

Carbon Fiber Adhesive

Carbon fiber adhesive includes carbon fiber primer HM-180, carbon fiber levelling adhesive HM-180CE, carbon fiber impregnating adhesive HM-180C3P. Primer HM-180, used for improving the properties of the concrete surface, which is in direct contact with the carbon fiber system. Levelling Adhesive HM-180CE, used for levelling and repairing physical defect on the concrete surface of the existing structure. Impregnating Adhesive HM-180C3P, used for impregnating carbon fibers and bonding the carbon fiber fabric to concrete surface.



▲▲ Product Advantages

- Use of the advanced nano material technology to improve the product' s overall performance, and ensure the thixotropic and other properties are better so fibers could be easily coated.
- Use of low viscosity two components A style modified epoxy resin, and adjusted polarity of the functional group to improve penetrability.
- Adoption of very advanced formula, which makes the adhesive coupling-reaction takes place with different substrates, the bond strength improved by at least 18%, along with achieving higher durability.
- No organic volatile, no filler, good suitability. Compared with other products, it saves at least 15% in usage.
- Advanced high speed dual planetary power mixing equipment, which results in the raw materials being mixed evenly. Meanwhile, the use vacuum treatment ensures no air bubble created, which extends the shelf life of the product and improves the stability of its performance.
- Product passed several safety tests, e.g. Non-toxic testing, Horizontal firing test, Non ethanediamine test, Acute oral toxicity test etc.

▲▲ Product Characteristics

- Primer HM-180: low viscosity, good liquidity, strong penetration ability, can well infiltrate and bond the crack and defects on the concrete surface.
- Levelling adhesive HM-180CE: Good thixotropic properties, easy to apply, excellent for filling small holes and chipped-out concrete, and level the surface of the concrete.
- Carbon fiber impregnating adhesive HM-180C3P: low viscosity, good impregnating properties, can well infiltrate the carbon fiber fabrics, and has the thixotropic properties makes it easy to apply.
- Good compatibility with carbon fibers.
- Excellent durable performance, corrosion resistance, humidity and moisture resistance, and chemical corrosion resistance.
- After curing, it has good physical properties, good toughness and elastic properties.

▲▲ Application Range

This product is high performance epoxy adhesive, which can be used for the effective penetration bonding to many substrate materials such as concrete, steel material, ceramic, stone, wood component, and many fiber fabrics, e.g. carbon fiber, glass fiber, basalt fiber, and aramid fiber. It is mainly used for the strengthening and reinforcement of structural systems.

▲▲ Technical Parameters

Physical Properties

Description	HM-180 Carbon Fiber Primer	HM-180CE Levelling Putty Adhesive	HM-180C3P Carbon Fiber Impregnated Adhesive
Performance	Part A: Transparent viscous liquid	Part A: Viscous paste	Part A: Viscous liquid
	Part B: Brown viscous liquid	Part B: Viscous paste	Part B: Viscous liquid
Operable Time (25°C, min)	< 40	< 50	< 70
Touch Dry Time (25°C, h)	1~2	1~2	1~2
Mix Ratio (by Weight)	A:B=2:1	A:B=2:1	A:B=2:1
Viscosity (mPa · s)	≤ 600	-	-
Thixotropy Index	-	≥ 3.0	≥ 3.0
25°C Sag Mobility (mm)	-	≤ 2.0	-
Pot Life (min)	Spring & Autumn (23°C)	≤ 70	≤ 100
	Summer (30°C)	≤ 40	≤ 75
	Winter (10°C)	≤ 190	≤ 250
Shelf Life (month)	12	12	12

Properties Performance

HM-180 Carbon Fiber Primer Properties Performance

Test Item	Test Conditions	Test Result
Tensile Strength (MPa)	ASTM D638	50
Shear Strength (MPa)	ASTM D732	45
Bonding Strength with Concrete (MPa)	ASTM C882	≥ 20



HM-180C3P Carbon Fiber Impregnated Adhesive Properties Performance

Description	Test Item	Test Conditions	Test Result
Adhesive Performance	Tensile Strength (MPa)	ASTM D638	60
	Tensile Elastic Modulus (MPa)		3100
	Elongation at Break (%)		6
	Flexural Strength (MPa)	ASTM D790	90
	Compressive Strength (MPa)	ASTM D695	95
Bonding Performance	Steel-steel Shear Bonding Strength (MPa)	$(23 \pm 2) ^\circ\text{C}$, $(50 \pm 5) \% \text{RH}$	Standard Value ≥ 14
			Average Value ≥ 16
	Steel-steel Normal Bonding Strength (MPa)	Under $(23 \pm 2) ^\circ\text{C}$, $(50 \pm 5) \% \text{RH}$ conditions, testing as the inspection standard loading speed	≥ 40
	Steel-steel T Impact Stripping Length (mm)		≤ 20
Steel-C45 Pulling Bonding Strength (MPa)		≥ 2.5 , concrete cohesive failure	
	HDT(Heat Deflection Temperature) ($^\circ\text{C}$)	Use 0.45MPa option B of bending stress	≥ 65
	Nonvolatile matter Content (%)	$(105 \pm 2) ^\circ\text{C}$, $(180 \pm 5) \text{ min}$	≥ 99

HM-180C3P Carbon Fiber Adhesive Long Term Application Performance

Test Item		Test Conditions	Qualified Standard (GB50728-2011)
Conditions Resistance	Wet And Heat Ageing Resistance	Under 50℃、95% RH conditions, ageing 90days, testing at ambient temperature by steel-steel tensile shear strength	Compared with the short-term results at roomtemperature, shear strength loss: ≤ 12%
	Heat Aging Resistance	Under (80±2) °C conditions, ageing 30day, testing as the same temperature by steel-steel tensile shear strength	Compared with the short-term results at same temperature 10min, shear strength loss: ≤ 5%
	Freezing And Thawing Resistance	Under -25℃-35℃ freezing circulating temperature, circulate 8h every time, after 50 times, testing at ambient temperature by steel-steel tensile shear strength	Compared with room temperature, short-term results, shear strength loss is not greater than 5%
Stress Resistance	Performance Under Sustained Load	Under (23±2) °C, (50±5) % RH conditions, undertake 4.0MPa shear strength continuous to 210d	Steel - steel tensile shear specimens does not fail, and creep deformation value is less than 0.4 mm
	Fatigue Performance	Under ambient temperature, as frequency 5Hz, stress ratio 5:1.5, max stress 4.0MPa fatigue load testing by steel-steel tensile shear strength	After 2×10 ⁶ times continuous sine wave fatigue loads, specimen does not fail

▲▲ Package

The A and B components of this product are packed in separate metal containers. Group A is 20kg/container and Group B is 10kg/container.

▲▲ Construction Process

Please scan the QR code to watch the video



▲▲ Transportation and Storage

- This product should be kept sealed and stored in a dry and clean storage space of ambient temperature between -5 °C and 40 °C. In order to prevent damage, do not store outdoor under direct sunlight or under direct rain.
- A & B components should be kept separately. Shelf life is 12 months at room temperature (25 °C). Product should be tested if exceeded the shelf life. If the physical and mechanical properties after 12 months meet the standard requirements, then it could be used.
- These products are not inflammable, explosive, toxic, or dangerous cargoes. They could be transported with general transportation cargo. The epoxy containers should not be damaged, exposed to direct sunlight or rain, and should not be tilted or stored upside-down during transportation.

▲▲ Points for Attention

- Mix proper amount of adhesive at one time, use up within the applicable period, do not use the adhesive if it is beyond the applicable period.
- If components A and B of the adhesive are not used up, they should be covered and sealed. They should not be exposed to air for a long time.

▲▲ Safety Measures

- The construction workers should take safety measures (such as wearing masks, gloves, goggles, etc.), and maintain fire prevention measures, as well as keeping the site clean.
- If the adhesive accidentally got in touch the skin and cloths, acetone can be used to wipe it at once, followed by a great deal of clear water.
- If accidentally swallowed or splashed into the eyes, please seek immediate medical service.