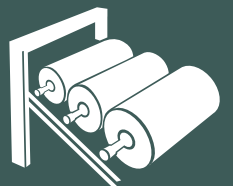


Pulp & Paper

System Guide

Coatings and Linings



Coatings

NEW CON- STRUCTION / MAINTENANCE	SURFACE PREPARA- TION (SSPC)	1ST COAT	MILS (MICRONS)	2ND COAT	MILS (MICRONS)	3RD COAT	MILS (MICRONS)
Interior, Wet Environment – Steel							
Structural steel, equipment, tanks, pumps, motors, piping & pipe racks.							
New	SP 10	Carbozinc 859 Organic Zinc	3-5 (75-125)	Carboguard 635 VOC Epoxy	4-6 (100-150)	Carbothane 133 Series Polyurethane	3-5 (75-125)
New	SP 10	Carbozinc 859 Organic Zinc	3-5 (75-125)	Carboguard 635 VOC Epoxy	4-6 (100-150)	Carboguard 635 VOC Epoxy	4-6 (100-150)
New or maintenance	SP 6, 10	Carboguard 890 Epoxy	4-6 (100-150)	Carboguard 890 Epoxy	4-6 (100-150)		
Maintenance	SP 2, 3	Carbomastic 615 Surface Tolerant Epoxy	4-6 (100-150)	Carboguard 635 VOC Epoxy	4-6 (100-150)		
Maintenance	SP 2, 3	Carbomastic 615 Surface Tolerant Epoxy	4-6 (100-150)	Carbozinc 615 Surface Tolerant Epoxy	4-6 (100-150)	Carbothane 133 Series Polyurethane	3-5 (75-125)
Maintenance	SP 2, 3	Rustbond or Rustbond FC Penetrating Sealer Epoxy Sealer	4-6 (100-150)	Carbozinc 615 Surface Tolerant Epoxy	4-6 (100-150)	Carboguard 635 VOC Epoxy	4-6 (100-150)
Interior, Dry Environment – Steel							
Structural steel, equipment, tanks, pumps, motors, and miscellaneous.							
New	SP 10, 6	Carbozinc 859 Organic Zinc	3-5 (75-125)	Carboguard 635 VOC Epoxy	4-6 (100-150)		
New	SP 10, 6	Carbozinc 859 Organic Zinc	3-5 (75-125)	Carboguard 635 VOC Epoxy	4-6 (100-150)	Carbothane 133 Series Polyurethane	3-5 (75-125)
Maintenance	SP 2, 3	Carboguard 635 VOC Epoxy	4-6 (100-150)				2-2 1/2 (50-62)
Maintenance	SP 2, 3	Rustbond or Rustbond FC Penetrating Sealer Epoxy Sealer	1-2 (25-50)	Carboguard 635 VOC Epoxy	4-6 (100-150)	Carbothane 133 Series Polyurethane	3-5 (75-125)
Maintenance	SP 2, 3	Carbomastic 615 (spot) Surface Tolerant Epoxy	4-6 (100-150)	Carbocrylic 3359 DTM Acrylic	3-5 (75-175)	Carbocrylic 3359 DTM Acrylic	3-5 (75-175)
Overhead Structures – Steel							
Structural steel, trusses, beams.							
New or maintenance	SP 2, 3	Carbomastic 615 Surface Tolerant Epoxy	4-6 (100-150)	Carboguard 890 Epoxy	4-6 (100-150)		
New or maintenance	SP 2, 3	Rustbond or Rustbond FC Penetrating Sealer Epoxy Sealer	1-2 (25-50)	Carboguard 635 VOC Epoxy	4-6 (100-150)	Carboguard 635 VOC Epoxy	4-6 (100-150)
Overhead Surfaces - Concrete							
Ceilings, underside of concrete slabs.							
New or maintenance	SP 13	Sanitile 100 WB acrylic block filler	As required	Sanitile 155 WB acrylic finish	2-3 (50-75)		
New or maintenance	SP 13	Carboguard 890 Epoxy	4-6 (100-150)	Carboguard 890 Epoxy	4-6 (100-150)		

Coatings

NEW CON- STRUCTION / MAINTENANCE	SURFACE PREPARA- TION (SSPC)	1ST COAT	MILS (MICRONS)	2ND COAT	MILS (MICRONS)	3RD COAT	MILS (MICRONS)
Interior Environments – Concrete							
Interior walls, labs, warehouses, mechanical rooms, control rooms, chemical storage, locker rooms.							
New or maintenance	SP 13	Sanitile 755 Epoxy	10-15 (250-375)	Sanitile 755 Epoxy	10-15 (250-375)	Sanitile 855 Polyester urethane	3-5 (75-125)
New or maintenance	SP 13	Sanitile 500 WB epoxy filler/sealer	As required	Sanitile 555 WB epoxy finish	3-4 (75-100)		
New or maintenance	SP 13	Sanitile 755 Epoxy finish	5-8 (125-200)	Sanitile 755 Epoxy finish	5-8 (125-200)		
New or maintenance	SP 13	Sanitile 500 WB epoxy filler/sealer	As required	Sanitile 855 Polyester urethane	2-3 (50-75)		
New or maintenance	SP 13	Sanitile 600 Epoxy block filler	As required	Sanitile 655 Epoxy finish	4-6 (100-150)		
Galvanized Steel – Weathered							
Weathered surfaces, cable trays, ducts, structures.							
Maintenance	SP 1, 2 or 16	Rustbond or Rustbond FC Penetrating Sealer Epoxy Sealer	1-2 (25-50)	Carbocrylic 3359 DTM Acrylic	3-5 (75-175)		
Exterior, Weathering - Steel							
Structural steel, equipment, building frames, tanks, piping & pipe racks.							
Maintenance	SP 6	Rustbond or Rustbond FC Penetrating Sealer Epoxy Sealer	1-2 (25-50)	Carboguard 635 VOC Epoxy	3-5 (75-175)	Carbothane 133 Series Polyurethane	3-5 (75-125)
Maintenance	SP 6	Rustbond or Rustbond FC Penetrating Sealer Epoxy Sealer	1-2 (25-50)	Carbothane 133 Series Polyurethane	3-5 (75-125)		
Maintenance	SP 2, 3, 6	Carbomastic 615 Surface Tolerant Epoxy	4-6 (100-150)	Carbothane 133 Series Polyurethane	3-5 (75-125)		
Paper Machines, Wet End – Steel							
Fourdrinier, press section, frames, pumps, motors, equipment							
New	SP 10	Phenoline 379 Epoxy novolac	20-25 (500-625)	Carboguard 890 Epoxy	4-6 (100-150)		
New	SP 10	Carbozinc 859 Organic zinc	3-5 (75-125)	Carboguard 635 VOC Epoxy	4-6 (100-150)	Carbothane 133 Series Polyurethane	3-5 (75-125)
Maintenance	SP 2,3	Carbomastic 615 Surface tolerant epoxy	5-7 (125-175)	Carbothane 133 Series Polyurethane	3-5 (75-125)		
Maintenance	SP 2,3	Carbomastic 615 Surface tolerant epoxy	5-7 (125-175)	Carboguard 635 VOC Epoxy	4-6 (100-150)		

Coatings

NEW CON- STRUCTION / MAINTENANCE	SURFACE PREPARATION (SSPC)	1ST COAT	MILS (MICRONS)	2ND COAT	MILS (MICRONS)	3RD COAT	MILS (MICRONS)
Chemical Exposure, Caustic – Steel							
Structural steel, equipment, pumps, motors, piping, tanks, storage & warehouse areas, and other miscellaneous steel							
New	SP 6	Carbozinc 859 Organic zinc	3-5 (75-125)	Carboguard 60 Epoxy	4-6 (100-150)	Sanitile 855 Polyester urethane	4-6 (100-150)
New or maintenance	SP 6 SP 2, 3	Carboguard 635 VOC Epoxy	4-6 (100-150)	Carboguard 890 Epoxy	4-6 (100-150)		
New or maintenance	SP 6	Phenoline 379 Epoxy novolac	15-18 (375-450)				
Maintenance	SP 2, 3	Carbomastic 615 Surface tolerant epoxy	5-7 (125-175)	Carbocrylic 3359 DTM Acrylic ter polymer	3-5 (75-125)		
Chemical Exposure, Acid – Steel							
Structural steel, equipment, pumps, motors, piping, tanks, misc. steel							
New	SP 6	Carbozinc 859 Organic zinc	3-5 (75-125)	Carboguard 60 Epoxy	4-6 (100-150)	Carbothane 133 Series Polyurethane	3-5 (75-125)
New	SP 3	Carboguard 800 Series Epoxy	4-6 (100-150)	Carbothane 133 Series Polyurethane	3-5 (75-125)		
Sulfuric vapor	SP 6	Phenoline 379 Epoxy novolac	15-18 (375-450)				
Sulfuric spills	SP 10	Phenoline 379 Epoxy novolac	15-35 (375-875)				
Below Grade, Wet Soil – Steel							
Buried pipe, tanks, vessels							
New or maintenance	SP 10	Bitumastic 300 M Coal tar epoxy	8-10 (200-250)	Bitumastic 300 M Coal tar epoxy	8-10 (200-250)		
Surface Exposures to 500°F (260°C) – Steel							
Boiler housings, stacks, burners, soot blowers, ash hoppers, piping, tank exteriors, equipment.							
New or maintenance	SP 10	Carbozinc 11 Series Inorganic zinc	2-3 (50-75)	Thermaline 4900 Silicone acrylic	1.5-2 (100-150)		
Surface Exposures to 800°F (425°C) – Steel							
Structural steel, tower skirts, pipe racks, cable trays, control rooms							
New or maintenance	SP 10	Carbozinc 11 Series Inorganic zinc	2-3 (50-75)	Thermaline 4000 Silicone	3-5 (76-127)		
Surface Exposures to 1200°F (650°C) – Steel							
Structural steel, tower skirts, pipe racks, cable trays, control rooms							
New or maintenance	SP 10	Thermaline Heat Shield Inorganic polymer	3-5 (89-127)	Thermaline Heat Shield Inorganic polymer	3-5 (89-127)		
Under Insulation -500 to 400°F (-450 to 205°C) – Steel							
Piping, structural steel under insulation. NACE: SP0198-2010 CS-4							
New or maintenance	SP 10	Thermaline 450 EP Modified epoxy phenolic	4-8 (100-200)	Thermaline 450 EP Modified epoxy phenolic	4-8 (100-200)		
Under Insulation -500 to 1200°F (-450 to 650°C) – Steel							
Piping, structural steel under insulation. NACE: SP0198-2010 CS-6							
New or maintenance	SP 10	Thermaline Heat Shield Inorganic polymer	3-5 (89-127)	Thermaline Heat Shield Inorganic polymer	3-5 (89-127)		

Coatings

NEW CON- STRUCTION / MAINTENANCE	SURFACE PREPARA- TION (SSPC)	1ST COAT	MILS (MICRONS)	2ND COAT	MILS (MICRONS)	3RD COAT	MILS (MICRONS)
Fireproofing – Steel							
Structural steel, tower skirts, pipe racks, cable trays, control rooms							
Intumescent	SP 6	Carbozinc 859 Organic zinc	3-5 (75-125)	Thermo-Lag 3000 Intumescent epoxy	As required	Carbomastic 94 Epoxy	5-7 (50-75)
Cementitious	SP 6	Carbozinc 11 Series Inorganic zinc	2-3 (50-75)	Pyrocrete 241 Series Cementitious	As required	See data sheet for specified products	3-5 (75-125)
Fire retardant	Clean & dry	Thermo-Lag 270 Water based mastic	125 (3125)				
Stack Interiors – Steel							
Interior lining for up to 380°F (193°C) with excursions to 460°F (238°C)							
New or maintenance	SP 10	Plasite 4310 Vinyl ester	17-22 (425-550)	Plasite 4310 Vinyl ester	17-22 (425-550)		

Notes:

- Carbozinc 11 Series consists of four inorganic zinc products designed to meet every need: Carbozinc 11, Carbozinc 11 FG, Carbozinc 11 HS, and Carbozinc 11 VOC.
- Carbothane 133 Series include a choice of polyurethane topcoats to meet your needs: Carbothane 133 HB, 133 LH, 133 VOC, 133 MC or 133 LV.
- Maintenance coating systems can be applied in two (2) or three (3) coats, depending on the service conditions.
- Thermaline 4900 VOC and Thermaline 4700 VOC may be substituted for Thermaline 4900 and Thermaline 4700, respectively, as local VOC regulations dictate.
- Carboguard 890 may be used as an epoxy topcoat in lieu of polyurethane where additional corrosion protection is more critical than appearance.
- Rustbond Penetrating Sealer may be used as a primer/sealer overcoat over existing, aged paints (with appropriate topcoats)
- Carbozinc 859 can provide superior performance as a maintenance primer. Please consult your Carboline Sales Representative to discuss your specific application.
- In maintenance painting, some coats may be eliminated depending on the condition of the existing paint system. Please consult your Carboline Sales Representative.
- Heavily pitted steel can make coating application more complicated. Please consult your Carboline Sales Representative.
- The application technique of stripe coating edges and weld lines will improve coating system performance.
- Carbothane 134 Series may be used in lieu of 133 Series when a gloss finish is desired.
- Carbothane 134 Series includes a choice of high gloss polyurethane topecoats to meet your needs including Carbothane 134 HG, 134 VOC, 134 MC, 134 LV, 134 WB, and 134 HP.
- Carboxane 2000 may be used in lieu of Carbothane Series when an ultra-durable performance topcoat is desired.
- Surface Cleaner 3 is a water based, biodegradable cleaner that is effective in cleaning and degreasing surfaces prior to painting.
- Where surface preparation designations of SSPC SP 10, SP 6, SP 7, SP 3, and SP 2 are used the ISO designations of Sa 2 ½, Sa 2, Sa 1, St 3, and St 2 (respectively) are also applicable.
- Water blasting may be used in lieu of abrasive blasting in some instances. SSPC WJ1, WJ2, WJ3 and WJ4 are standards that may apply. Consult your Carboline Sales Representative for specific advice.
- For Fireproofing Systems, other primers and topcoats than those listed may be acceptable. Consult your Carboline Sales Representative for specific advice.

Linings

SUBSTRATE	SURFACE PREPARATION	1ST COAT	MILS (MICRONS)	2ND COAT	MILS (MICRONS)	TOTAL DFT MILS (MICRONS)
Pulp & Paper Making – Concrete & Tile						
Stock chests (machine, decker, broke, etc.), fan & seal pits, pulper boxes, brown stock washers, couch & wire pits						
New or maintenance	SP 13			Plasite 5302 Epoxy	125 (3175)	125 (3125)
New or maintenance	SP 13	Plasite 5371 Epoxy	125 (3175)	Plasite 5302 Gel Coat Epoxy	5-8 (125-200)	130 (3250)
Pulp & Paper Making - Steel						
High density towers, filtrate tanks, stock washers, washer vats, blow tanks, bleach plants (consult technical service)						
New or maintenance	SP 10	Plasite 5371 Epoxy	125 (3175)	Plasite 5302 Gel Coat Epoxy	5-8 (125-200)	130 (3250)
New or maintenance	SP 10	Plasite 5302 Epoxy	125 (3175)			125 (3125)
New or maintenance	SP 10	Semstone 140 or 145 Epoxy/epoxy novolac	30-40 (750-1000)			30-40 (750-1000)
New or maintenance	SP 10	Plasite 7159 HAR Epoxy	5-6 (125-150)	Plasite 7159 HAR Epoxy	5-6 (125-150)	10-12 (250-300)
Chemical Recovery – Steel						
Liquor tanks, clarifiers, precipitators & duct work, stacks, evaporators						
New or maintenance	SP 10	Plasite 4310 Vinyl ester	35-45 (875-1125)			35-45 (875-1125)
New or maintenance	SP 10	Plasite 7159 HAR Epoxy	5-6 (125-150)	Plasite 7159 HAR Epoxy	5-6 (125-150)	10-12 (250-300)
New or maintenance	SP 10	Plasite 9573 Baked epoxy phenolic	6-7 (150-175)	Plasite 9573 Baked epoxy phenolic	6-7 (150-175)	12-15 (300-375)
New or maintenance	SP 10	Plasite 4100 Vinyl ester	20 (500)	Plasite 4100 Vinyl ester	20 (500)	40 (1000)
New or maintenance	SP 10	Plasite 4300 Vinyl ester	20 (500)	Plasite 4300 Vinyl ester	20 (500)	40 (1000)
Chemical Recovery – Concrete						
Trenches and sumps throughout the processes						
New or maintenance	SP 13			Semstone 140 or 145 Epoxy/epoxy novolac	40-100 (1000-2500)	40-100 (1000-2500)
New or maintenance	SP 13	Plasite 5371 Epoxy	125 (3125)	Plasite 5202 Gel Coat Epoxy	10 (50)	135 (3375)
New or maintenance	SP 13			Plasite 5302 Epoxy	125 (3175)	125 (3125)

Linings

SUBSTRATE	SURFACE PREPARATION	1ST COAT	MILS (MICRONS)	2ND COAT	MILS (MICRONS)	TOTAL DFT MILS (MICRONS)
Chemical Storage – Steel						
Immersion service, consult tech service for specific recommendations based on service conditions						
Green & black liquor to 200°F	SP 10	Plasite 4550 S Epoxy novolac	30-40 (750-1000)			30-40 (750-1000)
Caustic & alkaline	SP 10	Plasite 4500 or 4550 Epoxy/epoxy novolac	30-40 (750-1000)			30-40 (750-1000)
Sulfuric acid to 98% (high purity)	SP 10	Plasite 3073 Baked phenolic	2-3 (50-75)	Plasite 3073 Baked phenolic	2-3 (50-75)	4-6 (100-150)
Starch, clay	SP 10	Plasite 7122 VOC Epoxy phenolic	6-7 (150-175)	Plasite 7122 VOC Epoxy phenolic	6-7 (150-175)	12-15 (300-375)
Demineralized water, high temp, brine	SP 10	Plasite 9052 Epoxy	5-7 (125-175)	Plasite 9052 Epoxy	5-7 (125-175)	10-14 (250-350)
50% Caustic	SP 10	Plasite 9081 Epoxy	6-7 (150-175)	Plasite 9081 Epoxy	6-7 (150-175)	12-15 (300-375)
Concentrated sulfuric acid (92%-98%)	SP 10	Plasite 9085 Epoxy novolac	6-7 (150-175)	Plasite 9085 Epoxy novolac	6-7 (150-175)	12-15 (300-375)
Calcium carbonate	SP 10	Plasite 9133 Epoxy	5-7 (125-175)	Plasite 9133 Epoxy	5-7 (125-175)	10-15 (250-375)
75% Caustic to 200°F	SP 10	Plasite 9573 Baked epoxy phenolic	6-7 (150-175)	Plasite 9573 Baked epoxy phenolic	6-7 (150-175)	12-15 (300-375)
Sulfur dioxide & salt cake	SP 10	Plasite 4100 Vinyl ester	20 (500)	Plasite 4100 Vinyl ester	20 (500)	40 (1000)
Hydrogen peroxide, tall oil	SP 10	Plasite 4300 Vinyl ester	20 (500)	Plasite 4300 Vinyl ester	20 (500)	40 (1000)
Chlorine dioxide max. 2% @ 160°F	SP 10	Plasite 4310 Vinyl ester	20 (500)	Plasite 4310 Vinyl ester	20 (500)	40 (1000)

Linings

SUBSTRATE	SURFACE PREPARATION	1ST COAT	MILS (MICRONS)	2ND COAT	MILS (MICRONS)
Complementary Products - Concrete					
Tank pads, pump pads, grout fill and patching mortar, form voids and bug hole fillers, sealants					
Concrete filler & patching material	SP 13	Semstone 110 Epoxy primer	8-10 (200-250)	Semstone 305 Epoxy novolac	As needed
Concrete fill & patching material	SP 13	Semstone 8084 Vinyl ester primer	8-10 (200-250)	Semstone 884 Vinyl ester	As needed
Concrete grout & repitching mortar	SP 13	500 Series primer Epoxy	3-4 (75-100)	Semstone 5400 Epoxy	As needed
Concrete sealant	SP 13	Semstone 110 Epoxy primer	8-10 (200-250)	Semstone 806 Epoxy novolac	As needed
Concrete sealant	SP 13	Semstone 6325 Polyurethane	As needed		

Notes (for concrete surfaces):

- Concrete surfaces may require filling, sealing or repair to eliminate surface imperfections, voids or bug holes prior to application of the coating system. See Complementary Products.
- Exact thickness depends on the extent of patching or repair work necessary.



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