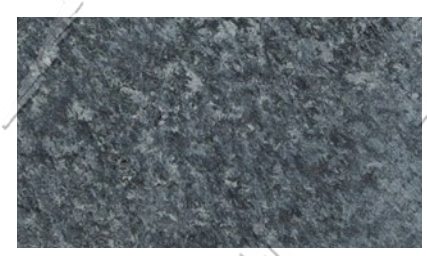
Succetti
stones for your life

Pietra Ollare

Pietra Ollare

DISK CUT

HONED



BRUSHED

SANDED

TECHNICAL TESTS - AVERAGE VALUES
SURFACE: RESINED & HONED
BACK: RESINED WITH FIBREGLASS NET

Apparent Density UNI EN 1936:2007
2880 kg/m^3

Open Porosity UNI EN 1936:2007
0,2 %

Water Absorption at atmospheric pressure
UNI EN 13755:2008
0,1 %

Abrasion Resistance UNI EN 14157:2017
20,0 mm

Flexural Strength UNI EN 12372:2007
29,2 MPa

Frost Resistance:
flexural strength after 14 freeze/thaw cycles
UNI EN 12371:2010 - UNI EN 12372:2007
30,0 MPa

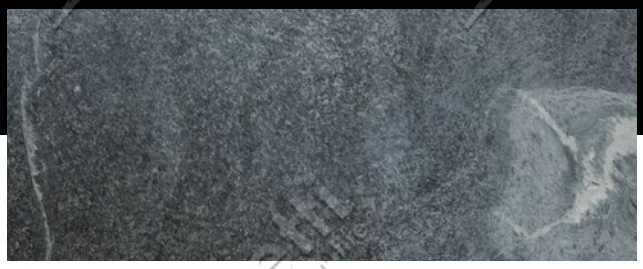
Frost Resistance: flexural strength after 56 freeze/
thaw cycles UNI EN 12371:2010 - UNI EN 12372:2007
24,9 MPa

Breaking Load at dowel hole UNI EN 13364:2003
1950 N

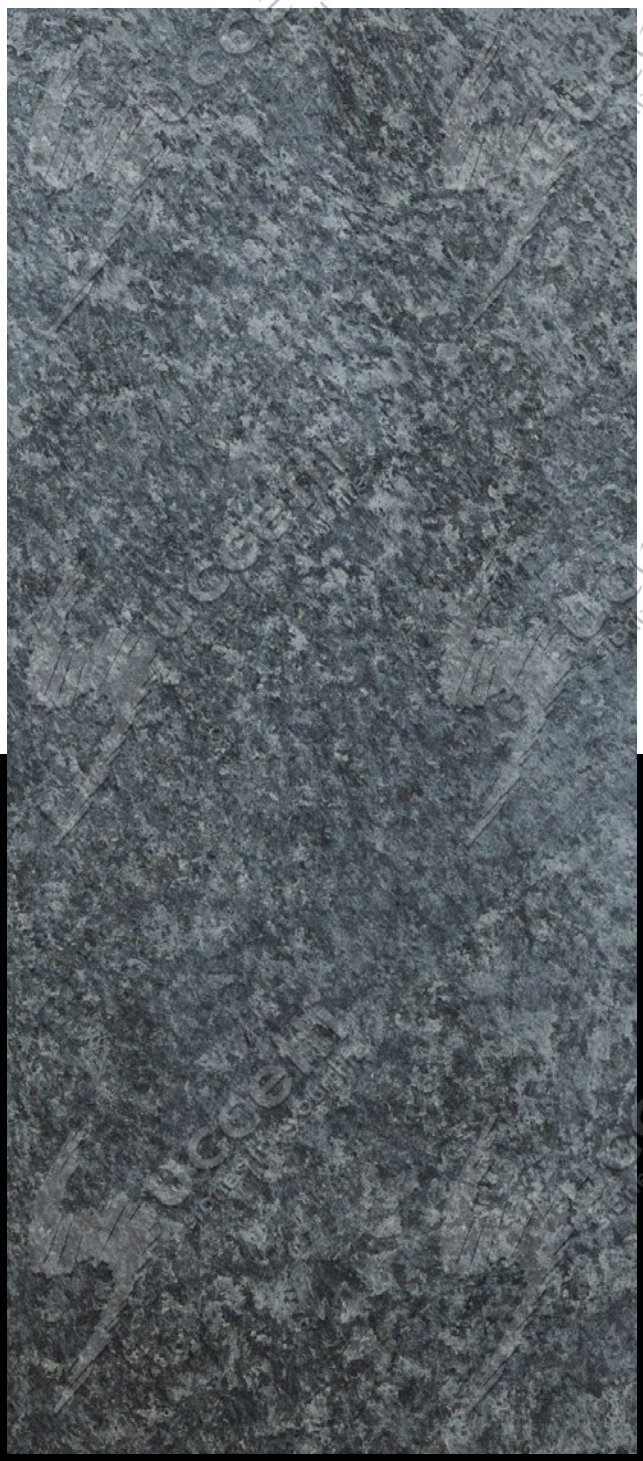
Resistance to Ageing: flexural strength
after thermal shock cycles
UNI EN 14066:2013 - UNI EN 12372:2007
21,0 Mpa

DISK CUT

HONED

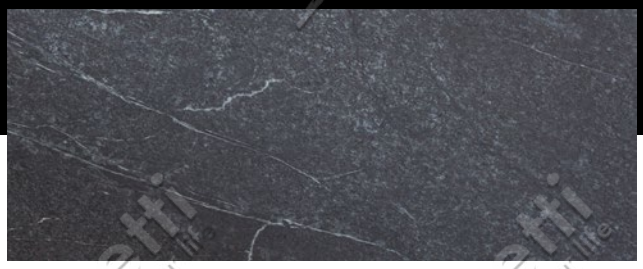


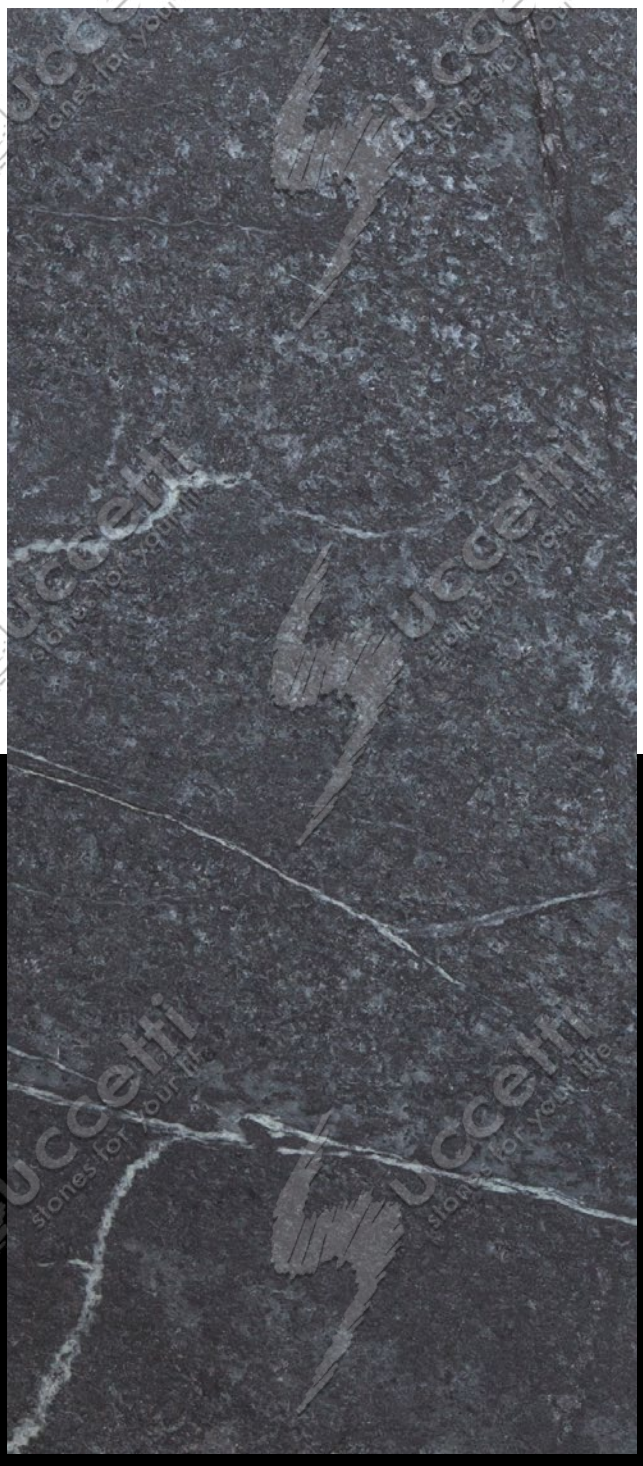
Slab
78,7x31,5''



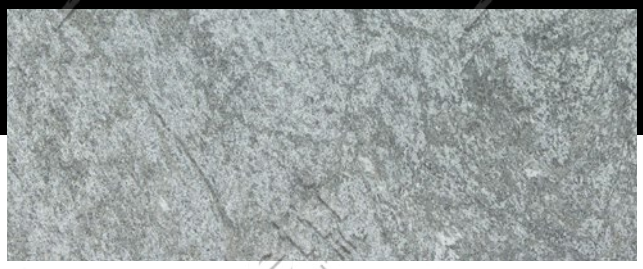
Detail
13,8x31,5''

BRUSHED





SANDED



Slab
78,7x31,5''

Detail
13,8x31,5''

Technical Sheets

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ECAMRICERT SRL
Viale del Lavoro, 6
36030 Monte di Malo
Vicenza, Italy
T +39 0445 605838
F +39 0445 581430
info@ecamricert.com
C.F./P.I. 01650050246

ecamricert.com

ACCREDIA
L'ENTE ITALIANO DI ACCREDITAMENTO
LAB N° 0699

Test Report n° 18-4260-004/E **Issue date, 07/30/2018**

Client	**SUCCETTI LUCIANO S.R.L.** **VIA REZIA N.30** **23022 - CHIAVENNA, SO** **ITALIA**

Sample description	**PIETRA OLLARE #**
Origin	CUSTOMER PLANT
Kind of sample	SLABS OF NATURAL STONE FOR CUTTING
Sampling by	CLIENT
Sampling date	NOT DECLARED
Taken from	COURIER
Delivery date	05/17/2018
Acceptance number	18-4260
Acceptance date	05/17/2018
Test start date	05/21/2018
Test end date	07/30/2018
Object	ITT TESTS FOR CE MARKING ACCORDING TO: UNI EN 1469 UNI EN 12057 UNI EN 12058

DISPOSITION OF ANISOTROPY PLANS COMPARED TO THE DIMENSIONS OF THE SPECIMENS:

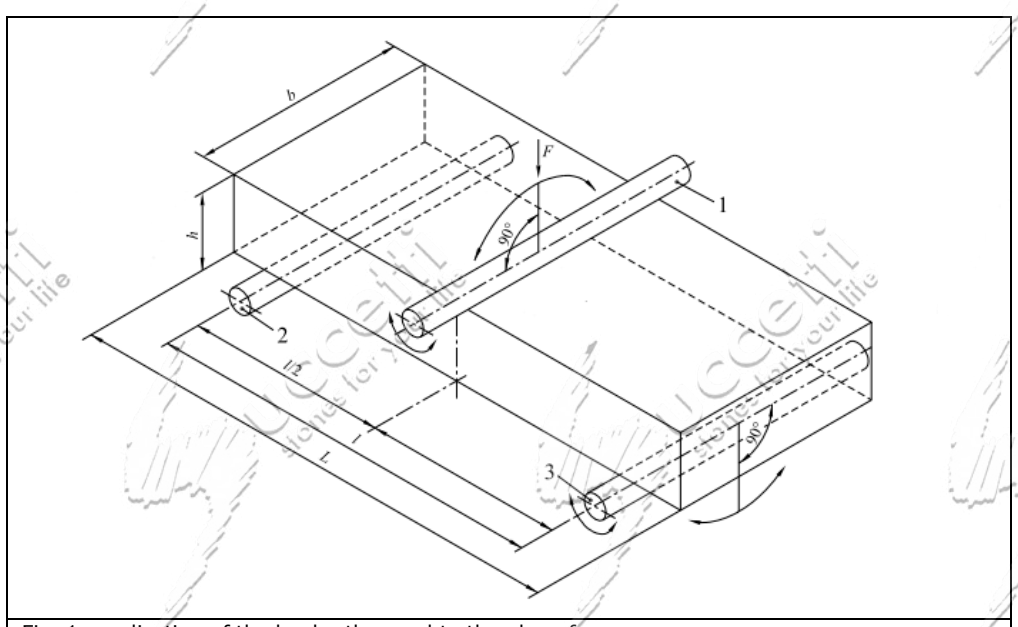

Fig. 1: application of the load orthogonal to the plan of use

Test Report n° 18-4260-004/E **Issue date, 07/30/2018**

PETROGRAPHIC EXAMINATION **

Test according to: UNI EN 12407: 2007

Macroscopic description by lens (10X), diluted hydrochloric acid at 10%

Metamorphic rock of talcum-chlorite and amphibolic composition, non-reactive to cold hydrochloric acid. The rock presents a same orientation of the crystals highlighting a lepidoblastic structure

Petrographic microscopic analysis in thin section by polarizing microscope (thin section at 30 microns) - Microchemical test with Alizarina S coloring solution (red Alizarina)

Components		%	Grain
Mains	Amphibole	30	fibrous acicular crystals
	Talcum	35	Acicular crystals
	Chlorite	25	Acicular crystals
	Serpentine	10	Acicular crystals
	-	-	-
	-	-	-
Lessers	-	-	
	-	-	
	-	-	-

Equipment: Cropper Micromet Remet
Microscope Olympus BX 41
Digital Camera Canon EOS 450D
Remote control and image management Eos Utility
Magnifying glass 10x

Test Report n° 18-4260-004/E **Issue date, 07/30/2018**

PETROGRAPHIC EXAMINATION **

Test according to: UNI EN 12407: 2007

Petrographic microscopic analysis in thin section by polarizing microscope (thin section at 30 microns) - Microchemical test with Alizarina S coloring solution (red Alizarina)

Intergranular texture	Lepidoblastic texture
Intergranular texture	No internal schistosity
Porosity observable under the microscope	No porosity observable
Residual	Absent
Grain	Medium-fine
Classification	talcum schist with amphibole
Commercial name	Pietra Ollare

PHOTOGRAPHIC DOCUMENTATION

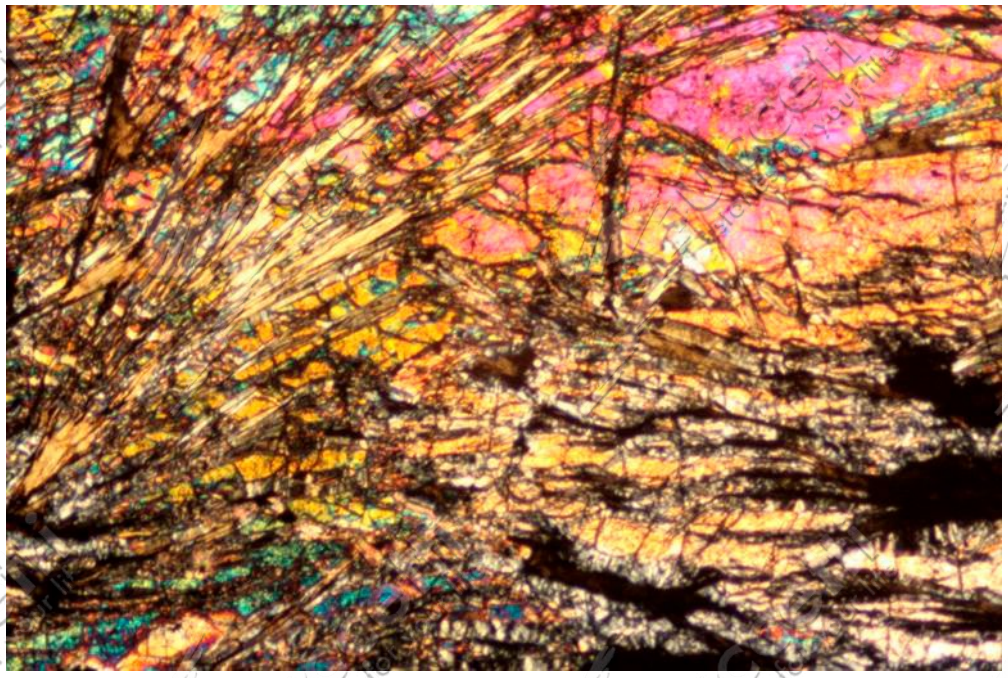

Photo 1: Photo under an optical microscope, thin section, trasmitted light, 20 magnifications, cross nicols

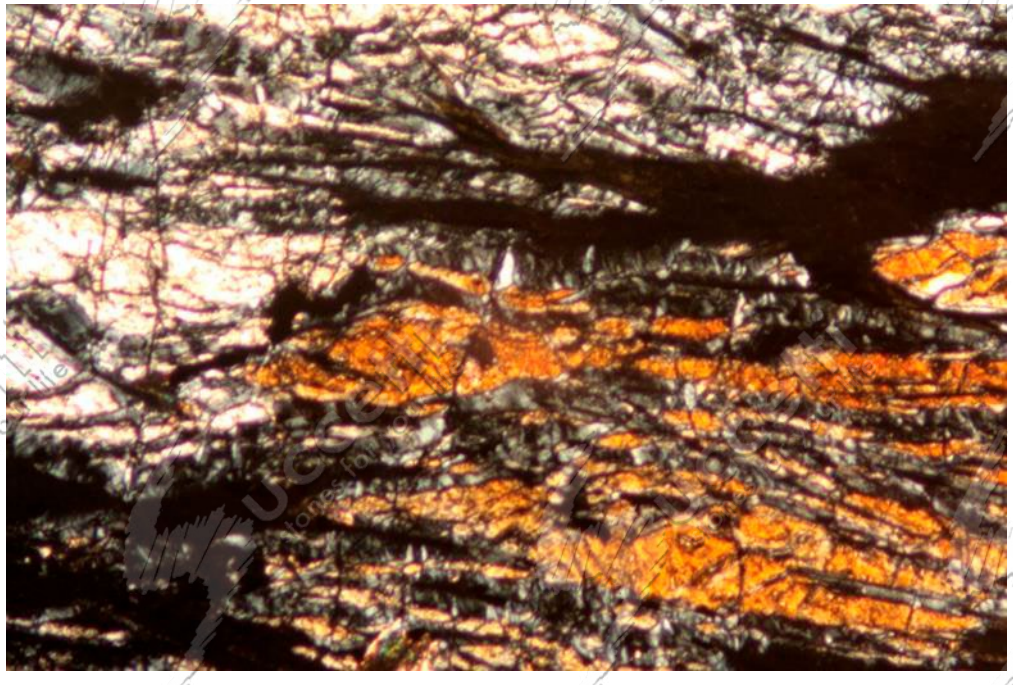

Photo n. 2 - Photo under an optical microscope, thin section, trasmitted light, 20 magnifications, cross nicols

DETERMINATION OF WATER ABSORPTION AT ATMOSPHERIC PRESSURE (UNI EN 13755:2008)

SPECIMEN	specimen dimensions (mm)			Mass of the dry specimen (g)	Mass of the saturated specimen (g)	Absorption (%)
n.	L	l	h	m_d	m_s	A_b
ASS - 1	100,2	99,9	27,0	775,34	775,95	0,1
ASS - 2	100,0	100,0	27,0	769,79	770,39	0,1
ASS - 3	100,1	100,1	27,0	781,76	782,26	0,1
ASS - 4	100,0	99,9	27,1	773,02	773,65	0,1
ASS - 5	99,9	100,0	27,0	774,32	774,88	0,1
ASS - 6	99,9	99,9	27,2	771,72	772,40	0,1
					average absorption (%)	**0,1±0,1**

Note: measurement uncertainty reported in extended form with k = 2.57 corresponding to a confidence level of 95%

DETERMINATION OF APPARENT DENSITY (UNI EN 1936:2007)*

SPECIMEN	Mass of the dry specimen (g)	Mass of the saturated specimen (g)	Mass of the specimen in water (g)	Apparent density (kg/m³)
ASS - 1	775,34	775,95	506,50	2871,7
ASS - 2	769,79	770,39	502,82	2871,2
ASS - 3	781,76	782,26	513,60	2904,0
ASS - 4	773,02	773,65	504,53	2866,7
ASS - 5	774,32	774,88	506,07	2874,8
ASS - 6	771,72	772,40	504,34	2873,1
			Apparent density (kg/m³)	**2880,0**

DETERMINATION OF OPEN POROSITY (1936:2007)*

SPECIMEN	Mass of the dry specimen (g)	Mass of the saturated specimen (g)	Mass of the specimen in water (g)	Open porosity (%)
ASS - 1	775,34	775,95	506,50	0,2
ASS - 2	769,79	770,39	502,82	0,2
ASS - 3	781,76	782,26	513,60	0,2
ASS - 4	773,02	773,65	504,53	0,2
ASS - 5	774,32	774,88	506,07	0,2
ASS - 6	771,72	772,40	504,34	0,3
			Average open porosity (%)	**0,2**

ECAMRICERT SRL
Viale del Lavoro, 6
36030 Monte di Malo
Vicenza, Italy
T +39 0445 605838
F +39 0445 581430
info@ecamricert.com
C.F./P.I. 01650050246

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Test Report n° 18-4260-004/E **Issue date, 07/30/2018**

DETERMINATION OF THE ABRASION RESISTANCE (UNI EN 14157:2017)
Method A with abrasive disk

Surface finish:	**Resined-honed #**
Abrasion surface:	**ORTHOGONAL TO THE PLAN OF USE**
[1]Correction value :	- 0,5 mm

specimen number	groove width (mm)	correct groove width (mm) [1]	average correct value (mm)
1	19,1	18,5	20,0 ± 3,0
2	21,4	21,0	
3	20,5	20,0	
4	21,9	21,5	
5	19,8	19,5	
6	19,8	19,5	

Note: measurement uncertainty on the average value reported in extended form with k = 2,57 corresponding to a confidence level of 95%

DETERMINATION OF FLEXURAL STRENGTH UNDER CONCENTRATED LOAD (UNI EN 12372-2007)

- Speed of load's application:	0,26 MPa/s
- Surface finish:	resined-honed with resined-reinforced (with net) back side #
- Direction of load's application:	orthogonal to the plan of use (vein cut, fig. 1)

SPECIMEN	**Dimension (mm)**				**Breaking load (N)**	**Type of breaking**	**Flexural strength (Mpa)**
n.	Total Length L	Distance supports I	b	d	W	-	R_{TF}
PO-1	180,3	144,0	90,1	28,5	8976		26,5
PO-2	180,9	144,0	90,3	29,1	10456		29,5
PO-3	180,5	144,0	90,5	29,1	10389		29,3
PO-4	180,5	144,0	90,6	28,9	11247		32,1
PO-5	180,3	144,0	90,4	28,8	9856		28,4
PO-6	180,1	144,0	90,5	28,6	10439		30,5
PO-7	179,9	144,0	90,4	28,5	10322		30,4
PO-8	180,1	144,0	89,9	28,6	10256		30,1
PO-9	180,4	144,0	80,7	28,4	7890		26,2
PO-10	180,5	144,0	80,4	28,6	8754		28,8
						Average flexural strength (MPa):	**29,2 ± 1,7**

number of specimens	10
Average flexural strength (MPa)	**29,2 ± 1,7**
Standard deviation (MPa)	1,8
Coefficient of variation	0,1
Logarithmic mean	3,37
logarithmic standard deviation (MPa)	0,06
Minimun value (MPa)	**26,2**
Maximun value (MPa)	**32,1**
Lower expected value (MPa)	**25,5**
Quantile factor K_s	2,10

Note: measurement uncertainty on the average value reported in extended form with k = 2,23 corresponding to a confidence level of 95%

DETERMINATION OF FROST RESISTANCE (UNI EN 12371:2010)*
by changing of the flexural strength (UNI EN 12372:2007)

- Number of cycles: 14
- Visible deterioration[X]: 0
- Surface finish: resined-honed with resined-reinforced (with net) back side #
- Direction of load's application: orthogonal to the plan of use (vein cut, fig. 1)

[X] Note (see par. 7.3.2.1 UNI EN 12371:2010):

0	specimen intact.
1	very minor damage (minor rounding of corners and edges) which does not compromise the integrity of the specimen.
2	one or several minor cracks (≤ 0,1 mm width) or detachment of small fragments (≤ 30 mm^2 per fragment).
3	one or several cracks, holes or detachment of fragments larger than those defined for the '2' rating, or alteration of material in veins, or the specimen shows important signs of crumble or dissolution.
4	specimen with major cracks or broken in two or more or disintegrated.

Average value of flexural strength (R_{TF}) of specimens not subjected to freezing and thawing cycles:

R_{TF} (MPa)	**29,2**

Average value of flexural strength (R_{TF}) of specimens subjected to freezing and thawing cycles (14 cycles):

R_{TF} (MPa)	**30,0**

Test Report n° 18-4260-004/E **Issue date, 07/30/2018**

DETERMINATION OF FLEXURAL STRENGTH UNDER CONCENTRATED LOAD (UNI EN 12372-2007)

- Speed of load's application:	0,26 MPa/s
- Surface finish:	resined-honed with resined-reinforced (with net) back side #
- Direction of load's application:	orthogonal to the plan of use (vein cut, fig. 1)

SPECIMEN	**Dimensions (mm)**				**Breaking load (N)**	**Type of breaking**	**Flexural strength (Mpa)**
n.	Total Length L	Distance supports I	b	d	W	-	R_{TF}
PO-11	180,4	143,0	90,2	28,0	9124		27,7
PO-12	181,1	143,0	90,4	28,7	11603		33,4
PO-13	180,1	143,0	90,6	28,8	11486		32,8
PO-14	180,4	143,0	90,8	28,4	12721		37,3
PO-15	180,2	143,0	90,6	28,3	10450		30,9
PO-16	180,4	143,0	90,6	28,6	11488		33,3
PO-17	180,3	143,0	90,5	28,3	9546		28,3
PO-18	180,1	143,0	90,7	28,8	11324		32,3
PO-19	180,5	143,0	90,9	28,3	5544		16,3
PO-20	180,7	143,0	90,3	29,1	9756		27,4
						Average flexural strength (MPa):	**30,0 ± 2,9**

number of specimens	10
Average flexural strength (MPa)	**30,0 ± 2,9**
Standard deviation (MPa)	5,7
Coefficient of variation	0,2
logarithmic mean	3,38
logarithmic standard deviation (MPa)	0,23
Minimun value (MPa)	**16,3**
Maximun value (MPa)	**37,3**
Lower expected value (MPa)	**18,2**
Quantile factor K_s	2,10

Note: measurement uncertainty on the average value reported in extended form with k = 2,31 corresponding to a confidence level of 95%

ECAMRICERT SRL
Viale del Lavoro, 6
36030 Monte di Malo
Vicenza, Italy
T +39 0445 605838
F +39 0445 581430
info@ecamricert.com
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DETERMINATION OF FROST RESISTANCE (UNI EN 12371:2010)*
by changing of the flexural strength (UNI EN 12372:2007)

- Number of cycles: 56
- Visible deterioration[X]: 0
- Surface finish: resined-honed with resined-reinforced (with net) back side #
- Direction of load's application: orthogonal to the plan of use (vein cut, fig. 1)

[X] Note (see par. 7.3.2.1 UNI EN 12371:2010):

0	specimen intact.
1	very minor damage (minor rounding of corners and edges) which does not compromise the integrity of the specimen.
2	one or several minor cracks (≤ 0,1 mm width) or detachment of small fragments (≤ 30 mm^2 per fragment).
3	one or several cracks, holes or detachment of fragments larger than those defined for the '2' rating, or alteration of material in veins, or the specimen shows important signs of crumble or dissolution.
4	specimen with major cracks or broken in two or more or disintegrated.

Average value of flexural strength (R_{TF}) of specimens not subjected to freezing and thawing cycles:

R_{TF} (MPa)	**29,2**

Average value of flexural strength (R_{TF}) of specimens subjected to freezing and thawing cycles (56 cycles):

R_{TF} (MPa)	**24,9**

Test Report n° 18-4260-004/E **Issue date, 07/30/2018**

DETERMINATION OF FLEXURAL STRENGTH UNDER CONCENTRATED LOAD (UNI EN 12372-2007)

- Speed of load's application:	0,25 MPa/s
- Surface finish:	resined-honed with resined-reinforced (with net) back side #
- Direction of load's application:	orthogonal to the plan of use (vein cut, fig. 1)

SPECIMEN	**Dimensions (mm)**				**Breaking load (N)**	**Type of breaking**	**Flexural strength (Mpa)**
n.	Total Length L	Distance supports I	b	d	W	-	R_{TF}
PO-56	181,2	142,0	90,3	28,5	4802		13,9
PO-57	179,7	142,0	90,2	28,2	9359		27,8
PO-58	180,2	142,0	90,6	28,6	8118		23,3
PO-59	180,4	142,0	90,8	28,5	9095		26,3
PO-60	180,3	142,0	90,4	28,2	4744		14,1
PO-61	180,3	142,0	90,5	28,3	10103		29,6
PO-62	180,7	142,0	90,8	28,6	9534		27,3
PO-63	180,5	142,0	90,7	28,6	10359		29,8
PO-64	180,2	142,0	90,8	28,4	9700		28,3
PO-65	180,3	142,0	90,2	28,6	9881		28,6
					Average flexural strength (MPa):		**24,9 ± 2,9**

number of specimens	10
Average flexural strength (MPa)	**24,9 ± 2,9**
Standard deviation (MPa)	6,0
Coefficient of variation	0,2
Logarithmic mean	3,18
logarithmic standard deviation (MPa)	0,29
Minimun value (MPa)	**13,9**
Maximun value (MPa)	**29,8**
Lower expected value (MPa)	**13,0**
Quantile factor K_s	2,10

Note: measurement uncertainty on the average value reported in extended form with k = 2,31 corresponding to a confidence level of 95%

ECAMRICERT SRL
Viale del Lavoro, 6
36030 Monte di Malo
Vicenza, Italy
T +39 0445 605838
F +39 0445 581430
info@ecamricert.com
C.F./P.I. 01650050246

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DETERMINATION OF BREAKING LOAD AT DOWEL HOLES (UNI EN 13364:2003)*

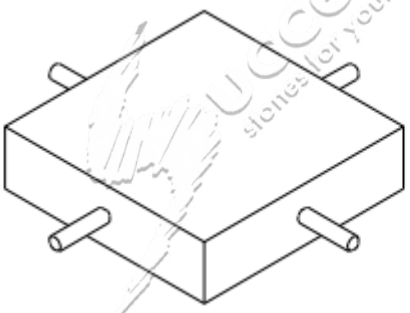


Fig. 4 Test system for a specimen without anisotropy plans (type 0)

TEST DATA:

Type of test:	0
Number of specimens:	3
Conditioning specimens	In ventilated oven at 70 ± 5 ° C to constant mass
Type of cement used:	Cement Mortar CEM I 52,5 R
Surface finish:	resined-honed with resined-reinforced (with net) back side #
Hole's diameter [mm]	10
Pin's diameter [mm]	6,1

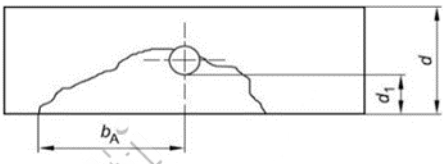
TEST RESULTS:

Definitions

d: specimen's thickness

d_1: distance from the hole to the face in the direction of the force

b_A: maximum distance of the center of the hole to the edge of the fracture



Test Report n° 18-4260-004/E **Issue date, 07/30/2018**

Specimen n°	**Specimen's dimension** [mm]			**Test n°**	d_1 [mm]	b_A [mm]	**Breaking load** F [N]
	L_1	L_2	d				
1	200,1	200,9	289,6	1	10	38	1400
				2	11	26	1350
				3	11	24	2000
				4	11	22	2150
2	200,9	200,4	28,3	5	11	28	1700
				6	10	25	1600
				7	10	49	2500
				8	10	19	1800
3	200,4	199,9	28,5	9	11	26	2600
				10	10	34	2450
				11	10	39	2000
				12	10	28	2100

Average value of d_1 [mm]:	10
Average value of b_A [mm]:	30
Average breaking load F [N]:	1950
Standard Deviation [N]:	416
Coefficient of variation:	0,21
Logarithmic mean:	7,58
Standard Logarithmic Deviation:	0,22
Minimun value [N]:	1350
Maximun Value [N]:	2600
Lower expected value [N]:	1250
Quantile factor K_S:	2,06

DETERMINATION OF ACCELERATED AGEING BY THERMAL SHOCK (UNI EN 14066:2013)*

Specimen's conditioning

Specimens previously dried with constant mass are subject to temperature variations according to the following procedure: 18 h in a ventilated oven at 70°C immediately followed by 6 h completely immersed in tap water at a temperature of 20 ° C.
The total number of the cycles are 20.
At the end of the cycles, specimens are dried with costant mass at 70°C and they are tested for the determination of open porosity (according to UNI EN 1936:2007) and flexural strength under concentrated load (according to UNI EN 12372:2007).

Following the thermal shock cycles, the specimens do not show appreciable surface changes.

OPEN POROSITY BEFORE THERMAL SHOCK CYCLES:	0,2 %
OPEN POROSITY AFTER THERMAL SHOCK CYCLES (average value of the tested specimens):	0,2 %
VARIATION OF THE OPEN POROSITY AFTER TERMAL SHOCK CYCLES (%):	0,0 %

FLEXURAL STRENGTH BEFORE THERMAL SHOCK CYCLES:	29,2 MPa
FLEXURAL STRENGTH AFTER THERMAL SHOCK CYCLES:	21,0 MPa
VARIATION OF THE FLEXURAL STRENGTH AFTER THERMAL SHOCK CYCLES (%):	- 28,1 %

Test Report n° 18-4260-004/E **Issue date, 07/30/2018**

DETERMINATION OF FLEXURAL STRENGTH UNDER CONCENTRATED LOAD (UNI EN 12372:2007)

- Speed of load's application: - Surface finish: - Direction of load's application:	0,29 MPa/s resined-honed with resined-reinforced (with net) back side # orthogonal to the plan of use (vein cut, fig. 1)

SPECIMEN	**Dimensions (mm)**				**Breaking load (N)**	**Type of breaking**	**Flexural strength (Mpa)**
n.	Total Length L	Distance supports I	b	d	W	-	R_{TF}
1 – ST	180,3	143,0	90,3	28,1	4584	1	13,8
2 – ST	180,2	143,0	90,6	28,8	5664		16,2
3 – ST	180,4	143,0	90,6	28,9	6936		19,7
4 – ST	180,6	143,0	90,4	28,3	4710		13,9
5 – ST	180,5	143,0	90,7	28,4	7823	1	23,0
6 – ST	180,1	143,0	91,1	28,9	6778		19,1
7 – ST	180,0	143,0	90,5	28,3	9628		28,6
8 – ST	180,8	143,0	90,2	28,5	5862		17,1
9 – ST	180,7	143,0	90,2	28,6	10499		30,5
10 - ST	180,2	143,0	90,5	29,1	9929		27,9
					Average flexural strength (MPa):		**21,0 ± 3,0**

1) Note: the fracture occurred at more than 15% of the distance between the supporting rollers and the middle

number of specimens	10
Average flexural strength (MPa)	**21,0 ± 3,0**
Standard deviation (MPa)	6,2
Coefficient of variation	0,3
Logarithmic mean	3,00
logarithmic standard deviation (MPa)	0,29
Minimun value (MPa)	**13,8**
Maximun value (MPa)	**30,5**
Lower expected value (MPa)	**10,9**
Quantile factor K_s	2,10

Note: measurement uncertainty on the average value reported in extended form with k = 2,31 corresponding to a confidence level of 95%

Director of Geotechnical and Costruction Products Sector **Geologist Dr. Massimo Bonato**

SUCCETTI LUCIANO S.R.L.
Via Rezia, 30
23022 Chiavenna (SO) - Italy

info@succettigraniti.com
+39 0343 33278
www.succettigraniti.com