



**PLANITOP
INTONACO
ARMATO**
THE NEW WAY
TO STRENGTHEN
STRUCTURES



PLANITOP INTONACO ARMATO

**INNOVATIVE CEMENT-FREE
MORTAR WITH DIFFUSED
MICRO REINFORCEMENT FOR
STRUCTURAL STRENGTHENING
OF MASONRY WITHOUT
STRENGTHENING MESH.**



Application of **PLANITOP INTONACO ARMATO** by spray



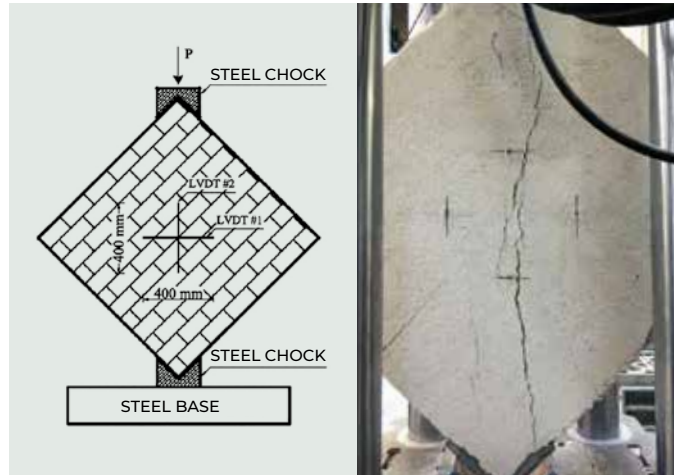
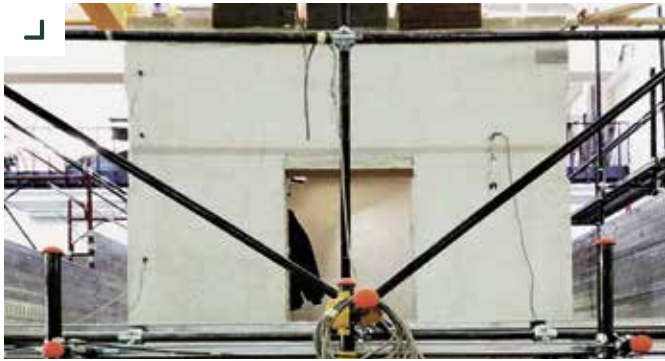
Enlargement of the fibres in **PLANITOP INTONACO ARMATO**

WHY YOU SHOULD USE IT:

- Performance properties comparable with reinforced render
- No strengthening mesh required
- No mechanical connectors required
- No significant increase in stiffness
- No significant increase in mass
- High ductility
- Considerable increase in shear and tensile strength of masonry
- Rapid application
- May be applied with hand tools or with a rendering machine
- No corrosion phenomenon

EXPERIMENTAL TESTING ON MASONRY PANELS AND STRUCTURES

"Federico II" University of Naples, Department of Structural Engineering and Architecture (DiSt)



Diagonal compression tests on masonry panels

Results of tests to determine the multiplication factor ($t = 280 \text{ mm}$)

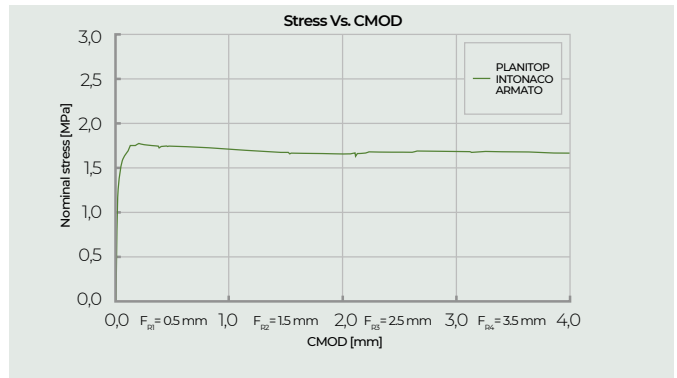
Sample	Type of strengthening	V_{med} [kN]	$\tau_{max, m}$ [MPa]	$\Delta\tau_{max, m}$ [%]	$\frac{C_c}{(\tau_{max, m})}$ [-]	G_m [MPa]	ΔG_m [%]	C_c (G) [-]
P	-	215	0.46	-	1.00	1270	-	1.00
P(PIA)**	PLANITOP INTONACO ARMATO	485	0.96	110%	2.10	3256	156%	2.56

P(PIA)** walls strengthened on both faces

METRICS project (METodologie e Tecnologie per la gestione e RIqualificazione dei Centri Storici e degli edifici di pregio - Methods and technologies for the management and redevelopment of old town centres and listed buildings); STRESS DISTRICT – Testing of scale 1:2 masonry building on a vibrating table.

MECHANICAL CHARACTERISATION AS FRC (Fibre Reinforced Concrete)

University of Brescia, Department of Civil Engineering, Architecture, Territory, the Environment and Mathematics (DICATAM)



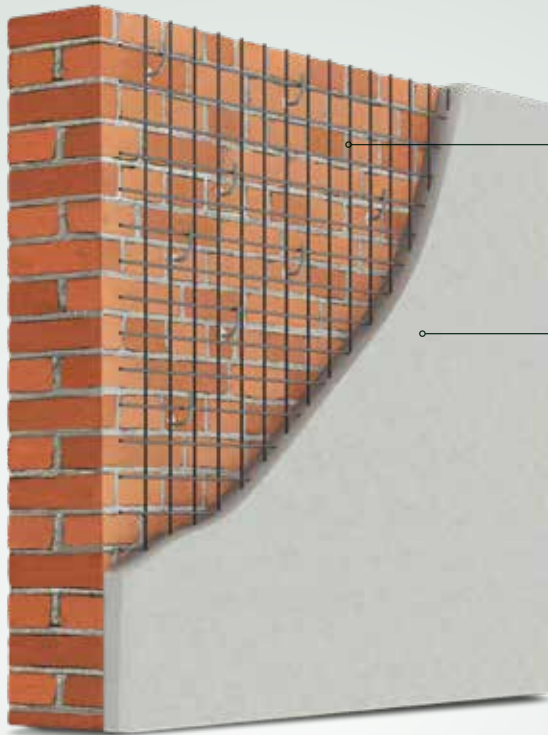
Results of tests to measure residual flexural strength according to EN 14651

Performance characteristics of PLANITOP INTONACO ARMATO

Performance characteristic	Test method	Performance	u.m.
Compressive strength after 28 days	EN 1015-11	>15	N/mm ²
Adhesion to substrate	EN 1015-12	≥ 0.8 failure mode (FP) = B	N/mm ²
Compressive modulus of elasticity	EN 13412	8	GPa
Average residual flexural strength:	EN 14651	f_{r1} 1.75 f_{r2} 1.68 f_{r3} 1.70 f_{r4} 1.69	MPa



> TOTAL THICKNESS 4 ÷ 6 cm

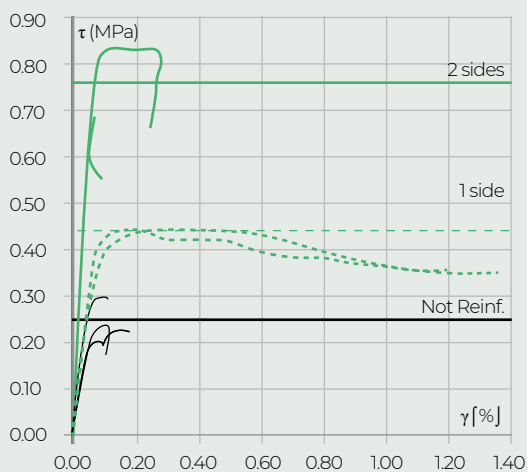


Galvanized or stainless steel electro-welded mesh

Cementitious Grout



TRADITIONAL REINFORCED RENDER

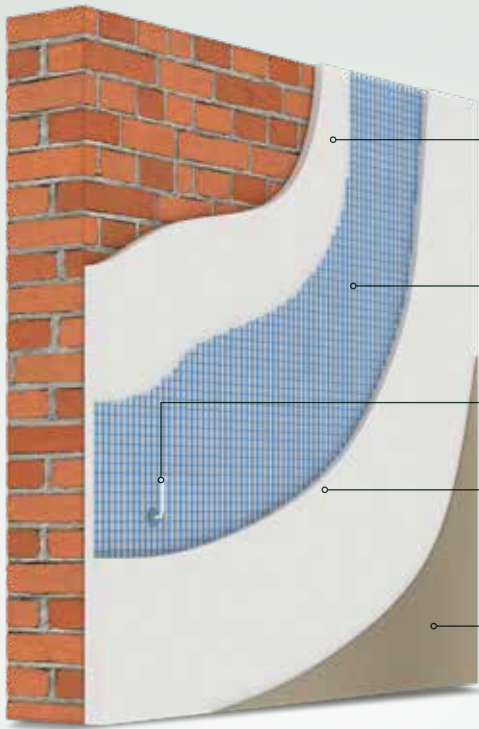


Stress-deformation curves: single-wythe tuff masonry with traditional reinforced concrete (galvanized mesh)

This type of technique has problems that should not be underestimated:

- considerable **increase in stiffness**: irregular distribution of loads / stresses
- considerable **increase in mass** (weight of intervention $\approx 100 \text{ kg/m}^2$): irregular distribution of loads / stresses
- **difficulty** in handling and applying electro-welded mesh
- **transversal connectors** required
- **corrosion** of the mesh

> TOTAL THICKNESS **3 ÷ 5 cm**



**MAPEWALL
RENDER & STRENGTHEN
or MAPE-ANTIQUE
STRUTTURALE NHL**

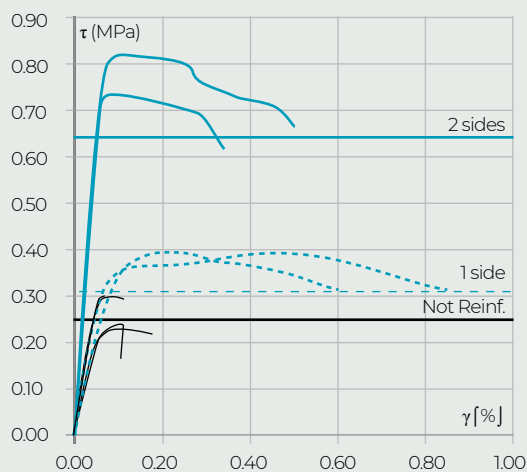
**MAPENET EM 30 or
MAPENET EM 40**

**MAPENET
EM-CONNECTOR
MAPEWALL
RENDER & STRENGTHEN
or MAPE-ANTIQUE
STRUTTURALE NHL**

**MAPE-ANTIQUE
FC (internal use)
and SILANCOLOR
TONACHINO
(external use)**



CRM - COMPOSITE REINFORCED MORTARS

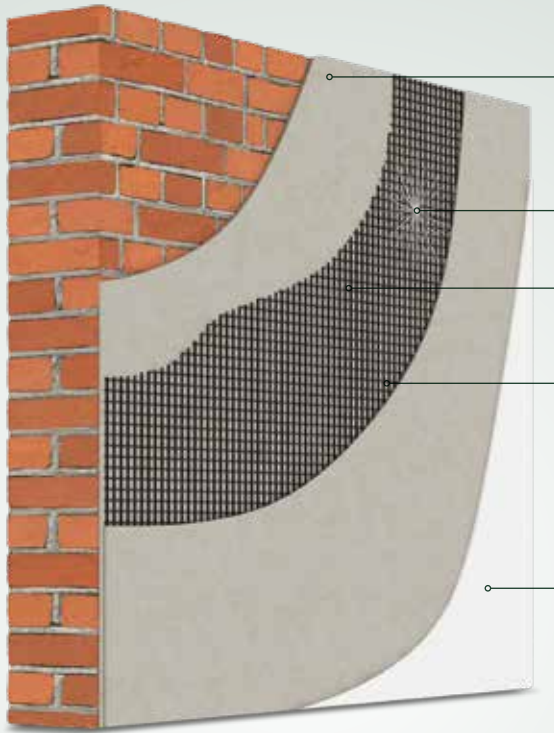


Stress-deformation curves: single-wythe tuff masonry with lime-based mortar and A.R. glass fibre mesh (Mapei CRM)

Unlike the technique of applying reinforced render, CRM systems have the following characteristics:

- **reduction in stiffness** compared with using electro-welded mesh
- **increase in mass** (weight of intervention $\approx 65 \text{ kg/m}^2$): irregular distribution of loads / stresses
- **easier** handling and application of fibre mesh
- **transversal connectors** required
- **no corrosion** phenomenon

> TOTAL THICKNESS 1 ÷ 1.5 cm



PLANITOP
HDM MAXI
or HDM RESTAURO

MAPEWRAP
C/G/B FIOCCO

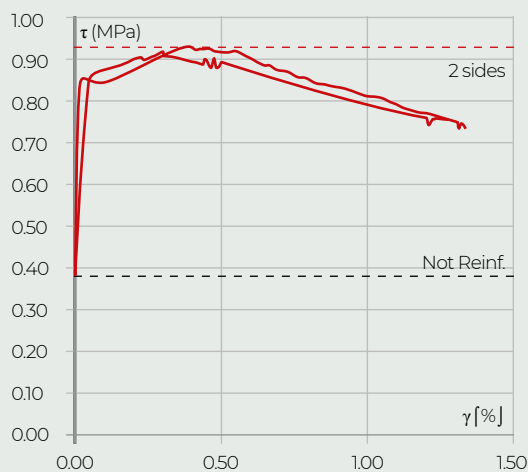
MAPEGRID
G220/B250

PLANITOP
HDM MAXI
or HDM RESTAURO

MAPE-ANTIQUE
FC (internal use)
and SILANCOLOR
TONACHINO
(external use)



FRCM - FIBER REINFORCED CONCRETE MATRIX



Stress-deformation curves: single-wythe tuff masonry with lime-based mortar and A.R. glass fibre mesh (Mapei FRCM)

Unlike the technique of applying reinforced render, FCRM systems have the following characteristics:

- significant **reduction in stiffness**
- considerable **reduction in mass** (weight of intervention $\approx 28 \text{ kg/m}^2$): intervention has little impact on overall geometry
- **easier** handling and application of fibre mesh
- **transversal connectors** not always required
- **no corrosion** phenomenon

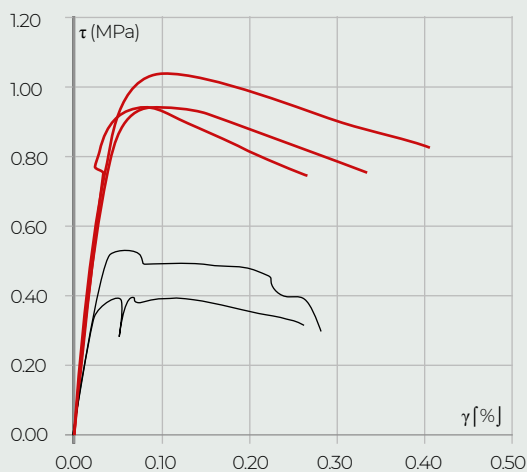
> TOTAL THICKNESS 1 ÷ 1.5 cm



**PLANITOP
INTONACO
ARMATO**



PLANITOP INTONACO ARMATO



The innovative technology of **PLANITOP INTONACO ARMATO** offers the following advantages:

- **no significant increase in stiffness**
- **no significant increase in mass** (weight of intervention $\approx 28 \text{ kg/m}^2$)
- **reinforcement mesh not required**
- **transversal connectors not required**
- **no corrosion** phenomenon
- **lower application time**



Stress-deformation curves: two-header masonry with lime-based mortar with "micro-structural reinforcement" (**PLANITOP INTONACO ARMATO**)

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