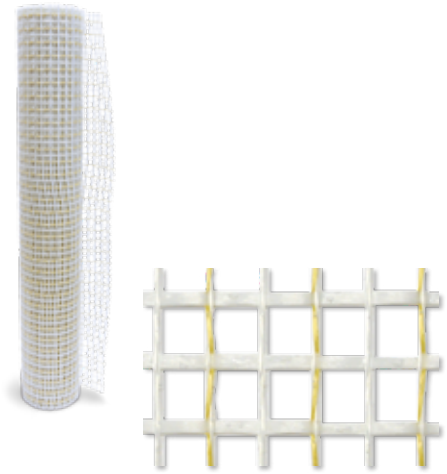
Rinforzo ARV 100

Bi-axial mesh made of alkali-resistant glass and aramid fibre, specific for strengthening, the improvement and the anti-seismic adaptation for low thickness in reinforced concrete buildings, with brick infill, and masonry structures.



Rinforzo ARV 100 is a mixed fibre mesh. When used in combination with Geocalce F Antisismico, it allows to create low thickness structural strengthening conveniently connected to the structure by means of connectors obtained from the Geosteel sheet or the Steel Dryfix stainless steel helical bars. When used in combination with Geocalce Multiuso and Geocalce Tenace, it allows to carry out anti-cracking interventions and anti-seismic protection of non-structural elements.

1. **Certified high resistance in an alkaline environment and to all potentially aggressive conditions**
2. **Excellent shear and tensile strength**
3. **Certified for use in structural strengthening in combination with Geocalce F Antisismico mineral matrix on masonry substrates**
4. **Suitable for anti-seismic protection of non-structural elements in combination with Geocalce Multiuso and Geocalce Tenace**

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Areas of application

→ Intended use:
- Static and seismic upgrade or improvement of structural elements in brick, natural stone and tuff masonry, creating reversible, ultra-thin reinforced plasters/renders that work together with the structure thanks special Geosteel steel-fibre connectors or Steel Dryfix helical bars with the special Tassello Steel Dryfix insert
- Retrofitting of brick, natural stone, tuff and wattle-and-daub masonry arches, vaults and domes
- Combined compressive and bending, shear and confinement strengthening of brick, natural stone or tuff masonry walls
- Suitable when combined with the special single and double thread connectors created using the Geosteel range of sheets and Steel Dryfix helical bars with the special Tassello Steel Dryfix insert
- Anti-collapse protective systems for dividing and enclosing walls in reinforced concrete framework or brick buildings
- Protective systems for floor slabs subject to break-away of the bottom layer

Instructions for use

→ Preparation
Rinforzo ARV 100 is ready-to-use. The mesh can be cut using normal shears. The sheet, even cut into thin strips, thanks to the particular weave of the mesh, ensures perfect stability without in any way compromising the workability of the sheet and its application.

→ Preparation of substrates
The substrate must be properly prepared and cleaned, always in accordance with the instructions dictated by the construction supervisor
In the case of substrates that are not deteriorated, prepare the surfaces as indicated in the technical data sheet for Geocalce F Antisismico, Geocalce Tenace or Geocalce Multiuso.
When the substrate is clearly deteriorated, uneven, or damaged by significant events, proceed as follows, always in accordance with the construction supervisor:
For brick, tuff and natural stone masonry substrates or wattle-and-daub:
- Completely remove residues from previous processes that could compromise adhesion, and any quantity of inconsistent rendering mortars from the stones;
- Saturation, spray, or brush application, if required, of a cortical stabilizing consolidant such as Rasobuild Consolidante, a consolidant in water solution, suitable for all types of substrates;
- Reconstruction, if necessary, of material continuity according to design instructions and the construction supervisor;
- Evening out previously consolidated surfaces with structural geo-mortar with a base of pure natural hydraulic lime NHL 3.5 and geo-binder such as Geocalce G Antisismico or Geocalce F Antisismico, depending on the thickness required;
- Make sure that the substrate is adequately dampened and with a roughness of at least 5 mm, equal to level 8 of the "Test Kit for preparation of reinforced concrete and masonry substrates" (follow the instructions on the Geocalce F Antisismico technical data sheet).

→ Application
The execution of the structural strengthening with an AR fibreglass and aramid fibre mesh, Fabric Reinforced Mortar, or of the protective system (combination of Rinforzo ARV 100 mesh with Geocalce F Antisismico or Geocalce Multiuso), will be carried out by applying a first coat of the inorganic matrix, ensuring on the substrate a sufficient quantity of material (average thickness 3 – 5 mm) to regularize it and to lay and embed the reinforcing mesh . Then apply Rinforzo ARV 100 AR fibreglass and aramid fibre mesh primed with alkali-resistant treatment to the still wet matrix. Take care that the mesh is perfectly embedded in the matrix layer, applying firm pressure with a steel spreader or roller. Make sure that the netting protrudes from the mesh, in order to ensure excellent adhesion between the first and second matrix layers and good impregnation of the fibre. Where two meshes are placed side-by-side, and in the case of the longitudinal extension of a strip, two layers of AR fibreglass and aramid fibre mesh will be overlapped by at least 30 cm. Finally proceed, wet-on-wet, with the protective final finishing (thickness 2 - 5 mm) in order to totally cover the strengthening grid and seal any possible voids. If there are additional layers after the first, proceed with laying of the second layer of steel fibre over the matrix while it is still wet, repeating the steps described above. Allow the surfaces to cure for at least 24 hrs.

Instructions for use

Carry out any plastering/rendering using Geocalce Tenace technical composite plaster/render. If the strengthening or protective system is installed in especially aggressive environments, or if further protection is to be provided in addition to that already provided by the matrix, it is recommended to apply Kerakover Silox Pittura on Geocalce F Antisismico, Geocalce Tenace or Geocalce Multiuso matrixes.

If the works are in permanent or occasional contact with water, the cycles described above must be replaced with a polyurethane epoxy cycle or an osmotic cement depending on the needs of the worksite and the design specifications.
For technical specifications, application, and preparation of the matrix, as well as protective systems adequate for the matrix type, consult the relevant data sheets.

Certificates and marks

CE-marked in combination with Geocalce F Antisismico for masonry structures

Abstract

FRM-Geocalce F Antisismico & Rinforzo ARV 100
Execution of repair, structural strengthening, improvement or seismic upgrade of masonry, tuff, natural stone or wattle-type elements and structures using an inorganic matrix composite FRM system (Fabric Reinforced Mortar), CE-marked with European Technical Assessment (ETA) pursuant to art. 26 of EU Regulation No. 305/2011 and international certificate of proven validity. FRM composed of bi-axial hybrid mesh of alkaline-resistant fibreglass and aramid – such as Rinforzo ARV 100 by Kerakoll Spa – with the following certified technical characteristics: tensile strength by unit of width ≈ 44 kN/m; modulus of elasticity ≈ 73 GPa; ultimate elongation ≈ 1.75%; equivalent thickness of mesh = 0.031 mm of the warp, 0.049 mm of the weft; mesh width 15x18 mm; weight of the primed mesh ≈ 250 g/m² ± 5%. Rinforzo ARV 100 impregnated with Geocalce F Antisismico by Kerakoll Spa, a highly breathable and hygroscopic geo-mortar made of pure NHL 3.5 natural hydraulic lime and mineral geo-binder, inert siliceous sand and Dolomitic limestone materials with a granulometric curve of 0-1.4 mm. To be applied directly on the structure requiring strengthening.
The procedure is conducted as follows:
1. Any restoration of degraded, weakened, non-cohesive, or non-planar surfaces, using Geocalce G Antisismico or Geocalce F Antisismico by Kerakoll Spa and in any case as prescribed and approved by the construction supervisor;
2. Preparation of the substrate for application of the first layer of Geocalce F Antisismico, the substrate must be adequately roughened by sanding or mechanical scarification, taking care to guarantee a roughness of at least 5 mm (equal to level 8 of the Test Kit for preparation of reinforced concrete and masonry), clean and dampened;
3. Lay a first layer, an average of ≈ 3-5 mm thick of fine-grain, structural, geo-mortar with pure natural hydraulic lime NHL 3.5 and geo-binder base, such as Geocalce F Antisismico by Kerakoll Spa;
4. While the mortar is still wet, lay the AR fibreglass and aramid fibre mesh primed with alkali-resistant treatment Rinforzo ARV 100 by Kerakoll Spa; press firmly with a spreader or metal roller in order to make sure that the sheet is completely impregnated; avoid allowing any voids or air bubbles to form, as these can compromise the adhesion of the sheet to the matrix or to the substrate;
5. Working fresh on fresh, apply the second layer of structural geo-mortar, such as Geocalce F Antisismico by Kerakoll Spa, until the reinforcing mesh is incorporated and any underlying voids are filled, giving an overall reinforcement thickness of ≈ 5 – 8 mm;
6. Repeat steps (4) and (5) if necessary for all subsequent reinforcing layers called for by the design;
7. Any insertion of thread connectors made from unidirectional, extra-high strength galvanized steel fibre sheets, after: preparation of the entrance hole, with a size suited to the nature of the connector to be fitted, preparation of the steel connector by cutting, "teasing" and final rolling of the steel fibre sheet, locking it in place with a plastic tie, insertion of the pre-formed connector into the hole with final, low pressure injection of highly breathable and hygroscopic geo-mortar with excellent water retention and a hyperfluid consistency, based on pure natural hydraulic lime NHL 3.5 and mineral geo-binder, grading 0 – 100 µm, awarded the CE mark – such as Geocalce FL Antisismico by Kerakoll Spa.
Delivery and installation of all the materials described above as well as everything else required to finish the job is included. The following are excluded: removal of any existing plaster/render, restoration of degraded areas and repair of the substrate; connectors, their injection and all the costs and charges required to create them; material acceptance tests; pre- and post-procedure testing, all aids required to perform the work.
The price is by unit of reinforcing surfaces actually laid, including overlaps.

Technical Data compliant with Kerakoll Quality Standard	
Dry fabric technical information	
Appearance	primed mesh with alkali-resistant primer
Nature of material	AR glass and aramid
Weight of primed mesh	≈ 250 g/m² ± 5%
Roll width	≈ 1 m
Roll length	≈ 25 m
Mesh width	≈ 15x18 mm
Shelf life	unlimited
Pack	25 m rolls

Values taken at +23 °C, 50% R.H. and no ventilation. Data may vary depending on specific conditions at the building site, i.e.temperature, ventilation and absorbency level of the substrate and of the materials laid.

Performance	
Technical characteristics data for mesh	
equivalent thickness of mesh:	
- warp	0,031 mm
- weft	0,049 mm
Tensile strength by unit of width:	
- warp	≈ 43 kN/m
- weft	≈ 44 kN/m

Performance					
Geosteel FRM system – ETA n° 18/0314					
FRM – Geocalce F Antisismico & Rinforzo ARV 100					
Performance characteristic [1]	**Test Method**		**Geosteel FRM system performance on brick substrates**	**Geosteel FRM system performance on tuff substrates**	**Geosteel FRM system performance on stone substrates**
Conventional tension limit	LG FRCM (§§ 2.1 – 7.2)	$\sigma_{lim,conv}$	972 MPa	1034 MPa	1051 MPa
Conventional deformation limit	LG FRCM (§§ 2.1 – 7.1)	$\varepsilon_{lim,conv}$	1.32 %	1.40 %	1.43 %
Elastic modulus of the sheet	LG FRCM (§§ 2.1 – 7.1.1)	E_f	73 GPa		
Mortar compressive resistance class (typical value)	EN 12190	$f_{c,mat}$	> 15 MPa (28 gg)		
Percentage of organic components by weight			< 1%		
Permeability to water vapour	EN 1745	μ	from 15 to 35 (table value)		
Installation conditions					
Maximum temperature (air and substrate)	-	-	< +35 °C		
Minimum temperature (air and substrate)	-	-	> +5 °C		
Relative air humidity	-	-	irrelevant		
Moisture of the substrate (gluing surface)	-	-	saturated substrate with no excess water on the surface		
Service conditions					
Maximum temperature (air and substrate)	-	-	< +80 °C		
Minimum temperature (air and substrate)	-	-	> -40 °C		
Relative air humidity	-	-	irrelevant		
Contact with water[2]	-	-	occasional		
Fire reaction[3]	-	-	class A1		

In the presence of installation and working temperatures outside the limits indicated above, contact the Kerakoll technical department to provide for suitable protective systems for application and operation of the GeoSteel FRM reinforcement system.

[1] The performance characteristics of the GeoSteel FRM system are compliant with and calculated as foreseen by the Guideline for the identification, qualification and acceptance testing of fibre reinforced composite materials with an inorganic matrix (FRCM) , for use in the structural consolidation of existing buildings, published by the "Consiglio Superiore dei Lavori Pubblici" (Italian authority responsible for overseeing public works) in December 2018.

[2] In the event of permanent contact with liquids, contact the Kerakoll technical department to provide for the most suitable protective system.

[3] In case of exposure to fire load, or fire resistance, protect the GEOSTEEL FRM reinforcement system by means of an appropriate REI certified system.

Warning

→ Abide by any standards and national regulations
→ wear protective gloves
→ when handling the mesh, wear protective clothing and goggles, and follow the instructions on how to apply the material
→ store in a dry place and away from substances that may compromise the integrity and adhesion with the chosen matrix
→ the product is an item according to the definitions of the EC Regulation No. 1907/2006 and therefore does not require a Safety Data Sheet
→ for any other issues, contact the Kerakoll Worldwide Global Service +39 0536 811 516

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