

CEMTRA d.o.o.

for controlling and ecology

DEPARTMENT FOR CONTROLLING PRODUCTS QUALITY

Croatia, 10000 Zagreb, Vlaška 67

Phone: (01) 46-46-744, 46-46-745; Phone fax: (01) 46-17-729

REPORT ON EXAMINATION OF THE CHARACTERISTICS OF ARCHITECTURAL-BUILDING STONE COMMERCIAL NAME "PLANO-REDI"


NUMBER : 7/agk/06

CLIENT: **ADRIAKAMEN ITD** d.o.o.
Smiljanićeva 2
21 000 Split

Date: 2006. 1. 31.

CEMTRA d.o.o.
za kontrolu i ekološku zaštitu
ZAGREB, Vlaška 67

Director


Branko Bobesić, BSc

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I. BASIC DATA

I-1	ORIGIN OF THE STONE	Quarry "REDI" near Trogir Croatia
I-2	DENOMINATION OF THE STONE	Architectral -building stone commercial name: PLANO-REDI
I-3	ORDERER OF CERTIFICATION	ADRIAKAMEN ITD d.o.o. Smiljanićeva 2 21 000 Split
I-4	DESTINATION OF THE STONE	Architectural -building- stone
I-5	APPLIED CERTIFICATIONS	Complete analysis in accordance with the "Regulation on collecting data, the method of making evidences and defining reserves of mineral raw-materials, and on elaborating the balance of these reserves"
I-6	THE LOCATION OF MAKING SAMPLES	Quarry "REDI"
I-7	SIGN OF THE SAMPLE OF THE CLIENT	Stone "PLANO-REDI"
I-8	LABORATORY SIGN OF THE SAMPLE	B-797/ag/05
I-9	DATE OF SAMPLING	December 2005.
I-10	SAMPLES MADE BY	Representative of the client Mr. Ivan Pulišević
I-11	SAMPLES DELIVERED BY	Representative of the client
I-12	DATE OF RECEIVING SAMPLES	2005. 12. 13.
I-13	DATE OF THE BEGINNING OF EXAMINATION	2005. 12. 14.
I-14	DATE OF FINISHING EXAMINATION	2006. 1. 31.
I-15	EXAMINATIONS ARE PERFORMED IN ACCORDANCE WITH THE FOLLOWING NORMS	Stated in the text

II. THE RESULTS OF THE LABORATORY DETERMINATION OF PHYSICAL-MECHANICAL CHARACTERISTICS, CHEMICAL PURITY AND PETROGRAPHIC SPECIFICATION OF THE STONE

II.1. PHYSICAL-MECHANICAL CHARACTERISTICS

Table 1.

No.	Kind of determination	Determined against	Results of determination
II.1.1. II.1.1.1.	Hardness on pressure In dry state	HRN B.B8.012	max. = 124,8 MPa min. = 84,5 MPa midd. = 111,2 MPa
II.1.1.2.	In water saturated state		max. = 121,8 MPa min. = 80,7 MPa midd. = 104,2 MPa
II.1.1.3.	After freezing		max. = 109,7 MPa min. = 73,3 MPa midd. = 100,4 MPa
II.1.2.	Hardness in bending	HRN B.B8.017	max. = 13,6 MPa min. = 8,9 MPa midd. = 11,7 MPa
II.1.3.	Resistance of the stone to breakage around the bore-hole of the anchor pin	HRN EN 13 364	max. = 4,7 kN min. = 1,7 kN midd. = 3,5 kN
II.1.4.	Water absorption under atmospheric pressure	HRN B.B8.010	= 0,97 % (mass)
II.1.5.	Bulk density	HRN B.B8.032	= 2 610 kg/m ³
II.1.6.	Density	HRN B.B8.032	= 2 695 kg/m ³
II.1.7.	Absolute porosity	HRN B.B8.032	= 3,15 %
II.1.8.	Resistance to freezing	HRN B.B8.001 (25 cycles)	The loss of mass: = 0,36 % (mass) Stable
II.1.9.	Resistance to salt crystallisation (Na ₂ SO ₄)	HRN B.B8.002 (5 cycles)	The loss of mass: = 0,74 % (mass) stable
II.1.10.	Resistance to wearing out by grinding	HRN B.B8.015	= 21,8 cm ³ /50 cm ²
II.1.11.	Petrographic specification	HRN B.B8.003	Organogenic limestone
II.1.12.	Spreading speed of longitudinal waves	HRN B.B8.121	= 4 150 (m/ s)
II.1.13.	Content of SO ₃ Content of Cl ⁻	HRN B.B8.042	= 0,09 % (mass) = 0,0020 % (mas.)

II.2. CHEMICAL ANALYSIS

The following results have been obtained (mass. %)

Table 2.

Chemical parameters (Determined against HRN B.B8.070)	Content (mass. %)
I. by heat.	43,62
SiO ₂	0,17
Fe ₂ O ₃	0,00
Al ₂ O ₃	0,10
CaO	55,70
MgO	0,25
SO ₃	0,09
Na ₂ O	0,03
K ₂ O	0,00
SUM:	99,96
Cl	0,0020
MINERALOGICAL CONTENT:	
Calcite, CaCO ₃	98,27
Dolomite, CaCO ₃ ·MgCO ₃	1,14

II.3. MINERALOGICAL-PETROGRAPHIC ANALYSIS

Macroscopic

The stone is partially dense, and partially minute cavities of whitish colour are observed. Macroscopically there can be clearly seen organogenic detritus which differs in colour. Bioclasts are partially coloured faintly brownish and partially they are whitish, of glassy brilliancy and ceramic appearance. Their maximal dimension measured on the stone sample are 12 mm x 18 mm and 5 mm x 22 mm. In the stone unequally disposed cavities in diameter of 1 mm may be observed. Breakage of the stone is even till uneven and superficially hooked. It reacts boisterously with cold diluted HCl.

Microscopic

In a microscopic slide we observe organogenic detritious structure, which reciprocal bioclast suport. Bioclasts are faintly rounded till rounded and unsorted. They are in dimensions of dia. 0,55. They are filled with fibrous and mosaic calcite.

One shell is formed of long grains of calcite along its whole width. Thickness of the shell is 1,5 mm (which is also the length of the calcite crystal in it), and thickness of the calcite grain is 0.10 mm. Calcite grains in that shell have pressing fused lamellas. In the part of bioclast some brownish wormlike formation have been observed in dimensions under 0,02 mm, filled with bitumen. Bioclast is present in approx. 75%.

There have been observed unequally disposed minute, irregular, interbioclast, nests of micrite. Their dimensions are under 1.5 mm. Micrite grains are of dimensions approx. from 0,00X till 0,01 mm. The part of micrite nests is approx. 3%.

Airy sparcalcite is of polygonal cross section with reciprocal pin and dental growing in. Their dimensions measured in mm make in dia, about 0,25, i.e. cross sections: 0,50 x 0,70 - 0,75 x 0,95 - 0,30 x 2,25. A part of spars of larger grains have pressing fused lamellas.

Around a part of bioclast the edge is in hardly brownish colour caused by bituminous substance.

Decision

The analyzed stone has been determined as a organogenic limestone, i.e. as biosparrudite according to R. L. Folk, and as radstone according to R. J. Dunham.

III. OPINION ON USABILITY

The results of laboratory determination of physical-mechanical characteristics, of chemical purity and mineralogical-petrographical composition of the submitted average sample of the stone under commercial name PLANO-REDI, from the locality Redi, reveal that the examined material can be used for inner and external revetting of vertical and pavement surfaces.


For the inner and external revetting pedestrian surfaces, stone can be recommended for surfaces of low traffic (up to 1500 people by day).

For the external revetting the stone need to be polished till high splendor, but for final treatment fine scrubbing is recommended. It is recommended that the stone should not be built in, because of its pronounced light colour, in the localities exposed to atmospheric contamination. Its colour freshness and decorativeness will be preserved by regular maintenance.

Date: 2006. 1. 31.

Signature of the responsible person:

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