

## TEST REPORT

KENZAI CERAMICS INDUSTRY CO., LTD.  
169/94-97 Rachadapisek Rd.,  
Dindeang, Dindeang, Bangkok, 10400, Thailand  
Tel: 66 2692 5080-90, Fax: 66 2692 5091

FAO: Mr.Surachet Teeratakon

REPORT OF TESTS ON TILES

Your Reference GRANITO TILE  
Colour/Details: Paradise Blue  
Article number: -  
MTEC Samples 1100318 - 1100357

Date Reported 06-01-2011 Order/Job No. TL11-0016/7  
Date Received 14-12-2010 Dates of Test 14-12-2010 to 05-01-2011

### DETERMINATION OF CHEMICAL RESISTANCE

ISO 10545-13: 1995

#### Sample description and preparation

Five test specimens of unglazed tile were used with each test solution. The surface was cleaned with methanol before testing.

#### Standard used

ISO 13006 is used for showing compliance. Group Bl<sub>b</sub>, 0.5% < E ≤ 3 %. Size 100 x 100 x 13 mm.

#### Results Chemical Resistance for Unglazed Tiles

TEST Solutions	Sample Number				
	1	2	3	4	5
1. Ammonium Chloride solution 100 g/l	UA	UA	UA	UA	UA
2. Sodium Hypochlorite solution 20mg/l	UA	UA	UA	UA	UA
3. Hydrochloric Acid solution 3% v/v	ULA	ULA	ULA	ULA	ULA
4. Citric Acid solution 100g/l	ULA	ULA	ULA	ULA	ULA
5. Potassium Hydroxide solution 30g/l	ULA	ULA	ULA	ULA	ULA
6. Hydrochloric Acid solution 18% v/v	UHA	UHA	UHA	UHA	UHA
7. Lactic Acid solution 5% v/v	UHA	UHA	UHA	UHA	UHA
8. Potassium Hydroxide solution 100g/l	UHA	UHA	UHA	UHA	UHA

For household chemicals and swimming pool salts (1 and 2) the Class is UA  
The stipulation is for a minimum of Class UB and so the tiles comply with the requirements.

For low concentration acids and alkalis (3, 4 and 5) the Class is ULA, ULA and ULA respectively.  
For high concentration acids and alkalis (6,7and 8) the Class is UHA, UHA and UHA respectively.

Samples selected and prepared by sender.

End of Test Reports



Savitree Kongkeatvanit  
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FAO: Mr.Surachet Teeratakorn

REPORT OF TESTS ON TILES

Your Reference GRANITO TILE  
Colour/Details: Cream  
Article number: EX GF-101  
MTEC Samples 1100310 - 1100314

Date Reported 03-02-2011 Order/Job No. TL11-0016/5(III)  
Date Received 01-02-2011 Dates of Test 01 to 03-02-2011

### DETERMINATION OF RESISTANCE TO DEEP ABRASION – UNGLAZED TILES ISO 10545-6: 2004

#### Test Specimens

Five test specimens of tile were used.

#### Standard used

ISO 13006 is used for showing compliance. Group Bl<sub>b</sub>, 0.5% < E ≤ 3 %. Size 100 x 100 x 13 mm.

#### Results – Deep Abrasion

Sample No	Chord Length (mm)		Volume Abraded (mm <sup>3</sup> )		Average
	A	B	A	B	
1	27.5	27.0	174	165	170
2	27.5	27.5	174	174	174
3	27.5	27.5	174	174	174
4	27.0	27.5	165	174	170
5	27.0	27.0	165	165	165
Average			170	170	170

The average value was 170 mm<sup>3</sup>. The stipulation is that no individual value should exceed 175 mm<sup>3</sup> and so the tiles comply with the requirements.

Sample selected by sender

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FAO: Mr.Surachet Teeratakon

REPORT OF TESTS ON TILES

Your Reference	GRANITO TILE Colour/Details: Brown Article number: EX GF-101		
MTEC Samples	1100309		
Date Reported	24-12-2010	Order/Job No.	TL11-0016/4
Date Received	14-12-2010	Dates of Test	22 to 24-12-2010

### DETERMINATION OF LINEAR THERMAL EXPANSION

ISO 10545-8: 1994

#### Test Specimens

Granito Tile.

#### Test

ISO 10545-8: 1996 Determination of linear thermal expansion.

#### Standard used

ISO 13006 is used for showing compliance. Group Bl<sub>b</sub>, 0.5% < E ≤ 3 %. Size 100 x 100 x 13 mm.  
(Requirements: Test method available)

#### Results

Two determinations of the coefficient of linear thermal expansion in mutually perpendicular directions gave the following values:

$$6.5115 \times 10^{-6} \text{ } ^\circ\text{C}^{-1} \quad \text{and} \quad 6.8274 \times 10^{-6} \text{ } ^\circ\text{C}^{-1}$$

**End of Test Report**

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FAO: Mr.Surachet Teeratakon

REPORT OF TESTS ON TILES

Your Reference GRANITO TILE  
Colour/Details: Cream  
Article number: EX GF-606  
MTEC Samples 1100287 - 1100293

Date Reported 11-02-2011 Order/Job No. TL11-0016/1(IV)  
Date Received 09-02-2011 Dates of Test 09 to 10-02-2011

### DETERMINATION OF MODULUS OF RUPTURE AND BREAKING STRENGTH

ISO 10545-4: 2004

#### Test Specimens

Seven test specimens were used for determination. Tile. Group BI<sub>a</sub>,  $E \leq 0.5$  %. Size 145 x 145 mm.

#### Standard used

ISO 13006 is used for showing compliance.

#### Results

Sample No.	Thickness (mm)	Breaking Load (kg)	Breaking Strength (N)	Modulus of Rupture (N/mm <sup>2</sup> )
1	11.2	357.3	2,956.9	35.35
2	11.4	394.4	3,262.9	39.03
3	11.2	394.1	3,284.1	39.98
4	11.1	364.5	3,037.4	36.97
5	11.4	385.4	3,211.6	37.06
6	11.2	403.4	3,361.6	40.19
7	11.6	395.5	3,545.8	39.52
<b>Mean</b>	11.3	384.9	3,237.2	38.30

Thickness of Rubber = 5 mm.  
Overlap = 10 mm.

Diameter of Rod = 20 mm.  
Span = 130 mm.

The average modulus of rupture was 38.30 N/mm<sup>2</sup>. The stipulation is that no individual value should be less than 32 N/mm<sup>2</sup> and that average should be  $\geq 35$  N/mm<sup>2</sup>.

The tiles therefore comply with the requirements.

The average breaking strength was 3,237.2 N. The stipulation is that the value should not be less than 1,300 N. The tiles therefore comply with the requirements.

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REPORT OF TESTS ON TILES

Your Reference	GRANITO TILE Colour/Details: Brown Article number: EX GF-101		
MTEC Samples	1100287 - 1100293		
Date Reported	20-12-2010	Order/Job No.	TL11-0016/3
Date Received	14-12-2010	Dates of Test	15 to 17-12-2010

### DETERMINATION OF RESISTANCE TO THERMAL SHOCK

ISO 10545-9

The test is carried out using a total immersion method.

#### Sample description

Five whole tiles were used for determination.

#### Standard used

ISO 13006 is used for showing compliance. Group BI<sub>b</sub>,  $0.5\% < E \leq 3\%$ . Size 100 x 100 x 13 mm.  
(Requirements: Test method available)

#### Results

After testing by total immersion there was no evidence of damage to the tiles.  
There were no visible crack lines on the test specimens.

**End of Test Report**

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REPORT OF TESTS ON TILES

Your Reference GRANITO TILE  
Colour/Details: Pink  
Article number: EX GF-101  
MTEC Samples 1100294 - 1100303

Date Reported 04-02-2011 Order/Job No. TL11-0016/2(III)  
Date Received 01-02-2011 Dates of Test 01 to 04-02-2011

### DETERMINATION OF WATER ABSORPTION ISO 10545-3

#### Sample description

Ten test specimens were used for determination.

#### Standard used

ISO 13006 is used for showing compliance.

#### Results

Sample No	Water Absorption (%)
1	0.40
2	1.63
3	0.53
4	0.26
5	0.50
6	0.41
7	2.35
8	1.40
9	0.31
10	1.40
<b>Average</b>	<b>0.92</b>

The stipulation for Group BI<sub>b</sub> tiles/quarries is that the average value should be 0.5%  $E \leq 3\%$  and the individual maximum should not exceed 3.3%. The tiles therefore comply with the requirements.

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