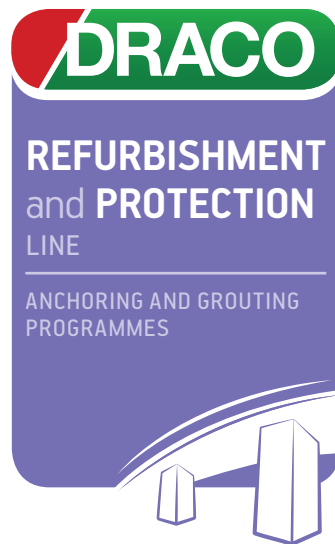


ARMOSHIELD CFK

PULTRUDED STRIPS IN UNIDIRECTIONAL CARBON-FIBRE FABRIC WITH SUPERIOR STRENGTH FOR REINFORCEMENT AND PLATING OF CONCRETE, WOOD AND STEEL STRUCTURES



Pultruded carbon fibre strips for reinforcing concrete structures in reinforced and pre-stressed reinforced concrete, steel and wood to be used in conjunction with the specifically designed ARMOFIX MTL and the ARMOSHIELD C tapes. The **ARMOSHIELD CFK** strips are ideal for reinforcement even with pre-tensioning.

Thanks to their lower weight and improved performance they are an excellent substitute for the traditional beton plaque systems.

BENEFITS

The specific characteristics of the product are:

- ✓ Superior chemical and mechanical resistance and resistance to corrosion.
- ✓ Increased tensile strength with no increase in weight.
- ✓ Light and flexible.
- ✓ Easy to lay even on complex or irregular structures.
- ✓ Superior tear resistance even on irregular surfaces.
- ✓ Reliability and durability of the system.
- ✓ Reinforcement thickness approx. 1 - 3 mm.



USES

The **ARMOSHIELD CFK** strips are used principally for:

- ✓ Structural reinforcement of elements subject to bending and combined bending and compressive stress in RC, pre-stressed RC, steel and wood.
- ✓ Static upgrade of damaged structures or structures with insufficient bearing capacity due to a change in use, changes in regulations or seismic events.
- ✓ Consolidation of structures of supporting structures in industrial and civil buildings, including prefabricated units.



PREPARATION OF SUBSTRATE

The ARMOSHIELD strengthening cycle requires a thorough preparation of the substrate.

CLEANING AND REPAIR

- ▶ **Remove all loose or flaking parts** in the area to be repaired taking care not to damage the structures.
- ▶ **Remove stains, efflorescence, soaked in oil**, and grease, paint, form release agents, dust or dirt etc.
- ▶ **When installing on brickwork or arches** the surface must be brushed and all traces of dust removed. Any cracks must be saturated with ARMOLIME or a lime-based mortar.
- ▶ **If the concrete substrate** is in good condition it is sufficient to sand the surface. Where the substrate is deteriorated you must first remove the damaged layer by bush-hammering or pressure washing. Then repair the structure by treating the rebars with the anti-corrosion agent DRACOSTEEL and build up the concrete using mortars from the FLUECO line. To repair corner or fine cracks you can use ARMOFIX MTL. Where there are wider cracks the load-bearing capacity and monolithicity of the structure must be restored by injecting special wide-dispersion resins (EPOX INIEZIONE R.M.2 or R.M.3). Wait one to two weeks before installing the strips, depending on the temperature and ventilation inside the buildings.

PRIMING

Apply ARMOPRIMER 100 primer on the dry substrate using either a brush or roller. If the substrate is fragile or porous use PRIMER ES40. Apply the adhesive within 16 hours of applying the primer.

RENDERING

Rendering is necessary if the substrate is irregular or not flat. The render must be carried out when the primer is past touch dry, but no later than 24 hours after its application using the epoxy adhesive ARMOFIX MTL applied with either a spatula or float.

APPLYING THE ADHESIVE

Apply a first coat of the resin adhesive ARMOFIX MTL at a thickness of between 1-3 mm to the clean, dry substrate and on the sides of the strips to be glued.

PREPARATION OF THE STRIPS

Cut the strip to the desired length using a cutting tool with a diamond blade. The **ARMOSHIELD CFK LAMELLE** must be cleaned carefully with a soft cloth using the special **ARMOCLEANER CFK** solvent to remove any fine carbon dust that may be present.

APPLYING THE STRIPS

Place the strips as envisaged in the project and apply even pressure along the entire length using either your hands or a hard-rubber roller to remove any air-bubbles and ease the escape of excess glue which must then be removed. Be careful when removing the excess glue that the strips do not shift; avoid vibrations to the structure for at least 1-2 days.

Repeat the cycle if there is to be more than one layer of reinforcement. You can sprinkle quartz sand over the last layer of adhesive fresh-on-fresh if plaster or other coatings are to be applied over the top. If a protection coat is to be applied this should be done when the adhesive is no longer touch dry.

APPLICATION OF ARMOSHIELD C CARBON FIBRE TAPES

To avoid any lifting of the edges of the strips that are subject to tension, and when specifically indicated by the project designer, it is advisable to wrap the edges of the strips with carbon fibre tapes.

ARMOSHIELD CFK strips can be used in combination with ARMOSHIELD C carbon fibre tapes for the consolidation of pillars and beams and to reinforce elements subject to bending and combined bending and compressive stress.

FINISHING

Where a final protection coating of the reinforcement is to be applied you must apply a flexible coating that is resistant to UV rays using either the elastic cement coating MAGIFLEX BRAVO, or the acrylic-based flexible paint ACRIFLEX, or the intumescent coating DRACOFIRE (REI 180). The coating must only be applied after the complete hardening of the epoxy systems used (1-2 days according to the temperature).

GENERAL RULES THAT MUST BE FOLLOWED DURING THE APPLICATION

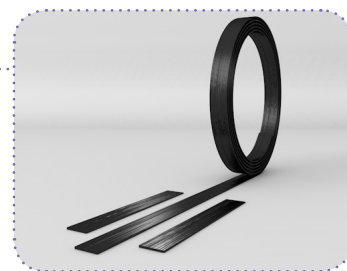
The performance of the ARMOSHIELD structural reinforcement system is directly linked to the care with which the various stages of the application cycle are followed. Particular attention should be taken regarding the following:

- ▶ Respect application times and project design closely.
- ▶ Before installing the ARMOSHIELD system make sure the tear resistance of the substrate is at least 1.5 MPa; otherwise strengthen the substrate.
- ▶ Cut the carbon fibre strips with a suitable cutter with a diamond blade.
- ▶ Prepare the substrate as required.
- ▶ It is advisable to install at temperatures of $\geq + 5^{\circ}\text{C}$.
- ▶ Check the complete adhesion of the strips to the substrate along their entire length and increase bonding by using clamps.
- ▶ Protect the impregnated fabric from dust or rain.
- ▶ Maintain the treated surfaces at a temperature of $\geq + 5^{\circ}\text{C}$.

PACKAGING AND STORAGE

The carbon-fibre **ARMOSHIELD CFK** strips are available in 50 m rolls of differing widths (see Table).

The **ARMOSHIELD CFK** strips if properly stored will maintain their characteristics indefinitely.



PRECAUTIONS

During application use impermeable rubber gloves and avoid contact of the resins with skin, eyes or mucous membranes. In case of contact wash thoroughly with water and neutral soap. Use protective eye-wear and masks. For further information consult the safety sheet.

PRODUCT CHARACTERISTICS

APPEARANCE	Black carbon strips
FIBRE TYPE	High resistance carbon
MATRIX	Epoxy resin
AVAILABLE WIDTHS	1 - 2.4 - 5 - 8 - 10 - 12
PACKAGING	50 m roll

APPLICATION DATA

CONSUMPTION	160 GPA				160 GPA				210 GPA			
DENSITY (g/cm ³)	1.6				1.6				1.6			
FIBRE CONTENT (%)	68%				68%				68%			
THICKNESS (mm)	1.2				1.4				1.4			
WIDTH (mm)	24	50	80	100	10	50	80	100	50	80	100	120
RESISTANT SECTION (mm ²)	28.8	60	96	120	14	70	112	140	70	112	140	168

FINAL PERFORMANCE

FEATURE	PRODUCT PERFORMANCE											
TENSILE STRENGTH (MPa)	2400 MPa				2400 MPa				2400 MPa			
TENSILE MODULUS (MPa)	160				160				210			
ELONGATION AT BREAK (%)	1.36%				1.36%				0.95%			
WIDTH (mm)	24	50	80	100	10	50	80	100	50	80	100	120
RESISTANT SECTION (mm ²)	28.8	60	96	120	14	70	112	140	70	112	140	168

ARMOSHIELD CFK LAMELLE IS SUPPLIED IN 50 M ROLLS IN THE FOLLOWING VERSIONS:

PRODUCT	ELASTIC MODULUS	TYPE	WIDTH (cm)	LOAD (kN)	EA.EXTENSIONAL STIFFNESS (kN)
1.2 mm Thickness	160 GPa	160/2400/1224	24		
		160/2400/1205	50	144	12600
		160/2400/1208	80	230	15360
		160/2400/1210	100	288	19200
1.4 mm Thickness	160 GPa	160/2400/1401	10		
		160/2400/1405	50	168	11200
		160/2400/1408	80	269	17920
		160/2400/1410	100	336	22400
		160/2400/1412	120	403	26880
1.4 mm Thickness	210 GPa	210/2400/1405	50	168	14700
		210/2400/1408	80	269	23520
		210/2400/1410	100	336	29400
		210/2400/1412	120	403	35280

CONSUMPTION OF APPLICATION CYCLE

CONSUMPTION OF APPLICATION CYCLE		
PRIMING	ARMOPRIMER	approx. 200/300 g/m ² according to substrate porosity
RENDER/SKIM	ARMOFIX MTL	150 g/m ² per mm of thickness - Recommended thickness 1 - 3 mm
CONSUMPTION OF ARMOFIX MTL USED AS ADHESIVE FOR THE ARMOSHIELD CFK CARBON FIBRE STRIPS		
ADHESIVE	STRIP WIDTH (cm)	CONSUMPTION (g/m)
ARMOFIX MTL	1	30-50
	2,4	50-100
	5	150-200
	8	240-320
	10	300-400
	12	360-480

TECHNICAL SPECIFICATIONS



TYPE OF INSTALLATION

The installation of **ARMOSHIELD CFK**, produced by **DRACO Italiana SpA**, is for the structural reinforcing and seismic retrofitting of reinforced concrete and the confinement of concrete structures exposed to compression and bending using smooth superior-strength, carbon-fibre strips.

APPLICATION

- ▶ Preparation of the substrate: elimination of grout or any residual concrete as well as any damaged parts, stains, efflorescence, dust or dirt;
- ▶ Levelling of substrate: removal of protuberances and filling of any holes in the area of gluing;
- ▶ Application of a primer such as **ARMOPRIMER 100**;
- ▶ Rendering of the substrate and application of an adhesive such as **ARMOFIX MTL**.
- ▶ Application of a carbon-fibre strips such as **ARMOSHIELD CFK**.
- ▶ More than one layer may be applied in accordance with the requirements of the project design.

Possible application of a protective coating over the area reinforced.

The size, thickness and elastic modulus to be used will be decided according to the project requirements and type of intervention.

PRODUCT CHARACTERISTICS

APPEARANCE	Black carbon strips
FIBRE TYPE	High resistance carbon
MATRIX	Epoxy resin
AVAILABLE WIDTHS	1 - 2.4 - 5 - 8 - 10 - 12
PACKAGING	50 m roll

APPLICATION DATA

CONSUMPTION	160 GPA				160 GPA				210 GPA			
DENSITY (g/cm ³)	1.6				1.6				1.6			
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