Carboguard 696 HBE

PRODUCT DATA SHEET

SELECTION & SPECIFICATION DATA

Generic Type	Carboguard® 696 HBE is a phenalkamine cured high solids, syntactic foam modified, high build epoxy coating
Description	Carboguard® 696 HBE is designed for single coat application in areas such as a penstock lining, to film thicknesses typically ranging between 400 & 600 microns. Carboguard® 696 HBE may be applied using correctly equipped industry standard airless spray equipment of sufficient capacity. Carboguard® 696 HBE is suitable for service in various immersion environments, including industrial wastewater, slurry tanks, marine or fresh water, on buried structures, and on high wear surfaces in atmospheric exposure.
Features	• High Build Single Coat – 0.4mm to 0.6 mm in a single coat • Extensive case history in hydro penstocks & scroll casings, along with industrial waste water processing • Positive cure, even at low temperatures • Highly abrasion resistant • Unique flexibilised formulation imparts excellent impact resistance • May be used on buried structures, structures immersed in fresh or salt water, and for atmospheric exposure • Suitable for use with cathodic protection systems – impressed current or anode types • Low density of 1.09 – heavy duty protection with minimal added weight • Easy application qualities using properly set up standard heavy-duty airless spray equipment
Colour	Pale Beige (yellows on UV exposure)
Gloss	Textured low sheen
Primer	Self-priming or as specified by Carboline Technical Services
Film Build	Typical: 500 microns DFT Range: 400-600 microns DFT per coat
Solid(s) Content	95% by volume
Coverage Rate	9.5 square metres per litre at 100 microns DFT 1.9 square metres per litre at 500 microns DFT
VOC Value(s)	65 grams per litre (mixed)
Dry Temp. Resistance	Continuous: 90°C (194°F) Non-Continuous: 121°C (250°F) Discolouration will be observed above 93°C
Limitations	Exterior exposure will cause early loss of sheen, possible discolouration and chalking. This will not affect the protective properties of the coating.
Topcoats	• Immersion or Buried Structures: • None normally required • Atmospheric Exposure: • May be colour finished with Carbothane® or Carboguard® as required

SUBSTRATES & SURFACE PREPARATION

General	Remove any oil or grease from surface using clean rags soaked in Thinner #2 or toluene.

SUBSTRATES & SURFACE PREPARATION

Steel

- Immersion or High Impact Service: Abrasive SSPC-SP 10 (AS 1627.4 Class 2½) with a 50-75 micron jagged blast profile.
- Non-Immersion: Abrasive blast to a minimum of SSPC-SP 6 (AS 1627.4 Class 2) with a 50 - 60 micron jagged blast profile.
  Optimum performance will always be achieved by abrasive blasting to SSPC-SP 10 (AS 1627.4 Class 2½).

Concrete

Concrete should be fully cured for 28 days at 21°C and 50% RH or equivalent.
Remove all laitance by sweep abrasive blasting, HP Water-Jetting or acid etching. For maximum performance and to reduce the risk of pin-holing seal the prepared concrete with Carboguard® 1340 or Altra~Lock® 576.

*Altra~Lock® is the registered trademark of Altex Coatings Limited

PERFORMANCE DATA

Test Method	System	Results
*Acid Resistance Bund Lining Test 98% H_2SO_4	2 cts to 1000 µm on concrete	36 hours immersion @ ~20°C No measurable effect Slight brown discolouration
Adhesion & Cohesion ASTM D 4541	1 ct @ 500 microns Class 2½ blast; 50 µm profile	>6.9 MPa (1000 psi)
Cathodic Disbondment** AS/NZS 4352:1995 Test Cell A (Concentric Cup Method) ~ ASTM G8-90	1 ct @ 500 µm on 3mm MS	No effect on field adhesion 1.5 mm disbondment No blistering
Impact Resistance ASTM D2794	2 cts to 1000 microns	Passes 69 kg-cm (60 inch-pounds)
Intercoat Adhesion 1 year between coats ASTM D4541	2 cts @ 500 per ct 12 months aging between cts Class 2½ blast	>6.9 MPa (1000 psi)

*Acid Bund Test: Tests with other known 'strong' acids such as nitric acid, hydrochloric (muriatic acid) & acetic acid yielded similar results. Emergency bund linings are only required to retain the spill for 24 hours without compromising the bund wall.
**Cathodic Disbondment: Benchmark accelerated test; 9 mm 'holiday', aqueous electrolyte (1% sodium chloride, 1% sodium sulphate, 1% sodium carbonate), 3000 mV at 25°C for 7 days.

MIXING & THINNING

Mixing

Power mix each component separately, then combine and mix to the correct 2:1 proportions.
DO NOT MIX PARTIAL KITS

Thinning

Under normal circumstances HBE does not require thinning.
In cold conditions, or when using undercapacity spray equipment, very sparing thinning may be necessary.
We do not recommend the addition of more than 2% v/v of Thinner #109 or Denatured Ethanol (less than 200 ml / 10 litre kit).
A very small amount of thinner gives a large drop in viscosity that may adversely affect wet film build and / or retard cure response.

Ratio

2:1 by volume (Part A : Part B)

MIXING & THINNING

Pot Life	1 hour at 25°C (9 litre kit)
Induction Time	10 minutes max at 15°C or colder. Not required at > 15°C

APPLICATION EQUIPMENT GUIDELINES

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

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Conventional Spray	Generally not suitable.
Airless Spray	Pump Ratio: 45:1 Pump Intake: 45 mm (1¾") ID from Gravity Feed Hopper Volume Output: 12 l/minute min. Material Hose: 12.5mm min. (½" I.D.) recommended Tip Size: .019-.021" Tip Type: Free-flow (no baffle bar) Output Press.: 2200-2500 psi *Teflon packings are recommended and available from pump manufacturer.
Brush & Roller (General)	Recommended for touch up and striping of welds only. Use a natural bristle brush with full strokes. Avoid re-brushing.

APPLICATION CONDITIONS

Condition	Material	Surface	Ambient	Humidity
Minimum	15°C (59°F)	2°C (36°F)	0°C (32°F)	0%
Maximum	30°C (86°F)	43°C (109°F)	38°C (100°F)	85%
Optimum	21°C (70°F)	23°C (73°F)	23°C (73°F)	30%

Note: The above minimum material temperature is stated at 15°C. We strongly recommend conditioning of the coating to be applied to ensure 15°C is achieved. This will significantly improve application properties.
Industry standards are for substrate temperatures to be above the dew point. Condensation due to substrate temperatures being below the dew point can cause flash rusting on prepared steel and interfere with proper adhesion to the substrate.

CURING SCHEDULE

Surface Temp.	Dry to Touch	Dry to Recoat Maximum	Dry to Recoat Minimum	Dry Hard
10°C (50°F)	9 Hours	30 Days	24 Hours	36 Hours
16°C (61°F)	6 Hours	30 Days	18 Hours	24 Hours
24°C (75°F)	4 Hours	30 Days	12 Hours	18 Hours
32°C (90°F)	3 Hours	15 Days	8 Hours	10 Hours

These times are based on a 500 micron dry film thickness. 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 time is exceeded, the surface must be abraded by sweep blasting prior to the application of additional coats. For force curing, contact Carboline Technical Service for specific requirements.

CLEANUP & SAFETY

Cleanup	Use Thinner #2, #12 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.

PACKAGING, HANDLING & STORAGE

Shelf Life	Part A: 24 months @ 24°C Part B: 24 months @ 24°C *Shelf Life: (actual stated shelf life) when kept at recommended storage conditions and in original unopened containers.
Storage Temperature & Humidity	4-38°C 0-95%
Flash Point (Setaflash)	Mix: 27°C
Storage	Store indoors and KEEP DRY
Packaging	9 litre two components kits Part A: 6 litres (in part 10 litre) Part B: 3 litres (in part 4 litre)

WARRANTY