

TEST REPORT

No. : XMIN2501204222CM

Date : Dec 21, 2025

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Summary of Results:

No.	Test Item	Test Method	Result
1	Abrasion Resistance	EN 14617-4:2012	28.2mm
2	Dimensional Stability	EN 14617-12:2012	0.03mm Class A
3	Flexural Strength	EN 14617-2:2016	48.5MPa
4	Impact Resistance	EN 14617-9:2005	2.57J
5	Thermal Shock Resistance	EN 14617-6:2012	The change in flexural strength: 2.1%
6	Slip Resistance	EN 14231:2003	Dry: 48 Wet: 7
7	Water Absorption and Apparent Density	EN 14617-1:2013	Water Absorption:0.05% Density: 2388kg/m ³
8	Chemical Resistance	EN 14617-10:2012	C4
9	Dimensions, Geometric Characteristics and Surface Quality of Modular Tiles	EN 14617-16:2005	See result
10	Linear Thermal Expansion	EN 14617-11:2005	20.4×10 ⁻⁶ /°C
11	Composition Analysis*	FTIR, EDX and TGA	See result
12	Reaction to Fire	EN 13823:2010+A1:2014	Class A1 See result



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Original Sample Photo:



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1. Test Item: Abrasion Resistance

Sample Description: See photo

Test Method: EN 14617-4:2012 Agglomerated stone - Test methods - Part 4: Determination of the abrasion resistance

Test Condition:

Specimens: 150mm×100mm×11mm, 6pcs, one face polished

Testing surface: polished

Test Result:

Specimens identification No.	1	2	3	4	5	6
The length of the groove (mm)	28.0	28.5	29.0	28.0	27.5	28.5
Mean value(mm)	28.2					

2. Test Item: Dimensional Stability

Sample Description: See photo

Test Method: EN 14617-12:2012 Agglomerated stone - Test methods - Part 12: Determination of dimensional stability

Test Condition:

Specimen: 300mm×300mm×11mm, 1pc, one face polished

Test Result:

Vertical displacement: 0.03mm.

Classification: Class A

Note: Vertical displacement after the test,

Class A: <0.3 mm; Class B: ≥0.3 mm and <0.6 mm; Class C: ≥0.6 mm.



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3. Test Item: Flexural Strength

Sample Description: See photo

Test Method: EN 14617-2:2016 Agglomerated stone - Test methods - Part 2: Determination of flexural strength (bending)

Test Condition:

Specimens: 200mm×50mm×11mm, 10pcs, one face polished

Loading rate: (0.25±0.05) MPa/s

Test Result:

Specimens identification No.	1	2	3	4	5	6	7	8	9	10
Flexural strength (MPa)	48.2	49.0	48.0	46.5	49.2	52.2	52.5	46.4	43.5	49.3
Mean value (MPa)	48.5									
Standard deviation (MPa)	2.9									
Lower expected value (MPa)	42.8									



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4. Test Item: Impact Resistance

Sample Description: See photo

Test Method: EN 14617-9:2005 Agglomerated stone - Test methods - Part 9: Determination of impact resistance

Test Condition:

Specimens: 200mm×200mm×11mm, 4pcs

Test Result:

Specimens identification No.	1	2	3	4
Drop height, h (m)	0.25	0.25	0.25	0.25
Fracture work, L (J)	2.57	2.57	2.57	2.57
Average value (J)	2.57			

Note: The fracture work L in joule is expressed by the formula

$$L=M \times h \times g$$

Where

M is the sphere mass, 1.040kg

h is the drop height in meters of the sphere which causes the sample to break

g is the gravity acceleration equal to 9.806m/s²



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5. Test Item: Thermal Shock Resistance

Sample Description: See photo

Test Method: EN 14617-6:2012 Agglomerated stone – Test methods – Part 6: Determination of thermal shock resistance

Test Condition:

Specimens: 200mm×50mm×11mm, 10pcs, one face polished

Test Result:

After 20 cycles of thermal shock:

For each specimen, there is no obvious change of colour, no obvious appearance of spots, no obvious swelling, no obvious cracking, no obvious scaling or exfoliation.

The change in mass:

Specimens identification No.	1	2	3	4	5	6	7	8	9	10
Mass loss (%)	0.02	0.03	0.02	0.02	0.03	0.03	0.03	0.02	0.02	0.02
Mean mass loss (%)	0.02									

The flexural strength: (Loading rate: (0.25±0.05)MPa/s)

Specimens identification No.	1	2	3	4	5	6	7	8	9	10
Flexural strength (MPa)	44.1	49.1	46.5	49.6	48.8	48.2	39.2	44.2	50.3	49.8
Mean value (MPa)	47.0									

The change in flexural strength: 3.3 %



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6. Test Item: Slip Resistance

Sample Description: See photo

Test Method: EN 14231:2003 Natural stone test methods - Determination of the slip resistance by means of the pendulum tester

Test Condition:

Specimen: 150mm×150mm×11mm, 6pcs,
one face polished

Type of slider: Slider 57

Test surface: polished

Test Result:

Specimens identification No.	1	2	3	4	5	6
Mean pendulum value (Dry condition)	46	49	47	48	50	47
Slip resistance value (SRV "dry")	48					
Mean pendulum value (Wet condition)	6	7	7	8	6	7
Slip resistance value (SRV "wet")	7					



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7. Test Item: Apparent Density and Water Absorption

Sample Description: See photo

Test Method: EN 14617-1:2013 Agglomerated stone - Test methods - Part 1: Determination of apparent density and water absorption

Test Condition:

Specimens: 100mm×100mm×11mm, 6pcs, one face polished

Test Result:

Specimens identification No.	1	2	3	4	5	6
Water absorption (%)	0.05	0.06	0.06	0.05	0.06	0.05
Arithmetic mean of the water absorption (%)	0.05					
Apparent density (kg/m ³)	2392	2384	2385	2385	2384	2401
Arithmetic mean of the apparent density (kg/m ³)	2388					



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8. Test Item: Chemical Resistance

Sample Description: See photo

Test Method: EN 14617-10:2012 Agglomerated stone - Test methods - Part 10: Determination of chemical resistance

Test Condition:

Specimens: 300mm×300mm×11mm, 4pcs, one face polished

Testing surface: polished

Water solutions preparation:

- 1) Hydrochloric acid solution, 50% (V/V), prepared from N hydrochloric acid solution
- 2) Sodium hydroxide solution, 50% (V/V), prepared from normal water sodium hydroxide not carbonated solution

The kind and intensity of the light source: CIE D65

Reflection direction of the light: 60°

Test Result:

Chemical resistance	Sample No.	Reference value	Classification
Hydrochloric acid solution (HCl)	1 (1h)	100.0%	C ₄ (see note)
	2 (8h)	99.8%	
Sodium hydroxide solution (NaOH)	3 (1h)	96.2%	
	4 (8h)	90.1%	

Note:

C₁: Agglomerated stones which keep below 60 % of the reference reflection values after 8 h of alkali or acid attack.

C₂: Agglomerated stones which keep between 60 % and 80 % of the reference reflection value after 8 h of alkali attack and 1 h of acid attack.

C₃: Agglomerated stones which keep between 60 % and 80 % of the reference reflection value after 8 h of acid attack and 1 h of alkali attack.

C₄: Agglomerated stones which keep at least 80 % of the reference reflection value after 8 h of acid or alkali attack(or if only in one specimen the attack is between 60% and 80%).



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9. Test Item: Dimensions, Geometric Characteristics and Surface Quality of Modular Tiles

Sample Description: See photo

Test Method: EN 14617-16:2005 Agglomerated stone - Test methods - Part 16: Determination of dimensions, geometric characteristics and surface quality of modular tiles

Test Condition:

Nominal size: 150mm×150mm×11mm, 10pcs

Test Result:

Test items		Test results
Length and width	Average dimension of 10 test specimens	150.62mm
	Deviation, as a percentage, of the average size of each tile from work sizes	0.39%~0.45% 0.58mm~0.67mm
Thickness	Average thickness of 10 test specimens	10.72mm
	The deviation, as a percentage, of the average thickness of each tile from the work size thickness	-3.36%~-2.09% -0.37mm~-0.23mm
Straightness		Maximum deviation from straightness, as a percentage, related to the corresponding work sizes -0.01%~0.01% -0.02mm~0.02mm
Rectangularity		Maximum deviation from Rectangularity, as a percentage, related to the corresponding work sizes -0.03%~0.04% -0.05mm~0.06mm
Flatness	Centre curvature	Maximum centre curvature, as a percentage, related to the diagonal calculated from the work sizes -0.01%~0.02% -0.02mm~0.04mm
	Edge curvature	Maximum edge curvature, as a percentage, related to the corresponding work sizes -0.01%~0.02% -0.02mm~0.03mm
	Warpage	Maximum warpage, as a percentage, related to the diagonal calculated from the work sizes -0.01%~0.02% -0.03mm~0.04mm
Surface quality		No defects



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10. Test Item: Linear thermal expansion coefficient

Sample Description: See photo

Test Method: EN 14617-11:2005 Agglomerated stone - Test methods - Part 11: Determination of linear thermal expansion coefficient

Test Condition:

Specimens: 150mm×150mm×10mm, 3pcs, one face polished

Heating rate: 3°C/min

Test Result:

Temperature: range from 30°C to 60°C.

Specimens identification No.	1	2	3
Linear thermal expansion coefficient (10 ⁻⁶ /°C)	23.3	16.5	21.3
Mean value(10 ⁻⁶ /°C)	20.4		

11. Test Item: Composition Analysis*

Test Method:

Fourier Transform Infrared Spectrometer (FTIR)

Energy dispersive X-ray fluorescence spectrometer (EDX)

Thermogravimetric Analyzer (TGA)

Test Result:

No.	Composition	Content, Wt%
1	Unsaturated Polyester (UP)	7
2	Quartz	93

Note:

1. Wt%- weight percent.
2. Quartz stands for crystalized silicon dioxide.
3. Quantitative data is for reference only.



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12. Test Item: Reaction to fire

Test Method:

This test is conducted as per EN 13501-1:2007+A1:2009 Fire classification of construction products and building elements-Part 1: Classification using data from reaction to fire tests.

And the test methods as following:

1. EN 13823:2010+A1:2014 Reaction to fire tests for building products - Building products excluding floorings exposed to the thermal attack by a single burning item.
2. EN ISO 1716:2010 Reaction to fire tests for products -Determination of the gross heat of combustion.

Mounting and fixing (For EN 13823:2010+A1:2014):

The specimen was tested free standing at a distance of at least 80 mm from the backing board. Both wings were clamped at the top and the bottom.

Test Results:

<u>Test method</u>	<u>Parameter</u>	<u>Number of tests</u>	<u>Results</u>
EN 13823:2010+A1:2014	FIGRA _{0.2MJ} (W/s)	3	24.0
	THR _{600s} (MJ)		1.0
	SMOGR _A (m ² /s ²)		0.4
	TSP _{600s} (m ²)		1.3
	LFS < edge of specimen		Yes
	Flaming particles or droplets		No
EN ISO 1716:2010	For homogeneous products: Heat of Combustion -PCS (MJ/kg)	3	1.9

Remark:

FIGRA-Fire growth rate index used for classification purposes [W/s]

For the classes A and B, FIGRA_{0.2MJ}

For the classes C and D, FIGRA_{0.4MJ}

LFS -Lateral flame spread m

THR_{600s}-Total heat release within 600 s MJ

SMOGR_A -Smoke growth rate [m²/s²]

TSP_{600s} -Total smoke production within 600 s m²

PCS -gross heat of combustion [MJ/kg or MJ/m²]

***** To be continued*****



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Classification and direct field of application

This classification has been carried out in accordance with **EN 13501-1:2007+A1:2009**.

Classification:

Fire behaviour		Smoke production			Flaming droplets
A1	—	s	1	,	d 0

Remark:

The classes with their corresponding fire performance are given in Table 1.

Reaction to fire classification is based on the 7-step scale of A1 to F, where A1 is good and F is bad

Statement:

The test results relate to the behaviour of the test specimens of a product under the particular conditions of the test; they are not intended to be the sole criterion for assessing the potential fire hazard of the product in use.

Warning:

This classification report does not represent type approval or certification of the product.

The test laboratory has, therefore, play no part in sampling the product for the test, although it holds appropriate references to the manufacturer's factory production control that is aimed to be relevant to the samples tested and that will provide for their traceability.

***** To be continued*****



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Table 1 — Classes of reaction to fire performance for construction products excluding floorings and linear pipe thermal insulation products.

Class	Test method(s)		Classification criteria	Additional classification
A1	EN ISO 1182 ^a	and	$\Delta T \leq 30^{\circ}\text{C}$, and $\Delta m \leq 50\%$, and $t_f = 0$ (i.e. no sustained flaming)	-
	EN ISO 1716		$PCS \leq 2.0\text{MJ/kg}$ ^a and $PCS \leq 2.0\text{MJ/kg}$ ^{b c} and $PCS \leq 1.4\text{MJ/m}^2$ ^d and $PCS \leq 2.0\text{MJ/kg}$ ^e	-
A2	EN ISO 1182 ^a or	and	$\Delta T \leq 50^{\circ}\text{C}$, and $\Delta m \leq 50\%$, and $t_f \leq 20\text{ s}$	-
	EN ISO 1716		$PCS \leq 3.0\text{MJ/kg}$ ^a and $PCS \leq 4.0\text{MJ/m}^2$ ^b and $PCS \leq 4.0\text{MJ/m}^2$ ^d and $PCS \leq 3.0\text{MJ/kg}$ ^e	-
	EN 13823		$FIGRA \leq 120\text{W/s}$ and $LFS < \text{edge of specimen}$ and $THR_{600s} \leq 7.5\text{MJ}$	Smoke production ^f and Flaming droplets/particles ^g
B	EN 13823	and	$FIGRA \leq 120\text{W/s}$ and $LFS < \text{edge of specimen}$ and $THR_{600s} \leq 7.5\text{MJ}$	Smoke production ^f and Flaming droplets/particles ^g
	EN ISO 11925-2 ⁱ Exposure = 30s		$F_s \leq 150\text{mm}$ within 60 s	
C	EN 13823	and	$FIGRA \leq 250\text{W/s}$ and $LFS < \text{edge of specimen}$ and $THR_{600s} \leq 15\text{MJ}$	Smoke production ^f and Flaming droplets/particles ^g
	EN ISO 11925-2 ⁱ Exposure = 30s		$F_s \leq 150\text{mm}$ within 60 s	
D	EN 13823	and	$FIGRA \leq 750\text{W/s}$	Smoke production ^f and Flaming droplets/particles ^g
	EN ISO 11925-2 ⁱ Exposure = 30s		$F_s \leq 150\text{mm}$ within 60 s	
E	EN ISO 11925-2 ⁱ Exposure = 15s		$F_s \leq 150\text{mm}$ within 20 s	flaming droplets/particles ^h
F	No performance determined			

***** To be continued*****



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