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DICHIARAZIONE DI PRESTAZIONE N. 0483

1. Cod unic de identificare al produsului-tip:
GeoSteel FRM (GeoSteel Grid 400 e Geocalce F Antisismico)
2. Utilizări preconizate: **Kit adecvat pentru consolidarea, îmbunătățirea și adaptarea seismică a elementelor structurale din zidărie de cărămidă, tuf și piatră naturală.**
3. Fabricant: **Kerakoll S.p.A Via dell'Artigianato, 9 - 41049 Sassuolo (MO) Italia**
4. Sistemele de evaluare și de verificare a constanței performanței: **Sistem 2+**
5. Documentul de evaluare europeană: **EAD 340275-00-0104, Ianuarie 2018**
Evaluare tehnică europeană: **ETA-19/0326 din 13/07/2022**
Organism de evaluare tehnică: **ITC CNR**
Organisme notificate: **ITC n° 0970**
6. Performanțe declarate:
 - valori caracteristice pentru forțe de tracțiune și deformații
 - valori medii pentru modulii de elasticitate

Caracteristici esențiale	Performanță
Reacție la foc	Clasa A1
GeoSteel Grid 400-Geocalce F Antisismico	A se vedea Annex A

Performanța produsului identificat mai sus este în conformitate cu setul de performanțe declarate. Această declarație de performanță este eliberată în conformitate cu Regulamentul (UE) nr. 305/2011, pe răspunderea exclusivă a fabricantului identificat mai sus.

Semnată pentru și în numele fabricantului de către: **Romano Sghedoni**

În Sassuolo, la 29/07/2022

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Annex A – GeoSteel Grid 400-Geocalce F Antisismico

Essential characteristics			Performance	
			Average value	Characteristic value
Tensile strength (σ_u)	WEFT		1268 MPa	1160 MPa
Strain (ϵ_u)	WEFT		1,77 %	1,52 %
Stress-strain curve (E)	WEFT	Elastic modulus of stage A	870 GPa	196 GPa
		Stiffness modulus in stage C	67 GPa	54 GPa
Interlaminar shear strength (τ)			0.90 MPa	0.75 MPa
Lap tensile strength (σ_{lap})	Tested Overlap length $l_{lap}=300\text{ mm}$		1125 MPa	921 MPa
Bond strength on substrate CLAY: pull-off test	Ambient		0.80 MPa	-
	Water	1000 h	0.79 MPa	-
		3000 h	0.86 MPa	-
	saltwater	1000 h	1.02 MPa	-
		3000 h	0.96 MPa	-
	alkali	1000 h	0.81 MPa	-
3000 h		0.72 MPa	-	
Bond strength on substrate TUFF: pull-off test	Ambient		0.23 MPa	-
	Water	1000 h	0.20 MPa	-
		3000 h	0.23 MPa	-
	saltwater	1000 h	0.21 MPa	-
		3000 h	0.28 MPa	-
	alkali	1000 h	0.24 MPa	-
3000 h		0.20 MPa	-	
Bond strength on substrate CLAY: single-lap shear test (failure mode FR)	ambient		P_{max} 3004 N P_{deb} - ⁽¹⁾ $\sigma_{lim,conv}$ 1043 MPa	P_{max} 2461 N P_{deb} - ⁽¹⁾ $\sigma_{lim,conv}$ 854 MPa
	Water	1000 h	2990 N	-
		3000 h	2833 N	-
	saltwater	1000 h	2954 N	-
		3000 h	NPA	-
	alkali	1000 h	2601 N	-
3000 h		NPA	-	

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Essential characteristics		Performance		
		Average value		Characteristic value
Bond strength on substrate TUFF: single-lap shear test (failure mode FR)	ambient	P_{max} 3601 N P_{deb} - ⁽¹⁾ $\sigma_{lim,conv}$ 1250 MPa	P_{max} 3087 N P_{deb} - ⁽¹⁾ $\sigma_{lim,conv}$ 1071 MPa	
	Water, saltwater and alkali conditioning	NPA		NPA
Bond strength on substrate NATURAL STONE: single-lap shear test (failure mode FR)	Ambient	P_{max} 2253 N P_{deb} - ⁽¹⁾ $\sigma_{lim,conv}$ 782 MPa	P_{max} 1933 N P_{deb} - ⁽¹⁾ $\sigma_{lim,conv}$ 670 MPa	
	Water, saltwater and alkali conditioning	NPA		NPA
Freezing and Thawing	Direct tension	Tensile strength $\sigma_{u,FT}$ Strain $\epsilon_{u,FT}$ Stiffness moduli E_{1FT} Stiffness moduli E_{3FT} Inter. shear strength (τ_{FT})	1102 MPa 1.43 % 1332 GPa 69 GPa 0.93 MPa	932 MPa 0.97 % 739 GPa 66 GPa 0.71 MPa
	Retained properties	Tensile strength $\sigma_{u,FT,ret}$ Stiffness moduli $E_{1FT,ret}$ Stiffness moduli $E_{3FT,ret}$ Inter. shear strength ($\tau_{FT,ret}$)	87 % 153 % 104 % 104 %	-
Water resistance	Direct tension (1000 h)	Tensile strength $\sigma_{u,w}$ Strain $\epsilon_{u,w}$ Stiffness moduli E_{1w} Stiffness moduli E_{3w} Inter. shear strength (τ_w) Lap tensile ($\sigma_{lap,w}$)	1071 MPa 1.37 % 1197 GPa 71 GPa 0.80 MPa 995 MPa	924 MPa 1.01 % 479 GPa 68 GPa 0.71 MPa 851 MPa
	Direct tension (3000 h)	Tensile strength $\sigma_{u,w}$ Strain $\epsilon_{u,w}$ Stiffness moduli E_{1w} Stiffness moduli E_{3w} Inter. shear strength (τ_w) Lap tensile ($\sigma_{lap,w}$)	1075 MPa 1.34 % 1106 GPa 72 GPa 0.79 MPa 1005 MPa	843 MPa 0.82 % 567 GPa 69 GPa 0.70 MPa 815 MPa
	Retained properties (1000 h)	Tensile strength $\sigma_{u,w,ret}$ Stiffness moduli $E_{1w,ret}$ Stiffness moduli $E_{3w,ret}$ Inter. shear strength ($\tau_{w,ret}$) Lap tensile ($\sigma_{lap,w,ret}$)	85 % 138 % 105 % 89 % 88 %	-
	Retained properties (3000 h)	Tensile strength $\sigma_{u,w,ret}$ Stiffness moduli $E_{1w,ret}$ Stiffness moduli $E_{3w,ret}$ Inter. shear strength ($\tau_{w,ret}$) Lap tensile ($\sigma_{lap,w,ret}$)	85 % 127 % 106 % 87 % 109 %	-

(1) Rupture of fibres was observed outside the bonded length, therefore no value for the bond capacity is indicated

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Essential characteristics		Performance		
			Average value	Characteristic value
Saltwater resistance	Direct tension (1000 h)	Tensile strength $\sigma_{u,sw}$ Strain $\varepsilon_{u,sw}$ Stiffness moduli $E_{1,sw}$ Stiffness moduli $E_{3,sw}$ Inter. shear strength (τ_{sw})	929 MPa 1.16 % 1595 GPa 70 GPa 1.04 MPa	794 MPa 0.96 % 878 GPa 67 GPa 0.86 MPa
	Direct tension (3000 h)	Tensile strength $\sigma_{u,sw}$ Strain $\varepsilon_{u,sw}$ Stiffness moduli $E_{1,sw}$ Stiffness moduli $E_{3,sw}$ Inter. shear strength (τ_{sw})	895 MPa 1.12 % 1473 GPa 74 GPa 1.17 MPa	768 MPa 0.78 % 464 GPa 54 GPa 0.94 MPa
	Retained properties (1000 h)	Tensile strength $\sigma_{u,w,ret}$ Stiffness moduli $E_{1,w,ret}$ Stiffness moduli $E_{3,w,ret}$ Inter. shear strength ($\tau_{sw,ret}$)	73 % 183 % 104 % 115 %	-
	Retained properties (3000 h)	Tensile strength $\sigma_{u,sw,ret}$ Stiffness moduli $E_{1,sw,ret}$ Stiffness moduli $E_{3,sw,ret}$ Inter. shear strength ($\tau_{sw,ret}$)	71 % 169 % 109 % 130 %	-
	Lap Tensile		NPA	NPA
Alkali resistance	Direct tension (1000 h)	Tensile strength $\sigma_{u,alk}$ Strain $\varepsilon_{u,alk}$ Stiffness moduli $E_{1,alk}$ Stiffness moduli $E_{3,alk}$ Inter. shear strength (τ_{alk})	1127 MPa 1.52 % 1441 GPa 68 GPa 0.85 MPa	1072 MPa 1.49 % 788 GPa 66 GPa 0.49 MPa
	Direct tension (3000 h)	Tensile strength $\sigma_{u,alk}$ Strain $\varepsilon_{u,alk}$ Stiffness moduli $E_{1,alk}$ Stiffness moduli $E_{3,alk}$ Inter. shear strength (τ_{alk})	1063 MPa 1.41 % 1510 GPa 69 GPa 1.10 MPa	1013 MPa 1.24 % 679 GPa 65 GPa 0.83 MPa
	Retained properties (1000 h)	Tensile strength $\sigma_{u,alk,ret}$ Stiffness moduli $E_{1,alk,ret}$ Stiffness moduli $E_{3,alk,ret}$ Inter. shear strength ($\tau_{alk,ret}$)	89 % 166 % 101 % 95 %	-
	Retained properties (3000 h)	Tensile strength $\sigma_{u,alk,ret}$ Stiffness moduli $E_{1,alk,ret}$ Stiffness moduli $E_{3,alk,ret}$ Inter. shear strength ($\tau_{alk,ret}$)	84 % 173 % 102 % 122 %	-
	Lap Tensile		NPA	NPA
Alkali soil resistance	Direct tension (1000 h)	Tensile strength $\sigma_{u,soil}$ Strain $\varepsilon_{u,soil}$ Stiffness moduli $E_{1,soil}$ Stiffness moduli $E_{3,soil}$	985 MPa 1.15 % 1033 GPa; 69 GPa	840 MPa 1.00 % 863 GPa; 65 GPa
	Retained properties (1000 h)	Tensile strength $\sigma_{u,soil,ret}$ Stiffness moduli $E_{1,soil,ret}$ Stiffness moduli $E_{3,soil,ret}$	78 % 119 % 102 %	-

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Essential characteristics		Performance		
			Average value	Characteristic value
Dry heat resistance	Direct tension (1000 h)	Tensile strength $\sigma_{u, heat}$ Strain $\epsilon_{u, heat}$ Stiffness moduli $E_{1, heat}$ Stiffness moduli $E_{3, heat}$	1073 MPa 1.29 % 1683 GPa; 72 GPa	808 MPa 0.80 % 1082 GPa; 65 GPa
	Retained properties (1000 h)	Tensile strength $\sigma_{u, heat, ret}$ Stiffness moduli $E_{1, heat, ret}$ Stiffness moduli $E_{3, heat, ret}$	85 % 193 % 107 %	-
	Direct tension (3000 h)	Tensile strength $\sigma_{u, heat}$ Strain $\epsilon_{u, heat}$ Stiffness moduli $E_{1, heat}$ Stiffness moduli $E_{3, heat}$	NPA	NPA
	Retained properties (3000 h)	Tensile strength $\sigma_{u, heat, ret}$ Stiffness moduli $E_{1, heat, ret}$ Stiffness moduli $E_{3, heat, ret}$	NPA	NPA
Fuel resistance	Direct tension	Tensile strength $\sigma_{u, fuel}$ Strain $\epsilon_{u, fuel}$ Stiffness moduli $E_{1, fuel}$ Stiffness moduli $E_{3, fuel}$	1233 MPa, 1.74 % 1213 GPa, 69 GPa;	1125 MPa, 1.41 % 571 GPa, 62 GPa;
	Retained properties	Tensile strength $\sigma_{u, fuel, ret}$ Stiffness moduli $E_{1, fuel, ret}$ Stiffness moduli $E_{3, fuel, ret}$	97% 66% 92 %	-
Creep behaviour related to the adhesion on substrate	Substrate: clay	Displacement vs time (tabular) Maximum load $P_{max, creep}$ Bond capacity $P_{deb, creep}$	0.047 mm 3094 N (1)	- 1528 N (1)
	Substrate: tuff	Displacement vs time (tabular) Maximum load $P_{max, creep}$ Bond capacity $P_{deb, creep}$	0.030 mm 3364 N (1)	- 2808 N (1)
Tensile strength after long term actions (creep)			NPA	NPA
Tensile strength after low number of cycles (seismic behaviour) - WEFT			NPA	NPA
Tensile strength after high number of cycles (fatigue actions)			NPA	NPA
Mechanical properties of fabric		Ultimate stress $\sigma_{u, f}$ Ultimate strain $\epsilon_{u, f}$ Mean elastic modulus E_f	1479 MPa 2,17 % 67 GPa	1280 MPa 1,74 % 55 GPa
	Substrate: clay	Conventional limit strain $\epsilon_{lim, conv}$	1,55 %	1,27 %
	Substrate: tuff	Conventional limit strain $\epsilon_{lim, conv}$	1,85 %	1,59 %
	Substrate: Natural Stone	Conventional limit strain $\epsilon_{lim, conv}$	1,16 %	0,99 %
Tensile strength on bent fabric (for steel fabrics)			Not applicable	Not applicable

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