



INSTITUTE IGH

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Working Code No.: 62562888

TEST REPORT NO. 72562-0112/21

Client: BRAČKI KAMEN d.o.o.

Contract/purchase order: Purchase order according to Offer no. 72562-0-0763-1/20

Construction material: Architectural-building stone with commercial name „AVORIO ARGENTO“

Tested properties: Physical and mechanical properties, petrographic examination

Date of report: 2021-01-29

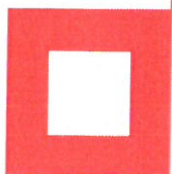
Test supervisor:

Jere Bolanča, MSc.Geol.

Head of the Laboratory:

Nataša Peček, BSc.Geol.

The results are relevant only for tested samples. No part of this report may be reproduced without the written permission of the head of the laboratory. Total number of text pages: 17, Annexes: 1.



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1. GENERAL

1.1. GENERAL INFORMATION

Client: BRAČKI KAMEN d.o.o.
Donji Humac 45, 21423 Nerežišća

Producer: BRAČKI KAMEN d.o.o., Nerežišća

Origin of sample: Croatia

1.2. INFORMATION ABOUT SAMPLING

Location of sampling: exploitation field „Sv. Ana“

Commercial name: **AVORIO ARGENTO**

Date of sampling: -

Samples taken by: client representatives

Clients' sampling report: -

Clients' sample designation: -

1.3. INFORMATION ABOUT RECEIVING OF THE SAMPLES

Date of receiving samples in the laboratory: 2020-12-07

Laboratory sample designation: 20-5321

1.4. TEST INFORMATION

Laboratory tests started on: 2020-12-07

Laboratory tests completed on: 2021-01-29

Tested properties: Testing was performed in accordance with requirements from following specifications:
HRN EN 1469:2015 - Natural stone products – Slabs for cladding – Requirements (EN 1469:2004)
HRN EN 12058:2015 – Natural stone products – Slabs for floors and stairs – Requirements (EN 12058:2004)

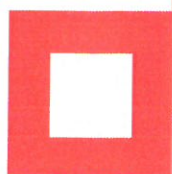
Uniaxial compressive strength in dry state, water saturated state and after 80 cycles of freezing and thawing, flexural strength under concentrated load in dry state, after 80 cycles of freezing and thawing and after 20 cycles of thermal shock, real density, apparent density, total and open porosity, water absorption, resistance to salt crystallization, resistance to ageing by thermal shock, petrographic examination, frost resistance, resistance to abrasion, determination of the slip resistance and breaking load at a dowel hole

1.5. NOTE

Sawn and prepared test samples were delivered by the clients representatives.

* Test methods from scope of accreditation (Accreditation No. 1043)

** Test methods outside the scope of accreditation



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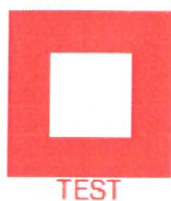
2. TEST RESULTS

2.1. Determination of uniaxial compressive strenght in dry state - HRN EN 1926:2008*

Sample designation	Dimensions of test specimens - cube [mm]			Failure load F [kN]	Compressive strenght R [MPa]
	Distance between opposite vertical faces [l ₁]	Distance between opposite vertical faces [l ₂]	Height [h]		
TS-1	51,1	51,0	50,6	458	176
TS-2	51,1	51,3	50,6	397	152
TS-3	50,9	50,6	50,6	464	180
TS-4	51,0	50,4	50,4	434	169
TS-5	49,1	51,1	50,4	427	170
TS-6	50,6	51,0	51,1	366	142
TS-7	51,0	51,0	50,5	402	154
TS-8	51,2	50,1	50,5	448	175
TS-9	51,1	50,5	50,1	439	170
TS-10	50,3	51,2	50,5	410	159
Minimum value R _{min} :					142 MPa
Maximum value R _{max} :					180 MPa
Mean value of compressive strenght:					165 MPa
Standard deviation (s):					12 MPa
Coefficient of variation (v):					7,5%
Minimal expected value (E):					140 MPa
Date of testing: 2020-12-11					
Note: Sample surface is sawn.					
Petrographic determination of the sample is dolomite.					

* Test methods from scope of accreditation (Accreditation No. 1043)

** Test methods outside the scope of accreditation



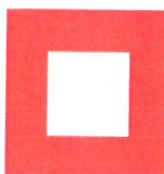
Test report No.: 72562-0112/21

2.2. Determination of uniaxial compressive strength in water saturated state- HRN EN 1926:2008, Annex A*

Sample designation	Dimensions of test specimens - cube [mm]			Failure load F [kN]	Compressive strength R [MPa]
	Distance between opposite vertical faces [l ₁]	Distance between opposite vertical faces [l ₂]	Height [h]		
TV-1	51,1	50,6	50,5	445	172
TV-2	51,1	50,1	50,5	399	156
TV-3	51,2	49,3	50,6	400	158
TV-4	50,4	51,2	50,1	365	142
TV-5	50,4	51,2	50,5	380	147
TV-6	49,4	51,2	50,5	376	149
TV-7	51,0	50,3	50,6	428	167
TV-8	51,2	50,1	50,3	393	153
TV-9	50,8	51,1	50,6	438	169
TV-10	51,2	50,0	50,3	388	152
Minimum value R _{min} :					142 MPa
Maximum value R _{max} :					172 MPa
Mean value of compressive strength:					156 MPa
Standard deviation (s):					10 MPa
Coefficient of variation (v):					6,4%
Minimal expected value (E):					137 MPa
Date of testing: 2021-01-14					
Note: Sample surface is sawn.					
Petrographic determination of the sample is dolomite.					

* Test methods from scope of accreditation (Accreditation No. 1043)

** Test methods outside the scope of accreditation



Test report No.: 72562-0112/21

2.3. Determination of uniaxial compressive strength after 48 cycles of freezing and thawing- HRN EN 1926:2008*

Sample designation	Dimensions of test specimens - cube [mm]			Failure load F [kN]	Compressive strength R [MPa]
	Distance between opposite vertical faces [l ₁]	Distance between opposite vertical faces [l ₂]	Height [h]		
TM-1	51,2	50,6	51,0	375	145
TM-2	51,1	50,4	50,4	418	162
TM-3	51,2	50,4	50,4	405	157
TM-4	51,2	50,4	50,2	386	149
TM-5	51,1	49,3	50,6	409	162
TM-6	50,5	51,2	50,1	459	178
TM-7	51,1	50,1	50,5	456	178
TM-8	51,1	50,4	50,0	403	157
TM-9	51,1	50,6	50,4	419	162
TM-10	51,1	50,6	50,4	423	164
Minimum value R _{min} :					145 MPa
Maximum value R _{max} :					178 MPa
Mean value of compressive strength:					161 MPa
Standard deviation (s):					11 MPa
Coefficient of variation (v):					6,6%
Minimal expected value (E):					140 MPa
Date of testing: 2021-01-29					
Note: Sample surface is sawn.					
Petrographic determination of the sample is dolomite.					

2.4. Frost resistance (80 cycles) - HRN EN 12371:2010*

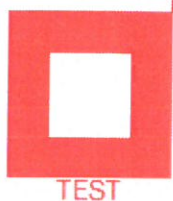
Specimen size: 50 x 50 x 50 mm

Section 7.3.2.2. Visual inspection

Number of freezing cycles	Score according to 7.3.2.2	Visual inspection
80	0 – specimen intact	After 80 cycles of freezing and thawing, no change in appearance of samples occurred, samples are flawless, without defect.
Test started on: 2020-12-07		Test completed on: 2021-01-25

* Test methods from scope of accreditation (Accreditation No. 1043)

** Test methods outside the scope of accreditation



Test report No.: 72562-0112/21

Section 7.3.2.3. Measurement of apparent volume

Sample designation	Apparent volume of the specimen before freezing V_{b0}	Apparent volume of the specimen after 80 cycles V_{bn}
TM-1	131,83	131,90
TM-2	129,73	129,89
TM-3	129,62	129,80
TM-4	129,20	129,29
TM-5	127,25	127,39
TM-6	129,52	129,65
TM-7	129,04	129,14
TM-8	128,84	129,00
TM-9	129,91	129,95
TM-10	127,43	127,52
Mean value:	129,24	129,35
Change in apparent volume of the specimen (%)		$V_b = -0,09\%$

Change of uniaxial compressive strength in water saturated state

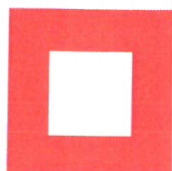
Uniaxial compressive strength in dry state [MPa]	Uniaxial compressive strength in water saturated state [MPa]	Change of uniaxial compressive strength (decrease of strength) (%)
165	156	5,5

Change of uniaxial compressive strength after 80 cycles of freezing and thawing

Uniaxial compressive strength in dry state [MPa]	Uniaxial compressive strength after 80 cycles of freezing and thawing [MPa]	Change of uniaxial compressive strength (decrease of strength) (%)
165	161	2,4

* Test methods from scope of accreditation (Accreditation No. 1043)

** Test methods outside the scope of accreditation



Test report No.: 72562-0112/21

2.5. Flexural strength under concentrated load - HRN EN 12372:2008*

Note: 10 test samples with dimensions 300 x 50 x 50 mm were delivered for testing. Sample surface is sawn and smooth. Petrographic determination of the sample is dolomite.
Loading rate: 0,22 MPa/s.

Sample designation	Thickness h [mm]	Width b [mm]	Distance between supporting rollers l [mm]	Breaking load F [N]	Flexural strength R _{tr} [MPa]	Distance of the fracture from the middle of the specimen f [mm]
S-1	50,5	49,6	250,0	3,766	11,2	2
S-2	50,5	49,0	250,0	4,277	12,8	4
S-3	50,5	49,6	250,0	2,763	8,2	5
S-4	50,5	51,0	250,0	4,190	12,1	32
S-5	50,6	51,2	250,0	3,620	10,4	7
S-6	50,5	51,2	250,0	4,086	11,7	1
S-7	50,6	49,7	250,0	4,057	12,0	2
S-8	50,4	50,0	250,0	3,907	11,5	12
S-9	50,5	50,9	250,0	3,234	9,3	23
S-10	50,6	51,2	250,0	3,922	11,2	0
Mean value of the flexural strength:					11,0	
Standard deviation:					1,4	
Minimal expected value:					8,3	
Date of testing: 2021-01-20						

* Test methods from scope of accreditation (Accreditation No. 1043)

** Test methods outside the scope of accreditation

Test report No.: 72562-0112/21

2.6. Determination of resistance to ageing by thermal shock - HRN EN 14066:2013*

Section 9.1. Change in visual appearance

Sample designation	Visual observations after 20 cycles of thermal shock
ST-1	no visible changes in comparison with reference specimen
ST-2	no visible changes in comparison with reference specimen
ST-3	no visible changes in comparison with reference specimen
ST-4	no visible changes in comparison with reference specimen
ST-5	no visible changes in comparison with reference specimen
ST-6	no visible changes in comparison with reference specimen
ST-7	no visible changes in comparison with reference specimen
ST-8	no visible changes in comparison with reference specimen
ST-9	no visible changes in comparison with reference specimen
ST-10	no visible changes in comparison with reference specimen

Resistance to ageing by thermal shock was tested on 300x50x50mm samples with sawn surface.
No change has occurred on samples in comparison with reference specimen – there was no cracking, scaling, swelling, exfoliation, oxidation nor change in colour.

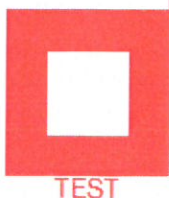
Section 9.2. Change of dynamic modulus of elasticity according to HRN EN 14146**

Sample designation	Sample dimensions (mm)			Dynamic modulus of elasticity before thermal shock cycles (MPa) E_0	Dynamic modulus of elasticity after 20 cycles of thermal shock (MPa) E_n	Decrease of dynamic modulus of elasticity after 20 cycles of thermal shock (%) ΔE
	a	b	l			
ST-1	49,1	50,5	301,1	38468	37940	1
ST-2	51,2	50,6	301,1	40348	39534	2
ST-3	50,5	49,7	301,4	43002	42722	1
ST-4	50,4	50,9	301,4	42441	39696	6
ST-5	49,4	50,6	301,2	39590	38519	3
ST-6	50,5	49,7	301,2	42888	42052	2
ST-7	50,4	49,6	301,2	48082	44588	7
ST-8	50,3	50,0	301,3	43507	39644	9
ST-9	50,3	51,2	301,3	40454	37253	8
ST-10	50,4	49,6	301,5	43906	41939	4
Mean values:				42269	40389	4

Test started on: 2020-12-11
Test completed on: 2021-01-29

* Test methods from scope of accreditation (Accreditation No. 1043)

** Test methods outside the scope of accreditation



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Section 9.5. Flexural strength under concentrated load after 20 cycles of thermal shock according to HRN EN 12372:2008*

Note: 10 test samples with dimensions 300 x 50 x 50 mm were delivered for testing. Sample surface is sawn and smooth. Petrographic determination of the sample is dolomite.
Loading rate: 0,22 MPa/s.

Sample designation	Thickness h [mm]	Width b [mm]	Distance between supporting rollers l [mm]	Breaking load F [N]	Flexural strength R _{tf} [MPa]	Distance of the fracture from the middle of the specimen f [mm]
ST-1	49,1	50,5	250,0	3,599	11,1	2
ST-2	51,2	50,6	250,0	3,829	10,8	0
ST-3	50,5	49,7	250,0	3,010	8,9	15
ST-4	50,4	50,9	250,0	3,681	10,7	6
ST-5	49,4	50,6	250,0	3,384	10,3	16
ST-6	50,5	49,7	250,0	3,960	11,7	5
ST-7	50,4	49,6	250,0	2,954	8,8	11
ST-8	50,3	50,0	250,0	2,951	8,7	3
ST-9	50,3	51,2	250,0	3,852	11,2	5
ST-10	50,4	49,6	250,0	2,356	7,0	20
Mean value of the flexural strength:					9,9	
Standard deviation:					1,5	
Minimal expected value:					7,0	
Date of testing: 2021-01-29						

Change of flexural strength after 20 cycles of thermal shock

Flexural strength [MPa]	Flexural strength after 20 cycles of thermal shock [MPa]	Change of flexural strength (decrease of strength) (%)
9,6	8,9	7,3

2.7. Frost resistance (80 cycles) - HRN EN 12371:2010*

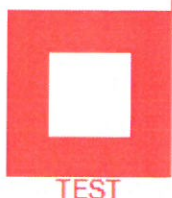
Specimen size: 300 x 50 x 50 mm

Section 7.3.2.2. Visual inspection

Number of freezing cycles	Score according to 7.3.2.2	Visual inspection
80	0 – specimen intact	After 80 cycles of freezing and thawing, no change in appearance of samples occurred, samples are flawless, without defect.
Test started on: 2020-12-07		Test completed on: 2021-01-25

* Test methods from scope of accreditation (Accreditation No. 1043)

** Test methods outside the scope of accreditation



Test report No.: 72562-0112/21

Section 7.3.2.3. Measurement of apparent volume

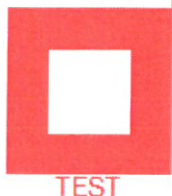
Sample designation	Apparent volume of the specimen before freezing V_{b0}	Apparent volume of the specimen after 80 cycles of freezing and thawing V_{bn}
SM-1	767,4	767,5
SM-2	774,5	774,2
SM-3	747,8	747,9
SM-4	735,3	735,2
SM-5	758,2	758,1
SM-6	770,8	770,7
SM-7	747,0	748,0
SM-8	778,2	778,1
SM-9	750,0	750,1
SM-10	759,8	760,1
Mean value:	758,9	759,0
Change in apparent volume of the specimen (%)		$V_b = -0,01\%$

Section 7.3.2.4. Change of dynamic modulus of elasticity according to HRN EN 14146**

Sample designation	Sample dimensions (mm)			Dynamic modulus of elasticity before freezing (MPa) E_0	Dynamic modulus of elasticity after 80 cycles of freezing and thawing (MPa) E_n	Decrease of dynamic modulus of elasticity after 80 cycles of freezing and thawing (%) ΔE
	a	b	l			
SM-1	50,4	50,8	301,2	39595	34139	14
SM-2	50,4	51,2	301,1	35690	31885	10
SM-3	50,4	49,3	301,3	35960	30060	16
SM-4	50,4	48,7	301,1	36120	31162	14
SM-5	50,3	50,4	301,0	43620	35562	18
SM-6	50,5	51,0	301,2	41225	34895	15
SM-7	49,3	50,4	301,2	35148	29787	15
SM-8	51,3	50,6	301,4	39971	33979	15
SM-9	50,5	49,6	301,1	40624	34848	14
SM-10	50,4	50,3	301,2	40406	34895	14
Mean values:				38828	33121	15
Test started on: 2020-12-09						
Test completed on: 2021-01-25						

* Test methods from scope of accreditation (Accreditation No. 1043)

** Test methods outside the scope of accreditation



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2.8. Flexural strength under concentrated load after 80 cycles of freezing and thawing according to HRN EN 12372:2008*

Note: 10 test samples with dimensions 300 x 50 x 50 mm were delivered for testing. Sample surface is sawn. Petrographic determination of the sample is dolomite.
Loading rate: 0,22 MPa/s.
Distance of the fracture from the middle of the specimen SM-6 was larger than 15% of specimen length.

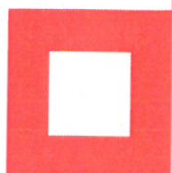
Sample designation	Thickness h [mm]	Width b [mm]	Distance between supporting rollers l [mm]	Breaking load F [N]	Flexural strength R _{ff} [MPa]	Distance of the fracture from the middle of the specimen f [mm]
SM-1	50,4	50,8	250,0	3,411	9,9	22
SM-2	50,4	51,2	250,0	2,983	8,6	6
SM-3	50,4	49,3	250,0	3,446	10,3	2
SM-4	50,4	48,7	250,0	3,515	10,7	1
SM-5	50,3	50,4	250,0	2,377	7,0	4
SM-6	50,5	51,0	250,0	2,933	8,5	50
SM-7	49,3	50,4	250,0	3,125	9,6	1
SM-8	51,3	50,6	250,0	3,646	10,3	21
SM-9	50,5	49,6	250,0	3,016	8,9	11
SM-10	50,4	50,3	250,0	3,242	9,5	7
Mean value of the flexural strength:					9,3	
Standard deviation:					1,1	
Minimal expected value:					7,1	
Date of testing: 2021-01-25						

Change of flexural strength under concentrated load after 80 cycles of freezing and thawing

Flexural strength in dry state [MPa]	Flexural strength after 80 cycles of freezing and thawing [MPa]	Change of flexural strength (decrease of strength) (%)
11,0	9,3	15,5

* Test methods from scope of accreditation (Accreditation No. 1043)

** Test methods outside the scope of accreditation



Test report No.: 72562-0112/21

2.9. Determination of water absorption at water pressure - HRN EN 13755:2008*

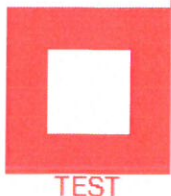
Sample designation	Dimensions of the specimens [mm]			Apparent volume (geometrical) (min.60cm ³)	Water absorption A _b (%)
	Length	Width	Height		
U-1	51,0	50,6	49,2	127,0	1,29
U-2	50,3	51,1	50,6	130,1	1,23
U-3	51,0	50,1	50,6	129,3	1,04
U-4	50,2	50,4	51,1	129,3	1,27
U-5	50,4	50,3	51,1	129,5	1,26
U-6	50,5	51,1	50,7	130,8	1,41
U-7	50,5	51,2	50,1	129,5	1,06
U-8	50,3	51,3	50,5	130,3	1,18
Mean value:					1,22
Test started on: 2020-10-12				Test completed on: 2020-12-17	

2.10. Real density, apparent density, total and open porosity - HRN EN 1936:2008*

Sample designation	Sample dimensions [mm]			Apparent density ρ_b [kg/m ³]	Real density ρ_r [kg/m ³]	Open porosity p_o [%]	Total porosity p [%]
	a	b	c				
U-1	51,0	50,6	49,2	2630	2800	5,51	6,26
U-2	50,3	51,1	50,6	2630	2800	5,54	6,19
U-3	51,0	50,1	50,6	2660	2810	4,48	5,39
U-4	50,2	50,4	51,1	2630	2800	4,88	6,06
U-5	50,4	50,3	51,1	2630	2790	4,86	5,87
U-6	50,5	51,1	50,7	2620	2790	5,31	6,18
Mean values:				2630	2800	5,10	5,99
Test started on: 2020-12-17					Test completed on: 2021-01-21		

* Test methods from scope of accreditation (Accreditation No. 1043)

** Test methods outside the scope of accreditation



Test report No.: 72562-0112/21

2.11. Determination of the abrasion resistance- method B Bohme test - HRN EN 14157:2017**

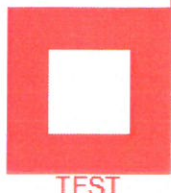
Sample designation	Sample dimensions [mm]			Surface finish of the samples	Loss in mass after 16 cycles Δm (g)	Apparent density ρ_b [kg/m ³]	Loss in volume ΔV (mm ³)
	Lengh	Width	Height				
H-1	69,5	69,4	70,5	sawn	58,84	2630	22373
H-2	70,7	69,4	69,5	sawn	54,35		20665
H-3	69,3	69,6	70,4	sawn	50,61		19243
Mean value:							20760
Date of testing: 2020-12-18							

2.12. Determination of the breaking load at a dowel hole - HRN EN 13364:2003**

Sample designation	Sample dimensions [mm]				Distance from the hole to the face in the direction of the force [mm] d₁	Max. distance of the centre of the hole to the fractures edge[mm] b_A	Breaking load F [N]
	Length	Width	Hole designation	Sample thickness by the hole (30±3)			
B-1	200,9	200,8	1-I	30,3	9,9	37,9	2070
			1-II	30,2	9,7	39,8	2350
			1-III	29,8	10,2	47,0	2160
			1-IV	29,8	9,5	39,0	2070
B-2	201,0	200,8	2-I	30,4	10,2	32,8	2090
			2-II	30,1	10,2	36,0	1820
			2-III	29,7	9,7	32,2	2040
			2-IV	30,0	9,8	31,3	1810
B-3	200,8	200,7	3-I	30,3	9,8	34,5	2210
			3-II	29,2	9,3	38,6	2450
			3-III	29,7	10,0	42,4	2210
			3-IV	30,4	10,3	42,5	2170
Mean values:					10	38	2121
Dowel hole diameter: 10 mm							
Dowel diameter: 6 mm							
Loading rate: 50 N/s							
Date of testing: 2020-12-15							

* Test methods from scope of accreditation (Accreditation No. 1043)

** Test methods outside the scope of accreditation



Test report No.: 72562-0112/21

2.13. Determination of resistance to salt crystallisation - HRN EN 12370:1999**

Sample designation	Mass of the dry sample (g)		Loss in mass after 15 cycles of crystallisation	
	Before crystallisation Md	After 15 cycles of crystallisation Mf	ΔM	
			(g)	(%)
K-1	164,198	164,121	0,077	0,05
K-2	164,199	164,118	0,081	0,05
K-3	163,531	163,513	0,018	0,01
K-4	163,835	163,752	0,083	0,05
K-5	164,101	164,065	0,036	0,02
K-6	163,184	163,141	0,043	0,03
K-7	163,482	163,474	0,008	0,00
K-8	163,744	163,727	0,017	0,01
Mean value:				0,03
Note: Test samples were cubes with 40 mm long edges. After 15 cycles of salt crystallisation no change in appearance of samples occurred, samples are flawless, without defect (Annex 1).				

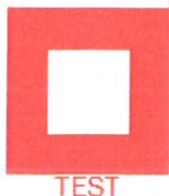
2.14. Determination of the slip resistance - HRN EN 14231:2004*

Date of testing: 2020-12-10							
Surface finish of the specimens: polished							
Sample dimensions: 86 x 136 mm							
Slider width: 76 mm							
Sample designation	1	2	3	4	5	6	SRV "dry"
Mean value of slip resistance in dry test condition	55	53	55	54	55	54	54
Sample designation	1	2	3	4	5	6	SRV "wet"
Mean value of slip resistance in wet test condition	8	9	8	8	8	8	8

Classification of slip potential *		<i>*Classification of slip potential according to HSE - The Health and Safety Executive, Great Britain</i>
SRV	slip potential	
0 - 24	high	
25 - 35	moderate	
36 - 64	low	
> 64	very low	

* Test methods from scope of accreditation (Accreditation No. 1043)

** Test methods outside the scope of accreditation



Test report No.: 72562-0112/21

2.15. Petrographic examination - HRN EN 12407:2019*

(Date of preparation/examination of sample: 2021-01-07/2021-01-29)

One thin section was prepared, with dimensions 25 x 40 mm.

Macroscopic examination/analysis

Macroscopically, the investigated sample is grey to beige in colour. It has homogeneous structure and fine-grained to medium-grained texture. No fissures, fractures or pores can be seen on sample surface. The sample breaks irregularly and the breakage surface is slightly rugged.

The sample reacts moderately with cold diluted HCl (5%). Its hardness after Mohs scale is between 3 and 4. It does not smell and has no taste.

Under the microscope/thin section analysis

Under the microscope we observe carbonate rock with homogeneous structure and fine-grained to medium-grained texture. It is incompletely dolomitized limestone and the volume share of dolomite is around 70% (determined by visual estimate) (Figure 1). Dolomite crystals are commonly idiomorphic rhomboedral (sections up to 0,2x 0,2 mm large), but in parts of sample where dolomitization is more advanced, dolomite crystals are xenotypic. Calcite is present in form of bioclasts – macrofossil fragments, with sections up to 1,2x1,8 mm large. Discontinuities can rarely be seen in the sample: only several unfilled pores (sections up to 0,3x 0,7 mm large), with isometric to elongated shape, have been observed. No minerals potentially harmful for concrete have been observed in sample.

The sample corresponds to **calcitic dolomite**.

Thin section was stained with solution of Alizarin Red S according to Evamy and Shearman (1962), a method used to differentiate calcite and dolomite.

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** Test methods outside the scope of accreditation

Test report No.: 72562-0112/21

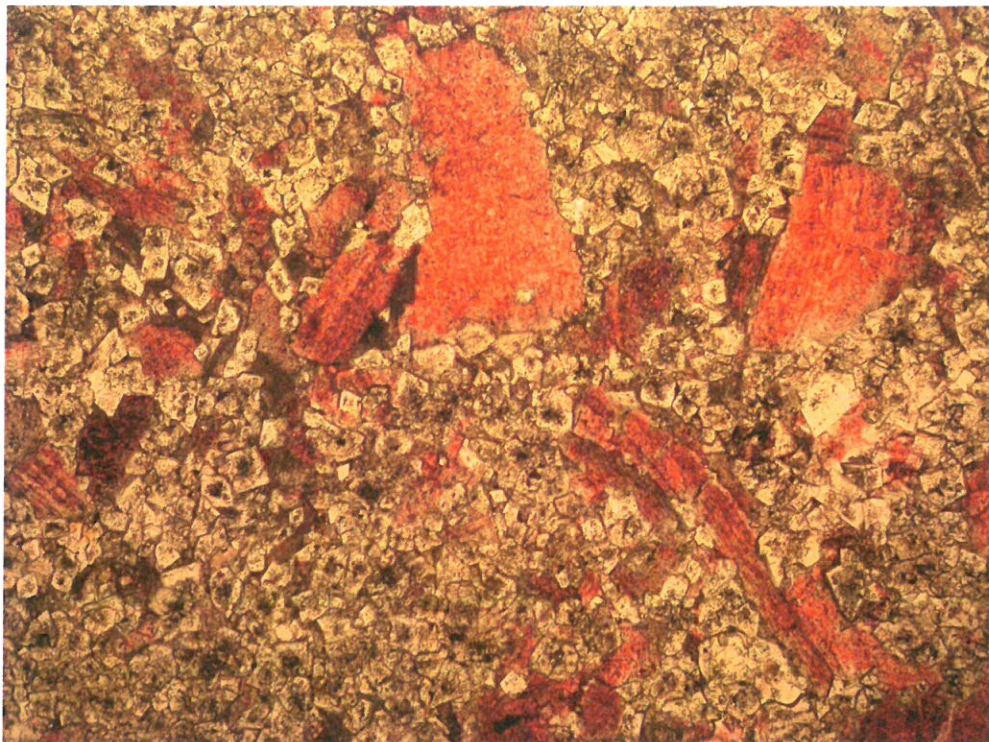


Figure 1. Microphotograph of the thin section of the tested stone, analyser off.

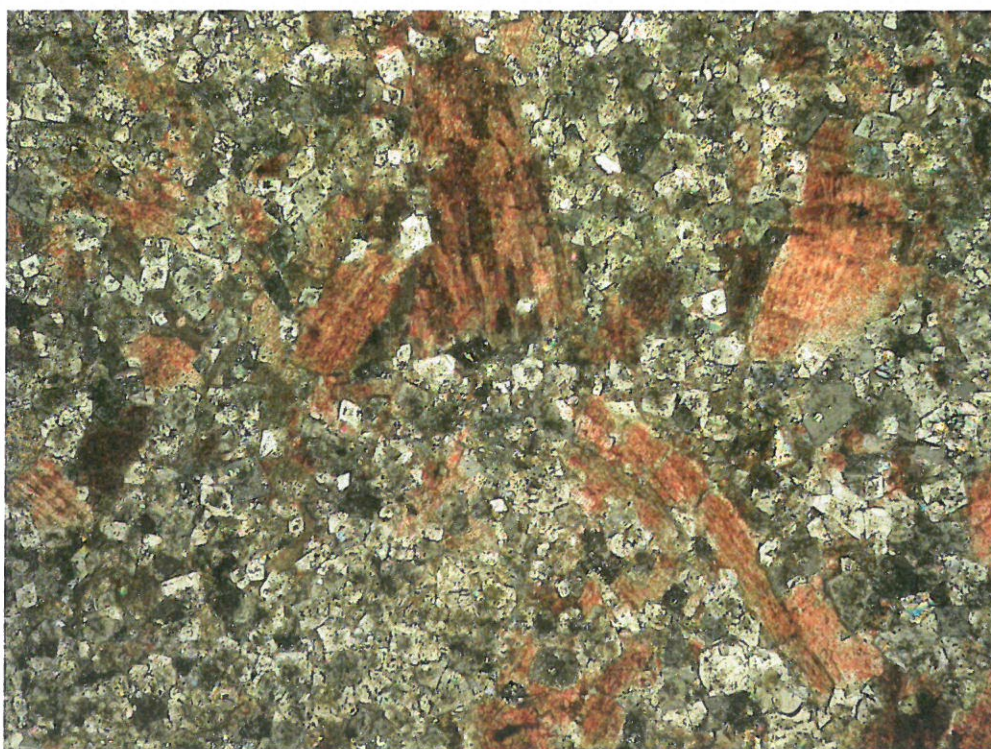


Figure 2. Microphotograph of the thin section of the tested sample, analyser on.

* Test methods from scope of accreditation (Accreditation No. 1043)

** Test methods outside the scope of accreditation

Test report No.: 72562-0112/21

Test results

TESTED PROPERTIES	Test method	RESULT
Petrographic examination	HRN EN 12407	dolomite
Uniaxial compressive strenght in dry state (mean value)	HRN EN 1926	165 MPa
Uniaxial compressive strenght in water saturated state (mean value)	HRN EN 1926, Annex A	156 MPa
Uniaxial compressive strenght after 80 cycles of freezing and thawing (mean value)	HRN EN 1926	161 MPa
Frost resistance (80 cycles)	HRN EN 12371	No change in appearance (resistant)
Change in apparent volume after 80 cycles		$V_b = -0,09\%$
Flexural strength	HRN EN 12372	$R_{tf} = 11,0 \text{ MPa}$
Flexural strength after 20 cycles of thermal shock		$R_{tf} = 9,9 \text{ MPa}$
Flexural strength after 80 cycles of freezing and thawing		$R_{tf} = 9,3 \text{ MPa}$
Resistance to ageing by thermal shock	HRN EN 14066	No change in appearance (resistant)
Change of flexural strength under concentrated load after 20 cycles of thermal shock		$\Delta R_{tf} = 10,0\%$
Decrease of dynamic modulus of elasticity after 20 cycles of thermal shock (%)		$\Delta E = 4\%$
Frost resistance (80 cycles)	HRN EN 12371	No change in appearance (resistant)
Change in apparent volume after 80 cycles		$V_b = -0,01\%$
Change of flexural strength under concentrated load after 80 cycles of freezing and thawing		$\Delta R_{tf} = 15,5\%$
Decrease of dynamic modulus of elasticity after 80 cycles of freezing and thawing (%)		$\Delta E = 15\%$
Apparent density	HRN EN 1936	2630 kg/m^3
Real density		2800 kg/m^3
Open porosity		5,10%
Total porosity		5,99%
Water absorption	HRN EN 13755	1,22%
Resistance to salt crystallisation	HRN EN 12370	0,03%
Breaking load at a dowel hole	HRN EN 13364	$F = 2121 \text{ N}$
Determination of the abrasion resistance (method B Bohme test)	HRN EN 14157	Loss in volume: 20760 mm^3 ($20,8 \text{ cm}^3$)
Slip resistance (polished surface finish)	HRN EN 14231	SRV „dry“ = 54
		SRV „wet“ = 8

-End of the test report-

* Test methods from scope of accreditation (Accreditation No. 1043)

** Test methods outside the scope of accreditation

ANNEX 1

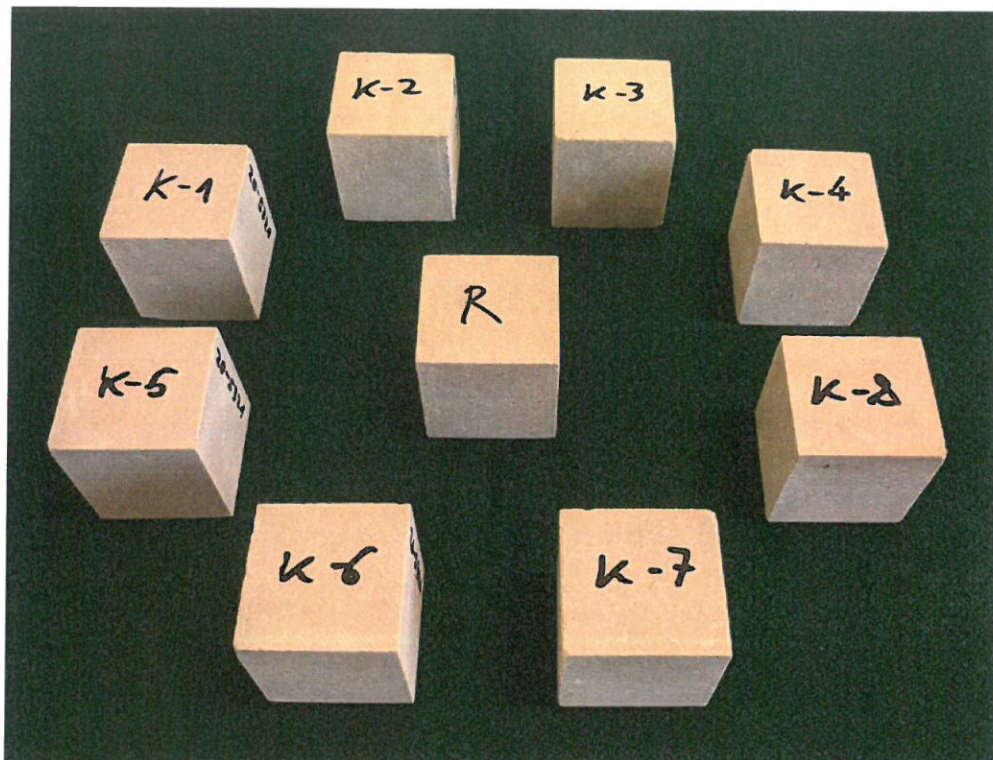


FIGURE 1: Reference sample (sample in the center) and test samples before 15 cycles of salt crystallization.

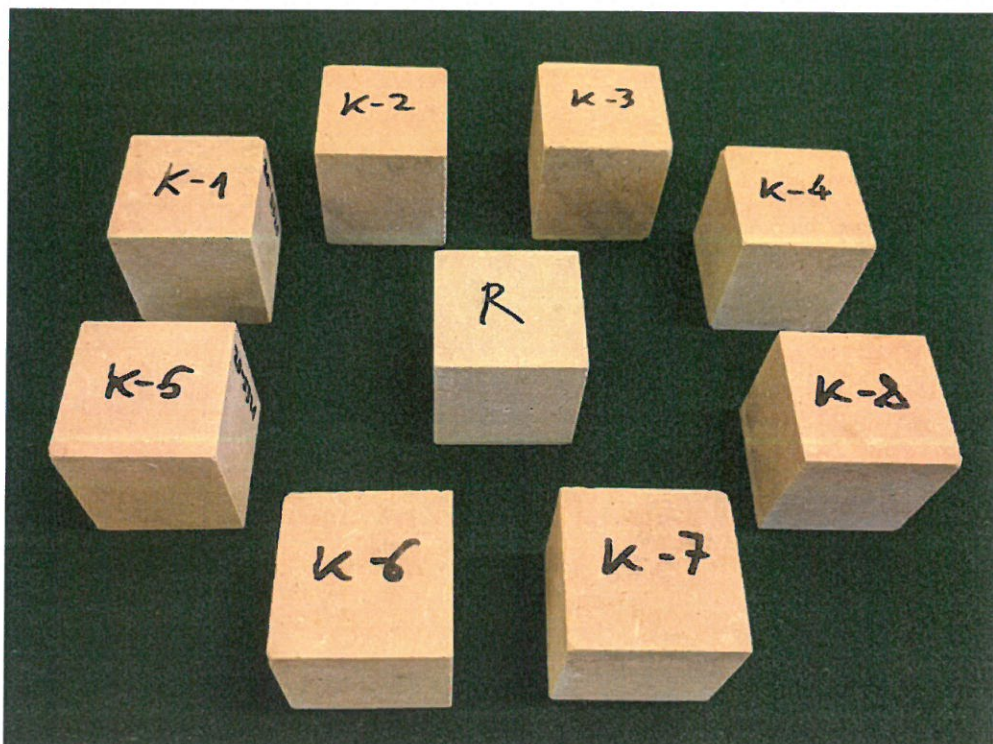


FIGURE 2: Reference sample and test samples after 15 cycles of salt crystallization.