if sealed tightly.
PACKAGING: 1 Gal., 2 Gal., 70 Gal. Kits
YIELD: 140-150 sq. ft./gal. at 10 mils

CURING TEMP. TACK FREE COMPLETE CURE
90 F 4.5 HRS. 18 HRS.
70 F 8.0 HRS. 36 HRS.
33 F 2.0 DAYS 4 DAYS
To recoat, allow coating to become tack free. If coating is allowed to exceed the complete cure period, then mechanically abrade before recoating. Although UT-15 will cure at 33 F, normal recommended water temperature should not fall below 45 F.

**Properties of Cured System:**
- Compressive Strength (ASTM D-692): 24600 psi
- Tensile Strength (ASTM D-638): 8950 psi
- Tensile Modulus (ASTM D-638): 550000 psi
- Shore "D" Hardness (ASTM D-2240): 72
- Bond Strength to Steel (ASTM D-1002): 1830 psi
- Bond Strength to Concrete: Greater than tensile strength of concrete.
- Heat Deflection Temperature (ASTM D-256): 145 F

**Application Instructions:**

**Surface Preparation:**
Abrasive blast or otherwise etch to remove surface laitance and other contaminants. Minimum concrete strength must be 3,000 psi.

**Installation Procedures:**
1. Mix 1 part Component A to 1 part Component B of the UT-15 for 2-3 minutes. Trowel apply this material.
2. Allow to cure overnight.

**Handling and Safety Precautions:**
This bulletin does not accompany the product when sold. For First Aid instructions and Hazard Warnings, refer to Material Safety Data Sheets, which are included with each shipment.

Picco Coatings Co. Inc. strongly recommends you read and fully understand handling and safety precautions prior to installation of materials.
Part A: Liquid Epoxy Resin
Warning! Causes eye and skin irritation. May cause allergic reaction. Harmful if swallowed. Avoid contact with eyes, skin and clothing. Wash thoroughly after handling. Avoid prolonged or repeated contact with skin.

Part B: Liquid Epoxy Hardener
Contains Alkaline Amines. Danger! Causes severe eye and skin burns. May cause allergic skin and respiratory reaction. Harmful if swallowed, inhaled or absorbed through skin. Contains trace quantities of MDA a suspected carcinogen and is therefore listed as "Extremely Hazardous Substance" by OSHA. Do not get in eyes, on skin or clothing. Avoid breathing vapor. Keep container closed. Use only adequate ventilation, wash after handling. Keep away from heat or open flame.

DISCLAIMER:
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