

**SELECTION & SPECIFICATION DATA**

<b>Generic Type</b>	Glass Filled Phenalkamine Epoxy
<b>Description</b>	High performance, glass-flake filled, cold cure epoxy having excellent film strength and resistance to water, salt water and wastewater exposures. This coating exhibits outstanding moisture tolerance during application, low temperature cure capability, and very fast cure response for quick return to service. Glass flake reinforcement enhances film strength, impact resistance and barrier properties. Can be used on a variety of surfaces including structural steel, piping, pilings, ships, offshore structures and other equipment exposed to industrial or marine environments. It can also be used in immersion service for salt water, process water (non-potable) and waste water treatment projects.
<b>Features</b>	<ul style="list-style-type: none"> <li>• High solids, low VOC</li> <li>• High build - capable of 400+ microns</li> <li>• Increased chemical, abrasion &amp; thermal shock resistance (as compared to std 690)</li> <li>• Suitable for service under insulation (CUI) - refer to Approvals NZ/AU, page 5</li> <li>• Approved for use in Food Processing plants - refer to Approvals NZ/AU, page 5</li> <li>• Low temperature cure -7°C (20°F)</li> <li>• Excellent moisture tolerance during application</li> <li>• Fast cure response</li> <li>• Excellent physical and barrier properties</li> </ul>
<b>Colour</b>	<ul style="list-style-type: none"> <li>• White</li> <li>• N53 Blue Grey</li> </ul>
<b>Finish</b>	Semi-Gloss (35-70)
<b>Primer</b>	Self-Priming or epoxies
<b>Dry Film Thickness</b>	254 - 381 microns (10 - 15 mils) per coat Can be applied up to 400 microns in a single coat- see Limitations section.
<b>Solids Content</b>	By Volume 82% +/- 2%
<b>Theoretical Coverage Rate</b>	32.3 m <sup>2</sup> at 25 microns (1315 ft <sup>2</sup> at 1.0 mils) 3.2 m <sup>2</sup> at 250 microns (132 ft <sup>2</sup> at 10.0 mils) 2.2 m <sup>2</sup> at 375 microns (88 ft <sup>2</sup> at 15.0 mils) Allow for loss in mixing and application.
<b>VOC Values</b>	<b>As Supplied</b> : 155 g/l mixed These are nominal values and may vary with colour.
<b>Dry Temp. Resistance</b>	Continuous: 93°C (199°F) Non-Continuous: 121°C (250°F)
<b>Limitations</b>	<ul style="list-style-type: none"> <li>• Epoxies lose gloss, discolour and eventually chalk in sunlight exposure. Discolouration is more pronounced with this product.</li> <li>• For immersion projects use only factory made material in standard colours.</li> <li>• This product has the ability to be applied over damp or even wet substrates. Remove excess water by blowing down the surface and apply in multiple coats to achieve desired film thickness.</li> <li>• Brush or roller, and multiple coats are preferred over wet substrates.</li> </ul>

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**Wet Temp. Resistance** | Immersion temperature resistance depends upon exposure (50°C maximum). Linings exposed to cargoes warmer than the outside steel temperature are subject to a "cold-wall" effect. The smaller the temperature differential, the less negative influence on performance.  
Before proceeding, applicators should ensure that adequate insulation will be put in place to minimise the temperature gradient between the cargo and the tank wall.

### SUBSTRATES & SURFACE PREPARATION

**General** | Surfaces must be clean and dry. Employ adequate methods to remove dirt, dust, oil and all other contaminants as described in AS 1627.1 (SSPC SP1).

**Steel** | Immersion:  
AS 1627.4, Class 2½ (SSPC-SP10); Surface Profile: 38-75 microns  
Non-Immersion:  
AS 1627.4 Class 2 (SSPC-SP6); Surface Profile: 38-75 microns.  
In certain situations AS 1627.2, St3 (SSPC-SP3) is acceptable for thicknesses up to 200 microns.

**Concrete or CMU** | Do not apply coating unless concrete has cured at least 28 days 21°C and 50% RH or equivalent. Clean and dry. Remove all loose, unsound concrete. Consult Carboline Technical Service for more specific recommendations.

### PERFORMANCE DATA

Test Method	System	Results
Abrasion Resistance ASTM D4060	1000 cycles, CS17 Wheel 1000 gm load	255 mg loss
Adhesion (DTM) ASTM D4541	1 ct 690; steel Class 2½ 1 ct 690; steel Class 2 1 ct 690; steel power tool	1300-1500 psi 1200-1400 psi 1100-1300 psi
Adhesion - System (Cohesion) ASTM D4541	CZ11/690/134HG 615/690 CZ859/690	1300-1500 psi 1700-1900 psi 800-1000 psi
Adhesion / Cohesion Self Recoat ASTM D4541	15 days @ 24°C 7 days @ 32°C 1 day @ 49°C 1 day at 65°C	2000-2200 psi 2200-2400 psi 2300-2500 psi 2500-2700 psi
Elongation ASTM D522 Conical Mandrel	1 ct 690 at 250 microns	> 30%
Flexibility ASTM D522 Conical Mandrel	1 ct 690 at 250 microns	Passes 1/8" (3 mm)
Impact Resistance ASTM D2794 Direct Impact	1 ct 690; steel Class 2½	61 inch-pounds

## MIXING & THINNING

<b>Mixing</b>	<p>Mix separately, then combine Parts A &amp; B followed by slow addition of Glass Flake Additive and mix in the following proportions (4:1:0.45 ratio):</p> <p><u>Kit Size 5.45 lt:</u></p> <ul style="list-style-type: none"> <li>• Part A: 4 litre</li> <li>• Part B: 1 litre</li> <li>• Part C: Glass Flake Filler +0.45 litre</li> </ul> <p><u>Kit Size 10.9 litre:</u></p> <ul style="list-style-type: none"> <li>• Part A: 8 litre</li> <li>• Part B: 2 litre</li> <li>• Part C: Glass Flake Filler +2 x 0.45 litre</li> </ul>
<b>Thinning</b>	<p>For non-immersion thin as required, up to 12.5% with Thinner #2; for immersion applications use Thinner #10.</p>
<b>Pot Life</b>	<p>1.5 hours at 24°C (5.45 litre mix) and less at higher temperatures. Pot life ends when coating becomes too viscous to use.</p>

## APPLICATION EQUIPMENT GUIDELINES

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

<b>Spray Application (General)</b>	<p>Hold gun 300-350 mm from the surface and at a right angle to the surface</p>
<b>Conventional Spray</b>	<p>Pressure pot equipped with dual regulators, 9.5 mm (3/8") I.D. minimum material hose, 2.8 mm (0.110") I.D. fluid tip and appropriate air cap.</p>
<b>Airless Spray</b>	<p>Pump Ratio: 45:1 min. Volume Output: 11.5 l/minute min. Material Hose: 12.5mm (1/2") recommended; 9.5 mm (3/8") I.D. minimum Tip Size: 0.035-0.041" Pressure: 140-175kg/cm<sup>2</sup> (2000-2500 psi) *PTFE packings are recommended and available from pump manufacturer.</p>
<b>Brush &amp; Roller (General)</b>	<p>Multiple coats may be required to obtain desired appearance, recommended dry film thickness and adequate hiding. Avoid excessive re-brushing or re-rolling. For best results, tie-in within 10 minutes at 24°C. Thin up to 12.5% by volume Thinner #2. Use a short-nap synthetic roller cover with phenolic core.</p>

## APPLICATION CONDITIONS

Condition	Material	Surface	Ambient	Humidity
Minimum	72°C (162°F)	-7°C (19°F)	-7°C (19°F)	0%
Maximum	32°C (90°F)	49°C (120°F)	38°C (100°F)	95%

Industry standards are for substrate temperatures to be above the dew point. For immersion conditions it is recommended to follow this procedure.

For non-immersion conditions this product can tolerate damp substrates. See Brush or Roller above.

Special thinning and application techniques may be required above or below normal conditions.

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### CURING SCHEDULE

Surface Temp.	Dry to Handle	Minimum Recoat Time	Maximum Recoat Time
-7°C (20°F)	72 Hours	72 Hours	60 Days
2°C (35°F)	17 Hours	17 Hours	45 Days
16°C (60°F)	6 Hours	6 Hours	30 Days
24°C (75°F)	2 Hours	2 Hours	15 Days
32°C (90°F)	1 Hours	2 Hours	7 Days

Schedule above based on 50% relative humidity and 250-375 micron dry film thickness per coat. Higher film thickness, insufficient ventilation or cooler temperatures will require longer cure times and could result in solvent entrapment and premature failure. Excessive humidity or condensation on the surface during curing can interfere with the cure, can cause discoloration and may result in a surface haze. Any haze or blush must be removed by water washing before recoating. If the maximum recoat times have been exceeded, the surface must be abraded by sweep blasting or sanding prior to the application of additional coats. For force curing, contact Carboline Technical Service for specific requirements. For application and cure conditions below 2°C, dehumidify before, during, and after application to prevent ice formation on the surface.

### CLEANUP & SAFETY

<b>Cleanup</b>	Use Thinner #2 or Acetone. In case of spillage, absorb and dispose of in accordance with local applicable regulations.
<b>Safety</b>	Read and follow all caution statements on this product data sheet and on the SDS for this product. Employ normal workerlike safety precautions. Hypersensitive persons should wear protective clothing, gloves and use protective cream on face, hands and all exposed areas.
<b>Ventilation</b>	When used as a tank lining or in enclosed areas, thorough air circulation must be used during and after application until the coating is cured. The ventilation system should be capable of preventing the solvent vapour concentration from reaching the lower explosion limit for the solvents used. User should test and monitor exposure levels to insure all personnel are below guidelines. If not sure or if not able to monitor levels, use suitable approved supplied air respirator.
<b>Caution</b>	This product contains flammable solvents. Keep away from sparks and open flames. All electrical equipment and installations should be made and grounded in accordance with the National Electric Code. In areas where explosion hazards exist, workers should be required to use non-ferrous tools and wear conductive and non-sparking shoes.

### PACKAGING, HANDLING & STORAGE

<b>Shelf Life</b>	<ul style="list-style-type: none"><li>• Part A: 24 months at 24°C</li><li>• Part B: 12 months at 24°C</li><li>• Glass Flake Additive: 60 months @ 24°C</li></ul> <p>*Shelf Life: (actual stated shelf life) when kept at recommended storage conditions and in original unopened containers.</p>
<b>Shipping Weight (Approximate)</b>	<ul style="list-style-type: none"><li>• 5.45 litre Kit: 10 kg</li><li>• 10.9 litre Kit: 20 kg</li></ul>
<b>Storage Temperature &amp; Humidity</b>	<ul style="list-style-type: none"><li>• 4°-38°C</li><li>• 0-95% Relative Humidity</li></ul>
<b>Flash Point (Setaflash)</b>	<ul style="list-style-type: none"><li>• Part A: 33°C</li><li>• Part B: 27°C</li><li>• Glass Flake Additive: N/A</li></ul>

## PACKAGING, HANDLING & STORAGE

**Storage** | Store Indoors. KEEP DRY.

## APPROVALS

### Approvals NZ/AU

#### Food Processing

NZASUREQuality assessed & passed for food/beverage including dairy farm & factory non-incident contact. Ref: H3108

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**Note:** *the Potable Water Approval for Carboguard 690 to AS 4020:2005 does not apply to Carboguard 690 GF – refer to approval data in Carboguard 690 data sheet.*

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#### Coating Under Insulation (CUI)

Carboguard 690 and 690 GF have been tested in line with recommendations under NACE RP0198:2004 and deemed suitable for application under insulation as follows:

- Austenitic Stainless Steel: NACE Systems 1 & 2 (-45° to 150°C)
- Carbon Steel: NACE Systems 1 & 5 (-45° to 150°C)

## WARRANTY

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