product data

Carboguard® 690

Potable Water Approved – AS4020:2005*

Selection & Specification Data

Generic Type
Phenalkamine Epoxy

Description
High performance, surface tolerant epoxy that has excellent resistance to 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. Can be used on structural steel, piping, tankage, and 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.

Features
- High solids, low VOC
- High build (16 mils)
- Low temperature cure -7°C (20°F)
- Excellent moisture tolerance during application
- Fast cure response
- Available in a range of standard and tintable colours.

Gloss
Semi-gloss

Colour
AU / NZ: White, Black, Yellow (LF), MIOX & Aluminium, N53 Blue Grey
AU only: N35 Light Grey
Tints - AU/NZ: Extensive range of AS 2700, BS 5252, RAL and custom tinted colours.
Global: Refer to Carboline Colour Chart

Primers
Self-priming, zinc-rich or epoxies

Topcoats
Acrylics, alkyds, Epoxies, Polyurethanes

Dry Film Thickness
For most applications: 125-200 microns per coat. Can be applied up to 400 microns in a single coat. (See Limitations).

Solids Content
Theoretical solids of mixed material by volume: SBV: 80 +/- 2%

Theoretical Coverage Rate
32 m²/l at 25 microns, 6.4 sq. m/l @ 125 microns
NOTE: Material losses during mixing and application will vary and must be taken into consideration when estimating job requirements.

Mix Ratio
4:1 by volume (Part A : Part B)

VOC Values
As supplied: 170 gm/litre mixed.
Thinned: 125ml #2 per litre (12.5%): 248 gm/litre)
These are nominal values and may vary with color.

Dry Temp. Resistance
Continuous: 93°C
Non-Continuous: 121°C

Wet Temp. Resistance
Immersion temperature resistance depends upon exposure (50°C maximum). Consult Carboline Technical Service for specific information. Linings exposed to cargos warmer than the outside steel temperature are subject to a "cold-wall" effect. The smaller the temperature differential, the less negative influence on performance

Substrates & Surface Preparation

General
Remove any oil or grease from surface to be coated with clean rags soaked in Carboline Thinner #2, toluene or Altex 10/90 Preparation Solvent. Concrete Do not apply coating unless concrete has cured at least 28 days 21°C and 50% RH or equivalent.

Steel
Immersion:
AS 1627.4, Class 2½ (SSPC-SP10); Surface Profile: 38-75 microns (See Limitations)
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
Clean and dry. Remove all loose, unsound concrete. Consult Carboline Technical Service for more specific recommendations.

Limitations
Epoxies lose gloss, discolour and eventually chalk in sunlight exposure. Discolouration is more pronounced with Carboguard 690. For immersion projects use only factory made material in special colors. This product has the ability to be applied over damp or even wet substrates. Remove excess water by blowing down the surface. For thicknesses in excess of 125-200 microns, use additional coats. Brush or roller is preferred over wet substrates.

Approvals

Potable Water Approval – AS 4020:2005

Australian Water Quality Centre

Carboguard 690 White* Reference: 130243-2009-CSR-1
Carboguard 690 N53 Bl/Gr* Reference: 130243-2009-CSR-2

*Important Note: This approval relates only to standard manufactured colours (White and N53 Blue Grey) as listed above. On no account should other colours be used for potable water service; nor should any tinted colours be used for any other immersion service.

Typical Performance Data

Test / Method	Exposure / System / Method	Results
DTM Adhesion (ASTM D4541)	1 ct 690; steel Class 2½	**1300-1500 psi**
	1 ct 690; steel Class 2	**1200-1400 psi**
	1 ct 690; steel. power tool clean	**1100-1300**
System Adhesion (ASTM D4541)	CZ11/690/134HG; steel Class 2½	**1300-1500 psi**
	615HS/690; steel Class 2½	**1700-1900 psi**
	CZ859/690; steel Class 2½	**800-1000 psi**
Self Recoat Adhesion (ASTM D4541)	15 day self recoat @ 24°C	**2000-2200 psi**
	7 day self recoat @ 32°C	**2200-2400 psi**
	1 day self recoat @ 49°C	**2300-2500 psi**
	1 day self recoat @ 65°C	**2500-2700 psi**
Abrasion Resistance	ASTM D4060; 1000 cycles, CS-17 wheel, 1000 gram load	**255 mg loss**
Impact Resistance	ASTM D2794 – Direct Impact	**61 inch/lbs**
Flexibility	ASTM D522 – Conical Mandrel	**Passes 1/8"**
Elongation	ASTM D522 – Conical Mandrel	**>30%**

Issued March 2010 – Ex Jan 2010

Carboguard® 690

Application Equipment

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

Conventional Spray

Pressure pot equipped with dual regulators, 9.5 mm (3/8") I.D. minimum material hose, 1,8 mm (.070") I.D. fluid tip and appropriate air cap.

Airless Spray

Hold gun 300-350 mm from the surface and at a right angle to the surface.
Pump Ratio: 4:1
Volume Output: 11.5 l/min min.
Material Hose:
12.5mm min. (½" I.D.) recommended
Tip Size: 0.43-0.53mm (0.017-0.021")
Output Pressure: 140-175kg/cm² (2000-2500 psi)

The following spray equipment has been found suitable; or equivalent.
Mfr. & Gun: Graco 207-300
Pump*: Bulldog 45:1
*Teflon packings are recommended and available from pump manufacturer.

Brush & Roller (General)

Not recommended for tank lining applications except when striping welds. For non-immersion applications over damp surfaces, brush and roller is the preferred method. 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 with Carboline #2. Use a short-nap synthetic roller cover with phenolic core.

Mixing & Thinning

Mixing

Mix separately, then combine and mix in the following proportions (4:1 ratio):

Ratio

Kit Size	5 litre	10 litre	20 litre
Part A	4 litre	8 litre	16 litre
Part B	1 litre	2 litre	4 litre

Thinning

Thin up to 12.5% by volume with Carboline Thinner #2 for non-immersion applications and Thinner #10 for immersion projects.

Pot Life

1.5 hours at 24°C and less at higher temperatures. Pot life ends when coating becomes too viscous to use.

Cleanup & Safety

Cleanup

Use Thinner #2 or Acetone. In case of spillage, absorb and dispose of in accordance with local applicable regulations.

Safety

Read and follow all caution statements on this product data sheet and on the MSDS for this product. Employ normal workmanlike safety precautions. Hypersensitive persons should wear protective clothing, gloves and use protective cream on face, hands and all exposed areas.

Ventilation

When used as a tank lining or in enclosed areas, thorough air circulation must be used during and after application until the coating is cured. The ventilation system should be capable of preventing the solvent vapour concentration from reaching the lower explosion limit for the solvents used.

Caution

This product contains flammable solvents. Keep away from sparks and open flames.

Application Conditions

Condition	Material	Surface	Ambient	Humidity
Optimum	16° - 24°C	16° - 24°C	16° - 24°C	30 – 70%
Minimum	7°C	-7°C	-7°C	0%
Maximum	32°C	50°C	35°C	85%

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.

Curing Schedule

For nominal film thicknesses 125 – 200 microns

Surface Temp °C @ 50% RH	Dry to Handle	Recoat Minimum	Minimum Cure for Immersion	Maximum Recoat Time
-7	72 hrs	72 hrs	45 days	60 days
2	36 hrs	17 hrs	30 days	45 days
14	12 hrs	6 hrs	14 days	30 days
24	5 hrs	2 hrs	7 days	15 days
32	3 hrs	2 hrs	6 days	7 days

These times are based on recommended coverage rates.

These times are based on a 125-200 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 discolouration 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.

For higher film thicknesses – 400 microns

Temperature °C	To Handle	To Recoat
10	48 hours	2 days
16	24 hours	40 hours
24	8 hours	24 hours
32	6 hours	24 hours

*Carboguard 690 that has been applied at thicknesses greater than 400 microns will require longer cure times, especially if applied thinned.

Packaging, Handling & Storage

Pack Sizes

AU: Std Colours 5 litre & 20 litre
Au: Tint Colours 5 litre & 10 litre
NZ: 5 litre & 10 litre

Flash Point (Setaflash)

Part A: 41°C
Part B 7°C

Storage Temperature & Humidity

Store indoors. KEEP DRY
4° to 38°C
0 to 95%

Shelf Life

Part A: 24 months – Part B: 12 months

***Shelf Life: (actual stated shelf life) when kept at recommended storage conditions and in original unopened containers.**

Manufactured / distributed by:-

Altex Coatings Ltd, 91-111 Oropi Road,
Tauranga 3112
New Zealand
Phone: +64 7 5411221

Resene Paints Australia Ltd.
T/A Altex Coatings
7 Production Avenue
Queensland 4214
Australia
Phone: +61 7 55949522

carboline®

350 Hanley Industrial Court, St. Louis, MO 63144-1599
314/644-1000 314/644-4617 (fax) www.carboline.com

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Issued March 2010 – Ex Jan 2010