

Analysis Report No.: R20240075

Customer	C038	Sample Arrival Date	29.08.2024
		Contract No.	N/A
		Sample No.	S20240103
		Sampler / sent by	customer / post
Terrastone Kosova		Horn & Co. Analytics sh.p.k.	
St.Ardianët		29.08.2024 – 03.09.2024	
RKS – 15000 Obiliq			

Contact

Mr. Adhurim Maloku

Sample IdentificationS20240103 - natural stone marble

OriginCustomer

Place of SamplingCustomer

Remarks: These testing of natural stone marble has been done in the collaboration with our partner laboratory “Institute for Building Material and Structures”.

Results of Analysis

1.1. Determination of water absorption coefficient by capillarity based on standard EN 1925

Methodology: Preparation of marble stone samples and application of the water absorption test at time intervals of 10, 30, 60 and 90 minutes. The results are recorded and analyzed to determine the water coefficient.

Formula for calculating capillarity: $C = \frac{Mt - M_0}{A \cdot \sqrt{t}}$

Capillarity coefficient table

Sample	Starting mass (g)	Mass after 10min (g)	Mass after 30min (g)	Mass after 60min (g)	Mass after 90min (g)	Contact surface (m²)	Coefficient of Capillarity
1	970	972	974	977	978	0.01	4.1
2	975	978	981	983	987	0.01	6.8
3	980	983	985	994	996	0.01	8.2

Comment: The water absorption coefficient for marble stone is relatively low in all tested samples. This indicates that the material has a low capacity to absorb water, making it suitable for applications where exposure of water is likely.

Analysis Report No.: R20240075

Customer	C038	Sample Arrival Date	29.08.2024
Terrastone Kosova		Contract No.	N/A
St.Ardianët		Sample No.	S20240103
RKS – 15000 Obiliq		Sampler / sent by	customer / post
		Analysis done by	Horn & Co. Analytics sh.p.k.
		Analysis Date	29.08.2024 – 03.09.2024

1.2. Apparent density based on standard EN 1936

Formula for the determination of apparent density

$$\rho = \frac{M}{V}$$

Where:

- M is the mass of the sample (g)
- V is the sample volume (mm³)

Table of output results for apparent density

Sample	Dimensions (mm)	Mass (g)	Volume (mm³)	Apparent density (g/m³)
1	199 x 199 x 36.7	3251.8	1444270.3	2.25
2	200 x 199 x 36.6	3262.0	1455840.0	2.24
3	199 x 200 x 36.4	3243.3	1450120.0	2.24

Comment: The bulk density value is lower than what is sometimes expected for marble (typically around 2.60 to 2.70 g/cm³) but the bulk density results for the marble samples are relatively consistent. Small variation in these results is acceptable and may be the result of natural variations in material composition.

Analysis Report No.: R20240075

Customer	C038	Sample Arrival Date	29.08.2024
Terrastone Kosova		Contract No.	N/A
St.Ardianët		Sample No.	S20240103
RKS – 15000 Obiliq		Sampler / sent by	customer / post
		Analysis done by	Horn & Co. Analytics sh.p.k.
		Analysis Date	29.08.2024 – 03.09.2024

1.3. Abrasion resistance according to EN 13748-2 standard

The test was performed by "eroding" the upper surface with an abrasive material according to the standard of natural stone Marble with sample data:

M1=69.48 x 71.07 x 31.64 mm

M2=71.17 x 70.95 x 31.44 mm

M3=68.99 x 71.12 x 31.46 mm

extracted from the element of natural stone.

The results of the abrasion test are given in the table below:

$\Delta V = \Delta m / \rho_R$, where:

ΔV - is the mass loss in (mm³)

Δm - is the mass loss in (g)

ρ_R - is the volumetric mass of the sample (g/mm³)

Table of results

Sample	Mass before testing (g)	Mass after testing (g)	Loss in mass (g)	Loss in volume (mm ³)	Classification
1	403.5	396.1	7.4	2813.3	3
2	408.1	401.5	6.6	2538.5	3
3	396.1	391.7	4.4	1702.7	2

Note: • Samples M1 and M2 are classified in Category 3, which suggests a low abrasion performance, reflecting a high-volume loss.
• Sample M3 is classified in Category 2, showing a better performance and a lower volume loss compared to the other samples.

Analysis Report No.: R20240075

Customer	C038	Sample Arrival Date	29.08.2024
Terrastone Kosova		Contract No.	N/A
St.Ardianët		Sample No.	S20240103
RKS – 15000 Obiliq		Sampler / sent by	customer / post
		Analysis done by	Horn & Co. Analytics sh.p.k.
		Analysis Date	29.08.2024 – 03.09.2024



Picture.1 Samples before examination



Picture. 2 Samples after examination



Picture. 3 Samples during examination

Analysis Report No.: R20240075

Customer	C038	Sample Arrival Date	29.08.2024
Terrastone Kosova		Contract No.	N/A
St.Ardianët		Sample No.	S20240103
RKS – 15000 Obiliq		Sampler / sent by	customer / post
		Analysis done by	Horn & Co. Analytics sh.p.k.
		Analysis Date	29.08.2024 – 03.09.2024

1.4. Water absorption according to EN 1338 standard

Sample	Wd g	Ws g	Ws-Wd g	Absorption		Absorption average %
				%		
1 199 x 199 x 36.7 mm	3251.8	3272.9	21.1	0.644		0.66 %
2 200 x 199 x 36.6 mm	3262.0	3288.1	26.1	0.793		
3 199 x 200 x 36.4 mm	3243.3	3261.3	18.0	0.552		

Comment: The water absorption results of 0.66% is well below 1%. This indicates that your material (the natural marble) has excellent resistance to water absorption. According to the EN 1338 standard, this result classifies the material in Group 1, which is the best category for water performance.

Analysis Report No.: R20240075

Customer	C038	Sample Arrival Date	29.08.2024
Terrastone Kosova		Contract No.	N/A
St.Ardianët		Sample No.	S20240103
RKS – 15000 Obiliq		Sampler / sent by	customer / post
		Analysis done by	Horn & Co. Analytics sh.p.k.
		Analysis Date	29.08.2024 – 03.09.2024

Contact
Mr. Adhurim Maloku

Sample Identification S20240103
Origin Customer
Place of Sampling Customer

Calculations
EN 1925; EN 1936; EN 13748-2; EN 1338

Horn & Co. Analytics SH.P. K, Prishtina 03.09.2024

	
MSc. Vehbi Berisha Head of Laboratory	MSc. Dafina Hoti Laboratory Analyst

