

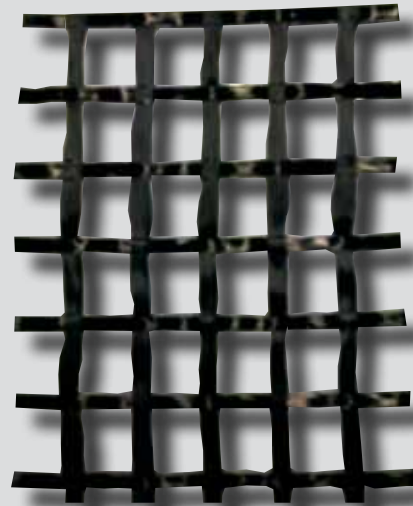
C-NET 170BL

C-NET 220BL

Tech. Sh. FS06-170BL/220B

FRCM SYSTEM

Structural consolidation



Carbon mesh for structural reinforcement

Description

The use of structural reinforcements in the form of carbon mesh C-NET very high resistance immersed in an inorganic matrix (FRCM SYSTEM) is a versatile technology, with reduced weights and thicknesses, which allows for the structural consolidation of elements in reinforced concrete, prestressed reinforced concrete, concrete, masonry with high levels of static effectiveness in functional requalification and in the seismic improvement of weakly-reinforced, impaired or uneven and deteriorated structures. Once adopted, this technology, which has been proposed in the international market in recent years, in fact enables a general improvement of the mechanical characteristics of structures, especially if they are deteriorated and subject to seismic action, through reinforcement with carbon mesh designed and commensurate with acting stresses particularly with respect to bending, cutting and confinement.

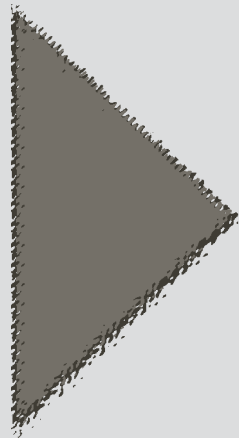


Thanks to its considerable versatility, the C-NET system may be adopted for the reinforcement of construction elements in concrete, reinforced concrete and prestressed reinforced concrete for wall panelling, curtain walls, pillars and masonry roofing/vaulting in brickwork and natural stone, for the creation of beading in reinforced concrete for the confinement of structures which have manifested various degrees of deterioration and impairment and which have to be restored with a technology presenting a limited degree of invasiveness, with reduced thickness and compatible with the various requirements relating to the structural consolidation and conservation of historical buildings. Our group has conducted and is currently carrying out studies and experimentation at the national and international level which bear witness to the validity of the system for the specific area in which it may be adopted. Our company moreover offers and is developing an important engineering consultancy service reserved for public administration bodies, companies, designers and technicians in this sector.

Areas of use

The main uses of the C-NET reinforcement system:

- Reinforcement of elements in concrete, reinforced concrete and prestressed reinforced concrete, such as beams, pillars, flooring system slabs, support walls and vaulted/roofed surfaces (tunnels/galleries).
- Increase of resistance in load-bearing wall panels, pillars, arches and roofing/vaults in masonry.
- Reinforcement with combined compressive and bending stress and the shear of wall panels.
- Confinement of structural elements.



Advantages

High resistance to tensile stress and improvement of structural ductility.
 Reduced thicknesses, weight and invasiveness for works to be consolidated and for historic buildings.
 Given the versatility of the C-NET system used with inorganic matrices for the various substrates, reinforced surfaces are obtained with superior adhesion, low thicknesses and high transpiration properties.
 Applicable on surfaces which may also be irregular, with reduced levelling requirements.
 Better resistance to fire FRCM SYSTEM.
 Compatibility and reversibility of the system in the cultural heritage.
 Fewer construction-site requirements.

Technical Data

The bi-directional carbon mesh C-NET is produced in standard dimensions and grammages and, more specifically, C-NET 170 BL with 170 g/m², C-NET 220 BL with 220 g/m² produced in rolls with 100 cm width and 50 m length.

Production flexibility allows for the execution of orders for different types of products in terms of grammage depending on quantity requested.

Please refer to our sales department for specific requests.

Type C-NET	170 BL	C-NET 220 BL
Mesh grammage	170 g/m ²	220 g/m ²
Mesh dimensions	15x15 mm	10x10 mm
Nominal thickness	0,047 mm*	0,061 mm*
Ultimate tensile stress (filament)	4700 N/mm ²	4700 N/mm ²
Elastic modulus (filament)	240 GPa	240 GPa
Elongation at break	1,8%	1,8%
Tensile stress at 7,5‰ strain	89 kN/m*	115 kN/m*

* 0°/90°

INORGANIC MATRICES FOR C-NET CARBON MESH

The main inorganic matrices for the C-NET carbon mesh are:

Inorganic matrices

For concrete: CONCRETE ROCK V-V2 one-two component mortar high resistance and adhesion to the supporting substrate, resistant to sulphates (compliant with European norm EN 1504-3 Class R4).

For masonry: CONCRETE ROCK S pozzolanic-reaction mortar (compliant with European norm EN 1504-3 Class R2) and LIMECRETE lime and pozzolan basis mortar (compliant with European norm EN 998-2).

INSTRUCTIONS FOR USE

Before starting an application cycle for structural reinforcement by means of cementitious, reactive, inorganic lime/pozzolanic matrices the support must be accurately prepared. Pre-existing plaster and any paint, varnish, oils and grease must be removed by scrub-brushing, power-washing or suitable and approved methods for surface roughening and specifically within the sector of cultural heritage. If there are any missing sections or cavities in the surface and in the presence of serious irregularities or damage, these areas will have to be restored with suitable mortars, such as CONCRETE ROCK V-V2-S or LIMECRETE. Following careful cleaning, any exposed reinforcement rods must be treated with FERRO-SAN anti-corrosion systems.

Thoroughly moisten the support until it is saturated. This operation allows for a reduction in the transfer of water from the mortar, avoiding the formation of fissures and poor adhesion to the support.

For greater thicknesses of regularisation in roofed/vaulted and concrete structures a layer of gunite may be applied.

Apply the most suitable type of mortar for the work to be carried out for the required thickness, using a metal float, trowel or spray (CONCRETE ROCK V-V2-S for cement-based matrices, LIMECRETE for lime-pozzolan matrices).

The average thickness is 5 – 10 mm per hand.



Position the C-NET mesh in the fresh mortar, making sure the mesh is perfectly impregnated, and avoiding the creation of air bubbles. Then, apply a second layer of mortar totally covering the mesh and not waiting until the mortar is completely hardened. For the application of various layers of mesh it is necessary to proceed applying the materials on a fresh underlying layer as in the previous cycle. For the overlays follow the project requirements, however with a minimum of 10 cm in the direction of the fibre. A reinforced surface may subsequently undergo further treatment, such as plastering, protection against external agents, etc.

In the presence of anchoring systems such as AFIX 10 or other types of connectors the connection with the mesh must be carried out with suitable adhesive systems like Resin 75. See technical sheet connector. Users may refer to the technical office for further details.

The application temperature must be preferably within the range $+5^{\circ}$ + $+35^{\circ}$ C. Avoid application during hot hours in the summer months and in the presence of a strong wind or frozen surfaces. The curing of the mortar must be facilitated with suitable forms of protection or curing systems in the presence of significant exposure to sunlight, wind and rain.

Caution

Apply the reinforcement systems within the temperature ranges indicated on the technical/data sheet. Avoid application of the mortar system in direct sunlight, during the hotter hours in the summer period and in the presence of a strong wind. Adopt suitable methods to protect the curing of the mortar in environments with strong ventilation and exposure to light. Do not use the reinforcement systems in the presence of rainwater in the first 6 hours at 20° C after application and in freezing weather.

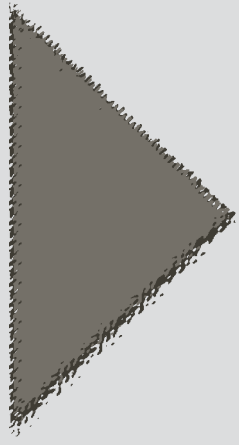
Use protective gloves during application of the materials. The mortars and resin must not come into contact with the skin, mucous membranes and eyes. Use an impact resistant mask or glasses.

All products and packing are strictly designed for professional use.

For further information refer to the technical/data sheets of the mortars and adhesives and to the corresponding safety information.

Yield

Consumption is closely linked to project requirements, the condition of the support and the type of mortar and adhesive used. It is advisable to carry out on-site tests.



Packing

C-NET 170-220 BL available in rolls with standard width of 100 cm and length 50 m.
Refer to the technical department for any queries or further information.

Matrices and adhesive

CONCRETE ROCK V one component mortar in bag 25 kg
CONCRETE ROCK V2 bi-component mortar in bag 25 kg + pail 5 kg
CONCRETE ROCK S pozzolanic-reaction mortar in bag 25 kg
LIMECRETE pozzolan-lime mortar in bag 25 kg
RESIN 75 bi-component epoxy adhesives in pail 3+1 kg

Storage

The C-NET mesh must be stored in a dry protected place for at least 24 months.
The mortars must be stored in a dry protected place for at least 12 months.
Protect Concrete Rock V2 liquid component from frost and very low temperature.
The adhesives must be protected against frost and direct sun for at least 12 months.



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