



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

# NATIONAL CERA LAB

## CERAMIC LABORATORY

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

Ref. No.

Date :

NCL/Vitrified Tile /SASO ISO/06/097/2017-18

Issue Date:- June.02.2017

Receive date of test sample :- 30.05.2017

Issue to

**SAMPLE DESCRIPTION & NAME:** Polished Glazed Vitrified Tiles PGVT/GVT size 600x600mm as submitted by the party

**TEST DESIRED:**

As SASO 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 SURFACE ABRASION
- (viii) SCRACH HARDNESS
- (x) BULK DENSITY
- xi) MOISTURE EXPANSION

**B) Physical Property**

- (i) WATER ABSORPTION %
- (ii) MODULUS OF RUPTURE ( MOR ) N/mm<sup>2</sup>
- (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 )	+ 0.03% - 0.00%	SASO 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	+ 0.02% - 0.00%	SASO ISO10545 - 2	± 0.50%
3.2) THICKNESS :- 8.75 mm The deviation in percent of the average thickness of each tile from the work size thickness	+ 0.23% - 0.00%	SASO ISO10545 - 2	± 5%
3.3) STRAIGHTNESS OF SIDES :- The maximum deviation from straightness, in percent related to the corresponding work size	+ 0.05% - 0.04%	SASO ISO10545 - 2	± 0.50%
3.4) RECTANGULARITY :- The maximum deviation from rectangularity in percent related to the corresponding work size.	+ 0.06% - 0.05%	SASO ISO10545 - 2	± 0.50%

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### TEST REPORT

June.02.2017  
Require

**3.5) SURFACE FLATNESS :-**

The maximum deviation from flatness, in (percent)

**( a ) Centre Curvature**

Centre curvature related to diagonal calculated from the work size.

Result	Test Method	Require
+ 0.05%	SASO ISO10545 - 2	± 0.50%
- 0.00%		

**(b) Edge curvature**

Edge curvature related to the corresponding work size.

+ 0.06%		± 0.50%
- 0.00%		

**( c ) Warpage**

Warpage related to diagonal calculated from the work size.

+ 0.04%		± 0.50%
- 0.00%		

**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% SASO ISO10545 - 2 95%

**PHYSICAL PROPERTIES :-**

**I) WATER ABSORPTION:-**

%
1 0.144 %
2 0.107 %
3 0.056 %
4 0.109 %
5 0.087 %

**Test Method**

SASO ISO 10545 - 3

6 0.112 %
7 0.111 %
8 0.094 %
9 n.d. %
10 n.d. %

Require As per SASO ISO 13006  
< e 0.50%  
Individual maximum 0.60%

**Average**

**0.10 %**

**II) MODULUS OF RUPTURE ( M O R ) :-**

N/mm <sup>2</sup>
1 36.61 N/mm <sup>2</sup>
2 35.99 N/mm <sup>2</sup>
3 36.02 N/mm <sup>2</sup>
4 36.52 N/mm <sup>2</sup>
5 37.18 N/mm <sup>2</sup>

**N/mm<sup>2</sup>**

6 37.13 N/mm <sup>2</sup>
7 37.44 N/mm <sup>2</sup>
8 36.05 N/mm <sup>2</sup>
9 n.d. N/mm <sup>2</sup>
10 n.d. N/mm <sup>2</sup>

**Require** SASO ISO 10545 - 4  
Minimum 35  
Individual minimum 32

**Average** 36.62 N/mm<sup>2</sup>

**III) BREAKING STRENGTH IN N**

1 1396.40 N
2 1373.15 N
3 1316.99 N
4 1334.82 N
5 1394.42 N

6 1431.15 N
7 1609.45 N
8 1576.83 N
9 n.d. N
10 n.d. N

**Test Method**

SASO ISO 10545 - 4

**Require**  
Thickness > e 7.5 mm  
Not less than 1300

**Average:-**

**1429.15 N**



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### TEST REPORT

June.02-2017

<p><b>IV CRAZING RESISTANCE :-</b> SASO ISO 10545-11            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><b>Result</b> Confirm</p>
<p><b>V) THERMAL SHOCK RESISTANCE.</b> 15/145°C 10cycle  <b>Result</b> Confirm    <b>Test Method</b> SASO ISO 10545 - 9</p>	<p><b>Require</b> 10 cycle,Min</p>
<p><b>VI) COEFFICIENT OF LINEAR THERMAL EXPANTION:-</b>            Expantion from ambient temperature to 100°C ( K - 1) 5.86x10 -6  <b>Result</b> SASO ISO 10545 - 8</p>	<p><b>Require</b> 9X10 - 6 Max</p>
<p><b>VII) RESISTANCE TO SURFACE ABRASION :-</b>            Visual failure was observed at 12000 revolution when the tiles ware subjected            to abrasion stage of 150,600,750,1500 , 2100,6000, etc up to 12000            revolution pass</p>	<p><b>Test Method</b> ISO 10545-7    <b>Result</b> Class - IV</p>
<p><b>VIII) MOISTURE EXPANSION mm/m</b></p>	<p><b>Result</b> ISO 10545 - 10 no expansion    <b>Require</b> 0.02 mm/m max</p>
<p><b>IX) SRACH HARDNESS OF SURFACE ( MOH'S SCALE ) :-</b></p>	<p><b>Result</b> 6 moh's scal    <b>Require</b> Min 6 Moh's</p>
<p><b>X) BULK DENSITY , IN ( g/cc )</b></p>	<p><b>Require</b> 2.2 min    <b>Result</b> 2.2458g/cc</p>
<p><b>C CHEMICAL PROPERTIES:</b> SASO ISO 10545-13</p>	<p><b>Result</b>    <b>Require</b></p>
<p><b>I). House hold chemical resistance:</b> No visual changes observed after immersion            Ammonium chloride solution for 24 hrs ; Pencil lines removed with wet            100G/L wiping removed</p>	<p>Class GA    Min Class-GC</p>
<p><b>II). Swimming pool salt :</b> No visual changes observed after immersion            Sodium hypochlorite solution , for 24 hrs ; Pencil lines removed with wet            20mg/L wiping removed</p>	<p>Class GA    Min Class-GC</p>
<p><b>III) Acid &amp; Alkalies :-</b> SASO ISO 10545-13</p>	<p>Class GLA    Min Class-GLC</p>
<p><b>A Low Concentrations ( L )</b></p>	<p>Class GLA    Min Class-GLC</p>
<p><b>i) Hydrochloric Acid solution 3% ( V/V )</b></p>	<p>Class GLA    Min Class-GLC</p>
<p><b>ii) Citric Acid Soln. 100gm/l</b></p>	<p>Class GLA    Min Class-GLC</p>

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### TEST REPORT

		Result	Require
iii) Potassium Hydroxide Soln 30gm/l	No visual changes observed after immersion for 4 days ; Pencil lines removed with wet wiping removed	Class GLA	Min Class-GLC
<b>Test Method</b>			
IV) RESISTANCE TO STAIN	SASO 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 CADMIUM RELEASE in mg/dm <sup>2</sup>	SASO ISO 10545 - 15		
		Result	Require
		No Release	

### **CONCLUSION:**

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

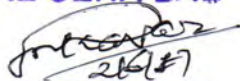
Test Procedure as per ISO 10545

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

Name of signatory : J.M. Kavar

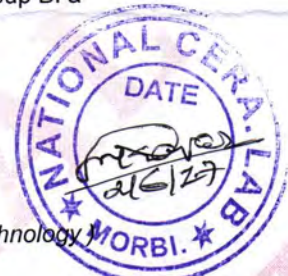
Designation of signatory .

**NATIONAL CERA LAB**

  
26/5/17  
**PROPRIETOR**

For  
**National Cera Lab**

J.M. Kavar  
( Dip in Ceramic Technology )



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