



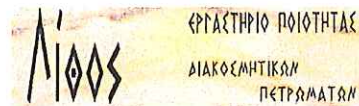
# HELLENIC SURVEY OF GEOLOGY AND MINERAL EXPLORATION (H.S.G.M.E.)

MINISTRY OF ENVIRONMENT AND ENERGY

1 Sp. Louis Str.,  
Olympic Village  
Acharnes, Greece, GR-136 77

www.eagme.gr

**UNIT:** Department of Mineral Resources and Prospecting  
Unit of Economic Geology and Mineral Exploration  
"LITHOS" - Ornamental Stones Quality Control Laboratory  
(+30) 213 - 1337316, (+30) 213 - 1337322  
**TEL.:**  
**FAX:** (+30) 213 -1337463  
**e-mail:** lithos@igme.gr  
**PERSONS RESPONSIBLE:** Dr. K. Laskaridis, Dr. M. Patronis



**TO:**  
**JOHN PAPAGIANNOULIS BROS S.A.**  
83, Irinis Avenue  
P. C. 177 78  
Tavros - Athens  
**TEL.: 210 3461275**  
**FAX: 210 3454941**  
**Our Ref.: 471B / 27.10.2020**

## LABORATORY TESTS RESULTS FOR THE DOLOMITIC MARBLE UNDER THE COMMERCIAL NAME "VOLAKAS MARBLE" \*, IN COMPLIANCE WITH EN 1469 (Quarry: Volakas, Drama Prefecture, Greece) \*

*\*Stone denomination and quarry location, as quoted by the client*

Apparent density (EN 1936)	2840 kg/m <sup>3</sup>
Open porosity (EN 1936)	1,0 % vol.
Water absorption at atmospheric pressure (EN 13755)	0,3 % wt.
Water absorption due to capillarity (EN 1925)	4,509 g / (m <sup>2</sup> x sec <sup>0,5</sup> )
Flexural strength under concentrated load (EN 12372)	6,1 MPa Minimum value expected: 3,8 MPa
Freeze-thaw resistance, 12 cycles: - Flexural strength after 12 freeze-thaw cycles (EN 12371 & EN 12372)	6,3 MPa
Resistance to ageing by thermal shock (EN 14066)	$\Delta\rho$ (%): 0,0 (change in open porosity)
	$\Delta F$ (%): 3,3 (change in flexural strength)
Breaking load at dowel hole (EN 13364)	1000 N - Standard deviation: 100 N - Minimum value expected: 799 N

EAOT EN 1469: Natural stone products – Slabs for cladding - Requirements

### PERSONS RESPONSIBLE FOR THE LABORATORY TESTS

**Dr. K. Laskaridis**  
Geologist



**Dr. M. Patronis**  
Mining Eng.



Laboratory tests were carried out by: I. Kouseris (Technician)

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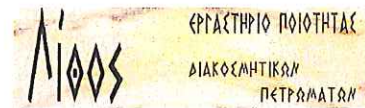
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**LABORATORY TESTS RESULTS FOR THE DOLOMITIC MARBLE  
UNDER THE COMMERCIAL NAME "VOLAKAS MARBLE" \*,  
IN COMPLIANCE WITH EN 12057  
(Quarry: Volakas, Drama Prefecture, Greece) \***

*\*Stone denomination and quarry location, as quoted by the client*

Apparent density (EN 1936)	2840 kg/m <sup>3</sup>	
Open porosity (EN 1936)	1,0 % vol.	
Water absorption at atmospheric pressure (EN 13755)	0,3 % wt.	
Water absorption due to capillarity (EN 1925)	4,509 g / (m <sup>2</sup> x sec <sup>0,5</sup> )	
Flexural strength under concentrated load (EN 12372)	6,1 MPa Minimum value expected: 3,8 MPa	
Freeze-thaw resistance, 48 cycles: - Flexural strength after 48 freeze-thaw cycles (EN 12371 & EN 12372)	5,1 MPa	
Resistance to ageing by thermal shock (EN 14066)	Δρ (%): 0,0 (change in open porosity)	
	ΔF (%): 3,3 (change in flexural strength)	
Abrasion resistance (EN 14157 – Method B)	25 cm <sup>3</sup> / 50 cm <sup>2</sup> (volume loss)	
Slip resistance (EN 14231)	Mat surface	SRV <sub>DRY</sub> = 61
		SRV <sub>WET</sub> = 36
Slip resistance (EN 14231)	Unpolished surface	SRV <sub>DRY</sub> = 78
		SRV <sub>WET</sub> = 70
Slip resistance (EN 14231)	Polished surface	SRV <sub>DRY</sub> = 61
		SRV <sub>WET</sub> = 6

EAOT EN 12057: Natural stone products – Modular tiles - Requirements

**PERSONS RESPONSIBLE FOR THE LABORATORY TESTS**

**Dr. K. Laskaridis**  
Geologist



**Dr. M. Patronis**  
Mining Eng.



Laboratory tests were carried out by: I. Kouseris (Technician)

471B / 27.10.2020



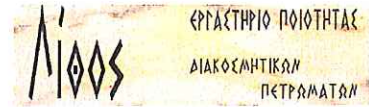
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**LABORATORY TESTS RESULTS FOR THE DOLOMITIC MARBLE  
UNDER THE COMMERCIAL NAME "VOLAKAS MARBLE" \*,  
IN COMPLIANCE WITH EN 12058  
(Quarry: Volakas, Drama Prefecture, Greece) \***

*\*Stone denomination and quarry location, as quoted by the client*

Apparent density (EN 1936)	2840 kg/m <sup>3</sup>	
Open porosity (EN 1936)	1,0 % vol.	
Water absorption at atmospheric pressure (EN 13755)	0,3 % wt.	
Water absorption due to capillarity (EN 1925)	4,509 g / (m <sup>2</sup> x sec <sup>0,5</sup> )	
Flexural strength under concentrated load (EN 12372)	6,1 MPa Minimum value expected: 3,8 MPa	
Freeze-thaw resistance, 48 cycles: - Flexural strength after 48 freeze-thaw cycles (EN 12371 & EN 12372)	5,1 MPa	
Resistance to ageing by thermal shock (EN 14066)	Δρ (%): 0,0 (change in open porosity)	
	ΔF (%): 3,3 (change in flexural strength)	
Abrasion resistance (EN 14157 – Method B)	25 cm <sup>3</sup> / 50 cm <sup>2</sup> (volume loss)	
Slip resistance (EN 14231)	Mat surface	SRV <sub>DRY</sub> = 61
		SRV <sub>WET</sub> = 36
Slip resistance (EN 14231)	Polished surface	SRV <sub>DRY</sub> = 61
		SRV <sub>WET</sub> = 6
Slip resistance (EN 14231)	Unpolished surface	SRV <sub>DRY</sub> = 78
		SRV <sub>WET</sub> = 70

EAOT EN 12058: Natural stone products – Slabs for floors and stairs - Requirements

**PERSONS RESPONSIBLE FOR THE LABORATORY TESTS**

**Dr. K. Laskaridis**  
Geologist



**Dr. M. Patronis**  
Mining Eng.



Laboratory tests were carried out by: I. Kouseris (Technician)

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