

RAPI-tec® restauro THIXO INNOVATION



RHSFCNC – *R*apid *H*ardening *S*hrinkage *F*ree
*C*ementitious *N*ano *C*omposite

Modular workability time :
10 minutes – 30 minutes

Modular Rapid Hardening :
30 minutes – 60 minutes

Anti-cracking SHRINKO-tec®

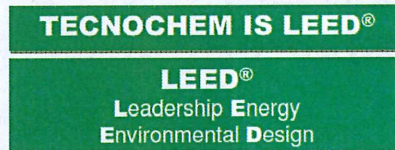
Anti-corrosion MuCis®

Reaction to Fire CLASS A1

Mechanical Resistance CLASS R3 - R4

Durability, Sustainability, Ecology :

CREDITS LEED®



**Innovative Systems with Very High Performance :
application and finish within 60 minutes**

↘ SYSTEMS

RAPI-tec® restauro

THIXO

- Applications in thickness from 2 mm to more than 10 cm, with finish within 60 minutes after application on reinforced concrete and masonry
 - Faceplates balcony, steps of staircases
 - Pillars, Beams, Walls, Shelves
 - On decorative elements to restore and reshape
- Even for thin fairing (2-3 mm)

**Nano-Technologic Pre-Mixes
with Very High Structural Performance and Durability
for Repair and Protection of Reinforced Concrete with
Very fast Application and Finishing - LEED® Credits
From Application to Finish in 1 hour!!**

TECNOCHEM IS LEED®

LEED®
Leadership Energy
Environmental Design

CE approved – Certificate n. 1305 - CPD - 0808
EN 1504-3 Class R3



RHSFCNC – *R*apid *H*ardening *S*hrinkage *F*ree *C*ementitious *N*ano *C*omposite
 Rapid Hardening: **RAPI-tec®** - Anti-corrosion: **MuCis®** - Anti-cracking: **SHRINKO-tec®**
 Fire Resistance : **Class A1** – Maximal **Durability** – Ecology – Sustainability

PRODUCT	Workability Time	Finishing Time	Compressive strength MPa			Thickness	
	minutes	minute	2 hours	4 hours	28 days	Min mm	Max mm
RAPI-tec®restauro THIXO (10)	10	30	8	14	>40	2	>100
RAPI-tec®restauro THIXO (30)	30	60	6	14	>40	2	>100

- **Fast application and finish !!!**
- **Maximal Saving in Time and Cost !!!**
- **Economic Advantages on Short and Long Term !!!**
- **Durability, Sustainability, Ecology, LEED Credits !!!**

INSTALLATION
at 8.00

MIXING
at 8.10

BEGIN APPLICATION
at 8.15 also for bigger thickness

EXAMPLE OF EXECUTION TIMES FOR THE REPAIR (ALSO AT HIGH THICKNESS), THE SMOOTHING, THE DEMOULDING AND THE PAINTING OF BALCONY RISER

SMOOTHING TO FINISH
at 9.00

1 Hour

DEMOLDING
After 2÷3 h

2÷3 Hours

PAINTING
after 4÷8 h

4÷8 Hours



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Performance	Testing Method	Performance Requirements according EN 1504-3 class R3 "structural repairs"	Requirements RAPI-tec® restauro THIXO 10 RAPI-tec® restauro THIXO 30
			(20 °C)
1) Compressive strength	EN 12190	≥ 25 MPa (28 d.)	14 MPa (4 h) 22 MPa (24 h) 40 MPa (28 d.)
Flexural tensile strength	EN 196/1	none	4 MPa (4 h) 5,5 MPa (24 h) 9 MPa (28 d.)
Linear shrinkage	EN 12671-1	≤ 0,3 %	< 0,02%
2) Chloride ion content	EN 1015-17	≤ 0,05 %	< 0,05 %
3) Bond strength	EN 1542	≥ 1,5 MPa (28 gg.)	> 2 MPa (28 d.)
4) Restrained shrinkage and expansion	EN 12617-4	Bond strength after test ≥ 1,5 MPa	>2 MPa
5) Carbonation resistance	EN 13295	Carbonation depth ≤ reference concrete [MC(0,45)]	Carbonation depth ≤ reference concrete [MC(0,45)]
6) Modulus of elasticity in compression	EN 13412	≥ 15 GPa (28 d.)	> 15 GPa (28 d.)
7) Thermal compatibility Part 1, freeze-thaw cycles	EN 13687-1	Bond strength after 50 cycles : ≥ 1,5 MPa	Bond strength after 50 cycles : > 2 MPa
8) Thermal compatibility Part 2, weathering	EN 13687-2	Bond strength after 30 cycles : ≥ 1,5 MPa	Bond strength after 30 cycles : > 2 MPa
9) Thermal compatibility Part 4, Dry cycle	EN 13687-4	Bond strength after 30 cycles : ≥ 1,5 MPa	Bond strength after 30 cycles : > 2 MPa
10) Thermal expansion coefficient	EN 1770	OK when exceeds test 7), 8) e 9)	Supersedes tests 7), 8) and 9)
Capillary absorption	EN 13057	≤ 0,5 Kg · m ⁻² · h ^{-0,5}	< 0,5 Kg · m ⁻² · h ^{-0,5}
Reaction to fire	EN 13501-1	Euro-class	A1

OTHER REQUIREMENTS OF THE PRODUCT

Performance	Method of testing	Requirements RAPI-tec® restauro THIXO 10 RAPI-tec® restauro THIXO 30
Protection against corrosion	ASTM C876 ASTM G109	corrosion ZERO after 2 years: < 100 mV corrosion ZERO after 2 years: < 10 µA
Resistance to impact	CSTB 3232	No cracking after 25 impacts
Wear resistance	(XP P 11-101)	$\Delta v_r \leq 2 \text{ cm}^3$
Consumption		2,1 Kg/m ² /mm

Anti-corrosion Protection

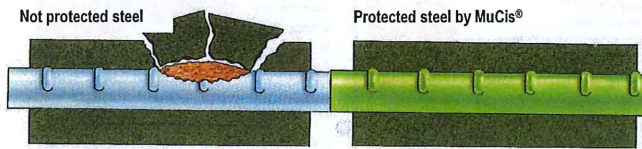


RAPI-tec® restauro THIXO contains migrating and contact corrosion inhibitors

RAPI-tec® restauro THIXO protects not only the steel reinforcement incorporated in the mortar, but also those inside the concrete.

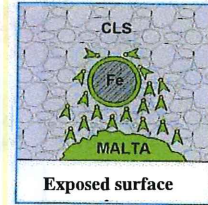


Sea water
Sea water +1% MuCis® ad 19 L



Corrosion process without MuCis®
Cathode: $O_2 + 2H_2O + 4e^- \rightarrow 4OH^-$
Anode: $Fe \rightarrow Fe^{++} + 2e^-$

with MuCis®



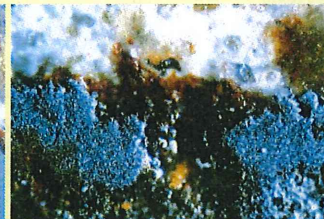
MuCis® migrates towards the concrete for protecting the steel

Effectiveness MuCis® in concrete mixes containing Chloride Salts

STEEL BAR Ø 6 mm
NO PROTECTION
AGEING 450 DAYS

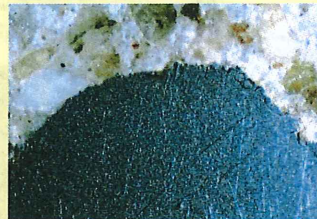


37 MAGNIFICATION
CORROSION AND DIFFUSION OF IRONOXYDE HYDRATES THROUGH THE CONCRETE POROSITY

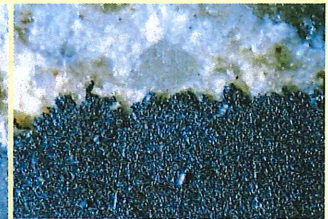


140 MAGNIFICATION:
EVIDENCE OF CORROSION AT HIGHER MAGNIFICATION

STEEL BAR Ø 6 mm PROTECTED WITH
MORTAR CONTAINING MuCis®
AGEING 450 DAYS



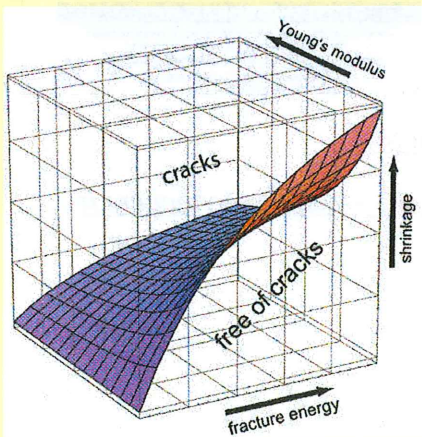
37 MAGNIFICATION
STEEL BAR PERFECTLY PRESERVED



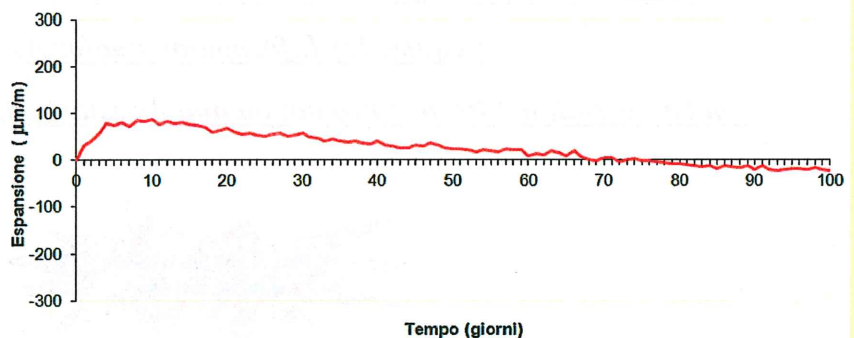
140 MAGNIFICATION:
CORROSION STATUS AT HIGHER MAGNIFICATION

Anti-CRACKING SHRINKO-tec®

The nature of the used binders, in combination with the function of **SHRINKO-tec®** in the composition of the mortar, result in maximal reduction of the shrinkage and consequently, elimination of cracks.



Monitoring of shrinkage/expansion at 100 days : **SHRINKAGE ZERO**



Finish and protection

ANTICORR 210 MuCis®

Protective anticorrosion multifunctional system for reinforced concrete exposed structures

MuCis® mis 210 PH + TECNORIV AC 100

Penetrating
Hydrophobic
Migrating and Cathodic Protection
Cathodic and Anodic Protection
Anticarbonate
Flexible permeable
Waterproofing and resistant to dissolved salts
RAL colours UV resistant

TECNOCHEM ITALIANA SPA

Via Sorte 2/4 - 24030 Barzana (BG) Italy - Tel. +39 035 546111 - Fax +39 035 546115
info@tecnochem.it www.tecnochem.it

ANTICORR 280 MuCis®

Polymer cementitious protection for reinforced concrete exposed structures

Flexible
Elastic
Antishrinkage
Self-cleaning
Anticorrosion
Anticarbonation
Waterproofing
Waterproofing and resistant to dissolved salts
UV resistant colours

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GOLDEN DROPS
gilt specialisti
in edilizia
the building specialists

Flexible permeable eco-compatible coating based on new generation acrylo-ellane resins in water, which outperforms the traditional finishes (not reinforced rendering systems)

GOLDENRASOFLEX

40 COLOURS

TECNOCHEM ITALIANA SPA

LINEA GOLDEN DROPS
gilt specialisti
in edilizia
the building specialists

GOLDEN RASOFLEX

FLEXIBLE DECORATIVE AND PROTECTIVE PLASTER FOR CONCRETE AND MASONRY - PHOTOCATALYTIC

CE approved - Certificate n. 1305 - CPD - 0808
EN 15042 type ZA.1d

TECNOCHEM ITALIANA SPA

TECNOCHEM TECNO ECO LOGICHEM
ITALIANA SPA

GOLDEN DROPS
gilt specialisti
in edilizia
the building specialists

40 COLORI PER I PROTETTIVI E FINITURE

TECNOCHEM ITALIANA SPA

Very High Durability
Resin & Protection System

TECNOCHEM E' LEED'
Leaders in Environmental Design

From Project to Jobsite

MINESSIL/CON

ECOLOGIC WATERBASED MINERALIZING FOR THE COLOUR HOMOGENISATION AND PROTECTION OF FAIRFACED

CE approved - Certificate n. 1305 - CPD - 0808
EN 1504-2 table ZA.1d

Very High Durability
Resin & Protection System

From Project to Jobsite

TECNORIV ELAST

ACRYL-SILOXANE COATING WITH DURABLE FLEXIBILITY FOR THE PROTECTION AND FINISHING OF CONCRETE AND MASONRY

CE approved - Certificate n. 1305 - CPD - 0808
EN 1504-2 type ZA.1d

Very High Durability
Resin & Protection System

From Project to Jobsite

TECNOSOLID 82 / WP

CONSOLIDATING AND WATERPROOFING PROTECTIVE TREATMENT - PRIMER FOR ACRYLIC PROTECTIVE COATINGS FOR FAIRFACED CONCRETE, FOR RENDER, MASONRY AND STONEMARK

CE approved - Certificate n. 1305 - CPD - 0810
EN 1504-2 table ZA.1a

Request for Information and/or Assistance :

send an e-mail to "Project Promotion and Assistance Office" - uapp@tecnochem.it

