



Certificate No. : TC-6265

NATIONAL CERA LAB

CERAMIC LABORATORY

Shop No. 16, 17, Ground Floor, Dariyalal Plaza,
Nr. Argil Ceramic, 8-A, N/H, Morbi - 363 642 (Guj.) INDIA.

Ph. : 02822 244049, Mo. : 98252 62649, 96622 97005, 98257 99418
E-mail : nationalceralab@rediffmail.com

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

Ref. No. NCL/Glazed Vitrified Tile /ISO/02/601/2020-21

Date :

Feb. 25. 2021

Receive date of test sample :- 15. 02. 2021

Sample description and name Digital Glazed Porcelain Floor Tile "First Grade", Nominal size 600x600x20 mm (Rectified) as submitted by the party. Sample not drawn by National Cera Lab.

Test desired As per Standard ISO 13006 : 2018 Group BI a Annex G

A Dimensions and surface quality

- I Deviation in Length (l) & Width (w)
- II Thickness
- III Straightness of Sides
- IV Rectangularity
- V Surface Flatness
- VI Surface quality
- B Physical Property
- I Water Absorption %
- II Breaking Strength in N
- III Modulus of Rupture (MOR) N/mm²
- IV Resistance to surface abrasion
- V Coefficient of Linear Thermal Expansion
- VI Thermal Shock Resistance

- VII Craze Resistance
- VIII Moisture Expansion (in mm/mm)
- IX Impact resistance
- X Scratch hardness of Surface (mohs scale)
- XI Bulk density , lin (g/cc)

C Chemical Property

- I Resistance to Stain
- II Resistance to Low Concentration of acid and alkali
- III Resistance to High Concentration of acid and alkali
- IV Resistance to house chemical
- V Resistance to swimming pool salt
- VI Lead and Cadmium release

TEST REPORT

A Dimensions and surface quality		Require	Test Method	Result	
I Deviation in Length (l) & Width (w)					
1 Length	The deviation in mm of average size of each tile (2 sides) from the average of 10 test specimens (20 Sides)	± 1 mm	ISO 10545 - 2	Avg+ Avg -	0.46 mm 0.00 mm Pass
2 Width	The deviation in mm of the average size of each tile (2 sides) from the average of 10 test specimens (20 Sides)	± 1 mm	ISO 10545 - 2	Avg+ Avg -	0.46 mm 0.00 mm Pass
II Thickness					
The deviation in mm of average thickness of 10 tile from the work size thickness		Party given 10 Pices Thickness Average 20.00 mm · 20.09 mm	± 0.5 mm	ISO 10545 - 2	Avg+ Avg - 0.09 mm 0.00 mm Pass
III Straightness of Sides					
Maximum deviation from straightness in mm related to the corresponding work size		±0.8 mm	ISO 10545 - 2	Max+ Max -	0.16 mm 0.18 mm Pass
IV Rectangularity					
Maximum deviation from rectangularity in mm related to the corresponding work size		±1.5 mm	ISO 10545 - 2	Max+ Max -	0.19 mm 0.21 mm Pass

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V Surface Flatness

(a) Centre Curvature

Centre curvature related to diagonal
calculated from the work size.

Test Method

Require

Result

ISO 10545 - 2

± 1.8 mm

Max+
Max -

0.12 mm
0.00 mm

(b) Edge curvature

Edge curvature related to the
corresponding work size.

± 1.8 mm

Max+
Max -

0.11 mm
0.00 mm

(c) Warpage

Warpage related to diagonal
calculated from the work size.

± 1.8 mm

Max+
Max -

0.10 mm
0.00 mm
Pass

VI 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.

ISO 10545 - 2

95%

100% free
from defects
Pass

B Physical Property

I Water Absorption %

1	0.033 %
2	0.030 %
3	0.046 %
4	0.032 %
5	0.029 %

Average 0.034 %

ISO 10545 - 3

Avg. 0.034%
Max. 0.046%
Pass

< e 0.50%
Individual maximum 0.60%

II Breaking Strength in N

1	9476.43 N	6	9529.50 N
2	9633.61 N	7	9166.51 N
3	9270.53 N	8	9056.51 N
4	9547.96 N		
5	9642.69 N	Average	9415.47 N

ISO 10545 - 4

Avg. 9415.47 N
Min. 9056.61 N
Pass

Not less than 1300
Thickness ≥ 7.5 mm

III Modulus of Rupture (MOR) N/mm²

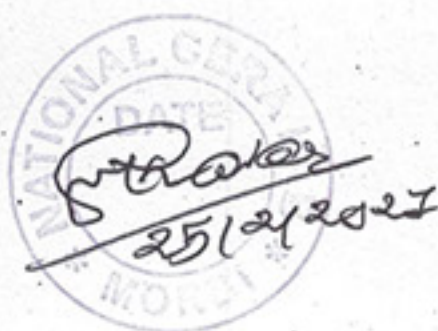
1	37.38 N/mm ²	6	38.57 N/mm ²
2	40.63 N/mm ²	7	36.84 N/mm ²
3	36.76 N/mm ²	8	36.89 N/mm ²
4	38.21 N/mm ²		
5	40.24 N/mm ²	Average	38.19 N/mm ²

ISO 10545 - 4

Avg. 38.19 N/mm²
Min. 36.76 N/mm²
Pass

Minimum 35
Individual minimum 32

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	Test Method	Require	Result
IV Resistance to surface abrasion Visual failure was observed at 6000 revolution when the tiles were subjected to abrasion stage of 150,600,750 1500, 2100, up to 6000 revolution, 2100 revolution pass.	ISO 10545-7		PEI Class - IV 2100 Revolution pass
V Coefficient of Linear Thermal Expansion Expansion from ambient temperature to 100°C (K - 1)	ISO 10545 - 8	9X10 ⁻⁶ Max	5.01 x10 ⁻⁶
VI Thermal Shock Resis 15/145°C 10cycle (With Immersion W.A. < 10%)	ISO 10545 - 9	10 cycle,Min	Confirm
VII Crazing Resistance No crazing in two cycle one hour duration at a steam pressure of 750±20kpa 6 Nos of tiles were subjected to autoclaving at a steam pressure 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.	ISO 10545-11	No Crazing in Two Cycle	Confirm
VIII Moisture Expansion (in mm/mm)	ISO 10545 -10	0.02 mm/m max	0.01 mm/m max
IX Impact resistance Coefficient of restitution (COR)	ISO 10545 - 5	0.55 Min	0.75
X Scrach hardness of Srfce (mohs scale)	IS 13630 - 13	5 moh's scal	5 Moh's
XI Bulk density , lin (g/cc)	ISO 10545 - 3	2.2 min	2.2929 g/cc
C Chemical Property			
I Resistance to Stain Stain put on tiles up to 24 hrs. Red Past in Light Oil (I Stain removed by hot water Iodine in Alcohol 13g/l Stain removed by weak cleaning agent Olive Oil Stain removed by hot water	ISO 10545-14	Min Class - 3 Min Class - 3 Min Class - 3	Class - 5 Class - 4 Class - 5
II Resistance to Low Concentration of acid and alkali a Hydrochloric Acid solu No visual changes observed after immersion for 4 days, pencil line removed with soft wet cloth. (V/V)	ISO 10545-13	Min Class-GLC	Class GLA
b Citric Acid Soln. 100gr No visual changes observed after immersion for 4 days, pencil line removed with soft wet cloth.	ISO 10545-13	Min Class-GLC	Class GLA
c Potassium Hydroxide : No visual changes observed after immersion for 4 days, pencil line removed with soft wet cloth. 30gm/l	ISO 10545-13	Min Class-GLC	Class GLA

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	Test Method	Require	Result
III Resistance to High Concentration of acid and Aakali			
a Hydrochloric Acid solution 18% (V/V)	No visual changes observed after immersion for 4 days, pencil line removed with soft wet cloth.	ISO 10545-13	Min Class GHC
b Lactic Acid Soln. 5% (v/v)	No visual changes observed after immersion for 4 days, pencil line removed with soft wet cloth.	ISO 10545-13	Min Class GHC
c Potassuim Hydroxide Soln. 100gm/l	visual changes observed after immersion for 4 days, pencil line removed with soft wet cloth.	ISO 10545-13	Min Class GHC
IV House hold chemical resistance			
Ammonium chloride solution 100gm/l	No visual changes observed after immersion for 24 hrs, pencil line removed with soft wet cloth.	ISO 10545-13	Min CLASS - GC
V Swimming poll salt			
Sodium Hypochorite solution 20mg/l	No visual changes observed after immersion for 24 hrs, pencil line removed with soft wet cloth.	ISO 10545-13	Min CLASS - GC
VI Lead and Cadmium release			
a Lead release		ISO 10545-15	Limit
Test Solution			
Acetic Acid Solution 4% (v/v), (in 960ml distilled water)	Digestion time- 24 hrs (20±2°) Detected by ED XRF	0.1mg/dm ²	0.004 mg/dm ²
b Cadmium release			
Test Solution			
Acetic Acid Solution 4% (v/v), (in 960ml distilled water)	Digestion time- 24 hrs (20±2°) Detected by ED XRF	0.1mg/dm ²	0.004 mg/dm ²

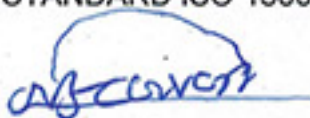
CONCLUSION:

The sample drawn by party from the above lot complies with ISO STANDARD ISO 13006 :2018 Group BI a
Test Procedure as per ISO 10545

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Verify by
Testing Engineer

Nimesh J. Kavar
(Nimesh J. Kavar)



For
National Cera Lab

Name of Authorised signatory :
Designation of signatory :

J.M. Kavar
Technical Manager

Jerambhai M. Kavar

QM/TM.

