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POLAR WHITE

TEST REPORT

No. : XMCCM131201220-4.1
Date : Jan.24, 2014
Page: 1 of 9

FOSHAN VEMY BUILDING MATERIAL CO., LTD
NO.1 HUIYIN ROAD, SHEN CUN MECHANICAL AND PLASTICS ZONE, BAINI TOWN, SANSHUI DISTRICT, FOSHAN CITY, GUANGDONG PROVINCE, CHINA

The following sample(s) was/ were submitted and identified on behalf of the client as:

Sample Name	:	DIAMOND QUARTZ SURFACE
Stone type	:	ENGINEERED QUARTZ STONE
SGS Ref No.	:	XMML131205001
Manufacturer	:	FOSHAN VEMY BUILDING MATERIAL CO., LTD
Test required	:	Selected test(s) as requested by applicant
Date of Receipt	:	Dec.17, 2013
Test Period	:	Dec.17, 2013 to Jan.06, 2014

Test result(s) : For further details, please refer to the following page(s)

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

Signed for and on behalf of
SGS-CSTC Ltd.

Civi Huang
Xiamen Materials Lab Technical Supervisor

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TEST REPORT

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Summary of test results:
(Average value)

Test item(s)	Test method(s)	Test result(s)
Absorption by weight	ASTM C97/C97M-09	0.05 %
Density		2350 kg/m^3
Abrasion resistance (polished)	ASTM C241/C241M-13	51
Flexural strength	ASTM C880/C880M-09	Dry condition: 35.8 MPa
		Wet condition: 38.0 MPa
Compressive strength	ASTM C170/C170M-09	Dry condition: 199 MPa
		Wet condition: 192 MPa
Specular Gloss(60°)	ASTM D523-08	42.5
Linear shrinkage and coefficient of thermal expansion	ASTM C531-00	36×10^{-6}/℃
Mohs' hardness (polished)	EN 101:1991	7~8
Linear thermal expansion coefficient	Refer to ISO 10545-8:1994	35×10^{-6}/℃
Abrasion resistance of unglazed tiles (polished)	Refer to ISO 10545-6:2010	39 mm^3
Radioactivity	GB 6566-2010	Class A

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

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1. Absorption by weight and density

Test Method:

ASTM C97/C97M-09 Standard Test Methods for Absorption and Bulk Specific Gravity of Dimension Stone

Specimens: Agglomerated stone, 50mm×50mm×20mm, 5pcs, one face polished

Test Result:

Specimens identification No.	1	2	3	4	5
Absorption by weight (%)	0.06	0.05	0.05	0.05	0.05
Mean water absorption (%)	0.05				
Density (kg/m^3)	2350	2360	2350	2350	2350
Mean density (kg/m^3)	2350				

2. Abrasion resistance

Test Method:

ASTM C241/C241M-13 Standard Test Method for Abrasion Resistance of Stone Subjected to Foot Traffic

Specimens: Agglomerated stone, 50mm×50mm×20mm, 3pcs, one face polished

Test Result:

Testing face: polished

Specimens identification No.	1	2	3
Abrasive hardness	54	51	49
Mean abrasive hardness	51		

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TEST REPORT

3. Flexural strength

Test Method:

ASTM C880/C880M-09 Standard Test Method for Flexural Strength of Dimension Stone

Specimens: Agglomerated stone, 250mm×100mm×20mm, 3pcs, one face polished

Span: 200mm

Test Result:

Dry Condition:

Specimens identification No.	1	2	3	4	5
Individual flexural strength value (MPa)	37.1	37.4	34.5	33.4	36.8
Mean flexural strength value (MPa)	35.8				
Standard deviation(MPa)	1.8				

Wet Condition:

Specimens identification No.	1	2	3	4	5
Individual flexural strength value (MPa)	38.7	37.6	34.8	41.0	37.7
Mean flexural strength value (MPa)	38.0				
Standard deviation(MPa)	2.2				

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

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TEST REPORT

4. Compressive strength

Test Method:

ASTM C170/C170M-09 Standard Test Method for Compressive Strength of Dimension Stone

Specimens: 50mm×50mm×20mm, total 20pcs, one face polished, two samples 50mm×50mm×20mm were overlaid to form one specimen 50mm×50mm×40mm

Test Result:

Dry Condition:

Specimens identification No.	1	2	3	4	5
Individual compressive strength value (MPa)	196	199	197	200	202
Mean compressive strength value (MPa)	199				

Wet Condition:

Specimens identification No.	1	2	3	4	5
Individual compressive strength value (MPa)	188	194	192	195	191
Mean compressive strength value (MPa)	192				

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

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TEST REPORT

5. Specular gloss

Test Method:

ASTM D523-08 Standard Test Method for Specular Gloss

Specimens: Agglomerated stone, 250mm×250mm×20mm, 5pcs, one face polished

Testing surface: polished

Test Result:

Incidence angle: 60°

Specimens identification No.	1	2	3	4	5
Individual value	43.4	40.7	40.5	43.3	44.4
Mean value	42.5				

6. Linear shrinkage and coefficient of thermal expansion

Test Method:

ASTM C531-00(2012) Standard Test Method for Linear Shrinkage and Coefficient of Thermal Expansion of Chemical-Resistant Mortars, Grouts, Monolithic Surfacings, and Polymer Concretes[1]

Specimens: Agglomerated stone, 250mm×20mm×20mm, 4pcs, one face polished

Test Result:

Specimens identification No.	1	2	3	4
Individual value(10^{-6}/℃)	35	36	37	38
Mean value(10^{-6}/℃)	36			

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

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7. Mohs' hardness

Test Method:

Refer to EN 101:1991 Ceramic tiles: determination of scratch hardness of surface according to Mohs

Specimens: Agglomerated stone, 100mm×100mm×20mm, 3pcs, one face polished

Testing surface: polished

Test Result:

Specimens identification No.	1	2	3
Mohs' hardness	7~8	7~8	7~8
Mean value	7~8		

8. Linear thermal expansion coefficient

Test Method:

Refer to ISO 10545-8:1994 Ceramic tiles - Part 8: Determination of linear thermal expansion

Specimens: Agglomerated stone, 50mm×20mm×5mm, 2pcs, one face polished

Test Result:

Temperature: from 30℃ to 60℃.

Specimens identification No.	1	2
Linear thermal expansion coefficient (10^{-6}/℃)	36	34
Mean value(10^{-6}/℃)	35	

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

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9. Abrasion resistance of unglazed tiles

Test Method:

Refer to ISO 10545-6:2010 Ceramic tiles — Part 6: Determination of resistance to deep abrasion for unglazed tiles

Specimens: Agglomerated stone, 150mm×150mm×20mm, 5pcs, one face polished

Testing surface: polished

Test Result:

Specimens identification No.	1		2		3		4		5	
Individual volume (mm^3)	38	41	34	41	38	41	41	38	38	41
Mean volume (mm^3)	39									

10. Radioactivity

Sample description:

Agglomerated stone, see the photo

Test Method:

GB 6566-2010 Limit of radionuclides in building materials

Test result:

Test items	Requirement in Standard (requirements of Class A of GB 6566-2010)	Test Results
Internal exposure index I_{Ra}	I_{Ra}≤1.0	<0.1
External exposure index I_{γ}	I_{γ}≤1.3	<0.1

Specific activity of the nuclides

Nuclides	Units	Specific activity
Ra-226	Bq/kg	2.09
Th-232		1.47
K-40		5.13

Note: 1. The sample complies with requirements of GB 6566-2010 Class A decorative materials, it's unlimited in manufacture, selling and using.

2. The test was carried out by external laboratory assessed as competent.

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

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