

## TEST REPORT

No. : SHIN190300695CCM

Date : May. 08, 2019

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CUSTOMER NAME: HANGZHOU NABEL CHINA CO., LTD.  
ADDRESS: NO. 1133, LINPING ROAD, YUHANG DISTRICT, HANGZHOU CITY,  
ZHEJIANG PROVINCE, CHINA

Sample Name : PORCELAIN SLAB  
Product specification : 1600×3200×12mm (H3216630)  
1600×3200×5.8mm (H3216630Q)

Above information and sample(s) was/were submitted and confirmed by the client. SGS, however, assumes no responsibility to verify the accuracy, adequacy and completeness of the sample information provided by client.

\*\*\*\*\*

Test Required : Please see the next page(s)  
Test Method : Please see the next page(s)  
Date of Receipt : Mar. 18, 2019  
Testing Start Date : Mar. 18, 2019  
Testing End Date : Apr. 28, 2019  
Test result(s) : For further details, please refer to the following page(s)  
(Unless otherwise stated the results shown in this test report refer only to the sample(s) tested)

Signed for  
SGS-CSTC Standards Technical  
Services ( Shanghai ) Co., Ltd.



Tiffany Liu  
Authorized signatory



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Summary of Result(s):

No.	Test Item	Test Method	Result	Conclusion
5.8mm				
1	Water absorption	With reference to EN 14411:2016 & EN ISO 10545-3:1997 Boiling method	0.051%	/
2	Breaking strength	EN 14411:2016 & EN ISO 10545-4:2014	995.8N	/
	Modulus of rupture		52.3 N/mm <sup>2</sup>	/
3	Coefficient of linear thermal expansion	EN 14411:2016 & EN ISO 10545-8:2014	See result	/
4	Resistance to thermal shock	EN 14411:2016 & EN ISO 10545-9:2013	No visible defects	/
5	Frost resistance	With reference to EN 14411:2016 & EN ISO 10545-12:1997	No visible defects	/
6	Resistance to chemicals	EN 14411:2016 & EN ISO 10545-13:2016	See result	/
7	Resistance to staining	EN 14411:2016 & EN ISO 10545-14:2015	Class 5	/
8	Mohs' hardness	EN 15771:2010	6	/
9	Reaction to fire	EN 13501-1:2007+A1:2009	A1	/
10	Abrasion resistance of unglazed tiles	EN 14411:2016 & EN ISO 10545-6:2012	86 mm <sup>3</sup>	/
11	Leachable Lead and Cadmium	With reference to EN 14411:2016 & EN ISO10545-15:1997	See result	/
12	Impact resistance	EN 14411:2016 & EN ISO 10545-5:1996/Cor 1:1997	0.83	/



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No.	Test Item	Test Method	Result	Conclusion
12mm				
13	Water absorption	With reference to EN 14411:2016 & EN ISO 10545-3:1997 Boiling method	0.022%	/
14	Breaking strength	EN 14411:2016 & EN ISO 10545-4:2014	4836.3N	/
	Modulus of rupture		54.3N/mm <sup>2</sup>	
15	Coefficient of linear thermal expansion	EN 14411:2016 & EN ISO 10545-8:2014	See result	/
16	Resistance to thermal shock	EN 14411:2016 & EN ISO 10545-9:2013	No visible defects	/
17	Frost resistance	With reference to EN 14411:2016 & EN ISO 10545-12:1997	No visible defects	/
18	Resistance to chemicals	EN 14411:2016 & EN ISO 10545-13:2016	See result	/
19	Resistance to staining	EN 14411:2016 & EN ISO 10545-14:2015	Class 5	/
20	Mohs' hardness	EN 15771:2010	6	/
21	Abrasion resistance of unglazed tiles	EN 14411:2016 & EN ISO 10545-6:2012	89 mm <sup>3</sup>	/
22	Leachable Lead and Cadmium	With reference to EN 14411:2016 & EN ISO10545-15:1997	See result	/
23	Impact resistance	EN 14411:2016 & EN ISO 10545-5:1996/Cor 1:1997	0.88	/

Note: Pass: Meet the requirements;

Fail: Does not meet the requirements;

/: Not Apply to the judgment.



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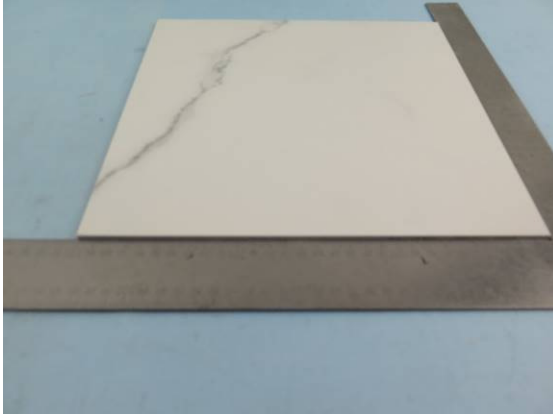
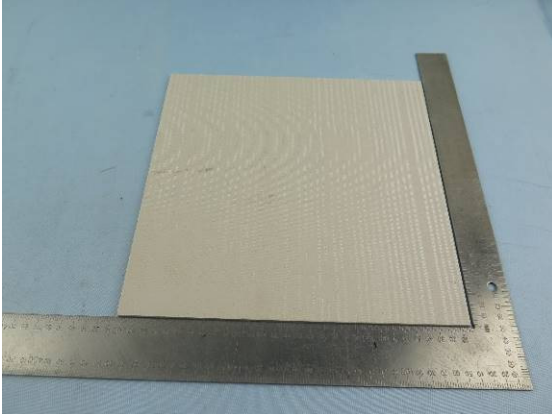
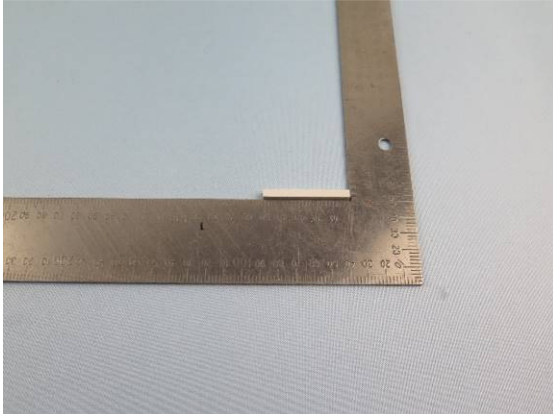
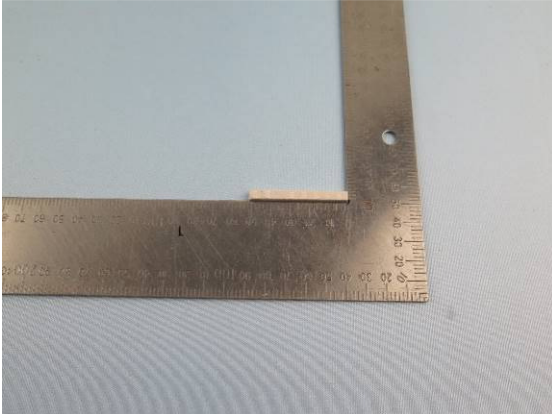
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Original sample photo(s):

	
<p>5.8mm: Water absorption / Breaking strength &amp; Modulus of rupture / Resistance to thermal shock / Frost resistance / Resistance to chemicals / Resistance to staining / Mohs' hardness – Front view</p>	<p>5.8mm: Water absorption / Breaking strength &amp; Modulus of rupture / Resistance to thermal shock / Frost resistance / Resistance to chemicals / Resistance to staining / Mohs' hardness -Back view</p>
	
<p>5.8mm: Coefficient of linear thermal expansion – Front view</p>	<p>5.8mm: Coefficient of linear thermal expansion - Back view</p>



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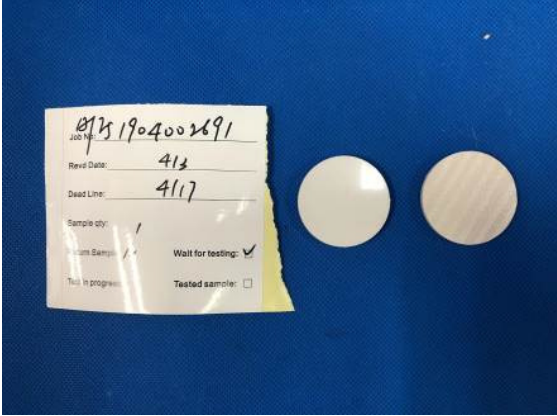

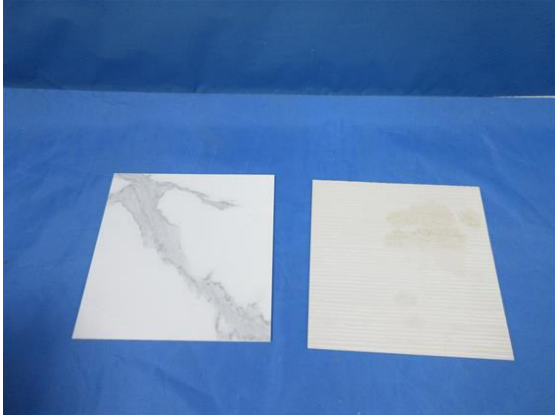
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<p>5.8mm: Reaction to fire</p>	<p>5.8mm: Abrasion resistance of unglazed tiles</p>
	
<p>5.8mm: Leachable Lead and Cadmium / Impact resistance</p>	



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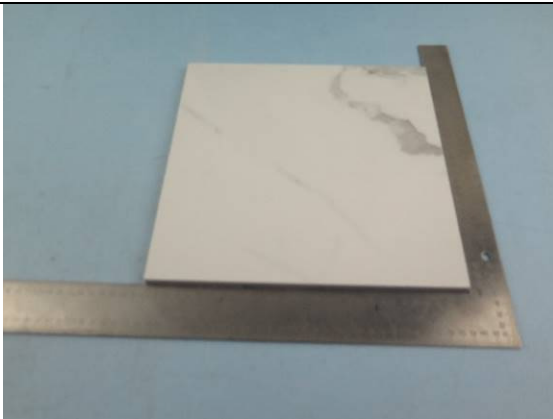
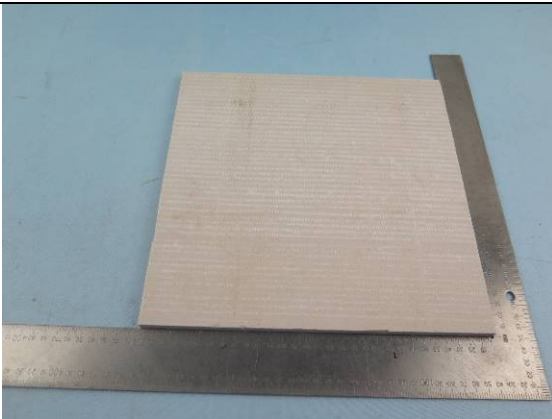
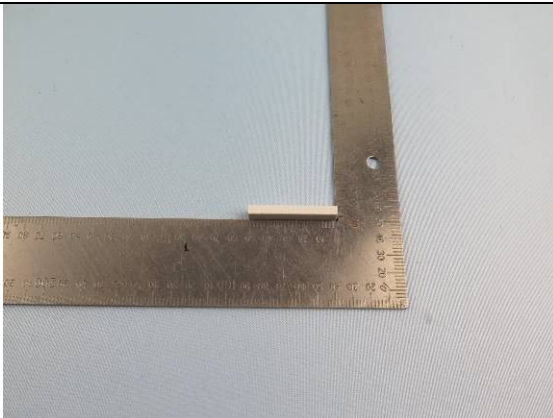
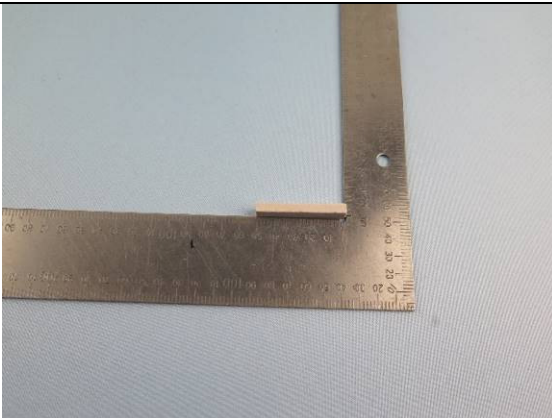
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<p>12mm: Water absorption / Breaking strength &amp; Modulus of rupture / Resistance to thermal shock / Frost resistance / Resistance to chemicals / Resistance to staining / Mohs' hardness - Front view</p>	<p>12mm: Water absorption / Breaking strength &amp; Modulus of rupture / Resistance to thermal shock / Frost resistance / Resistance to chemicals / Resistance to staining / Mohs' hardness – Back view</p>
	
<p>12mm: Coefficient of linear thermal expansion - Front view</p>	<p>12mm: Coefficient of linear thermal expansion – Back view</p>



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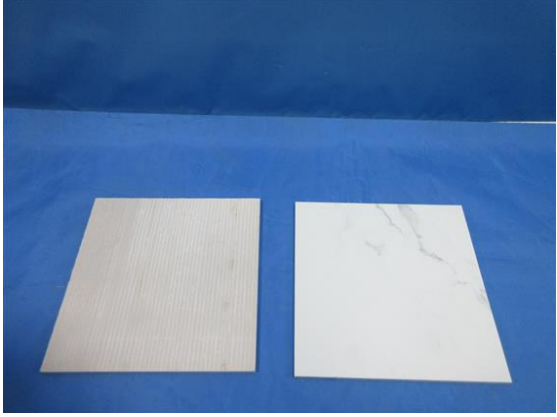
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<p>12mm: Abrasion resistance of unglazed tiles</p>	<p>12mm: Leachable Lead and Cadmium / Impact resistance</p>



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1. Test item: Water absorption

Test method: With reference to EN 14411:2016 & ISO 10545-3:1997 Boiling method

Test condition:

Specimen: 300mm×300mm×5.8mm, 5pcs

Dry condition: 110°C

Boiling condition: 100°C, 2h

Lab environmental condition: 23±2°C, 50±5%RH

Test result:

Test item	Test result					
	Individual value					Average value
Water absorption (%)	0.052	0.072	0.059	0.027	0.045	0.051

2. Test item: Breaking strength and Modulus of rupture

Test method: EN 14411:2016 & EN ISO 10545-4:2014

Test condition:

Specimen: 300mm×300mm×5.8mm, 7pcs

Dry condition: 110°C

Test span: 280mm

Test rate: 4mm/min

Lab environmental condition: 23±2°C, 50±5%RH

Test result:

Test item	Test result							
	Individual value							Average value
Breaking strength (N)	916.6	913.2	974.4	1097.4	1003.5	941.7	1124.0	995.8
Modulus of rupture (N/mm <sup>2</sup> )	48.9	48.8	52.4	55.0	54.0	50.9	56.3	52.3



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### 3. Test item: Coefficient of linear thermal expansion

Test method: EN 14411:2016 & EN ISO 10545-8:2014

Test condition:

Specimen: 50mm×5.1mm×5.8mm, 2pcs

Heating rate: 5°C /min

Lab environmental condition: 23±2°C, 50±5%RH

Test result:

Test item	Test result	
Coefficient of linear thermal expansion ( $10^{-6}/^{\circ}\text{C}$ )	5.0	4.9

### 4. Test item: Resistance to thermal shock

Test method: EN 14411:2016 & EN ISO 10545-9:2013

Test condition:

Specimen: 300mm×300mm×5.8mm, 5pcs

Test condition: Immersion in water at 15°C for 5min, then drying at 145°C for 20min

Cycles: 10

Lab environmental condition: 23±2°C, 50±5%RH

Test result:

Test item	Test result
Resistance to thermal shock	No visible defects



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5. Test item: Frost resistance

Test method: With reference to EN 14411:2016 & EN ISO 10545-12:1997

Test condition:

Specimen: 300mm×300mm×5.8mm, 10pcs

Lab environmental condition: 23±2°C, 50±5%RH

Test result:

Test item	Test result
Frost resistance	No visible defects

6. Test item: Resistance to chemicals

Test method: EN 14411:2016 & EN ISO 10545-13:2016

Test condition:

Specimen: 300mm×300mm×5.8mm, 25pcs

Lab environmental condition: 23±2°C, 50±5%RH

Test result:

Test item	Test result
hydrochloric acid solution 3% (V/V)	CLASS LA
Citric acid solution (100g/L)	CLASS LA
Potassium hydroxide solution (30g/L)	CLASS LA
Household chemicals: Ammonium chloride solution (100g/L)	CLASS A
Swimming pool salts: Sodium hypochlorite solution (20mg/L)	CLASS A



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7. Test item: Resistance to staining

Test method: EN 14411:2016 & EN ISO 10545-14:2015

Test condition:

Specimen: 300mm×300mm×5.8mm, 15pcs

Lab environmental condition: 23±2°C, 50±5%RH

Test result:

Test item		Test result
Resistance to staining	Lodine:13 g/L solution in alcohol	Class 5
	Green staining agent in light oil	Class 5
	Olive oil	Class 5

8. Test item: Mohs' hardness

Test method: EN 15771:2010

Test condition:

Specimen: 300mm×300mm×5.8mm, 3pcs

Lab environmental condition: 23±2°C, 50±5%RH

Test result:

Test item	Test result
Mohs' hardness	No scratch: 6
	Scratch: 7
	Mohs' hardness: 6

Scale: 1-Talc; 2- Gypsum; 3- Calcite; 4- Fluorspar; 5- Apatite; 6- Feldspar; 7- Quartz; 8- Topaz; 9- Corundum; 10- Diamond.



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### 9. Test item: Reaction to fire

#### I. Test conducted

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 ISO 1182:2010 Reaction to fire tests for building products — Non-combustibility test.
- 2) EN ISO 1716:2010 Reaction to fire tests for building products — Determination of the heat of combustion.

#### II. Details of classified product

Sample description	Ceramic tile
Color	White

#### III. Test results

Test method	Parameter	Number of tests	Results
EN ISO 1182 <sup>a</sup>	$\Delta T/K$	5	1.8
	$\Delta m/\%$		1.3
	t/s		0
EN ISO 1716	PCS/ MJ/kg <sup>a</sup>	3	0.05
	PCS/ MJ/kg <sup>b</sup>		-
	PCS/ MJ/m <sup>2</sup> <sup>d</sup>		-
	PCS/ MJ/kg <sup>e</sup>		-

#### Note:

$\Delta T$  — temperature rise [K]

$\Delta m$  — mass loss [%]

t<sub>f</sub> — duration of sustained flaming [s]

PCS — gross calorific potential [MJ/kg or MJ/m<sup>2</sup>]



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#### IV. Classification and direct field of application

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

Conclusion: The product, ceramic tile, classification is as following,

Reaction to fire classification: A1

Remark: The classes with their corresponding fire performance are given in annex A.

#### STATEMENT:

This declaration of conformity is only based on the result of this laboratory activity, the impact of the uncertainty of the results was not included.

The test results relate to the behavior 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.

Note: The test was performed by SGS-CSTC Standards Technical Services Co., Ltd. Anji Branch Testing Center.



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Annex A 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 <sup>a</sup> 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	$\text{PCS} \leq 2.0\text{MJ/kg}$ <sup>a</sup> and $\text{PCS} \leq 2.0\text{MJ/kg}$ <sup>b,c</sup> and $\text{PCS} \leq 1.4\text{MJ/m}^2$ <sup>d</sup> and $\text{PCS} \leq 2.0\text{MJ/kg}$ <sup>e</sup>	-
A2	EN ISO 1182 <sup>a</sup> or	and $\Delta T \leq 50^\circ\text{C}$ , and $\Delta m \leq 50\%$ , and $t_f \leq 20\text{ s}$	-
	EN ISO 1716		
	EN 13823	$\text{FIGRA} \leq 120\text{W/s}$ and $\text{LFS} < \text{edge of specimen}$ and $\text{THR}_{600\text{s}} \leq 7.5\text{MJ}$	Smoke production <sup>f</sup> and Flaming droplets/particles <sup>g</sup>
B	EN 13823 and	$\text{FIGRA} \leq 120\text{W/s}$ and $\text{LFS} < \text{edge of specimen}$ and $\text{THR}_{600\text{s}} \leq 7.5\text{MJ}$	Smoke production <sup>f</sup> and Flaming droplets/particles <sup>g</sup>
	EN ISO 11925-2 <sup>i</sup> Exposure = 30s	$\text{Fs} \leq 150\text{mm}$ within 60s	
C	EN 13823 and	$\text{FIGRA} \leq 250\text{W/s}$ and $\text{LFS} < \text{edge of specimen}$ and $\text{THR}_{600\text{s}} \leq 15\text{MJ}$	Smoke production <sup>f</sup> and Flaming droplets/particles <sup>g</sup>
	EN ISO 11925-2 <sup>i</sup> Exposure = 30s	$\text{Fs} \leq 150\text{mm}$ within 60 s	



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Class	Test method(s)	Classification criteria	Additional classification
D	EN 13823 and	FIGRA $\leq$ 750W/s	Smoke production <sup>f</sup> and
	EN ISO 11925-2 <sup>i</sup> Exposure=30s	F <sub>s</sub> $\leq$ 150mm within 60 s	Flaming droplets/particles <sup>g</sup>
E	EN ISO 11925-2 <sup>i</sup> Exposure =15s	F <sub>s</sub> $\leq$ 150mm within 20 s	flaming droplets/particles <sup>h</sup>
F	No performance determined		

<sup>a</sup> For homogeneous products and substantial components of non-homogeneous products.  
<sup>b</sup> For any external non-substantial component of non-homogeneous products.  
<sup>c</sup> Alternatively, any external non-substantial component having a PCS  $\leq$  2,0 MJ/m<sup>2</sup>, provided that the product satisfies the following criteria of EN 13823: FIGRA  $\leq$  20 W/s, and LFS < edge of specimen, and THR<sub>600s</sub>  $\leq$  4,0 MJ, and s1, and d0.  
<sup>d</sup> For any internal non-substantial component of non-homogeneous products.  
<sup>e</sup> For the product as a whole.  
<sup>f</sup> In the last phase of the development of the test procedure, modifications of the smoke measurement system have been introduced, the effect of which needs further investigation. This may result in a modification of the limit values and/or parameters for the evaluation of the smoke production.  
s1 = SMOGRA  $\leq$  30m<sup>2</sup>/s<sup>2</sup> and TSP<sub>600s</sub>  $\leq$  50m<sup>2</sup>; s2 = SMOGRA  $\leq$  180m<sup>2</sup>/s<sup>2</sup> and TSP<sub>600s</sub>  $\leq$  200m<sup>2</sup>;  
s3 = not s1 or s2  
<sup>g</sup> d0 = No flaming droplets/ particles in EN 13823 within 600 s;  
d1 = no flaming droplets/ particles persisting longer than 10 s in EN 13823 within 600 s;  
d2 = not d0 or d1.  
Ignition of the paper in EN ISO 11925-2 results in a d2 classification.  
<sup>h</sup> Pass = no ignition of the paper (no classification);  
Fail = ignition of the paper (d2 classification).  
<sup>i</sup> Under conditions of surface flame attack and, if appropriate to the end-use application of the product, edge flame attack.



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10. Test item: Abrasion resistance of unglazed tiles

Test method: EN 14411:2016 & EN ISO 10545-6:2012

Sample description: ceramic tiles, 150mm×100mm×5.8mm cut from original samples, 5pcs.

Test result(s):

Specimens identification No.	1		2		3		4		5	
Individual volume (mm <sup>3</sup> )	77	83	102	95	72	77	89	83	89	95
Mean volume (mm <sup>3</sup> )	86									

Note: The test was performed by SGS-CSTC Standards Technical Services Co., Ltd. Xiamen Branch Testing Center.



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11. Test item: Leachable Lead and Cadmium

Test Part Description: White w/ gray ceramic

Test Method: With reference to EN 14411:2016 & EN ISO10545-15:1997, analysis was performed by ICP-OES.

Test Results:

	Vol. of 4%HAc used(mL)	Area (dm <sup>2</sup> )
1	3108	18.61
2	3108	18.61
3	3108	18.61

	Leachable Lead (mg/dm <sup>2</sup> )	Leachable Cadmium (mg/dm <sup>2</sup> )
1	<0.1	<0.01
2	<0.1	<0.01
3	<0.1	<0.01

Note: 1. mg/dm<sup>2</sup> = milligram per square decimeter

2. mg/kg = milligram per kilogram

3. °C = degree Celsius

4. < = less than

5. MDL = Method Detection Limit

6. ND = Not Detected ( < MDL)

Note: The test was performed by SGS-CSTC Standards Technical Services Co., Ltd. Guangzhou Branch Testing Center.

12. Test item: Impact resistance

Test Part Description: White w/ gray ceramic

Test Method: EN 14411:2016 & EN ISO 10545-5:1996/Cor 1:1997

Test Results: 0.83

Note: The test was carried out by INSPECTION AND QUARANTINE COMPREHENSIVE TECHNOLOGY CENTRE OF FOSHAN ENTRY-EXIT INSPECTION & QUARANTINE BUREAU.



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13. Test item: Water absorption

Test method: With reference to EN 14411:2016 & EN ISO 10545-3:1997 Boiling method

Test condition:

Specimen: 300mm×300mm×12mm, 5pcs

Dry condition: 110°C

Boiling condition: 100°C, 2h

Lab environmental condition: 23±2°C, 50±5%RH

Test result:

Test item	Test result					
	Individual value					Average value
Water absorption (%)	0.028	0.028	0.012	0.024	0.016	0.022

14. Test item: Breaking strength and Modulus of rupture

Test method: EN 14411:2016 & EN ISO 10545-4:2014

Test condition:

Specimen: 300mm×300mm×12mm, 7pcs

Dry condition: 110°C

Test span: 280mm

Test rate: 4mm/min

Lab environmental condition: 23±2°C, 50±5%RH

Test result:

Test item	Test result							
	Ind.							Ave.
Breaking strength (N)	5187.1	4762.2	4651.0	5034.4	4896.7	4584.8	4738.1	4836.3
Modulus of rupture (N/mm <sup>2</sup> )	58.0	53.6	51.0	56.2	55.4	52.5	53.3	54.3



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15. Test item: Coefficient of linear thermal expansion

Test method: EN 14411:2016 & EN ISO 10545-8:2014

Test condition:

Specimen: 50mm×5.4mm×12mm, 2pcs

Heating rate: 5°C /min

Lab environmental condition: 23±2°C, 50±5%RH

Test result:

Test item	Test result	
Coefficient of linear thermal expansion (10 <sup>-6</sup> /°C)	5.0	5.1

16. Test item: Resistance to thermal shock

Test method: EN 14411:2016 & EN ISO 10545-9:2013

Test condition:

Specimen: 300mm×300mm×12mm, 5pcs

Test condition: Immersion in water at 15°C for 5min, then drying at 145°C for 20min

Cycles: 10

Lab environmental condition: 23±2°C, 50±5%RH

Test result:

Test item	Test result
Resistance to thermal shock	No visible defects



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17. Test item: Frost resistance

Test method: With reference to EN 14411:2016 & EN ISO 10545-12:1997

Test condition:

Specimen: 300mm×300mm×12mm, 10pcs

Lab environmental condition: 23±2°C, 50±5%RH

Test result:

Test item	Test result
Frost resistance	No visible defects

18. Test item: Resistance to chemicals

Test method: EN 14411:2016 & EN ISO 10545-13:2016

Test condition:

Specimen: 300mm×300mm×12mm, 25pcs

Lab environmental condition: 23±2°C, 50±5%RH

Test result:

Test item	Test result
hydrochloric acid solution 3% (V/V)	CLASS LA
Citric acid solution (100g/L)	CLASS LA
Potassium hydroxide solution (30g/L)	CLASS LA
Household chemicals: Ammonium chloride solution (100g/L)	CLASS A
Swimming pool salts: Sodium hypochlorite solution (20mg/L)	CLASS A



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19. Test item: Resistance to staining

Test method: EN 14411:2016 & EN ISO 10545-14:2015

Test condition:

Specimen: 300mm×300mm×12mm, 15pcs

Lab environmental condition: 23±2°C, 50±5%RH

Test result:

Test item		Test result
Resistance to staining	Lodine:13 g/L solution in alcohol	Class 5
	Green staining agent in light oil	Class 5
	Olive oil	Class 5

20. Test item: Mohs' hardness

Test method: EN 15771:2010

Test condition:

Specimen: 300mm×300mm×12mm, 3pcs

Lab environmental condition: 23±2°C, 50±5%RH

Test result:

Test item	Test result
Mohs' hardness(polished)	No scratch: 6
	Scratch: 7
	Mohs' hardness: 6

Scale: 1-Talc; 2- Gypsum; 3- Calcite; 4- Fluorspar; 5- Apatite; 6- Feldspar; 7- Quartz; 8- Topaz; 9- Corundum; 10- Diamond.



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21. Test item: Abrasion resistance of unglazed tiles

Test method: EN 14411:2016 & EN ISO 10545-6:2012

Sample description: Ceramic tiles, 150mm×100mm×12mm cut from original samples, 5pcs.

Test result(s):

Specimens identification No.	1		2		3		4		5	
Individual volume (mm <sup>3</sup> )	89	89	95	89	89	83	89	89	89	89
Mean volume (mm <sup>3</sup> )	89									



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Testing Center Commercial Construction Material Laboratory

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22. Test item: Leachable Lead and Cadmium

Test Part Description: White w/ gray ceramic

Test Method: With reference to EN 14411:2016 & EN ISO10545-15:1997, analysis was performed by ICP-OES.

### Test Results:

	Vol. of 4%HAc used(mL)	Area (dm <sup>2</sup> )
1	3210	19.22
2	3210	19.22
3	3210	19.22

	Leachable Lead (mg/dm <sup>2</sup> )	Leachable Cad- mium(mg/dm <sup>2</sup> )
1	<0.1	<0.01
2	<0.1	<0.01
3	<0.1	<0.01

Note: 1. mg/dm<sup>2</sup> = milligram per square decimeter

2. mg/kg = milligram per kilogram

3. °C = degree Celsius

4. < = less than

5. MDL = Method Detection Limit

6. ND = Not Detected ( < MDL)

Note: The test was performed by SGS-CSTC Standards Technical Services Co., Ltd. Guangzhou Branch Testing Center.



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23. Test item: Impact resistance

Test Part Description: White w/ gray ceramic

Test Method: EN 14411:2016 & EN ISO 10545-5:1996/Cor 1:1997

Test Results: 0.88

Note: The test was carried out by INSPECTION AND QUARANTINE COMPREHENSIVE TECHNOLOGY CENTRE OF FOSHAN ENTRY-EXIT INSPECTION & QUARANTINE BUREAU.

\*\*\*\*\* End of report\*\*\*\*\*

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