

# TEST REPORT

No. : XMCCM161201715

Date : Jul.18, 2017

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CUSTOMER NAME: GONMAR (XIAMEN) TRADING CO., LTD  
ADDRESS: ROOM 706, NO.668 XIAHE ROAD, XIAMEN, FUJIAN, CHINA CODE:361004

Commercial Name : QUARTZITE  
Petrographic Name : QUARTZ-BEARING MARBLE  
Typical colour : BEIGE, WHITE  
Manufacturer : GONMAR (XIAMEN) TRADING CO., LTD  
Manufacturer address : ROOM 706, NO.668 XIAHE ROAD, XIAMEN, FUJIAN, CHINA CODE:361004  
Place of origin : CHINA  
Name of quarry : GONMAR QUARRY  
Address of quarry : XISHANBEI VILLAGE, YI COUNTY, BAODING CITY, HEBEI PROVINCE, CHINA  
Intended use : Internal & external wall, flooring and stairs  
External uses and road finishes to cover external pedestrian and vehicular circulation areas

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 : EN 12057:2015 Natural stone products - Modular tiles - Requirements  
EN 12058:2015 Natural stone products - Slabs for floors and stairs - Requirements  
EN 1469:2015 Natural stone products - Slabs for cladding - Requirements  
EN 1341:2012 Slabs of natural stone for external paving - Requirements and test methods  
EN 1342:2012 Setts of natural stone for external paving - Requirements and test methods  
EN 1343:2012 Kerbs of natural stone for external paving - Requirements and test methods  
Date of Receipt : Feb.08, 2017  
Testing Start Date : Feb.08, 2017  
Testing End Date : Jul.18, 2017  
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)

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

Signed for  
SGS-CSTC Standards Technical  
Services Co., Ltd. XM Branch

Civi Huang Authorized Signatory



SGS-CSTC Standards Technical Services Co., Ltd.  
Xiamen Branch Testing Center Commercial Construction Material Laboratory

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## Summary of test results:

(Average value)

Test items	Test methods	Test results	Page
Apparent density	EN 1936:2006	2700 kg/m <sup>3</sup>	3
Open porosity	EN 1936:2006	0.33 %	3
Water absorption	EN 13755:2008	0.12 %	3
Flexural strength in natural condition	EN 12372:2006	15.9 MPa	4
Flexural strength after 56 cycles freeze/thaw	EN 12371:2010 EN 12372:2006	15.4 MPa	4
Abrasion resistance (sawn)	EN 14157:2004 method A	31.5 mm	5
Slip resistance (sawn)	CEN/TS 16165:2012 Annex C EN 14231:2003	SRV "dry": 78 SRV "wet": 70	5
Compressive strength in natural condition	EN 1926:2006	88 MPa	6
Compressive strength after 56 cycles freeze/thaw	EN 12371:2010 EN 1926:2006	93 MPa	6
Breaking load at dowel hole	EN 13364:2001	1395 N	7
Petrographic description	EN 12407:2007	QUARTZ-BEARING MARBLE	8

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



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## 1. Apparent density and open porosity

### Test Method:

EN 1936:2006 Natural stone test methods - Determination of real density and apparent density and of total and open porosity

Specimens: 6 cubes having 50mm edge, all specimens are in natural condition with sawn faces

### Test Result:

Specimens identification No.	1	2	3	4	5	6
Apparent density (kg/m <sup>3</sup> )	2700	2700	2700	2710	2710	2710
Arithmetic mean of the apparent density (kg/m <sup>3</sup> )	2700					
Open porosity (%)	0.32	0.32	0.33	0.49	0.26	0.25
Arithmetic mean of the open porosity (%)	0.33					

## 2. Water absorption

### Test Method:

EN 13755:2008 Natural stone test methods - Determination of water absorption at atmospheric pressure

Specimens: 6 cubes having 50mm edge, all specimens are in natural condition with sawn faces

### Test Result:

Specimens identification No.	1	2	3	4	5	6
Water absorption (%)	0.14	0.12	0.14	0.16	0.12	0.07
Arithmetic mean of the water absorption (%)	0.12					

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3. Flexural Strength in natural condition and subjected to frost test

**Test Method:**

EN 12372:2006 Natural stone test methods - Determination of flexural strength under concentrated load

EN 12371:2010 Natural stone test methods - Determination of frost resistance

Specimens: 300mm×50mm×50mm, 21pcs, all specimens are in natural condition with sawn faces

Loading rate: (0.25±0.05)MPa/s

**Test Result:**

Flexural strength in natural condition

Specimens identification No.	1	2	3	4	5	6	7	8	9	10
Flexural strength (MPa)	10.2	13.7	14.6	12.2	12.5	16.2	14.5	24.1	17.4	23.8
Mean value (MPa)	15.9									
Standard deviation (MPa)	4.7									
Lower expected value (MPa)	8.6									

Visual inspection after 56 freezing and thawing cycles: Scale 0, sample intact.

Flexural strength after 56 freezing and thawing cycles

Specimens identification No.	1	2	3	4	5	6	7	8	9	10
Flexural strength (MPa)	12.0	12.7	23.4	22.4	11.4	14.6	12.1	17.2	6.6	21.1
Mean value (MPa)	15.4									
Standard deviation (MPa)	5.6									
Lower expected value (MPa)	6.4									

Change in flexural strength after 56 cycles of freeze/thaw: 3.1%

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



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## 4. Abrasion resistance

### Test Method:

EN 14157:2004 Natural stone - Determination of abrasion resistance Method A - Wide wheel Abrasion Test

Specimens: 150mm×100mm×20mm, 6pcs, all specimens are in natural condition with sawn faces

Testing surface: sawn

### Test Result:

Specimens identification No.	1	2	3	4	5	6
The length of the groove (mm)	30.5	35.5	31.5	32.0	29.5	30.0
Mean value (mm)	31.5					

## 5. Slip resistance

### Test Method:

CEN/TS 16165:2012 Determination of slip resistance of pedestrian surfaces - Methods of evaluation -

Annex C - Pendulum friction test

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

Specimens: 200mm×150mm×20mm, 6pcs, all specimens are in natural condition with sawn faces

Slider material: Slider 55 rubber

Testing surface: sawn

### Test Result:

Specimens identification No.	1	2	3	4	5	6
Mean pendulum value (Dry condition)	79	78	78	77	79	79
Slip resistance value (SRV "dry")	78					
Mean pendulum value (Wet condition)	70	70	69	69	70	70
Slip resistance value (SRV "wet")	70					

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



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6. Compressive strength in natural condition and subjected to frost test

**Test Method:**

EN 1926:2006 Natural stone test methods - Determination of uniaxial compressive strength

EN 12371:2010 Natural stone test methods - Determination of frost resistance

Specimens: 50mm×50mm×50mm, 21pcs, all specimens are in natural condition with sawn faces

Loading rate: (1±0.5) MPa/s

**Test Result:**

Compressive strength in natural condition

Specimens identification No.	1	2	3	4	5	6	7	8	9	10
Compressive strength (MPa)	76	95	75	139	88	130	81	65	61	65
Mean value (MPa)	88									
Standard deviation (MPa)	27									
Lower expected value (MPa)	47									

Visual inspection after 56 freezing and thawing cycles: Scale 0, sample intact.

Compressive strength after 56 freezing and thawing cycles

Specimens identification No.	1	2	3	4	5	6	7	8	9	10
Compressive strength (MPa)	132	93	85	80	73	77	88	111	95	96
Mean value (MPa)	93									
Standard deviation (MPa)	18									
Lower expected value (MPa)	63									

Change in compressive strength after 56 cycles of freeze/thaw: -5.7%

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



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## 7. Breaking load at dowel hole

### Test Method:

EN 13364:2001 Natural stone test methods - Determination of the breaking load at dowel hole

Specimens: 200mm×200mm×30mm, 3pcs, 4 holes were drilled on each specimen, all specimens are in natural condition with sawn faces

Diameter of the hole: 10mm, Diameter of the dowel: 8mm

Loading rate: (50±5) N/s

### Test Result:

Specimens identification No.	d <sub>1</sub> (mm)	b <sub>A</sub> (mm)	Breaking load F (N)
1	Hole 1	9	850
	Hole 2	9	1050
	Hole 3	9	1100
	Hole 4	9	1050
2	Hole 1	9	1150
	Hole 2	9	950
	Hole 3	11	1300
3	Hole 1	11	2450
	Hole 2	11	2400
	Hole 3	9	1650
Mean value	10	56	1395
Lower expected value	/	/	597
Standard deviation	/	/	585

d<sub>1</sub>: Distance from the hole to the face

b<sub>A</sub>: Maximum distance from the centre of the hole to the edge of the fracture

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



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## 8. Petrographical description

### Test Method:

EN 12407:2007 Natural stone test methods - Petrographic examination

### Test Result:

**CLASSIFICATION: Quartz-bearing Marble**

### HAND SAMPLE DESCRIPTION

Strong, fresh, white, moderately hard. When it is reaction with alizarin red, it bubbles strongly and will stain with a dark red colour after washed by water.

### MICROSCOPIC DESCRIPTION

Texture	Schistose-granular blastic texture
Structure	Directional structure
Major mineral	Calcite (90-95%), Quartz( 5-10%), Biotite (small amount), Muscovite(small amount)
Accessory mineral	Metallic(Opaque) particles
Secondary mineral	/

MATERIAL COMPONENT	PETROGRAPHIC DETAILS
Calcite	Xenomorphic granular, which grain sizes are usually 0.1-0.5mm, partially 0.5-1.5mm, It is body of the rock. mosaic distribution, directional arrangement.
Quartz	Xenomorphic granular, which grain sizes are 0.05-0.45mm. mosaic distribution.
Biotite and Muscovite	Schistose, which grain sizes are 0.2-0.5mm. scattered distribution, directional arrangement.

### Alterations:

Note. Almost all of the calcite and quartz take on mosaic distribution and almost all calcite take on directional arrangement. Beyond moderate alteration the rock may be reclassified.

### Remarks:

The rock is composed of calcite, quartz, biotite and muscovite. Because of metamorphism, it turns into parametamorphic rocks from sedimentary rocks. According to the mineral component,content and texture of the rock, we named it **Quartz-bearing marble**. The rock is metamorphic rocks

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





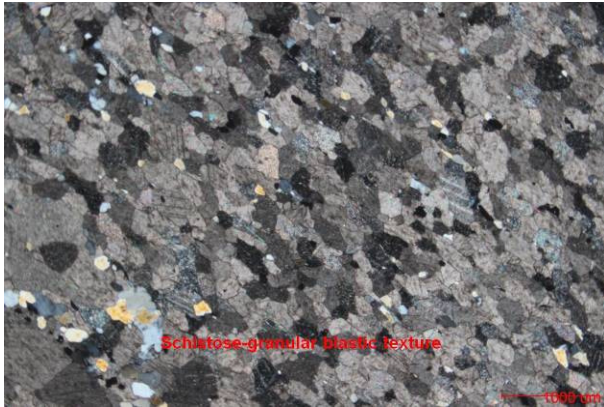
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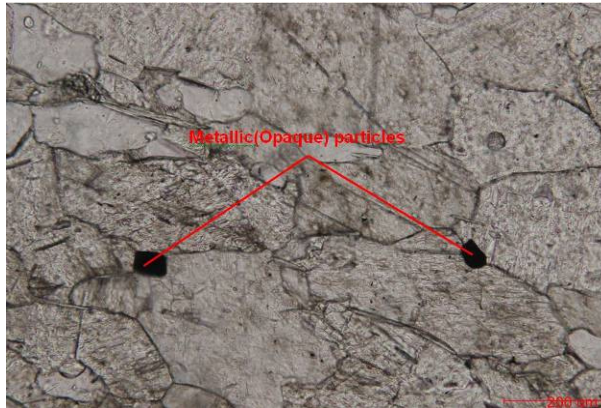
### Photomicrographs



Schistose-granular blastic texture  
(Crossed polarizers)



Schistose-granular blastic texture  
(Plain light)



Metallic(Opaque) particles (Plain light)

Note: The test was carried out by an external laboratory assessed as competent.

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



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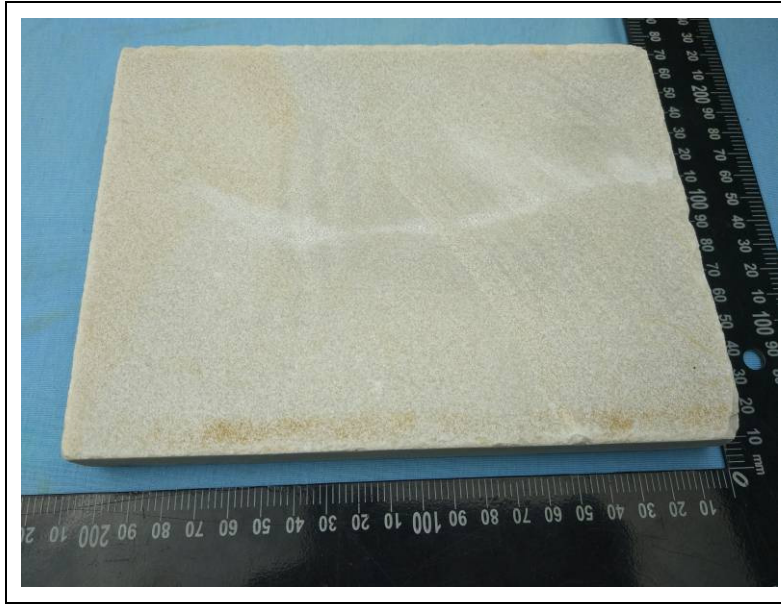
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Specimen photograph:



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