

RCF HS Laminate Epoxy Adhesive

HIGH STRENGTH AND MODULUS STRUCTURAL EPOXY PASTE ADHESIVE FOR USE WITH RHINO CARBON FIBER LAMINATE PLATE REINFORCEMENT SYSTEM

DESCRIPTION: RCF HS Laminate Epoxy Adhesive is a two-component, high modulus, structural epoxy paste adhesive designed for the application of Rhino Carbon Fiber Laminate. It can also be used for application on vertical surfaces and in horizontal and overhead oriented holes. Primary uses include fairing and leveling uneven concrete, filling of wide cracks, gaps and voids in concrete and masonry, bonding of rigid construction materials, e.g., hardened concrete, masonry, stone, steel and wood to themselves or each other and anchoring bolts, dowels and rebar into horizontal and overhead oriented holes in concrete, masonry or stone. The product is ideally suited for applications requiring significant manual labor, due usually to restricted access to the substrate. RCF HS Laminate Epoxy Adhesive bonds to dry, damp and wet (no free-standing water) substrates and can be applied up to 1/2 inch thick without sag or flow. The components do not contain volatile organic compounds (VOC's). **SPECIAL FEATURE:** Can be extended with Part C (Ceramic Filler) for thick overhead patching & filling.

Features

Convenient 1: 1, by vol. mix ratio

Long work life for high temperatures, limited access

Bonds to dry, damp and wet (no free standing water) substrates

Suitable for vertical, horizontal and overhead repairs

Meets ASTM C881 Type IV for load bearing applications

Exceptional substrate wetting/water displacement

Environmentally safe - No VOC solvents

Limitation: Minimum substrate and ambient temperature: 5 °C (41 ° F). Maximum substrate and ambient temperature: 35 °C (95 °F). Do not thin: Solvents will prevent proper cure. Use oven-dried aggregate only. Maximum glue line of neat epoxy: 3 mm (1/8 in). Maximum epoxy mortar thickness: 25 mm (1 in) per lift. Material is a vapour barrier after cure. Minimum adhesive strength of concrete substrate: 1.5 MPa (218 psi). Minimum age of concrete must be between 21 and 28 days, depending upon curing and drying conditions. Porous substrates must be tested for moisture-vapour transmission prior to mortar applications.

Packaging & Colors: Standard package sizes of Part A & Part B are 2 and 10 gallons. Standard color is concrete gray.

Chemical Resistance: RCF HS Laminate Epoxy Adhesive has excellent resistance to a wide range of commonly encountered chemicals including acids and bases, aircraft and automotive fluids, cutting oils, etc. Performance is a function of the specific chemical and concentration, exposure times and housekeeping procedures. For information on specific chemicals and exposure conditions, contact a RHINO Products USA Inc., technical representative.

Surface Preparation: Surface must be clean and sound. It may be dry or damp, but free of standing water and frost. Remove dust, laitance, grease, curing compounds, impregnations, waxes, foreign particles, disintegrated materials, and other bond inhibiting materials from the surface. Existing uneven surfaces must be filled with an appropriate repair mortar (i.e. RCF HS Laminate Epoxy Adhesive with the addition of 1 part silica sand). The concrete adhesive strength must be verified after surface preparation by random pull-off testing (ACI 503R) at the engineer's discretion. Minimum tensile strength: 1.5 MPa

(218 psi) with concrete substrate failure. **Planeness of substrate to be checked with a metal batten. tolerance for 2 m (6.5 ft) length max. 10 mm (3/8 in), or 2.5 mm (3/32 in) for 50 cm (20 in) length respectively.**

Concrete: Blast clean, shotblast or use other approved mechanical means to provide an open roughened texture.

(CSP 5) steel: Sandblast to white metal finish.

Timber: Blast clean or grind. After cleaning, remove all dust from the surface with an industrial vacuum cleaner.

Rhino Carbon Fiber Laminate: Surface should be wiped clean using an appropriate cleaner. Using a clean white cloth wipe down the side receiving adhesive (this side is not labeled) with acetone until all residual carbon dust is removed (i.e. the white cloth remains white after wiping the laminate). In the case where the design requires "stacking" of the strips, the bottom surface of the strip (labeled) should be lightly sanded (emery paper type 180) and cleaned as above prior to the application of the second strip.

Shelf Life: Three years minimum in unopened, original containers when stored between 60 and 90 deg. F in a dry place away from sunlight. Remixing of components may be required upon prolonged storage.

Mixing: RCF HS Laminate Epoxy Adhesive is a two-component system. The resin to hardener (Part A : Part B) mix ratio is 1 :1, by volume. Read all material safety data (MSDS) information before handling the product. Wear safety glasses and clean neoprene rubber gloves when handling the materials, Premix the individual components before drawing from bulk packaging. Transfer the appropriate quantities of Part A and Part B into a mixing container. Use quantities that can be applied before the pot life of the material expires. Blend thoroughly using a Jiffy mixer blade attached to a low speed (350 - 750 rpm) electric or pneumatic drill. Proper mixing will take 2 - 3 minutes.

Installing for bonded, external reinforcement: Apply the neat mixed RCF HS Laminate Epoxy Adhesive onto the concrete with a trowel or spatula to a nominal thickness of 1.5 mm (1/16 in). Apply mixed RCF HS Laminate Epoxy Adhesive onto the Rhino Carbon Fiber Laminate with a "roof-shaped" spatula to a nominal thickness of 1.5 mm (1/16 in). Within the epoxy open time and depending on the temperature, place Rhino Carbon Fiber Laminate onto the concrete surface. Using a hard rubber roller, press the laminate into the epoxy resin until the adhesive is forced out on both sides. Remove excess adhesive. Glue line should not exceed 3 mm (1/8 in). The laminate must not be disturbed for a minimum of 24 hours. The epoxy will reach its design strength after 7 days.

Installing for vertical and overhead patching: Work RCF HS Laminate Epoxy Adhesive with the addition of 1 part oven dried sand into the prepared substrate, filling the cavity. Strike off level. Lifts should not exceed 25 mm (1 in).

TYPICAL PROPERTIES (1)

Property (2)	Test Method	Value
MIX RATIO, A :B,	BY VOL	1:1
	BY WT	100 : 125
WEIGHT PER GALLON, LB:	PART A	10.36
	PART B	12.93
	MIXED	11.64
VISCOSITY, POISE: PART A	ASTM D 2393	--
		@ 50 F @73 F @105 F
		5000 -- --
	PART B	-- 4800 --
	MIXED	-- 4900 --
NON-SAG THICKNESS, INCHES	ASTM D 2730	-- ½ --
GEL TIME, 1 QUART, HOURS	ASTM C 881	4.4 1.4 0.5
THIN FILM PROPERTIES:		
OPEN TIME, HOURS	AASHTO T-237	-- 2 --
HARD DRY TIME, HOURS	ASTM D 1640	-- 4 --
CURE TIME, DAYS	AASHTO T-237	-- 1 --
COMPRESSIVE YIELD STRENGTH, PSI	ASTM D 695	11,500
COMPRESSIVE MODULUS, PSI	ASTM D 695	350,000
FLEXURAL STRENGTH, PSI	ASTM D 790	10,500
FLEXURAL MODULUS, PSI	ASTM D 790	630,000
HEAT DEFLECTION TEMP., DEG F	ASTM D 648	130
BOND STRENGTH, PSI:	2 DAY CURE @ 60° F	1000 (2)
	14 DAY CURE @ 60° F	1500 (2)

(1) CURE SCHEDULE, 7 DAYS AT 73° ± 4° F AND TEST TEMPERATURE, 73° ± 4° F UNLESS OTHERWISE INDICATED.

(2) COMPRESSIVE STRENGTH OF CEMENT MORTAR, 4500 PSI.

Clean up: Excess mixed product is best removed from the work area and tools before it hardens. Use of rags and solvents such as acetone or heavy-duty detergents facilitate cleaning. Cured product may be removed from tools by soaking in an epoxy stripper

Handling and Toxicity: This bulletin does not accompany the product when sold. For hazard warnings, safe handling and first aid instructions, READ CAREFULLY THE MATERIAL SAFETY DATA SHEETS AND CONTAINER WARNING LABELS.

Part A: Liquid epoxy resin, HMIS Health Hazard Rating - 2 (Moderate Hazard). Warning! Causes eye and skin irritation. May cause allergic skin reaction. Harmful if swallowed. Avoid contact with eyes, skin and clothing. Wash thoroughly after handling. Avoid prolonged or repeated contact with skin.

Part B: Liquid epoxy hardener, HMIS Health Hazard Rating - 3 (Serious Hazard). Contains alkaline amines. Danger! Causes severe eye and skin burns. May cause allergic skin and respiratory reaction. Corrosive. Do not get in eyes or skin or on clothing. Avoid breathing vapor. Keep container closed. Use only with adequate ventilation. Wash thoroughly after handling. Keep away from heat and open flame

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