

APSEFRP RESIN

TWO-COMPONENT STRUCTURAL EPOXY
RESIN FOR BONDING CARBON FIBER
AND GROUTING

DESCRIPTION

APSEFRP RESIN is a two-component structural adhesive specifically for bar grouting and bonding carbon fiber tapes for earthquake-resistant structural reinforcement work.

APSEFRP RESIN ensures easy and perfect fabric impregnation and excellent adhesion to any substrate while maintaining cohesion and ease of use even in vertical and overhead applications.

FIELDS OF USE.

- Bonding and impregnation of carbon fiber tapes and fabrics for structural reinforcement.
- Earthquake-resistant structural reinforcement with FRP composite materials.
- Structural reinforcement of concrete and wooden artifacts (beam heads, etc.).
- Structural bonding in concrete-plaque techniques.
- Engulfment of carbon bars and general engulfment.

PACKAGING

Comp. A + B = 4 + 1 kg

or

Comp. A + B = 8 + 2 kg

CONSUMPTIONS

Laying fabrics or reinforcing sheet: The consumption of APSEFRP RESIN is closely related to the characteristics of the substrate and the type of fabric. In general, on a planar surface, 1.1-1.5 kg/m² is recommended for bonding and impregnation of one layer of carbon fiber fabric

Laying grouting bar: about 1.1 kg/dm³ depending on the porosity of the cavity to be grouted.

MIXING RATIO

Comp. A : Comp. B = 4 : 1 parts by weight

FEATURES AND ADVANTAGES

- APSEFRP RESIN achieves structural adhesion on building materials such as concrete, masonry, wood, steel and natural stone.
- The thixotropic fluid gel consistency enables effective impregnation of carbon fiber while maintaining safety and convenience in vertical and overhead applications.
- Applicable even on damp substrates: APSEFRP RESIN is relatively insensitive to substrate moisture improving application stability.
- Easy injectability for bar grouting.
- APSEFRP RESIN is characterized by performance mechanical performance such as adhesion, shear and compressive strength at the highest level while maintaining resistance to chemical-environmental aggression and ease of use.
- APSEFRP RESIN has a formulation free of volatile organic compounds (VOCs), nonylphenols or other substances harmful to the environment or the health of applicators.

CERTIFICATIONS

ISO 9001 certified quality management system
(Certificate No. IT.17.0227.01.QMS).

APSE S.r.l. is an active member of CONPAVIPER



SUPPORT PREPARATION

Anchorage housing holes should be cleaned. Pressurized water can be used to facilitate cleaning and if the substrate does not react adversely. Then dry with dry, oil-free compressed air.

Remove all loose and detaching parts from the area being restored taking care not to damage the structures. Remove stains, efflorescence or impregnations of oil, grease, paint, dust, dirt, release agents, etc;

The substrate should then be clean, free of inconsistent parts of water stagnation, have a tear strength of at least 1.5 N/mm², with a moisture content of no more than about 5%.

To ensure effective and compliant application, the substrate must also be even and flat with no surface unevenness greater than ± 2 mm over a length of 1 m. If the substrate does not meet these characteristics, it will be necessary to restore and/or regularize it.

Metal substrate

Metal sheets should be sandblasted to SA2 surface and degreased with appropriate thinners.

Concrete substrates

Concrete substrates in good condition should be sanded or sanded before proceeding with the application of APSEFRP RESIN.

In the presence of deteriorated concrete substrates, the following steps should be taken:

- Remove the damaged layer by milling or hydrodemolition.
- Then the substrate should be restored by treating the reinforcing bars with passivating agent and volumetric reconstruction of the concrete with structural repair mortars.
- In case of cracks or fissures restore the load-bearing capacity and monolithicity of the structure by injections of specific resin. Wait about 1-2 weeks before laying the fabrics, depending on the indoor temperature and ventilation of the rooms.

Masonry support

The masonry supports must be brushed and dusted. Any cracks, injuries or repairs must be treated as follows:

- Before the intervention, any cracks must be injected with a product from the line
- Cracks or lesions large enough to compromise the continuity of the wall structure must be repaired with reinforced seams through the insertion of grouted carbon bars;
- If the masonry is subject to cortical weakness and/or chalking, a consolidating treatment is recommended
- If necessary, redraw the joints.

Realization of the mortar lanes for the housing of fabrics.

In any case in order to apply the strips on a flat surface of sufficient mechanical strength and it is appropriate to make bands with thixotropic non-shrink mortar.

PRIMER APPLICATION

On adequately prepared support proceed with the application of primer APSEFLOOR 150 or APSEPRIMER FRP by brush or roller on dry support.

PRODUCT PREPARATION

Pour component B into component A and mix with trowel or drill or suitable low-speed mixer until a homogeneous mixture is obtained. Avoid taking partial quantities from the packages to avoid errors in the mixing ratio that would cause an incorrect hardening of the product.

APSEFRP RESIN

TWO-COMPONENT STRUCTURAL EPOXY
RESIN FOR BONDING CARBON FIBER
AND GROUTING

APPLICATION METHODS

Apply APSEFRP RESIN by trowel within 24 hours after the application of the suitable primer, spreading a first layer of bonding resin in thicknesses of about 1 mm. Then place the carbon fiber tapes on the treated surface as per the design directions, taking care to exert light pressure with the hands during the spreading, which must be done without wrinkles and in a linear manner.

Then proceed to impregnate the fabrics by exerting vigorous pressure with Metal Roller specifically for the application of carbon fiber fabrics.

Laying of grouting bar

Employ an injection pump for thixotropic fluids with a pressure plate to extrude the product inside the hole. Inject the resin starting from the bottom of the hole to avoid air entrapment, filling the cavity about 3/4 full. Adjust the amount of product injected to ensure the grouting collar is filled. Then insert the bar and remove any excess resin.

Maximum application thickness: 1 mm

Apply the product at temperatures between +5°C and +35°C.

CURING TIME

The curing time of APSEFRP RESIN is affected by the ambient temperature.

Refer to the table below for drying and curing times (at 20°C).

Pot life	80 minutes
Complete hardening	10 days

WARNINGS

Moisture in the substrate may affect the proper adhesion of the adhesive.

Moisture in the substrate can affect the proper adhesion of the adhesive.

If the size of the grouting collar exceeds 1 cm, use our APSEFRP PASTA epoxy filler.

CLEANING OF TOOLS

Equipment used for preparation and application should be cleaned after use with DILUEPOX.

HEALTH AND SAFETY

For information on safety regulations, hazard statements and precautionary advice, rely on the latest MSDS by making a request to: laboratorio@apsebg.it

STORAGE

Shelf life of more than 12 months when stored in original packaging in a dry, moisture-free place. Store at temperatures between +10°C and +35°C.

DISPOSAL

Dispose of contents and/or container in accordance with local regulations.

PRODUCT TECHNICAL DATA

PHYSICAL CHARACTERISTICS OF THE TWO COMPONENTS (at +20°C)

FEATURE	NORMATIVE	RESULT	
		Component A	Component B
Appearance	-	Mellow	Mellow
Specific weight	EN ISO 2811-1	1.06 ± 0.02 g/cm ³	0.94 ± 0.02 g/cm ³

PHYSICAL CHARACTERISTICS OF THE MIXTURE (at+20°C)

FEATURE	NORMATIVE	RESULT
Density mixture	EN ISO 1675	1.075 g/cm ³
Viscosity of the mixture	EN ISO 2555	164000 mPa s

PRODUCT PERFORMANCE IN OPERATION

Tensile modulus of elasticity	EN ISO 527-1	2010 N/mm ²
Flexural elastic modulus (4 mm thick specimen x 10 mm x 80 mm)	EN ISO 178	1641 N/mm ²
Tensile strength	EN ISO 527-1	16.85 N/mm ²
Resistance to Flexure	EN ISO 178	28.47 N/mm ²
Tensile elongation	EN ISO 527-1	3,6 %
Adhesion to concrete	EN 12636	3.4 N/mm ²
Glass transition temperature	EN 12614	53°C
Temperature limits of use	CNR DT200-R1/2013	-10/+38°C
Fire resistance	-	n.d.p.

PERFORMANCE OF THE PRODUCT IN OPERATION, ACCORDING TO EN 1504-4 STANDARD

FEATURE	NORMATIVE	REQUIREMENTS	RESULT
Compressive elastic modulus	EN 13412	≥ 2000 N/mm ²	3.2 GPa
Flexural modulus of elasticity (8 mm thick specimen x 15 mm x 160 mm)	EN ISO 178	≥ 2000 N/mm ²	2.1 GPa
Coefficient of thermal expansion	EN 1770	≤ 100 × 10 ⁻⁶ for K	25 × 10 ⁻⁶ /K
Total linear shrinkage for structural adhesive agents	EN 12617-1	≤ 0,1%	0,03%
Glass transition temperature	EN 12614	≥ 40°C	53°C
Shear durability (temperature-humidity cycles)	EN 13733	Compressive shear load > of the tensile strength of concrete. No breakage steel specimens.	Specification exceeded
Performance requirements for reinforcement with adhered metal plate			
Shear strength	EN 12188	≥ 12 N/mm ²	20.3 N/mm ²
Adherence - inclined shear strength	EN 12188	50° ≥ 50 N/mm ² 60° ≥ 60 N/mm ² 70° ≥ 70 MPa	42 N/mm ² 53 M N/mm ² 78 N/mm ²
Performance requirements of adhesive agent for mortar or bonded concrete			
Compressive strength	UNI EN 12190	≥ 30 N/mm ²	80 N/mm ²
Shear strength	EN 12615	≥ 6 N/mm ²	> 6 N/mm ²
Adhesion cls mc (0.40) - en 1766	EN 12636	Cohesive failure of concrete substrate	Specification exceeded
Open time on concrete mc (0.40) en 1766	EN 12189	Declared by the manufacturer	40 min

The above data are information obtained based on our best technical knowledge, application, and research experience. However, since we are unable to intervene directly in site conditions and work execution, they represent general indications that do not bind APSE S.r.l. in any way. - V&V Group. The information given does not relieve the purchaser of his responsibility to personally test our products as to their suitability with regard to their intended use. The customer is also responsible for verifying that this data sheet is valid for the batch of product of interest to him and is not outdated as superseded by later editions. If in doubt, contact our Technical Department in advance. APSE S.r.l. - V&V Group reserves the right to make technical changes of any kind without prior notice. This revision cancels and supersedes all previous ones, all under the continuous verification of data according to the new current Standards and our ISO 9001 management system. Please be sure to check the most up-to-date version of this Data Sheet on our website: www.apsebg.it

