

SELECTION & SPECIFICATION DATA

Generic Type	Vinyl ester
Description	Plasite 4310 is a vinyl ester resin combined with special curing system and inert flake pigment to provide outstanding chemical and physical properties. Plastic 4310 is specially formulated for excellent abrasion resistance while retaining temperature, chemical and other physical properties of Plasite 4300.
Features	<ul style="list-style-type: none"> • Outstanding acid immersion performance • Solvent immersion lining • High temperature resistance • Performs under thermal shock • Extremely high abrasion resistance • self priming • High build
Color	Charcoal Gray
Primer	For steel surfaces, coating is considered to be a “self-priming” system. Do not apply directly to concrete.
Dry Film Thickness	20 - 30 mils (508 - 762 microns) per coat 35 - 45 mils (889 - 1143 microns) in two or more coats
Coverage Rate	Plasite 4310 will cover approximately 960 mil ft. ² /gal. or 86.4 m ² per 25 microns/gal. This is a coverage obtained from field use on small jobs and includes loss in can, spray loss, small amount of shrinkage, etc. Application by conventional spray equipment may decrease coverage rate. An approximate 20% reduction in coverage rate can be anticipated when using conventional equipment.
VOC Values	As Supplied : 0.56 lbs/gal (67 g/L) Plasite Thinner #20 : 0.85 lbs/gal (102 g/L)
Dry Temp. Resistance	Continuous: 380°F (193°C) Non-Continuous: 460°F (238°C) Limited short excursions to 460 °F (238 °C) acceptable. Wet temperature resistance depends upon concentration and reagent exposure.
Topcoats	Not Applicable
Density	81.7 lbs/ft ³ (0.2722 lbs/ft ² at 40 mils)

SUBSTRATES & SURFACE PREPARATION

General	Surfaces must be clean and dry. Employ adequate methods to remove dirt, dust, oil and all other contaminants that could interfere with adhesion of the coating.
Steel	Cleanliness: Abrasive blast to SSPC-SP10 (minimum) Profile: Minimum 4 mil (100 microns) dense, sharp anchor profile free of peening, as measured by ASTM D 4417. Defects exposed by blasting must be repaired.
Aluminum	Consult Carboline Technical Service

SUBSTRATES & SURFACE PREPARATION

Concrete or CMU | Concrete shall be designed, placed, cured, and prepared per NACE No. 6/SSPC-SP 13, latest edition. Abrade to remove all laitance, loose concrete, etc. and to create surface profile in accordance with the appropriate ICRI CSP 5-7.

PERFORMANCE DATA

All test data was generated under laboratory conditions. Field testing results may vary.

Test Method	System	Results
*Abrasion Resistance	Plasite 4310	Average loss per 1000 cycles, Taber CS-17 Wheel, 1000 gram weight: 9 milligrams
*Surface Hardness	Plasite 4310	Konig Pendulum Hardness of 152 seconds; (Glass Standard = 250 seconds); ASTM Method D4366-84
Elongation	Plasite 4310	1.5%; Method ASTM D638
Permeability	Plasite 4310	ASTM D1653: 0.0196 grams per m ² per 24 h
Thermal Shock	Plasite 4310	Unaffected by minus 70 °F to 200 °F in 5 cycles, or 40 °F to 400 °F in 10 cycles

*Note: Above tests were conducted on film cured at 150 °F.

MIXING & THINNING

Mixing | This is a 4-component material. Mix Part B into Part A using a mechanical high speed agitator, making sure all of Part B is completely mixed with Part A. Maintain a good vortex while mixing until a smooth liquid, free of any unmixed particles of pigment, is obtained (approximately 15-30 minutes). After the pigments and liquid are thoroughly mixed, add the entire amount of the measured liquid promoter (Part D). Mix completely. (no color streaking or residue of part D should remain on the container sidewalls). Allow to cool if material temperature increases, then add Part C and necessary amount of Plasite Thinner 20. Mix an additional three to five minutes.

WARNING! The promoter (Part D) and the catalyst (Part C) must be separately mixed into the coating (Parts A&B). Any contact of unmixed Part C with Part D may lead to a fire or an explosion!

Continuous mixing during use is required. Part A, Part B and Part D may be premixed up to 72 hours prior to adding Part C. Operator should wear face mask during high speed mixing of the coating components. Avoid breathing dust.

Kit components match as follows:

Small, 1 gallon kit:
 Part A - Approximately 3/4 of a gallon in a one gallon container
 Part B - Approximately 5 pounds in a one gallon container
 Part C - Approximately 3.5 fluid ounces in a 6 ounce plastic bottle
 Part D - Less than 0.5 fluid ounce in a 2 ounce plastic bottle

Large, 5 gallon kit:
 Part A - Approximately 3.75 gallons in a 6 gallon container
 Part B - Approximately 24 pounds in a one gallon container
 Part C - Approximately 18 fluid ounces in a 1 quart plastic bottle
 Part D - Less than 2.4 fluid ounce in a 6 ounce plastic bottle

MIXING & THINNING

Thinning	<p>Use Plasite Thinner 20. Thinning of 2 to 10% may be needed to adjust coating for higher temperatures and various application conditions. Topcoating of previously applied films will require the addition of 2 to 5% thinner.</p> <p>Consult Carboline Technical Service Department for unusual thinning requirements.</p>
Pot Life	<p>1.5 to 2.5 hours in 1-gallon cans and 1.5 to 2 hours in 5- gallon cans at 70 to 90 °F (21 to 32 °C) material temperature. Material temperatures in excess of 90 °F (32 °C) will significantly reduce pot life.</p> <p>CAUTION! Do not attempt to extend pot life by mixing newly catalyzed coating into coating near the end of its pot life.</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.

Spray Application (General)	<p>59ASS Fluid Nozzle 251 Air Cap 559SS Needle Pot pressure of approximately 50 psi Atomizing pressure of approximately 60 psi Use standard production type pressure pot with air motor drive agitator. Heavy-duty trigger spring recommended.</p> <p>Note: Application by conventional spray equipment may affect maximum film building capabilities and coverage rates.</p>
Airless Spray	<p>GPM Output 3.0 (minimum) Material hose 3/8" I.D. (minimum) Fluid nozzle 0.025" or larger Output PSI 1800-2200 12" minimum spray width All screens should be removed from pump and gun CONTINUOUS MIXING DURING USE IS REQUIRED</p>
Brush	<p>Brush application is not recommended, but may be used for repairs or touchup.</p>

APPLICATION PROCEDURES

General

The mixed coating shall be applied utilizing a multi-pass spray system. Apply horizontal and vertical passes with 50% overlap. Special precautions are required at overlaps and welds to eliminate excessive film build. Spray gun should be perpendicular to surface at all times, approximately 14 in/36 cm from surface.

Coating may be overcoated after initial “set” which will occur normally in 3 to 6 hours at 70 °F(21 °C) with proper ventilation. Initial “set” time will decrease as surface temperature increases.

WARNING! Refer to RECOATING TIME. When physical contact (foot traffic, scaffolding, etc.) with the previously applied coating is required, a minimum of 10 hours at 70 °F (21 °C) substrate and air temperature with ventilation is normally required before proceeding. Previously applied coats must have reached a “non-tacky” state before being exposed to physical contact. This condition will occur in less time as surface temperature increases. Overcoating shall be performed as soon as possible to prevent contamination.

Applicators may prefer to apply additional coats to achieve the 40mil/1000 microns nominal DFT.

LINING REPAIR

Clean damaged area, removing all contaminants and loose coating. Abrasive blast substrate to original specification where coating has been exposed to environment and where oxidation is evident. Feather the original coating not less than 2in/5cm from damaged area. If new coating is physically damaged and has not been in service, repair as shown above. For repairing holidays, sand surface and brush apply proper thickness of coating. Apply coating by brush or spray. Do not apply by brush on areas larger than 1 ft²/0.093 m² **WARNING:** Contamination of previously exposed coating film may be detrimental to adhesion of the repair and may affect service life expectancy.

RECOATING TIME

May be recoated after initial hardening which will occur normally in 3 to 10 hours depending upon the surface temperature. Following coating must be applied within 30 days. Each following coat shall be diluted approximately 2 to 5% with Plasite Thinner #20. Note: Previously applied coating exposed to an accumulation of 24 hours of sunlight or surface temperatures in excess of 130 °F (54 °C) may result in intercoat disbondment. An applied coating film must be topcoated before an accumulation of 24 hours exposure has occurred or special procedures (such as shading with tarps) must be used.

APPLICATION CONDITIONS

Condition	Material	Surface	Ambient	Humidity
Minimum	70°F (21°C)	60°F (16°C)	60°F (16°C)	0%
Maximum	90°F (32°C)	100°F (38°C)	100°F (38°C)	80%

A minimum surface temperature of 70 °F (21 °C) is required to obtain polymerization of the coating system. Coating can be applied at a surface temperature as low as 60 °F (16 °C) but polymerization will be inhibited. Succeeding coats cannot be applied without damaging the system until the surface temperature rises sufficiently to obtain partial polymerization. This will require raising to the minimum surface temperature of 70 °F (21 °C) within 12 hours of application. Refer to CURING. When surface temperatures are over 100 °F (38 °C), consult Carboline Technical Service Department for special instructions.

CURING SCHEDULE

Surface Temp.	Cure Time
70°F (21°C)	10 Days
90°F (32°C)	7 Days

The coating may be applied at substrate temperatures as low as 60 °F (16 °C), the substrate temperature must be raised to at least 70 °F (21 °C) within 12 hours and held until coating surface is tack-free (approximately 10 hours) to avoid possible loss of cure. A minimum of 70 °F (21 °C) surface temperature is required to obtain polymerization of this coating.

CURING SCHEDULE

Surface Temp.	Cure Time
110°F (43°C)	72 Hours
120°F (49°C)	38 Hours
130°F (54°C)	18 Hours
140°F (60°C)	10 Hours
150°F (66°C)	6 Hours
160°F (71°C)	4.5 Hours
170°F (77°C)	3.5 Hours
180°F (82°C)	2.5 Hours
190°F (88°C)	2 Hours
200°F (93°C)	1.75 Hours

Prior to raising the metal to the force curing temperature, it is necessary that an air dry time of 2 to 5 hours at temperatures from 70 °F (21 °C) to 100 °F (38 °C) be allowed. After the air dry time has elapsed, the temperature should be raised in increments of approximately 30 °F (17 °C) every 30 minutes until the desired force curing metal temperatures are reached. Any moisture from condensation of any source will kill the cure on freshly applied coating before it reaches a “non-tacky” stage.

CLEANUP & SAFETY

Cleanup	Clean with Plasite Thinner 71. 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 SDS for this product. Employ normal workmanlike safety precautions. Keep container closed when not in use.
Ventilation	When used 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 vapor 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, use MSHA/NIOSH approved respirator.
Caution	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

Packaging	<u>Small, 1 gallon kit:</u>
	Part A - Partially filled 1 gallon container
	Part B - Partially filled 1 gallon container
	Part C - Partially filled 6 ounce plastic bottle
	Part D - Partially filled 2 ounce plastic bottle
	<u>Large, 5 gallon kit:</u>
	Part A - Partially filled 6 gallon container
	Part B - Partially filled 1 gallon container
Part C - Partially filled 1 quart plastic bottle	
Part D - Partially filled 6 ounce plastic bottle	

PACKAGING, HANDLING & STORAGE

Shelf Life	At 75 °F (24 °C): Part A: 3 months Part B: 24 months Part C: 12 months Part D: 24 months
	Cooler storage temperatures will increase shelf life. Storage at higher temperatures can result in substantially shorter shelf life.
Storage	Store indoors.
Shipping Weight (Approximate)	12 lbs. per 1 gallon kit 60 lbs. per 5 gallon kit
Flash Point (Setaflash)	Part A: 74 °F (23 °C)
	Part B: None
	Part C: 51 °F (11 °C)
	Part D: 142 °F (61 °C)

WARRANTY

To the best of our knowledge the technical data contained herein is true and accurate on the date of publication and is subject to change without prior notice. User must contact Carboline Company to verify correctness before specifying or ordering. No guarantee of accuracy is given or implied. We guarantee our products to conform to Carboline quality control. We assume no responsibility for coverage, performance, injuries or damages resulting from use. Carbolines sole obligation, if any, is to replace or refund the purchase price of the Carboline product(s) proven to be defective, at Carbolines option. Carboline shall not be liable for any loss or damage. NO OTHER WARRANTY OR GUARANTEE OF ANY KIND IS MADE BY CARBOLINE, EXPRESS OR IMPLIED, STATUTORY, BY OPERATION OF LAW, OR OTHERWISE, INCLUDING MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. All of the trademarks referenced above are the property of Carboline International Corporation unless otherwise indicated.