



Pietra Smeralda

> 02 Catalogue

> 05 Technical sheets

Pietra Smeralda

HONED



BRUSHED



DISK CUT



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

Apparent Density UNI EN 1936:2007
2680 kg/m³

Open Porosity UNI EN 1936:2007
0,8 %

Water Absorption at atmospheric pressure
UNI EN 13755:2008
0,3 %

Abrasion Resistance UNI EN 14157:2017
16,5 mm

Flexural Strength UNI EN 12372:2007
17,6 MPa

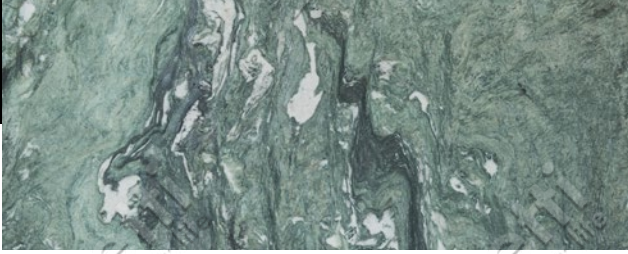
Frost Resistance:
flexural strength after 14 freeze/thaw cycles
UNI EN 12371:2010 - UNI EN 12372:2007
20,7 MPa

Frost Resistance: flexural strength after 56 freeze/thaw
cycles UNI EN 12371:2010 - UNI EN 12372:2007
17,8 MPa

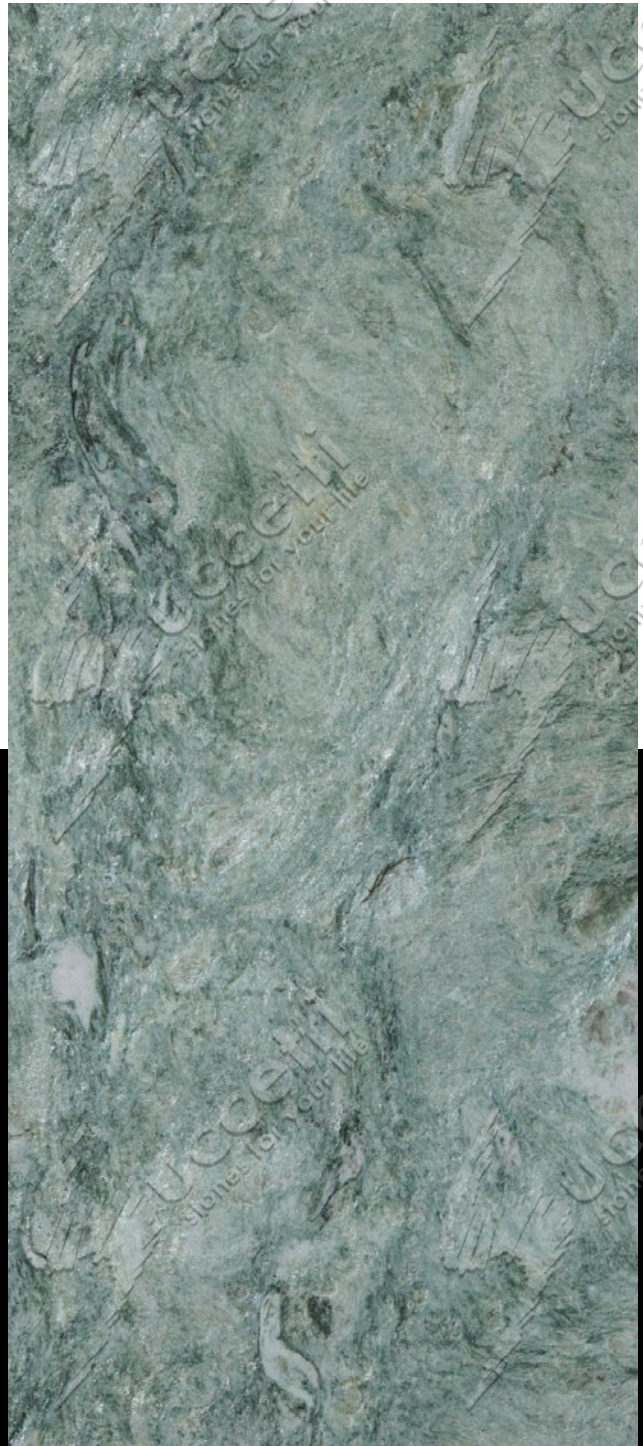
Breaking Load at dowel hole UNI EN 13364:2003
800 N

Resistance to Ageing: flexural strength
after thermal shock cycles
UNI EN 14066:2013 - UNI EN 12372:2007
15,5 Mpa

HONED



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Slab
78,7x31,5"

Detail
13,8x31,5"

DISK CUT



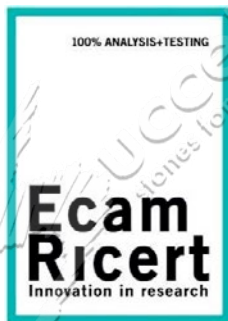
Slab
78,7x31,5"



Detail
13,8x31,5"

Technical sheets

uccetti
stones for your life



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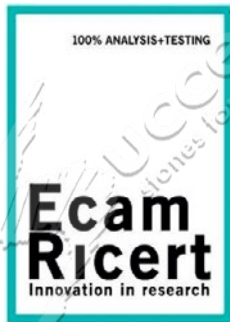
LAB N° 0699

Test Report n° 18-4260-001/E

Issue date, 07/30/2018

Client	SUC CETTI LUCIANO S.R.L. VIA REZIA N.30 23022 - CHIAVENNA, SO ITALIA
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Sample description	PIETRA SMERALDA #
Origin	CUSTOMER PLANT
Kind of sample	SLABS OF NATURAL STONE FOR CUTTING
Sampling by	CUSTOMER
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 12058



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PETROGRAPHIC EXAMINATION **

Test according to: UNI EN 12407: 2007

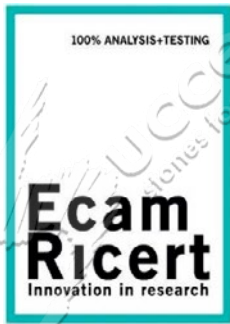
Macroscopic description by lens (10X), diluted hydrochloric acid at 10%

Metamorphic rock of quartz-muscovite composition, non-reactive to cold hydrochloric acid. The rock presents an alternation of granoblastic quartz (white) and lepidoblastic muscovite (green) levels.

**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	Quartz	65	Medium grained granoblasts
	Muscovite	30	Fine grained lepidoblasts
Lessers	Calcite	5	Coarse grained
	-	-	-
	-	-	-

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



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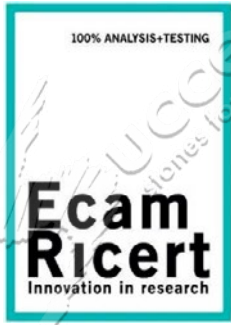
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PETROGRAPHIC EXAMINATION **

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	Alternation of granoblastic quartz and lepidoblastic muscovite levels.
Intragranular texture	No internal schistosity
Porosity observable under the microscope	No observable porosity
Residual	Absent
Grain	Medium-fine
Metamorphic level	Medium
Classification	Quartz and muscovite schist
Commercial name	Pietra Smeralda



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PHOTOGRAPHIC DOCUMENTATION

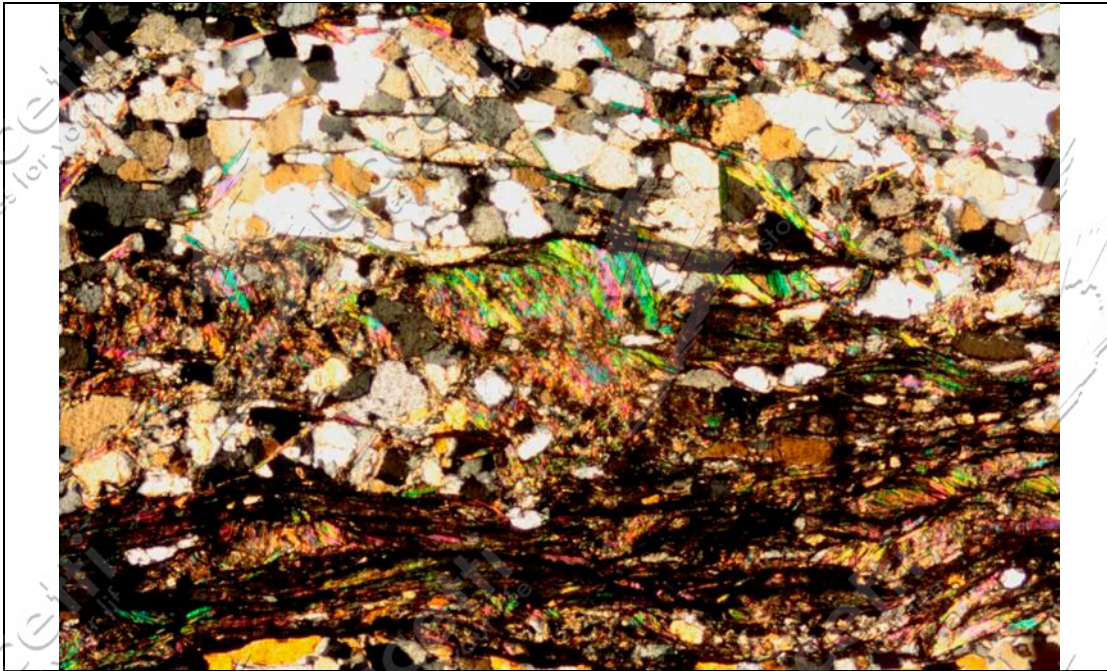
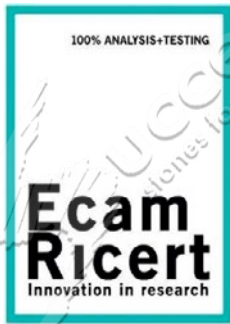


Photo 1: Photo under an optical microscope, thin section, transmitted light, 20 magnifications, cross nicols



Photo 2: Photo under an optical microscope, thin section, transmitted light, 20 magnifications, cross nicols



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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 _p
ASS - 1		99,8	100,1	27,5	724,52	726,71	0,3
ASS - 2		100,1	99,9	27,3	721,82	723,88	0,3
ASS - 3		100,1	100,6	26,9	722,60	724,68	0,3
ASS - 4		100,5	99,9	26,9	715,57	717,63	0,3
ASS - 5		99,9	100,2	27,0	715,75	717,68	0,3
ASS - 6		100,1	100,3	27,0	716,33	718,61	0,3
Average absorption (%)							0,3±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/m ³)
ASS - 1	724,52	726,71	455,56	2666,7
ASS - 2	721,82	723,88	454,81	2677,3
ASS - 3	722,60	724,68	456,43	2688,4
ASS - 4	715,57	717,63	450,42	2672,6
ASS - 5	715,75	717,78	450,94	2677,0
ASS - 6	716,33	718,61	451,23	2673,7
Apparent density (kg/m³)				2680,0

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	724,52	726,71	455,56	0,8
ASS - 2	721,82	723,88	454,81	0,8
ASS - 3	722,6	724,68	456,43	0,8
ASS - 4	715,57	717,63	450,42	0,8
ASS - 5	715,75	717,78	450,94	0,8
ASS - 6	716,33	718,61	451,23	0,9
Average open porosity (%)				0,8

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



LAB N° 0699

Test Report n° 18-4260-002/E

Issue date, 07/30/2018

Client	SUCCEITI LUCIANO S.R.L. VIA REZIA N.30 23022 - CHIAVENNA, SO ITALIA
Sample description	PIETRA SMERALDA #
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 12058

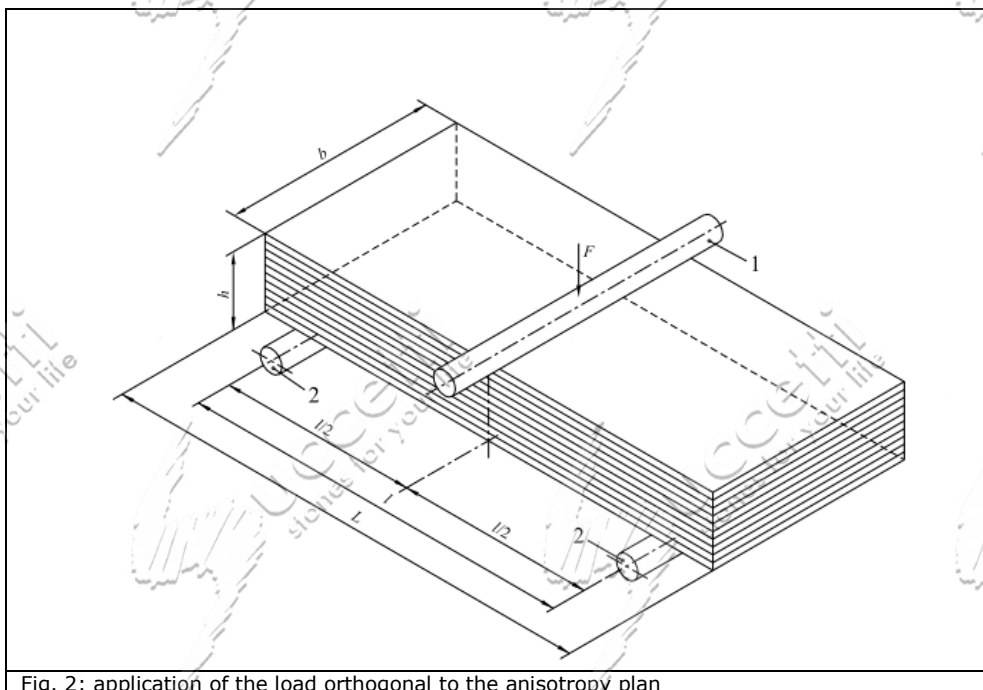
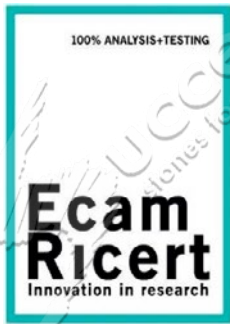
DISPOSITION OF ANISOTROPY PLANS COMPARED TO THE SPECIMEN'S DIMENSIONS:


Fig. 2: application of the load orthogonal to the anisotropy plan



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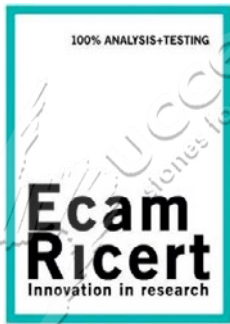
Issue date, 07/30/2018

**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 - VEIN CUT (fig 2)
¹ Correction value:	- 0,5 mm

specimen number	groove width (mm)	correct groove width (mm) ¹	average correct value (mm)
1	18,9	18,5	16,5 ± 4,00
2	17,1	16,5	
3	16,0	15,5	
4	18,8	18,5	
5	15,7	15,0	
6	15,4	15,0	

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



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

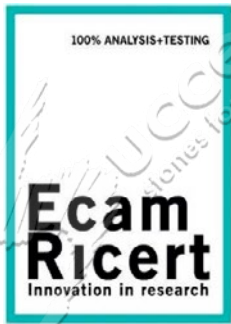
- Speed of load's application:	0,24 MPa/s
- Surface finish:	resined-honed with resined-reinforced (with net) back side #
- Direction of load's application:	orthogonal to the plan of use (vein cut, fig. 2)

SPECIMEN	Dimensions (mm)				Breaking load (N)	Type of breaking	Flexural strength (MPa)
	n.	Total Length L	Distance supports I	b			
1-PS-TQ	180,6	148,0	90,1	29,7	8908	-	24,9
2-PS-TQ	180,5	148,0	90,0	29,0	6412	-	18,8
3-PS-TQ	180,4	148,0	90,4	29,8	7288	-	20,2
4-PS-TQ	180,5	148,0	90,3	29,6	6035	1	16,9
5-PS-TQ	180,4	148,0	90,3	29,0	4710	1	13,7
6-PS-TQ	180,3	148,0	90,5	29,5	6041	-	17,0
7-PS-TQ	180,3	148,0	90,3	29,7	5024	-	14,1
8-PS-TQ	180,1	148,0	90,4	29,6	5209	-	14,6
9-PS-TQ	180,3	148,0	89,6	29,5	5818	1	16,6
10-PS-TQ	180,2	148,0	90,4	29,7	6743	-	18,8
Average flexural strength (MPa):							17,6 ± 1,7

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)	17,6 ± 3,0
Standard deviation (MPa)	3,4
Coefficient of variation	0,2
Logarithmic mean	2,85
logarithmic standard deviation (MPa)	0,18
Minimun value (MPa)	13,7
Maximun value (MPa)	24,9
Lower expected value (MPa)	11,8
Quantile factor K _s	2,10

Note: measurement uncertainty on the average value reported in extended form with k = 2,36 corresponding to a confidence level of 95%



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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: 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. 2)

^x Note (see par. 7.3.2.1 UNI EN 12371:2010):

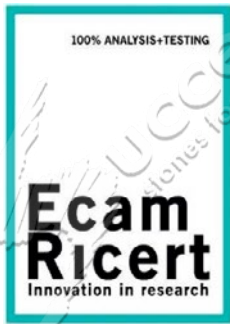
0	specimen intact.
1	very minor damage (minor rounding of corners and edges) which does not compromise the integrity of the specimen.
2	one or several minor cracks ($\leq 0,1$ mm width) or detachment of small fragments (≤ 30 mm ² per fragment).
3	one or several cracks, holes or detachment of fragments 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)	17,6
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Average value of flexural strength (R_{TF}) of specimens subjected to freezing and thawing cycles (14 cycles):

R_{TF} (MPa)	20,7
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DETERMINATION OF FLEXURAL STRENGTH UNDER CONCENTRATED LOAD (UNI EN 12372:2007)

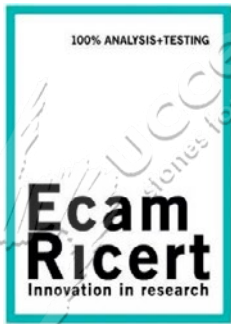
- Speed of load's application:	0,26 MPa/s
- Surface finish:	resined-honed with resined-reinforced (with net) back side #
- Direction of load's application	orthogonal to the plan of use (vein cut, fig. 2)

SPECIMEN	Dimensions (mm)				Breaking load (N)	Type of breaking	Flexural strength (MPa)
	n.	Lunghezza tot. L Total Length L	Distanza appoggi I Distance supports I	b			
PS-11	180,1	147,0	90,3	29,8	6887	-	18,9
PS-12	181,2	147,0	90,7	29,7	7840	-	21,6
PS-13	180,1	147,0	90,0	30,0	7473	1	20,3
PS-14	180,5	147,0	90,6	29,1	9444	-	27,1
PS-15	181,3	147,0	90,0	29,3	4665	1	13,3
PS-16	180,6	147,0	90,4	28,9	9289	-	27,1
PS-17	181,5	147,0	90,7	29,0	5988	1	17,3
PS-18	180,2	147,0	90,5	29,5	6469	-	18,1
PS-19	180,2	147,0	90,0	29,6	8533	-	23,9
PS-20	180,6	147,0	90,3	29,9	7194	-	19,6
Average flexural strength (MPa):							20,7 ± 2,0

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)	20,7 ± 2,0
Standard deviation (MPa)	4,4
Coefficient of variation	0,2
Logarithmic mean	3,01
logarithmic standard deviation (MPa)	0,22
Minimun value (MPa)	13,3
Maximun value (MPa)	27,1
Lower expected value (MPa)	12,9
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%



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Accreditamento LAB n° 0699 conforme ai requisiti della norma UNI CEI ISO/IEC 17025:2005



LAB N° 0699

Test Report n° 18-4260-002/E

Issue date, 07/30/2018

**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. 2)

* Nota (vedi par. 7.3.2.1 UNI EN 12371:2010):
Note (see par. 7.3.2.1 UNI EN 12371:2010):

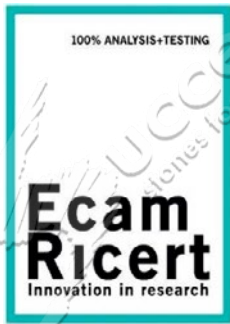
0	specimen intact.
1	very minor damage (minor rounding of corners and edges) which does not compromise the integrity of the specimen.
2	one or several minor cracks ($\leq 0,1$ mm width) or detachment of small fragments (≤ 30 mm ² per fragment).
3	one or several cracks, holes or detachment of fragments 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)	17,6
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Average value of flexural strength (R_{TF}) of specimens subjected to freezing and thawing cycles (56 cycles):

R_{TF} (MPa)	17,8
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LAB N° 0699

Test Report n° 18-4260-002/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. 2)

SPECIMEN	Dimensions (mm)				Breaking load (N)	Type of breaking	Flexural strength (MPa)
	n.	Total Length L	Distance supports I	b			
21-PS-56	179,6	148,0	90,3	29,8	4459	1	12,4
22-PS-56	180,8	148,0	90,5	29,4	5758		16,3
23-PS-56	180,3	148,0	90,5	29,6	7703		21,5
24-PS-56	179,6	148,0	90,0	29,9	5388		14,9
25-PS-56	179,9	148,0	90,1	29,6	6914		19,4
26-PS-56	180,3	148,0	90,4	29,7	7091		19,8
27-PS-56	180,3	148,0	90,4	29,6	7750		21,7
28-PS-56	180,6	148,0	89,2	29,5	4726	1	13,5
29-PS-56	180,7	148,0	90,1	29,3	8542		24,5
30-PS-56	179,6	148,0	90,1	29,9	5112		14,1
Average flexural strength (MPa):							17,8 ± 1,9

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)	17,8 ± 1,9
Standard deviation (MPa)	4,1
Coefficient of variation	0,2
Logarithmic mean	2,86
logarithmic standard deviation (MPa)	0,23
Minimun value (MPa)	12,4
Maximun value (MPa)	24,5
Lower expected value (MPa)	10,6
Quantile factor K _s	2,10

Note: measurement uncertainty on the average value reported in extended form with k = 2,36 corresponding to a confidence level of 95%

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

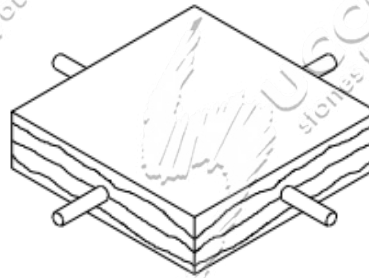


Fig. 4 Test system for a specimen with the direction of application of the load perpendicular to the anisotropy plans (type I)

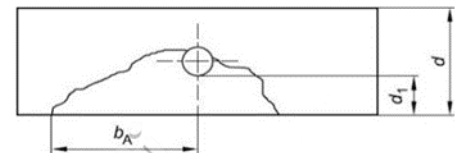
TEST DATA:

Type of test:	1
Number of specimen:	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





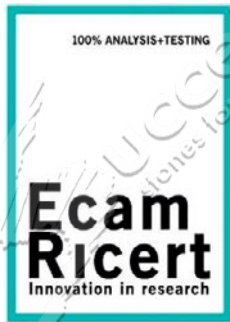
LAB N° 0699

Test Report n° 18-4260-002/E

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DIRECTION OF APPLICATION OF THE LOAD: orthogonal to the anisotropy plans (type I)							
Specimen n°	Specimen's dimension [mm]			Test n°	d _i [mm]	b _A [mm]	Breaking load F [N]
	L ₁	L ₂	d				
1	200,1	200,2	29,6	1	10	20	750
				2	11	30	1150
				3	10	30	750
				4	10	58	600
2	199,9	199,8	29,6	5	10	45	650
				6	11	25	750
				7	11	35	900
				8	11	28	800
3	200,1	200,3	29,8	9	10	33	1150
				10	9	90	700
				11	9	73	650
				12	10	45	750

Average value of d _i [mm]:	10
Average value of b _A [mm]:	43
Average breaking load F [N]:	800
Standard Deviation [N]:	181
Coefficient of variation:	0,23
Logarithmic average grade:	6,68
Standard Logarithmic Deviation:	0,21
Minimum value [N]:	600
Maximum Value [N]:	1150
Lower expected value [N]:	500
Quantile factor K _S :	2,06



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

Specimen's conditioning

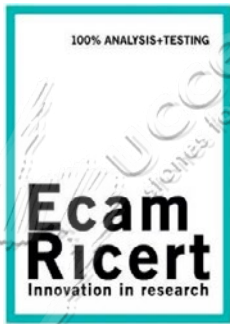
Specimens previously dried with constant mass are subject to temperature variations according to the following procedure: 18 h in a ventilated oven at 70°C immediately followed by 6 h completely immersed in tap water at a temperature of 20 °C. The total number of the cycles are 20.

At the end of the cycles, specimens are dried with constant 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 (SEE RDP 18-4260-001):	0,8 %
OPEN POROSITY AFTER THERMAL SHOCK CYCLES (average value of the tested specimens):	0,9 %
VARIATION OF THE OPEN POROSITY AFTER THERMAL SHOCK CYCLES (%):	12,5 %

FLEXURAL STRENGTH BEFORE THERMAL SHOCK CYCLES:	17,6 MPa
FLEXURAL STRENGTH AFTER THERMAL SHOCK CYCLES:	15,5 MPa
VARIATION OF THE FLEXURAL STRENGTH AFTER THERMAL SHOCK CYCLES (%):	- 11,9 %



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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. 2)

SPECIMEN	Dimensions (mm)				Breaking load (N)	Type of breaking	Flexural strength (Mpa)
	n.	Total Length L	Distance supports I	b			
1 - ST	180,2	147,0	90,4	29,7	4602	-	12,7
2 - ST	180,2	147,0	90,5	29,1	5545	-	15,9
3 - ST	180,7	147,0	89,8	29,4	7971	-	22,6
4 - ST	180,2	147,0	90,2	29,4	6245	-	17,7
5 - ST	180,3	147,0	90,6	29,2	5096	1	14,5
6 - ST	180,7	147,0	90,6	29,6	5733	-	15,9
7 - ST	180,4	147,0	90,6	29,8	4248	-	11,7
8 - ST	180,2	147,0	90,8	29,7	4628	1	12,7
9 - ST	180,4	147,0	90,5	29,4	7230	-	20,4
10 - ST	180,7	147,0	90,7	29,5	4054	-	11,3
Average flexural strength (MPa):							15,5 ± 1,8

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)	15,5 ± 1,80
Standard deviation (MPa)	3,8
Coefficient of variation	0,2
Logarithmic mean	2,72
logarithmic standard deviation (MPa)	0,23
Minimun value (MPa)	11,3
Maximun value (MPa)	22,6
Lower expected value (MPa)	9,3
Quantile factor K _s	2,10

Note: measurement uncertainty on the average value reported in extended form with k = 2,36 corresponding to a confidence level of 95%



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