



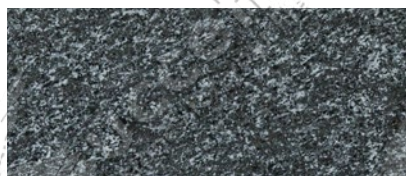
Dubino

> 02 Catalogue

> 07 Technical sheets

Dubino

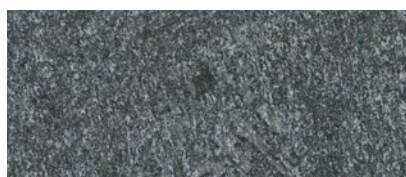
POLISHED



POLISHED DARK



HONED



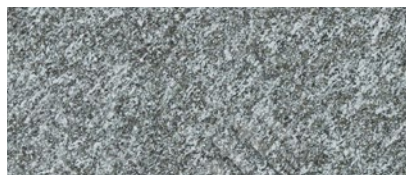
FLAMED + BRUSHED



FLAMED



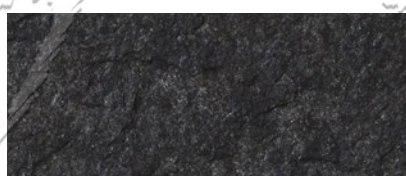
SANDED



NATURAL SPLIT



NATURAL SPLIT DARK



TECHNICAL TESTS - AVERAGE VALUES
SURFACE: DIAMOND DISK CUT

Apparent Density UNI EN 1936:2007
2840 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
15,5 mm

Flexural Strength UNI EN 12372:2007
24,4 MPa

Frost Resistance:
flexural strength after 14 freeze/thaw cycles
UNI EN 12371:2010 - UNI EN 12372:2007
25,6 MPa

Frost Resistance:
flexural strength after 56 freeze/thaw cycles
UNI EN 12371:2010 - UNI EN 12372:2007
26,2 MPa

Breaking Load at dowel hole UNI EN 13364:2003
1550 N

Resistance to Ageing: flexural strength
after thermal shock cycles
UNI EN 14066:2013 - UNI EN 12372:2007
25,2 Mpa

POLISHED



POLISHED DARK



Slab
78,7x31,5"

Detail
13,8x31,5"

HONED



FLAMED + BRUSHED



Slab
78,7x31,5"

Detail
13,8x31,5"

FLAMED



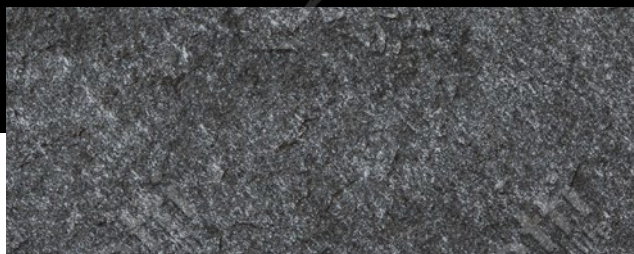
SANDED



Slab
78,7x31,5"

Detail
13,8x31,5"

NATURAL SPLIT



NATURAL SPLIT DARK



Slab
78,7x31,5"

Detail
13,8x31,5"

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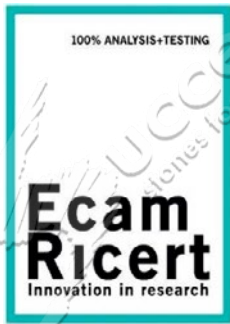


LAB N° 0699

Test Report n° 18-4260-006/E

Issue date, 07/31/2018

Client	SUCETTI LUCIANO S.R.L. VIA REZIA N.30 23022 - CHIAVENNA, SO ITALIA
Sample description	DUBINO #
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 1341 UNI EN 1469 UNI EN 12057 UNI EN 12058



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PETROGRAPHIC EXAMINATION **
 Test according to: UNI EN 12407: 2007

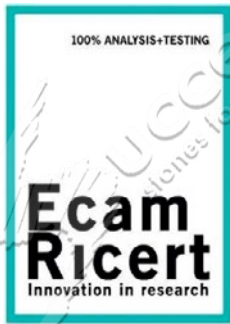
Macroscopic description by lens (10X), diluted hydrochloric acid at 10%

Rock of intrusive magmatic origin with weakly laminated intermediate chemism, non-reactive to cold hydrochloric acid. The rock presents a sensitive same orientation of the crystals highlighting a weakly grain-polyblastic-lepidoblastic-porfiroblastic 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	Plagioclase	40	Regular crystals oriented to close polysynthetic gemination
	Hornblend	25	Regular crystals oriented
	Orthoclase	10	Regular crystals oriented
	Biotite	15	Regular crystals oriented
	-	-	-
	-	-	-
Lessers	Epidoto	2	Small anaedral crystals
	Quartz	8	Small crystals
	-	-	-

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



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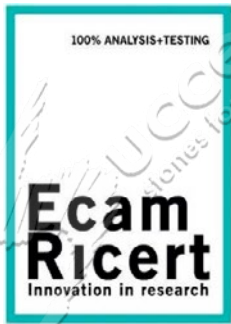
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PETROGRAPHIC EXAMINATION **

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	Slight granoblastic-lepidoblastic and porfiroblastic texture
Intergranular texture	No internal schistosity
Porosity observable under the microscope	No porosity observable
Residual	Absent
Grain	Medium-coarse
Metamorphic level	Low
Classification	Quartz-diorite (epidotic quartz diorite) oriented: low-grade Ortogneiss
Commercial name	Dubino



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PHOTOGRAPHIC DOCUMENTATION

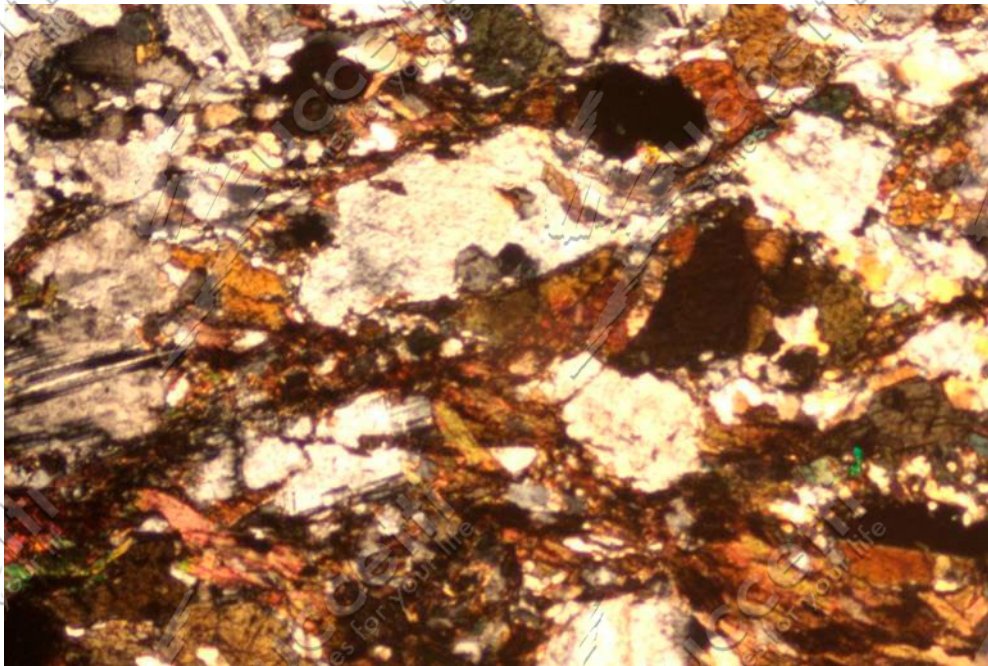


Photo n. 1 - Photo under an optical microscope, thin section, transmitted light, 20 magnifications, cross nicols

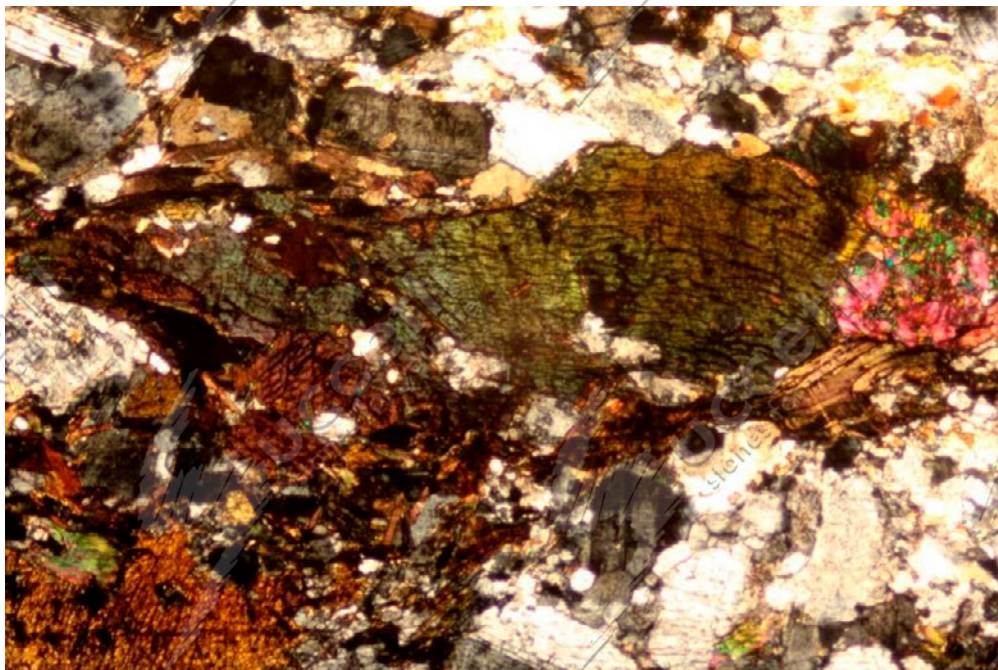
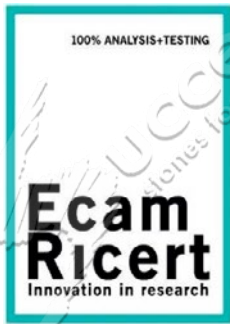


Photo 2 - Photo under an optical microscope, thin section, transmitted light, 20 magnifications, cross nicols



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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
ASS - 1		100,5	100,4	25,7	733,79	735,94	0,3
ASS - 2		101,0	100,4	25,7	731,87	733,86	0,3
ASS - 3		101,4	100,7	25,4	729,07	731,27	0,3
ASS - 4		100,6	100,4	25,7	730,01	732,18	0,3
ASS - 5		100,6	100,5	25,6	732,61	734,67	0,3
ASS - 6		100,5	100,1	25,6	733,55	735,63	0,3
average absorption (%)						0,3±0,1	

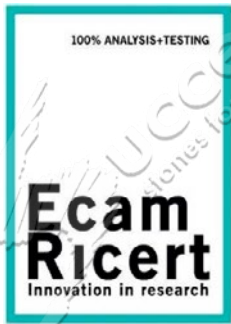
Note: measurement uncertainty reported in extended form with k = 2.57 corresponding to a confidence level of 95%

DETERMINATION OF THE 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	733,79	735,94	476,92	2827,3
ASS - 2	731,87	733,86	474,33	2814,3
ASS - 3	729,07	731,27	476,00	2850,4
ASS - 4	730,01	732,18	475,73	2840,9
ASS - 5	732,61	734,67	476,75	2834,8
ASS - 6	733,55	735,63	478,55	2847,7
Apparent density (kg/m³)				2840,0

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	733,79	735,94	476,92	0,8
ASS - 2	731,87	733,86	474,33	0,8
ASS - 3	729,07	731,27	476,00	0,9
ASS - 4	730,01	732,18	475,73	0,8
ASS - 5	732,61	734,67	476,75	0,8
ASS - 6	733,55	735,63	478,55	0,8
Average open porosity (%)				0,8



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LAB N° 0699

Test Report n° 18-4260-007/E

Issue date, 07/31/2018

Client	SUCETTI LUCIANO S.R.L. VIA REZIA N.30 23022 - CHIAVENNA, SO ITALIA
Sample description	DUBINO #
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
Oggetto Object	ITT TESTS FOR CE MARKING ACCORDING TO: UNI EN 1341 UNI EN 1469 UNI EN 12057 UNI EN 12058

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

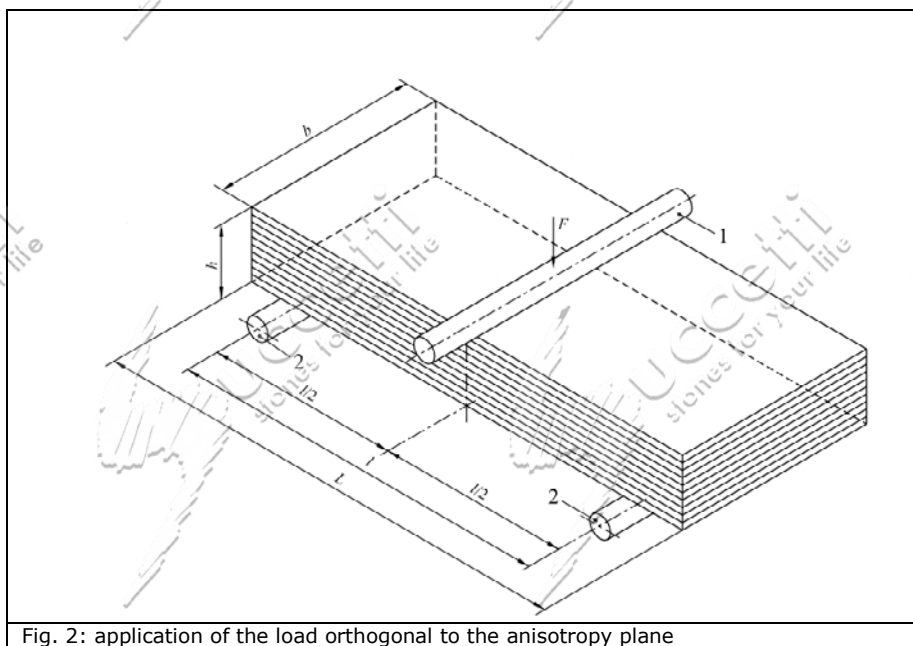
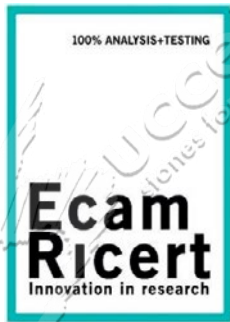


Fig. 2: application of the load orthogonal to the anisotropy plane



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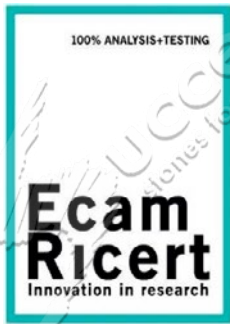
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**DETERMINATION OF THE ABRASION RESISTANCE (UNI EN 14157:2017)
Method A with abrasive disk**

Surface finish:	Disk cut #
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	15,8	15,5	15,5 ± 0,5
2	15,8	15,5	
3	16,0	15,5	
4	16,0	15,5	
5	15,5	15,0	
6	15,8	15,5	

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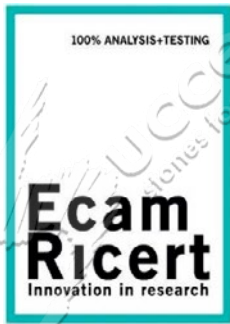
DETERMINATION OF FLEXURAL STRENGTH UNDER CONCENTRATED LOAD (UNI EN 12372-2007)

- Speed of load's application:	0,26 MPa/s
- Surface finish:	disk cut #
- 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-SD-TQ	180,5	154,0	90,7	30,7	8265	-	22,4
2-SD-TQ	180,5	154,0	90,6	31,1	9806	-	25,9
3-SD-TQ	180,6	154,0	90,6	31,1	8789	-	23,2
4-SD-TQ	180,6	154,0	90,6	31,4	9875	-	25,5
5-SD-TQ	180,2	154,0	90,6	30,6	8467	-	23,1
6-SD-TQ	180,4	154,0	90,6	30,8	9313	-	25,1
7-SD-TQ	180,4	154,0	90,8	30,4	8558	-	23,6
8-SD-TQ	180,4	154,0	90,6	30,5	9002	-	24,7
9-SD-TQ	180,3	154,0	90,5	30,8	9383	-	25,2
10-SD-TQ	180,3	154,0	90,5	31,0	9513	-	25,2
Average flexural strength (MPa):							24,4 ± 0,8

number of specimens	10
Average flexural strength (MPa)	24,4 ± 0,8
Standard deviation (MPa)	1,2
Coefficient of variation	0,0
Logarithmic mean	3,19
logarithmic standard deviation (MPa)	0,05
Minimun value (MPa)	22,4
Maximun value (MPa)	25,9
Lower expected value (MPa)	21,9
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%



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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: disk cut #
- 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):

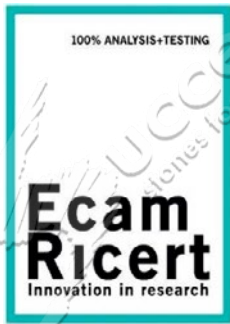
- | | |
|---|--|
| 0 | specimen intact. |
| 1 | very minor damage (minor rounding of corners and edges) which does not compromise the integrity of the specimen. |
| 2 | one or several minor cracks ($\leq 0,1$ mm width) or detachment of small fragments (≤ 30 mm ² per fragment). |
| 3 | one or several 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)	24,4
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Average value of flexural strength (R_{TF}) of specimens subjected to freezing and thawing cycles (14 cycles):

R_{TF} (MPa)	25,6
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DETERMINATION OF FLEXURAL STRENGTH UNDER CONCENTRATED LOAD (UNI EN 12372:2007)

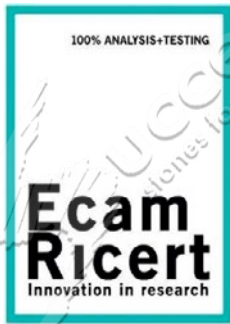
- Speed of load's application:	0,24 MPa/s
- Surface finish:	disk cut #
- Direction of load's application:	orthogonal to the plan of use (vein cut, fig. 2)

SPECIMEN	Dimensions (mm)				Breaking load (N)	Type of breaking	Flexural strength (Mpa)	
	n.	Total Length L	Distance supports I	b				d
21-SD-II 14		180,1	153,0	90,6	30,5	9235		25,1
22-SD-II 14		180,2	153,0	90,5	30,3	9576	1	26,5
23-SD-II 14		180,4	153,0	90,7	30,4	9482		26,0
24-SD-II 14		180,6	153,0	90,5	30,3	9699		26,8
25-SD-II 14		180,1	153,0	90,4	30,5	9054		24,7
26-SD-II 14		179,9	153,0	90,4	30,6	8897		24,1
27-SD-II 14		180,3	153,0	90,6	30,7	8978		24,1
28-SD-II 14		180,4	153,0	90,5	30,6	9485		25,7
29-SD-II 14		180,5	153,0	90,6	30,5	9833		26,8
30-SD-II 14		180,7	153,0	90,6	30,6	9685		26,2
Average flexural strength (MPa):							25,6 ± 0,6	

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)	25,6 ± 0,6
Standard deviation (MPa)	1,0
Coefficient of variation	0,0
Logarithmic mean	3,24
logarithmic standard deviation (MPa)	0,04
Minimun value (MPa)	24,1
Maximun value (MPa)	26,8
Lower expected value (MPa)	23,5
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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LAB N° 0699

Test Report n° 18-4260-007/E

Issue date, 07/31/2018

**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: disk cut #
- Direction of load's application: orthogonal to the plan of use (vein cut, fig. 1)

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

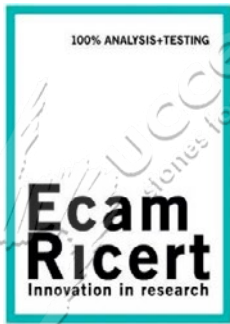
0	specimen intact.
1	very minor damage (minor rounding of corners and edges) which does not compromise the integrity of the specimen.
2	one or several minor cracks ($\leq 0,1$ mm width) or detachment of small fragments (≤ 30 mm ² per fragment).
3	one or several cracks, holes or detachment of fragments 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)	24,4
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Average value of flexural strength (R_{TF}) of specimens subjected to freezing and thawing cycles (56 cycles):

R_{TF} (MPa)	26,2
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LAB N° 0699

Test Report n° 18-4260-007/E

Issue date, 07/31/2018

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

- Speed of load's application:	0,26 MPa/s
- Surface finish:	disk cut #
- 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			
31-SD-II 56	180,3	152,0	90,8	30,6	9475		25,
32-SD-II 56	180,3	152,0	90,8	30,4	9756		26,6
33-SD-II 56	180,8	152,0	90,6	30,6	9688		26,1
34-SD-II 56	180,8	152,0	90,7	30,3	9808		26,9
35-SD-II 56	180,2	152,0	90,6	30,5	9216		24,9
36-SD-II 56	180,1	152,0	90,6	30,6	9010		24,3
37-SD-II 56	180,2	152,0	90,7	30,7	9763		26,1
38-SD-II 56	180,1	152,0	90,5	30,5	10844		29,4
39-SD-II 56	180,2	152,0	90,7	30,3	9920		27,1
40-SD-II 56	180,2	152,0	90,7	30,7	9526		25,5
Average flexural strength (MPa):							26,2 ± 0,8

number of specimens	10
Average flexural strength (MPa)	26,2 ± 0,8
Standard deviation (MPa)	1,4
Coefficient of variation	0,1
Logarithmic mean	3,27
logarithmic standard deviation (MPa)	0,05
Minimun value (MPa)	24,3
Maximun value (MPa)	29,4
Lower expected value (MPa)	23,5
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 BREAKING LOAD
AT DOWEL HOLE (UNI EN 13364:2003)***

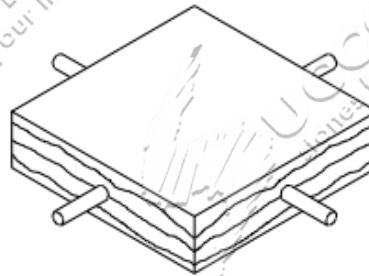


Fig. 4 Test system for a specimen with the direction of application of the load perpendicular to the anisotropy planes (type I)

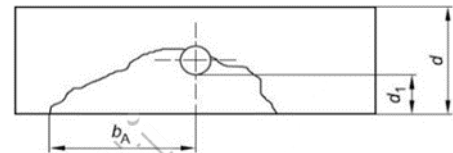
TEST DATA:

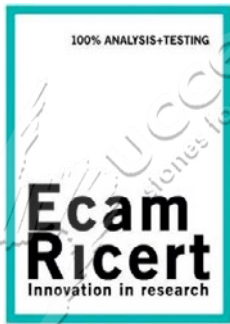
Type of test:	I
Number of specimens:	3
Conditioning specimens	In ventilated oven at 70 ± 5 ° C to constant mass
Type of cement used:	Cement Mortar CEM I 52,5 R
Surface finish:	Disk cut #
Hole's diameter [mm]	10
Pin's diameter [mm]	6,1

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





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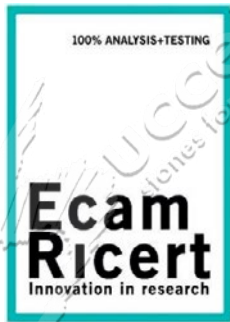
LAB N° 0699

Test Report n° 18-4260-007/E

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DIRECTION OF APPLICATION OF THE LOAD: orthogonal to the anisotropy planes (type I)							
Specimen n°	Specimen's dimension [mm]			Test n°	d ₁ [mm]	b _A [mm]	Breaking load F [N]
	L ₁	L ₂	d				
1	200,4	199,9	30,5	1	10	33	1750
				2	10	38	1550
				3	11	52	1900
				4	10	54	1250
2	200,5	200,1	30,5	5	11	50	1350
				6	11	45	1600
				7	10	49	1400
				8	11	48	1800
3	200,6	201,3	30,4	9	10	64	2050
				10	10	28	1100
				11	11	38	1450
				12	11	42	1650

Average value of d ₁ [mm]:	11
Average value of b _A [mm]:	45
Average breaking load F [N]:	1550
Standard Deviation [N]:	278
Coefficient of variation:	0,18
Logarithmic average grade:	7,35
Standard logarithmic deviation:	0,18
Minimum value [N]:	1100
Maximum Value [N]:	2050
Lower expected value [N]:	1050
Quantile factor K _S :	2,06



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LAB N° 0699

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

Specimen's conditioning

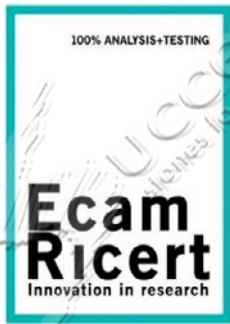
Specimens previously dried with constant mass are subject to temperature variations according to the following procedure: 18 h in a ventilated stove at 70°C immediately followed by 6 h completely immersed in tap water at a temperature of 20 °C. The total number of the cycles are 20.

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 18-4260-006):	0,8 %
OPEN POROSITY AFTER THERMAL SHOCK CYCLES (average value of the tested specimens):	0,7 %
VARIATION OF THE OPEN POROSITY AFTER THERMAL SHOCK CYCLES (%):	-12,5 %

FLEXURAL STRENGTH BEFORE THERMAL SHOCK CYCLES:	24,4 MPa
FLEXURAL STRENGTH AFTER THERMAL SHOCK CYCLES:	25,2 MPa
VARIATION OF THE FLEXURAL STRENGTH AFTER THERMAL SHOCK CYCLES (%):	+ 3,3 %



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Test Report n° 18-4260-007/E

Issue date, 07/31/2018

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

- Speed of load's application: - Surface finish: - Direction of load's application:	0,25 MPa/s Disk cut # Orthogonal to the plan of use (vein cut, fig. 2)
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SPECIMEN	Dimensions (mm)				Breaking load (N)	Type of breaking	Flexural strength (Mpa)
	Total Length L	Distance supports I	b	d			
n.					W	-	R _{TF}
1	180,7	154,0	90,7	30,3	9469		26,2
2	180,7	154,0	90,6	31,2	9870		25,8
3	180,8	154,0	90,7	30,3	9216		25,5
4	180,4	154,0	90,6	31,1	9987		26,4
5	180,7	154,0	90,8	30,9	8309	1	22,1
6	180,7	154,0	90,8	30,4	8983		24,8
7	180,3	154,0	90,6	31,0	9646		25,6
8	180,9	154,0	90,5	31,2	9214		24,2
9	180,3	154,0	90,6	31,1	9821		26,0
10	180,9	154,0	90,6	31,3	9618		25,1
Average flexural strength (MPa):							25,2 ± 0,8

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)	25,2 ± 0,8
Standard deviation (MPa)	1,3
Coefficient of variation	0,1
Logarithmic mean	3,22
Logarithmic standard deviation (MPa)	0,05
Minimun value (MPa)	22,1
Maximun value (MPa)	26,4
Expected minimun value (MPa)	22,5
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%

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



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