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Società benefit





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CONDUCTIVE, THERMAL INSULATED UPGRADED GRAPHITE[®] BASED GEOPOLYMER COATING

Dr. Alex Reggiani, GeoMITS, Italy

OUTLINE

GeoMITS, Alisea and Studio Saccozza
introduction of the partnership
Graphii-coat 30 GP 2.0 version,
Geopolymer coating with Upgraded
Graphite[®] for low porosity substrates
Final Properties
Promotional video
Application case

GeoMITS

MATERIAL INNOVATION TECHNOLOGY SERVICE

GeoMITS is focalized on :

Consulting, R&D and supplying about Geopolymer binders (precursors and liquid hardeners, through Italian industrial partner supplier, INGESSIL) for several applications

Customizing of automatic mixing plants (mobile and fixed central beton) for production from laboratory to industrial scale

360° Service about designing of final geopolymer recipes included choice of the best partially reactive aggregate curve. Intermediation between clients and aggregate suppliers



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Alisea

Alisea is benefit company focalized on :

Since 1994 design and production objects using sustainable raw materials from waste or from recycling

Since 2013 R&D division specialized on developing of new materials that ,using waste from industrial processing, created new production systems, useful to improve people's quality of life

Studio Saccozza

Studio Saccozza is engineering company focalized on :

Technical studies about Hydraulic and Thermotechnology Civil Engineering

Energy saving about building construction

20 years of experience as Building company with specialization in conservation and rehabilitation of existing artifacts and buildings



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GRAPHII - COAT 30 GP



Patented protective Geopolymer coating for thermal conductivity and thermal insulation

High content of graphite (Upgraded Graphite®)

High mechanical strength and adhesion

High durability (acid and seawater proof)

Fireproof and 50 Freeze / Thaw cycles resistant

VOC free, 100% Portland cement and lime free

Low thickness protecting coating

GRAPHII - COAT 30 GP

Promotional Video shared on LinkedIn



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GRAPHII - COAT 30 GP



MECHANICAL PROPERTIES

After 24h by air at room temperature:

F= 2,5 MPa C= 15 MPa

After 28 days by air at room temperature:

F= 6 to 8 MPa C= 40 to 60 MPa

(depending on temperature/season)

After 28 days under water:

F= 5,6 to 7,5 MPa C=38 to 55 MPa

(depending on temperature/season)

GRAPHII-COAT 30 GP

CERTIFICATION REPORT – OTHER PERFORMANCES DATA

UNI EN 1062-1 WATER PERMEABILITY CLASS = 0,02 W1-low

UNI EN 1542: 2000 – DIRECT PULL OFF TEST ON CONCRETE = 3 MPa (breaking type A)

UNI EN 1015-17: 2008 – CHLORINE CONTENT = 0,02 % (from extra water)

UNI EN 13892-4:2005 – ABRASION RESISTANCE BCA = STRONG (4 micron lost on 3,5mm)

UNI EN 13412:2007 – ELASTIC MODULE = density 1,86 g/cm³ ; E = 26730 N/mm²

UNI EN ISO 7783: 2019 – PAINTS, ACQUEUS VAPOR TRANSMISSION (μ) = 11 (breatable)

UNI EN 13295:2005 – CARBONATION RESISTENCY = low (shape A)

UNI EN 12190: 2000 – COMPRESSION TEST AFTER 50 FREEZE / THAW CYCLES (Testing started after only 21 days of air curing):

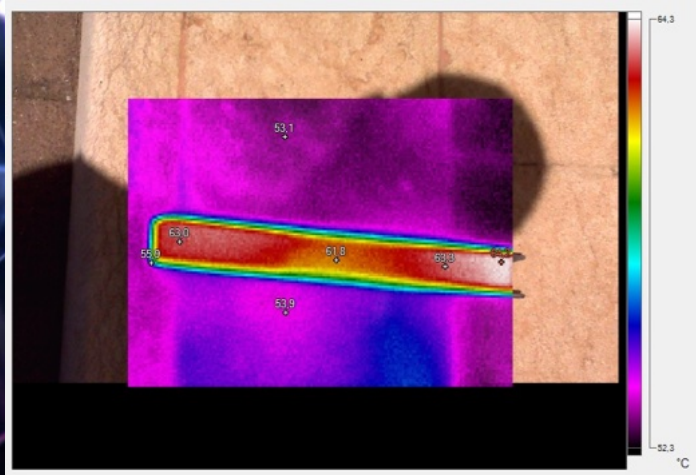
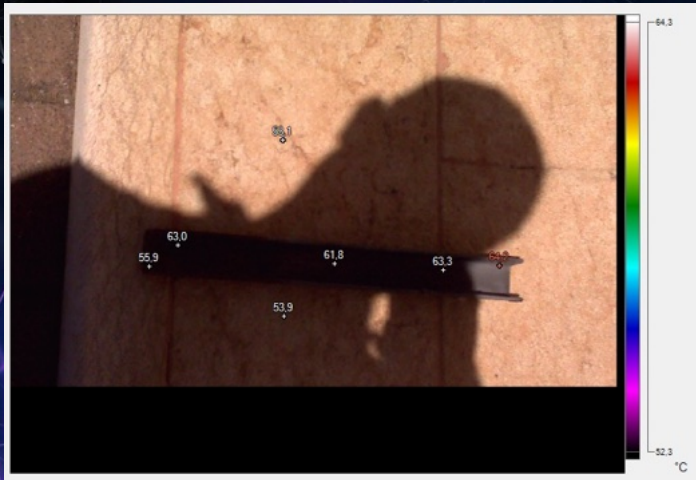
Reference cured by air = density 1,85 g/cm³ ; C = 50,1 MPa

Samples after 50 cycles = mean density 1,8 g/cm³ ; C = 45,2 MPa

GRAPHII - COAT 30 GP

20 MINUTES SUNLIGHT EXPOSURE

Oxidized iron with corrosion spots covered by Graphii-Coat 30 GP (1 hand from 0,4-0,6 mm)



THERMAL CAMERA DATA

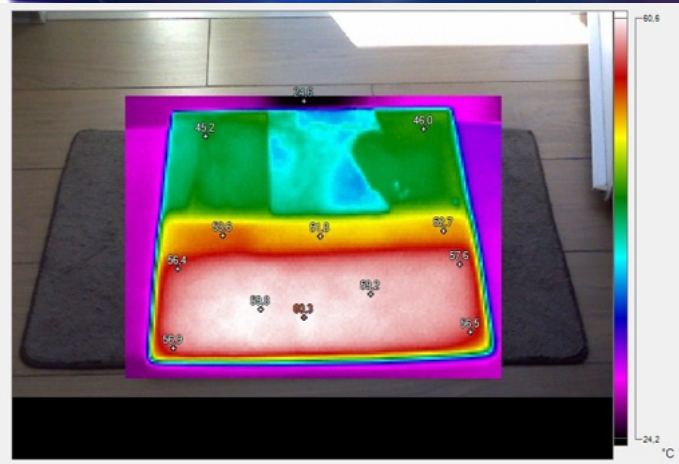
GRAPHII - COAT 30 GP

20 MINUTES SUNLIGHT EXPOSURE

Borosilicate glass coated by Graphii-Coat 30 GP about 0,7-0,8 mm (2 hands)



THERMAL CAMERA DATA



GRAPHII - COAT 30 GP

APPLICATION AND EQUIPMENTS

- BRUSH (if applied by hand on little surfaces)
- FLAT TROWEL (if applied on larger and regular surfaces)
- SPRAY GUN (if applied on curved surfaces)

PACKAGING

- 5 Kg KIT ready to use, composed by:
 - big bucket with Geopolymer precursor in powder form
 - small bucket with Partially reactive aggregate with Graphite and Antidust technology
 - Potassium silicate user friendly reagent in plastic bottle

GRAPHII - COAT 30 GP

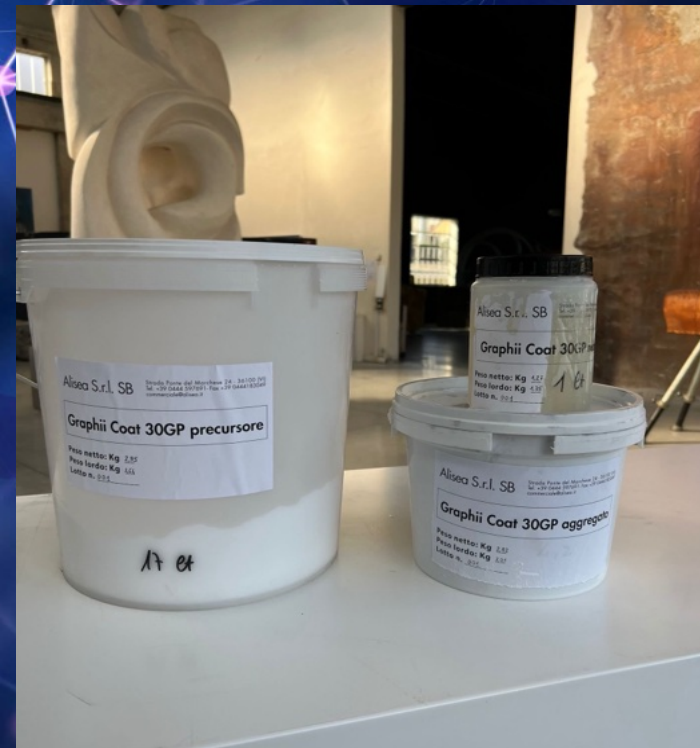
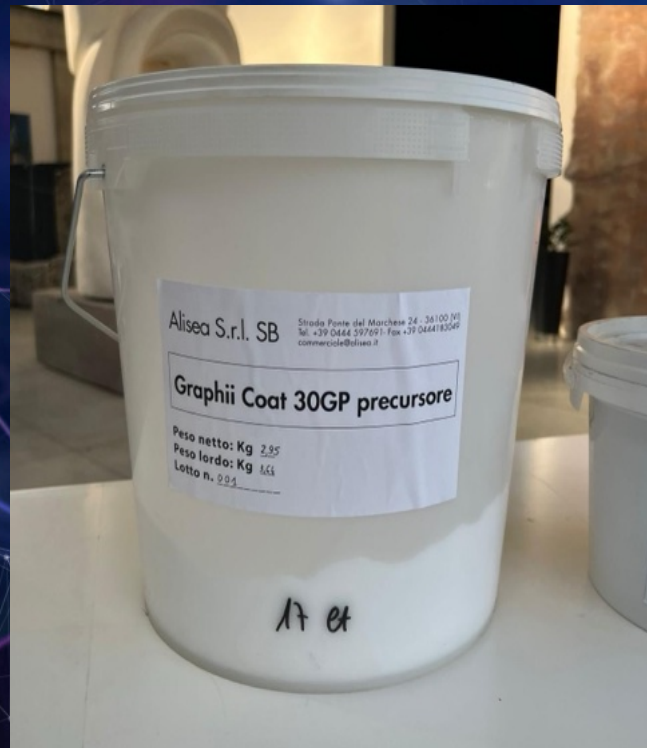


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5 kg KIT (available on Italian market)

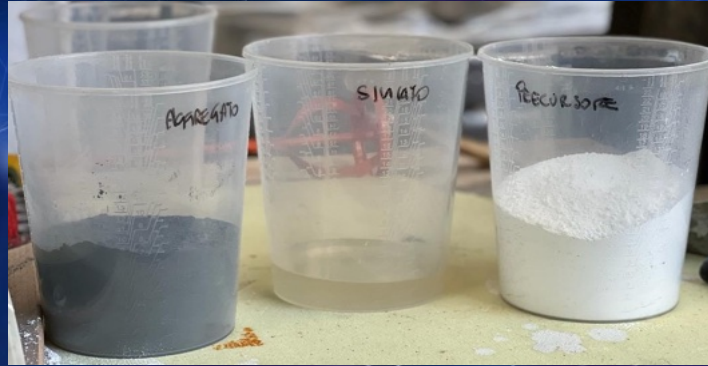


GRAPHII - COAT 30 GP

APPLICATIONS



UNTREATED RUST METAL



GRAPHII COAT 30 GP: COMPONENTS



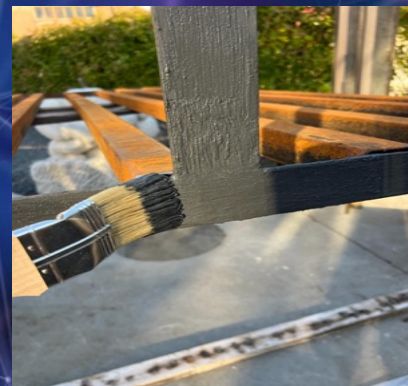
GP BINDER MIXING



READY TO BE USED



FIRST HAND BY BRUSH



SECOND HAND BY BRUSH

GRAPHII - COAT 30 GP

APPLICATIONS



THERMAL CONDUCTIVE ROOF TILE



PASSIVATING EFFECT ON RUSTY IRON ELEMENTS

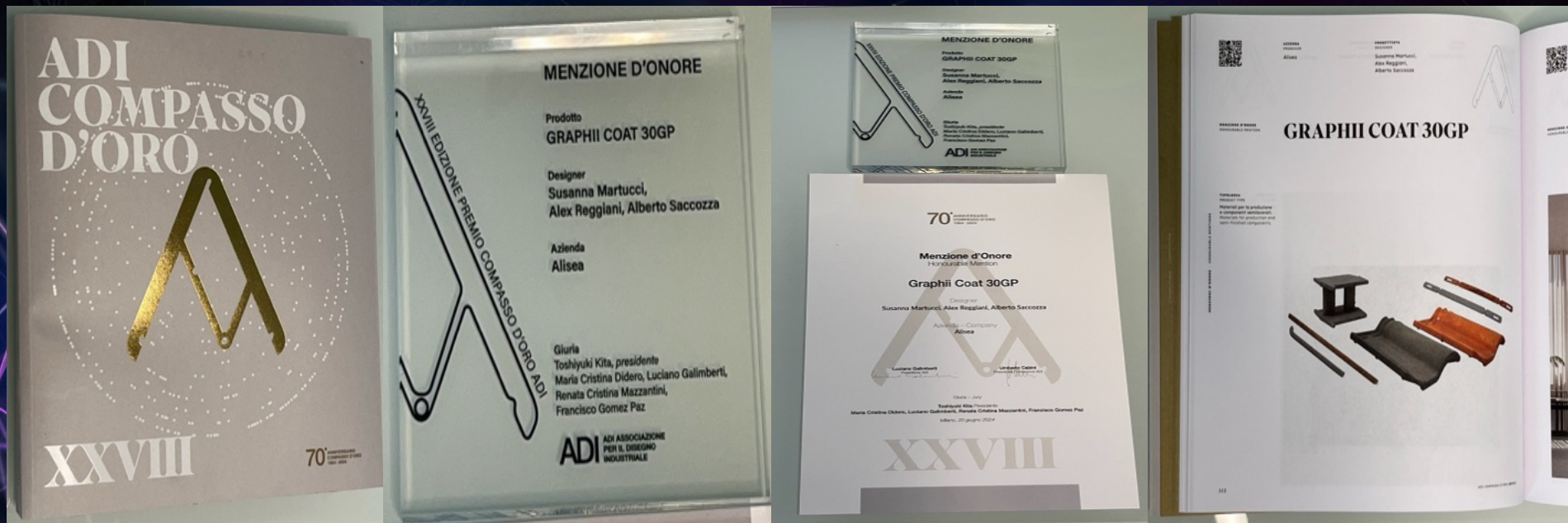


COVERING AND PASSIVATING RUSTY REBARS



ON CAST IRON OR STEEL

AWARDS AND HONORS

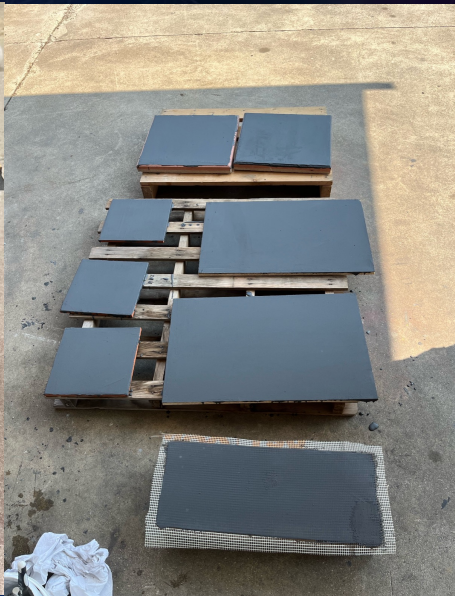


ADI (ASSOCIATION FOR INDUSTRIAL DESIGN) AWARDS 2024
HONORABLE MENTION

GRAPHII COAT 30 GP 2.0 – LOW POROSITY SUBSTRATES



ON SANDED METAL OR
LOW POROSITY BRICKS



ON MDF, METAL AND GRES



ON FIBER COMPOSITE



ON SANDED STEEL / IRON

GRAPHII COAT 30 GP 2.0 :

- FINER CURVE AND MUCH MORE FLUID THAN STANDARD
- IMPROVED WORKABILITY (PROLONGED OPEN TIME)
- HIGHER ADHESION ON SEVERAL TYPES OF SURFACES (> 5,5 MPa on metal)
- APPLIED BY ROLL, BRUSH AND EASY TO BE SPRAYED
- HIGHER MECHANICAL STRENGTH (28 days: F= 13 MPa , C= 72 MPa)

GRAPHII COAT 30 GP 2.0 – LOW POROSITY SUBSTRATES



APPLICATION OF 5 Kg KIT OF GRAPHII COAT 30 GP 2.0 BY ROLL ON SANDED METAL
(INCREASED YIELD OF THE PRODUCT, COVERING MORE THAN 5 m² OF ROUGH
METAL SURFACE)

THANKS TO SACCOZZA BROTHERS FOR ALL THE APPLICATION WORK



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GRAPHII COAT 30 GP 2.0 – LOW POROSITY SUBSTRATES

CHEMICAL RESISTANCE: **UNI EN ISO 868 (EPOXY STD. METHOD)**

- SURFACTANT SOLUTION FOR 28 d: MASS LOST IN 28 d, 4g = 0,16 g/d (PASSED)
- ACETIC ACID SOLUTION FOR 28 d: MASS LOST IN 28 d, 6g = 0,21 g/d (PASSED)
- SODIUM CHLORIDE SOLUTION FOR 28 d: MASS LOST IN 28d, 1g = 0,04 g/d (PASSED)
- SODIUM HYDROXIDE SOLUTION FOR 28 d: MASS LOST IN 28d, 2g = 0,08 g/d (PASSED)
- CHLORIDRIC ACID SOLUTION FOR 28 d: MASS LOST IN 28d, 7g = 0,25 g/d (PASSED)

GRAPHII COAT 30 GP 2.0 – LOW POROSITY SUBSTRATES



SAMPLES PREPARATION IN GEOMITS LABORATORY FOR GP CAMP 2025. ON METAL APPLIED BY BRUSH WHILE, FREE FLOWING CASTING FOR 3D PRINTED SILICON CORAL REEF-LIKE SHAPE

Thanks for the kind attention



 **eoMITS**

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 **Alberto Saccozza**
Engineering

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