



NATIONAL CERA LAB

CERAMIC LABORATORY

Certificate No. : T-4154

Hari Chamber, C10/12, Trajpar Char Rasta
8-A, N/H, Morbi - 363 642 (Guj.) INDIA.

Ph.: 02822 241911, Mo.: 9825262649, 9662297005, 9825799418
E-mail : nationalceralab@rediffmail.com

As per all Countries Export report of Wall, Floor, Vitrified Tiles & Sanitary Wares

Ref. No.

Date : 15/02/2020

Issue to

M/s Metrocity Tiles Pvt Ltd
8A N.H.; Lakhdirpur Road
Tal & Dist - Morbi ; Gujarat ; India

SAMPLE DESCRIPTION & NAME: Polishes Glazed Vitified Tiles / Porcelain size 1200x600mm as submitted by the party

TEST DESIRED:

As par ISO 13006:2012 Group B I a

A) Dimantion and surface quality

- (i) LENGTH & WIDTH
- (ii) THICKNESS
- (iii) STRAIGHTNESS OF SIDES (Facial sides)
- (iv) RECTANGULARITY
- (v) SURFACE FLATNESS
- (vi) SURFACE QUALITY

- (v) THERMAL SHOCK RESISTANCE
- (vi) CO EFFICIENT OF LINEAR THERMAL EXPANTION
- (vii) RESISTANCE TO DEEP ABRASION
- (viii) SCRACH HARDNESS
- (ix) BULK DENSITY

B) Physical Property

- (i) WATER ABSORPTION %
- (ii) MODULUS OF RUPTURE (MOR) N/mm²
- (iii) BREAKING STRENGTH
- (iv) CRAZING RESISTANCE

C) Chemical Property

- (i) Resistance to house chemical
- (ii) Resistance to swimming pool salt
- (iii) Resistance To Low Concentration OF Acid & Alkali
- (iv) Resistance to Stain

TEST REPORT**A) DIMANTION AND SURFACE QUALITY****III) DEVIATION IN LENGTH (l) & WIDTH(w) :-**

	Result	Test Method	Require
3.1) (a) The deviation in percentage of the average size of each tile (2 or 4 sides) from the work size (W)	+ 0.02% - 0.00%	ISO10545 - 2	± 0.60%
(b) The deviation in percentage of the average size of each tile (2 or 4 sides) from the average size of the 10 test specimen (20 or 40 sides)	+ 0.01% - 0.00%	ISO10545 - 2	± 0.50%
3.2) THICKNESS :- 10.50 mm The deviation in percent of the average thickness of each tile from the work size thickness	+ 0.19% - 0.00%	ISO10545 - 2	± 5%
3.3) STRAIGHTNESS OF SIDES :- The maximum deviation from straightness, in percent related to the corresponding work size	+ 0.04% - 0.03%	ISO10545 - 2	± 0.50%
3.4) RECTANGULARITY :- The maximum deviation from rectangularity in percent related to the corresponding work size.	+ 0.03% - 0.04%	ISO10545 - 2	± 0.50%

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TEST REPORT

3.5) SURFACE FLATNESS :- The maximum deviation from flatness,in (percent)	Result	Test Method	Require
(a) Centre Curvature Centre curvature related to diagonal calculated from the work size.	+ 0.05% - 0.00%	ISO10545 - 2	± 0.50%
(b) Edge curvature Edge curvature related to the corresponding work size.	+ 0.04% - 0.00%		± 0.50%
(c) Warpage Warpage related to diagonal calculated from the work size.	+ 0.03% - 0.00%		± 0.50%

II) SURFACE QUALITY

Tested by the visually

Minimum 95 percent of tile shall be free from visible defect that
would impair the appearance of the major area of tiles.

No any defect found in the tiles surface area and lot pass the test.

95% ISO10545 - 2 95%

B PHYSICAL PROPERTIES :-

I) WATER ABSORPTION:- %

1	0.086 %
2	0.095 %
3	0.061 %
4	0.075 %
5	0.068 %

Average 0.0770 %

Test Method

ISO 10545 - 3

Require As per SASO ISO 13006

< e 0.50%

Individual maximum 0.60%

II) MODULUS OF RUPTUREE (M O R) :-

1	40.71 N/mm ²
2	42.52 N/mm ²
3	40.85 N/mm ²
4	41.26 N/mm ²
5	42.07 N/mm ²

N/mm²

6	42.72 N/mm ²
7	41.88 N/mm ²
8	42.18 N/mm ²
9	40.88 N/mm ²
10	41.58 N/mm ²

Require

ISO 10545 - 4

Minimum 35

Individual minimum 32

Average: 41.67 N/mm²

III) BREAKING STRENGTH IN N

1	2628.05 N
2	2760.02 N
3	2605.44 N
4	2477.41 N
5	2771.43 N

6	2620.88 N
7	2682.54 N
8	2712.18 N
9	2684.64 N
10	2698.68 N

Test Method

ISO 10545 - 4

Require

Thickness > e 7.5 mm

Not less than 1300

Average:-

2664.13 N



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TEST REPORT

<p>IV CRAZING RESISTANCE :-</p> <p>NO CRAZING IN TWO CYCLE ONE HOUR DURATION At a steam pressure of 750±20Kpa 6 Nos of tiles ware subjected to autoclaving at a steam pressure of 750 ± 20 Kpa of saturated steam for Two hour consisting of Two cycle. None of the tiles show any sign of the crazing on the glaze surface and the lot pass the test.</p>	<p>ISO 10545-11</p>		<p>Result Confirm</p>
<p>V) THERMAL SHOCK RESISTANCE. 15/145°c 10cycle</p>	<p>Result Confirm</p>	<p>Test Method ISO 10545 - 9</p>	<p>Require 10 cycle,Min</p>
<p>VI) COEFFICIENT OF LINEAR THERMAL EXPANTION:- Expantion from ambient temperature to 100°c (K - 1)</p>	<p>Result 5.80x10 -6</p>	<p>ISO 10545 - 8</p>	<p>Require 9X10 - 6 Max</p>
<p>VII) RESISTANCE TO SURFACE ABRASION :- Visual failure was observed at 15000 revolution when the tiles ware subjected to abrasion stage of 150,600,750,1500 , 2100,6000,12000 etc up to 15000 revolution pass</p>	<p>Given class Class - IV</p>	<p>Test Method ISO 10545-7</p>	<p>Result Class - V</p>
<p>VIII) SRACH HARDNESS OF SURFACE (MOH'S SCALE) :-</p>	<p>Result 7 moh's scal</p>		<p>Require Min 6 Moh's</p>
<p>IX) BULK DENSITY , IN (g/cc)</p>	<p>Require 2.2 min</p>		<p>Result 2.2825g/cc</p>
<p>C CHEMICAL PROPERTIES:</p>			
<p>I). House hold chemical resistance: No visual changes observed after immersion Ammonium chloride solution 100G/L</p>	<p>ISO 10545-13</p>	<p>Result Class GA</p>	<p>Require Min Class-GC</p>
<p>II). Swimming pool salt : No visual changes observed after immersion Sodium hypochlorite solution , 20mg/L</p>	<p>ISO 10545-13</p>	<p>Class GA</p>	<p>Min Class-GC</p>
<p>III) Acid & Alkalies :-</p> <p>A Low Concentrations (L)</p> <p>i) Hydrochloric Acid solution 3% (V/V)</p>	<p>ISO 10545-13</p>	<p>Class GLA</p>	<p>Min Class-GLC</p>
<p>ii) Citric Acid Soln. 100gm/l</p>	<p>No visual changes observed after immersion for 4 days ; Pencil lines removed with soft wet cloth.</p>	<p>Class GLA</p>	<p>Min Class-UC</p>
<p>iii) Potassium Hydroxide Soln 100gm/l</p>	<p>visual changes observed after immersion for 4 days ; Pencil lines removed with soft wet cloth.</p>	<p>Class GLB</p>	<p>Min Class-GC</p>

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	TEST METHOD	ISO	Result	Require
B High Concentration (H)		ISO 10545-13		
i) Hydrochloric Acid solution 18% (V/V)	No visual changes observed after immersion for 4 days ; Pencil lines removed with soft wet cloth.		Class GHA	Min Class GHC
ii) Lactic Acid Soln. 5% (v/v)	No visual changes observed after immersion for 4 days ; Pencil lines removed with soft wet cloth.	ISO 10545-13	Class GHA	Min Class GHC
iii) Potassuim Hydroxide Soln. 200gm/l	visual changes observed after immersion for 4 days ; Pencil lines removed with soft		Class GHB	Min Class GHC
IV) RESISTANCE TO STAIN	Test Method	ISO 10545-14		
Red Past in Light Oil (Fe2O3)	Stain put on tiles up to 24 hrs		Class -4	Min Class - 3
Iodine in Alcohol 13g/l	Stain remove by weak cleaning agent		Class -5	Min Class - 3
Olive Oil	Stain remove by hot water		Class -4	Min Class - 3
	Stain remove by weak cleaning agent			
V) LEAD AND CADIUM RELEASE in mg/dm²		ISO 10545 - 15		
			Result	No Release

CONCLUSION:

The sample drawn by party from the above lot complies with ISO 13006 : 2012 Group BI a

Class -4

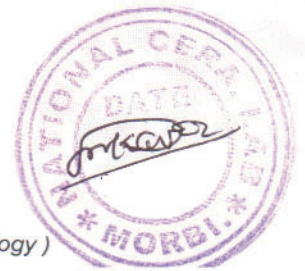
Test Procedure as per ISO 10545

Authorised signatory :- J.M. Kavar
(Dip in Ceramic Technology)

Name of signatory : J.M. Kavar

For
National Cera Lab

J.M. Kavar
(Dip in Ceramic Technology)



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