HEXIQON LABORATORY

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TC-9022

Plot No. 8, Shayona Estate Part-2,
Bh. Silver Oak Engineering College,
Nr. AUDA Water Tank, Gota,
Ahmedabad-382481 Gujarat, INDIA.
Email : hexiqonlab@gmail.com
Mb.: +91 8487878021, +91 9825577370
Tel.: 079-29600229

Test Report

Test Report No.: HL/MT/220602003 ULR No.: TC902222000000868F

Issued To: BLUEGRESS PORSELANO LLP Issue Date: 20-06-2022

TEST REPORT OF TILE

Name of Agency	:	BLUEGRESS PORSELANO LLP
Address	:	SURVEY NUMBER-547 , AT- SHAPAR , NEAR KAJARIYA SANITARY, JETPAR ROAD , MORBI , GUJARAT , 363630,INDIA
Sample Name	:	Pressed Ceramic Tiles (Glazed Vitrified Tiles)
Make	:	BLUEGRESS PORSELANO
Sample Code	:	Not Mentioned
Sample Received on	:	02-06-2022
Analysis End On	:	20-06-2022

SAMPLE DETAILS

Type	:	Dry Pressed Ceramic Tiles water absorption (Ev ≤ 0.5 %)
Group	:	Bla (Annexure-G)
Nominal Size (N)	:	1600 x 800 x 9.0 mm (Rectified)
Work Size	:	1600 x 800 mm
Nature of Surface	:	Glazed(GL)
Quantity of sample	:	40 Pieces
Batch No./Lot No.	:	27522
Date of Manufacturing	:	27-05-2022
Design	:	GL-ALINE CARRARA WHITE
Indication of First Quality	:	Provided (Premium)
Country of Origin	:	India
Any Other Information	:	Declared Thickness 9.0 mm
Total Weight of Box	:	Provided (54.0 kg Approx per box)
Specification	:	**ISO: 13006 Third Edition 2018-09 (Ceramic tiles- Definitions, Classification, Characteristics and marking)**
Reference Standards	:	ISO: 10545 (Part - 2, 3, 4, 5, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16) with Latest Edition.

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A. Determination of Dimensions and Surface Quality **Reference Standard : ISO: 10545 (Part - 2) - 2018**

(a) Dimensions

(i) Measurements of Average Size Lengthwise (Measurement of Length)

a) Description of tiles :	Pressed Ceramic Tiles					
b) Number of Specimen:	10 Whole Tiles					
c) Nominal Size:	1600	x	800	x	9.0	mm
d) Work Size:	1600	x	800	x	9.0	mm
e) Thickness:	9.0	mm				
f) Instruments Used:	Vernier Caliper					

Average Size Lengthwise Parameters	**Number of Specimens**									
	1	2	3	4	5	6	7	8	9	10
Individual Size (mm) side 1 Lengthwise	1600.12	1600.24	1600.26	1600.08	1600.14	1600.32	1600.20	1600.22	1600.12	1600.04
Individual Size (mm) side 2 Lengthwise	1600.14	1600.22	1600.28	1600.12	1600.24	1600.00	1600.14	1600.30	1600.20	1600.14
Average Size of each Specimen(mm) Both Sides Lengthwise	1600.13	1600.23	1600.27	1600.10	1600.19	1600.16	1600.17	1600.26	1600.16	1600.09
Average Size of 10 specimens (mm) Lengthwise	**1600.176**	**mm**								
Deviation of the average size of each specimen from the work size (mm) Lengthwise	0.130	0.230	0.270	0.100	0.190	0.160	0.170	0.260	0.160	0.090
Deviation of the average size for the average of 10 specimens (mm) lengthwise	**0.176**	**mm**				Required Value: ± 1.0 mm				
Deviation of the average size of each specimen from the work size (%) Lengthwise	0.008	0.014	0.017	0.006	0.012	0.010	0.011	0.016	0.010	0.006
% Deviation of the average size from the average of 10 Specimens Lengthwise	**0.011**	**%**				Required Value: ± 0.3 %				
Deviation of the average size of each specimen from the average of 10 specimen (mm) Lengthwise	-0.046	0.054	0.094	-0.076	0.014	-0.016	-0.006	0.084	-0.016	-0.086
Deviation of the average size of each specimne from average of 10 specimens (%) Lengthwise	-0.003	0.003	0.006	-0.005	0.001	-0.001	0.000	0.005	-0.001	-0.005

Remark: Conforms

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A. Determination of Dimensions and Surface Quality **Reference Standard : ISO: 10545 (Part - 2) - 2018**

(ii) Measurements of Average Size Widthwise (Measurements of Width)

a) Description of tiles : Pressed Ceramic Tiles
b) Number of Specimen: 10 Whole Tiles
c) Nominal Size: 1600 x 800 x 9.0 mm
d) Work Size: 1600 x 800 x 9.0 mm
e) Thickness: 9.0 mm
f) Instruments Used: Vernier Caliper

Average Size Widthwise Parameters	**Number of Specimens**									
	1	2	3	4	5	6	7	8	9	10
Individual Size (mm) side 1 Widthwise	800.02	800.08	799.98	800.00	800.10	800.10	800.00	800.04	800.08	800.12
Individual Size (mm) side 2 Widthwise	800.12	800.04	799.98	800.04	800.06	800.12	800.02	800.00	800.06	800.08
Average Size of each Specimen(mm) Both Sides Widthwise	800.070	800.060	799.980	800.020	800.080	800.110	800.010	800.020	800.070	800.100
Average Size of 10 specimens (mm) Widthwise	**800.052 mm**									
Deviation of the average size of each specimen from the work size (mm) Widthwise	0.070	0.060	-0.020	0.020	0.080	0.110	0.010	0.020	0.070	0.100
Deviation of the average size for the average of 10 specimens (mm) Widthwise	**0.052 mm**					Required Value: ± 1.0 mm				
Deviation of the average size of each specimen from the work size (%) Widthwise	0.009	0.007	-0.002	0.002	0.010	0.014	0.001	0.002	0.009	0.013
% Deviation of the average size from the average of 10 Specimens Widthwise	**0.006 %**					Required Value: ± 0.3 %				
Deviation of the average size of each specimen from the average of 10 specimen (mm) Widthwise	0.018	0.008	-0.072	-0.032	0.028	0.058	-0.042	-0.032	0.018	0.048
Deviation of the average size of each specimne from average of 10 specimens (%) Widthwise	0.002	0.001	-0.009	-0.004	0.003	0.007	-0.005	-0.004	0.002	0.006

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A. Determination of Dimensions and Surface Quality **Reference Standard : ISO: 10545 (Part - 2) - 2018**

(iii) Measurements of Thickness

a) Description of tiles : Pressed Ceramic Tiles
b) Number of Specimen: 10 Whole Tiles
c) Nominal Size: 1600 x 800 x 9.0 mm
d) Work Size: 1600 x 800 x 9.0 mm
e) Thickness: 9.0 mm
f) Instruments Used: Micrometer

Thickness Parameters	Number of Specimens									
	1	2	3	4	5	6	7	8	9	10
Thickness (mm) Position 1	9.29	8.75	9.25	9.05	9.09	9.17	9.13	9.19	8.70	8.72
Thickness (mm) Position 2	8.86	9.21	8.83	9.27	8.73	8.95	8.79	9.10	9.24	9.03
Thickness (mm) Position 3	9.12	9.06	9.23	8.85	9.00	8.96	9.18	9.20	8.76	9.04
Thickness (mm) Position 4	8.93	8.91	9.15	9.16	9.08	9.30	8.98	9.22	9.07	8.92
Average Tickness (mm)	9.050	8.983	9.115	9.083	8.975	9.095	9.020	9.178	8.943	8.928
Average Thickness of 10 specimens (mm) all positions	**9.037 mm**									
Deviation of the average thickness of each tile from the work size thickness(mm)	0.050	-0.017	0.115	0.082	-0.025	0.095	0.020	0.178	-0.058	-0.072
Deviation of the average thickness from the average of 10 specimens (mm)	**0.037 mm**					Required Value: ± 0.5 mm				
Deviation of the average thickness of each specimen from the work size (%)	0.556	-0.194	1.278	0.917	-0.278	1.056	0.222	1.972	-0.639	-0.806
% Deviation of the average thickness from the average of 10 Specimens	**0.408 %**					Required Value: ± 5.0 %				

Remark: Conforms

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A. Determination of Dimensions and Surface Quality **Reference Standard : ISO: 10545 (Part - 2) - 2018**

(iv) Measurements of Straightness of Sides

Straightness of Sides					**Number of Specimens**					
(a) Lengthwise	1	2	3	4	5	6	7	8	9	10
Straightness of sides (mm) side 1	0.41	0.32	-0.06	0.36	-0.02	-0.14	0.04	-0.18	0.23	0.15
Straightness of sides (mm) side 2	0.29	-0.19	0.10	0.06	-0.07	0.28	-0.13	0.14	0.01	-0.05
Maximum deviation of Straightness of both sides (mm)	**0.41 mm**				Required Value: ± 0.8 mm					
	-0.19 mm									
Maximum deviation from straightness related to the corresponding work size (%)	**0.026 %**				Required Value: ± 0.3 %					
	-0.012 %									
(b) Widthwise	1	2	3	4	5	6	7	8	9	10
Straightness of sides (mm) side 1	0.17	0.08	0.37	-0.12	0.11	-0.21	0.07	0.28	0.02	0.03
Straightness of sides (mm) side 2	0.35	0.01	0.21	-0.03	-0.11	0.34	0.42	-0.09	0.38	-0.14
Maximum deviation of Straightness of both sides (mm)	**0.42 mm**				Required Value: ± 0.8 mm					
	-0.21 mm									
Maximum deviation from straightness related to the corresponding work size (%)	**0.053 %**				Required Value: ± 0.3 %					
	-0.026 %									

Remark: Conforms

(v) Measurements of Rectangularity

Rectangularity of Sides					**Number of Specimens**					
(a) Lengthwise	1	2	3	4	5	6	7	8	9	10
Rectangularity (mm) side 1	0.15	-0.10	0.27	0.32	0.25	0.23	0.40	0.37	0.28	0.03
Rectangularity (mm) side 1	0.17	0.16	0.30	0.35	0.14	-0.01	0.02	0.33	0.24	0.22
Maximum deviation of Rectangularity of both sides (mm)	**0.40 mm**				Required Value: ± 1.5 mm					
	-0.10 mm									
Maximum deviation from Rectangularity related to the corresponding work size (%)	**0.025 %**				Required Value: ± 0.3 %					
	-0.006 %									
(b) Widthwise	1	2	3	4	5	6	7	8	9	10
Rectangularity (mm) side 1	0.18	0.36	0.15	0.33	0.09	0.16	0.17	-0.08	0.38	0.31
Rectangularity (mm) side 2	0.00	-0.09	0.29	0.06	0.21	0.32	-0.04	0.12	-0.11	0.13
Maximum deviation of Rectangularity of both sides (mm)	**0.38 mm**				Required Value: ± 1.5 mm					
	-0.11 mm									
Maximum deviation from Rectangularity related to the corresponding work size (%)	**0.048 %**				Required Value: ± 0.3 %					
	-0.014 %									

Remark: Conforms

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A. Determination of Dimensions and Surface Quality **Reference Standard : ISO: 10545 (Part - 2) - 2018**

(vi) Measurements of Surface Flatness (Curvature and Warpage)

A. Centre Curvature:

	Number of Specimens									
Centre Curvature	1	2	3	4	5	6	7	8	9	10
Centre curvature (mm) Diagonal 1	0.20	0.41	0.06	0.07	-0.23	-0.24	0.21	0.37	-0.02	-0.04
Centre curvature (mm) Diagonal 2	0.16	0.44	0.33	0.24	0.31	0.40	0.42	0.11	0.34	0.32

Maximum centre curvature related to the diagonal work size (mm)	**0.44 mm** **-0.24 mm**	Required Value: ± 1.8 mm
Maximum centre curvature related to the diagonal calculated from work size (%)	**0.025 %** **-0.013 %**	Required Value: ± 0.4 %

Remark: Conforms

B. Edge Curvature of Length

(a) Lengthwise	1	2	3	4	5	6	7	8	9	10
Edge curvature(mm) side 1	-0.20	-0.11	0.39	0.11	0.12	-0.16	-0.07	0.10	0.45	-0.13
Edge curvature(mm) side 2	0.42	-0.04	-0.24	-0.03	0.14	0.18	0.15	0.25	0.20	0.28

Maximum edge curvature related to the corresponding work size (mm)	**0.45 mm** **-0.24 mm**	Required Value: ± 1.8 mm
Maximum edge curvature related to the corresponding work size (%)	**0.028 %** **-0.015 %**	Required Value: ± 0.4 %

C. Edge Curvature of Width

(b) Widthwise	1	2	3	4	5	6	7	8	9	10
Edge curvature(mm) side 1	0.33	0.35	0.26	0.22	0.03	0.08	0.15	0.10	-0.08	0.13
Edge curvature(mm) side 2	0.23	0.31	-0.12	0.38	0.21	0.40	0.01	0.11	0.46	-0.02

Maximum edge curvature related to the corresponding work size (mm)	**0.46 mm** **-0.12 mm**	Required Value: ± 1.8 mm
Maximum edge curvature related to the corresponding work size (%)	**0.058 %** **-0.015 %**	Required Value: ± 0.4 %

Remark: Conforms

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A. Determination of Dimensions and Surface Quality **Reference Standard : ISO: 10545 (Part - 2) - 2018**

(vi) Measurements of Surface Flatness (Curvature and Warpage)

D. Warpage

(a) Lengthwise	1	2	3	4	5	6	7	8	9	10
Warpage (mm) side 1	-0.03	0.01	-0.02	-0.05	0.14	0.08	0.30	0.07	-0.01	0.23
Warpage (mm) side 2	-0.07	0.22	0.21	-0.09	0.00	-0.04	0.18	0.28	0.13	0.33

Maximum warpage related to the diagonal from work size (mm)	**0.33 mm** **-0.09 mm**	Required Value: ± 1.8 mm
Maximum warpage related to the diagonal from work size (%)	**0.018 %** **-0.005 %**	Required Value: ± 0.4 %

E. Warpage

(b) Widthwise	1	2	3	4	5	6	7	8	9	10
Warpage (mm) side 1	0.21	0.09	0.44	-0.04	0.19	0.31	0.23	0.15	0.29	-0.02
Warpage (mm) side 2	-0.01	0.12	0.27	0.28	0.22	-0.10	0.30	0.04	0.35	-0.18

Maximum warpage related to the diagonal from work size (mm)	**0.44 mm** **-0.18 mm**	Required Value: ± 1.8 mm
Maximum warpage related to the diagonal from work size (%)	**0.025 %** **-0.010 %**	Required Value: ± 0.4 %

Remark: Conforms

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A. Determination of Dimensions and Surface Quality **Reference Standard : ISO: 10545 (Part - 2) - 2018**

(vii) Measurements of Surface Quality

a) Description of tiles : Pressed Ceramic Tiles

b) Number of Specimen: 20 Whole Tiles

c) Nominal Size: 1600 x 800 x 9.0 mm

d) Work Size: 1600 x 800 x 9.0 mm

e) Thickness: 9.0 mm

f) Instruments Used: Fluorescent Lighting of Colour, Temp., Meter Rule, Light

Number of Specimen	Cracks	Crazing	Dry Spot	Unevenness	Pin Hole	Glaze Devitrification	Specks and Spots	Under glaze fault	Decorating fault	Chip	Blister	Rough Edge	Polishing defect
1	C	C	C	C	C	C	C	C	C	C	C	C	C
2	C	C	C	C	C	C	C	C	C	C	C	C	C
3	C	C	C	C	C	C	C	C	C	C	C	C	C
4	C	C	C	C	C	C	C	C	C	C	C	C	C
5	C	C	C	C	C	C	C	C	C	C	C	C	C
6	C	C	C	C	C	C	C	C	C	C	C	C	C
7	C	C	C	C	C	C	C	C	C	C	C	C	C
8	C	C	C	C	C	C	C	C	C	C	C	C	C
9	C	C	C	C	C	C	C	C	C	C	C	C	C
10	C	C	C	C	C	C	C	C	C	C	C	C	C
11	C	C	C	C	C	C	C	C	C	C	C	C	C
12	C	C	C	C	C	C	C	C	C	C	C	C	C
13	C	C	C	C	C	C	C	C	C	C	C	C	C
14	C	C	C	C	C	C	C	C	C	C	C	C	C
15	C	C	C	C	C	C	C	C	C	C	C	C	C
16	C	C	C	C	C	C	C	C	C	C	C	C	C
17	C	C	C	C	C	C	C	C	C	C	C	C	C
18	C	C	C	C	C	C	C	C	C	C	C	C	C
19	C	C	C	C	C	C	C	C	C	C	C	C	C
20	C	C	C	C	C	C	C	C	C	C	C	C	C

Remark: - C = Conform the Requirement

Procedure: Tile have been Placed in the observation table under 275± 25 lux light by 6000 K lighting source and observed for the surface defects and Intentional effects-

Observation: No cracks, crazing, dry spots, unevenness, pin hole, glaze devitrification, specks or spots, underglaze fault, polishing defects, polishing effects, decorating fault, chip, blister, rough edge, welt, etc. have been Observed. Also In order to judge whether there is a defect or an intentional decorative effect, the intentionality and aesthetics of the effect have been assessed, including a review of the manufacturer documentation. Cracks, chipped edges and chipped corners have not been detected. 100 % Tile is free from Visual Defects.

Required Value: Tiles should not have Above mentioned Defects in 95 % Tiles Observed

Remark: Conforms

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B. Physical Property

(i) Water Absorption **Reference Standard : ISO: 10545 (Part - 3) - 2018**

Sample Size: 200x200 x 9.0 mm

Specimen Number	Mass of the Dry Sample (gm) (M1)	Mass of the Wet Sample (gm) (M2)	Water absorption of Individual Specimen (%) (M2-M1) x 100/M1
1	810.15	810.47	0.0395
2	807.45	807.76	0.0384
3	795.44	795.75	0.0390
4	796.42	796.73	0.0389
5	795.69	796.05	0.0452
6	806.35	806.70	0.0434
7	796.95	797.26	0.0389
8	804.32	804.68	0.0448
9	806.53	806.85	0.0397
10	792.00	792.32	0.0404
11	799.22	799.49	0.0338
12	795.30	795.61	0.0390

Average Water Absorption of the all specimens tested in % **0.0401 %** Required Value Max. 0.5 %

Individual Max. Value of Water Absorption of the Specimen in % **0.0452 %** Required Value Max. 0.6 %

Remark: Conforms

(ii) Modulus of Rupture **Reference Standard : ISO: 10545 (Part - 4) - 2019**

Specimen Number	Breaking Load (Newton) F	Span between the support rods (mm) l_2	Width of the test Specimen (mm) b	Minimum thickness of the test specimen measured after the along the broken edge (mm) h	Modulus of Rupture of Individual Specimen (N/mm²) $3Fl_2/2bh^2$
1	915.5	780	400	8.71	35.30
2	966.0	780	400	8.71	37.24
3	972.5	780	400	8.71	37.50
4	986.5	780	400	8.71	38.04
5	988.5	780	400	8.71	38.11
6	961.0	780	400	8.71	37.05
7	967.5	780	400	8.71	37.30

Average Breaking Load, N **965.36 Newton**

Average Modulus of Rupture, N/mm² **37.22 N/mm2** Required Value: 35 N/mm²

Individual Minimum Modulus of Rupture, N/mm² **35.30 N/mm2** Required Value: 32 N/mm²

*** Note: Testing has been performed on cut tiles, specimen size(800x400)**

Remark: Conforms

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(iii) Breaking Strength **Reference Standard : ISO: 10545 (Part - 4) - 2019**

Specimen Number	Breaking Load (Newton) F	Span between the support rods (mm) l_2	Width of the test Specimen (mm) b	Breaking Strength of Individual Specimen (N) Fl_2/b
1	915.5	780	400	1785.23
2	966.0	780	400	1883.70
3	972.5	780	400	1896.38
4	986.5	780	400	1923.68
5	988.5	780	400	1927.58
6	961.0	780	400	1873.95
7	967.5	780	400	1886.63

Average Breaking Load, N **965.36 Newton**

Average Breaking Strength, N **1882.45 Newton** Required Value: Min 1300 Newton

*** Note: Testing has been performed on cut tiles, specimen size(800x400)** **Remark: Conforms**

(iv) Determination of Impact Resistance by measurement of coefficient of restitution

Reference Standard : ISO: 10545 (Part - 5) - 1996

Specimen Number	Dropping height of the ball (h1) mm	Indentation or Cracking	Coefficient of restitution of Specimen
1	1000	No Indentation or Cracking	0.801
2	1000	No Indentation or Cracking	0.798
3	1000	No Indentation or Cracking	0.805
4	1000	No Indentation or Cracking	0.802
5	1000	No Indentation or Cracking	0.800

Average Coefficient of Restitution of the all specimens tested 0.801 Required Value : Min 0.55 **Conforms**

Any indentation or Cracking in the Test Specimen No Indentation or Cracking Observed in all the test specimen tested

(v) Determination of Resistance to surface abrasion for glazed tiles

Reference Standard : ISO: 10545 (Part - 7) - 1996

Specimen Number	Abrasion stage at Revolutions	Failure Occur	Class of stain resistance for tiles of Abrasion	Average Class of stain resistance for tiles of Abrasion
1	100	No	NA	
2	150	No	NA	
3	600	No	NA	
4	750	No	NA	
5	1500	No	NA	4
6	2100	No	NA	
7	6000	Yes	4	
8	12000	NA	NA	

Resistance to surface abrasion of glazed tiles intended for use on floors **Class 4, Passed 2100 Revolutions** Required Vale: NA

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(vi) Determination of Linear Thermal Expansion

Reference Standard : ISO: 10545 (Part - 8) - 2014

Coefficient of Linear Thermal Expansion

Test Parameters	Length of Test Specimen at Ambient Temperature	Ambient Temperature	Length Increase at 100^{0}C in mm	Required	Results
a. Coefficient of linear thermal expansion, ambient to 100^{0}C, Specimen 2	25.29	28.0	0.006	NA	**3.30 x 10^{-6}**
b. Coefficient of linear thermal expansion, ambient to 100^{0}C, Specimen 2	25.23	28.9	0.005	NA	**2.79 x 10^{-6}**
Average Coefficient of linear thermal expansion, ambient to 100^{0}C	**3.04 x 10^{-6}**			NA	

Remark: Conforms

(vii) Determination of Resistance to Thermal Shock

Reference Standard : ISO: 10545 (Part - 9) - 2013

i) Water Absorption Coefficient: 0.0401 %

Specimen Number	Visual defect examine before the test				Visual defect examine after the test					
	Cracks (Naked eye)	Crazing (Naked eye)	Dryspot (Naked eye)	Using Methylene Blue Staining (Naked eye)		Cracks (Naked eye)	Crazing (Naked eye)	Dryspot (Naked eye)	Using Methylene Blue Staining (Naked eye)	
1	Satisfac.	Satisfac.	Satisfac.	Satisfac.	Satisfac.	No Def.	No Def.	No Def.	No Def.	No Def.
2	Satisfac.	Satisfac.	Satisfac.	Satisfac.	Satisfac.	No Def.	No Def.	No Def.	No Def.	No Def.
3	Satisfac.	Satisfac.	Satisfac.	Satisfac.	Satisfac.	No Def.	No Def.	No Def.	No Def.	No Def.
4	Satisfac.	Satisfac.	Satisfac.	Satisfac.	Satisfac.	No Def.	No Def.	No Def.	No Def.	No Def.
5	Satisfac.	Satisfac.	Satisfac.	Satisfac.	Satisfac.	No Def.	No Def.	No Def.	No Def.	No Def.

Remarks and Observation: No visual defects like Crack, Crazing, Dry Spots in all the five test specimen.

Remark: Conforms

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(viii) Determination of Moisture Expansion

Reference Standard : ISO: 10545 (Part - 10) - 2021

Specimen Number	Length of Specimen after re-firing (mm)		Length of Specimen after treatment in boiling water (mm)		Moisture Expansion of each test Specimen (mm/m)
	Initial Length (mm)	Length after 3 h from the initial measurement	Length After 1 h removal from the boiling	Length after 3 h from the first measurement	
1	100.175	100.175	100.177	100.176	0.00998
2	100.246	100.246	100.248	100.247	0.00998
3	100.183	100.183	100.186	100.184	0.00998
4	100.309	100.309	100.310	100.310	0.00997
5	100.218	100.218	100.220	100.219	0.00998
			Average Moisture Expansion (mm/m)		0.00998

Maximum Value of Moisture Expansion (mm/m) 0.00998 **Required Value** **Max. 0.6 mm/m**

Remark: Conforms

(ix) Determination of Crazing Resistance for glazed tiles

Reference Standard : ISO: 10545 (Part - 11) - 1994

Specimen Number	Examine the test Specimen for Crazing	Test Condition for the Specimen
1	No Crazing	Kept in Autoclave at Pressure 500±20 kPa, Steam Temperature 159±1°C
2	No Crazing	
3	No Crazing	
4	No Crazing	
5	No Crazing	

Remark: No test specimen shows any sign of Crazing after performing the test.

Remark: Conforms

(x) Determination of Frost Resistance

Reference Standard : ISO: 10545 (Part - 12) - 1995

Specimen Number	Visual defect examine before the test				Visual defect examine after the test					
	Cracks	Crazing	Dryspot	Using Methylene Blue Staining	Cracks	Crazing	Dryspot	Using Methylene Blue Staining		
1	Satisfac.	Satisfac.	Satisfac.	Satisfac.	Satisfac.	No Def.	No Def.	No Def.	No Def.	No Def.
2	Satisfac.	Satisfac.	Satisfac.	Satisfac.	Satisfac.	No Def.	No Def.	No Def.	No Def.	No Def.
3	Satisfac.	Satisfac.	Satisfac.	Satisfac.	Satisfac.	No Def.	No Def.	No Def.	No Def.	No Def.
4	Satisfac.	Satisfac.	Satisfac.	Satisfac.	Satisfac.	No Def.	No Def.	No Def.	No Def.	No Def.
5	Satisfac.	Satisfac.	Satisfac.	Satisfac.	Satisfac.	No Def.	No Def.	No Def.	No Def.	No Def.
6	Satisfac.	Satisfac.	Satisfac.	Satisfac.	Satisfac.	No Def.	No Def.	No Def.	No Def.	No Def.
7	Satisfac.	Satisfac.	Satisfac.	Satisfac.	Satisfac.	No Def.	No Def.	No Def.	No Def.	No Def.
8	Satisfac.	Satisfac.	Satisfac.	Satisfac.	Satisfac.	No Def.	No Def.	No Def.	No Def.	No Def.
9	Satisfac.	Satisfac.	Satisfac.	Satisfac.	Satisfac.	No Def.	No Def.	No Def.	No Def.	No Def.
10	Satisfac.	Satisfac.	Satisfac.	Satisfac.	Satisfac.	No Def.	No Def.	No Def.	No Def.	No Def.

Remark: All the test specimen having no visual defect after 100 cycles freeze thaw test

Remark: Conforms

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(xi) Small Colour Differences

Reference Standard : ISO: 10545 (Part - 16) - 2010

Observation No.	**1**	**2**	**3**	**4**	**5**
Observation Value ΔE	0.2	0.2	0.4	0.4	0.3
Average Value of colour Difference ΔE	0.30			Req. Value < 0.75	

Remark: Conforms

C. Chemical Property

(i) Determination of Chemical Resistance

Reference Standard : ISO: 10545 (Part - 13) - 2016

a. House hold chemical Resistance:

Specimen Number	**Characteristic/ Test**	**Requirements**	**Test Results**	**Remark**
1	Ammonium Chloride solution 100 gm/L	Min. class B(V)	**Class-A(V)** No visual change	
2		Min. class B(V)	**Class-A(V)** No visual change	Conforms
3		Min. class B(V)	**Class-A(V)** No visual change	

b. Swimming Pool Salt:

Specimen Number	**Characteristic/ Test**	**Requirements**	**Test Results**	**Remark**
1	Sodium Hypochlorite Solution 20mg/l	Min. class B(V)	**Class-A(V)** No visual change	
2		Min. class B(V)	**Class-A(V)** No visual change	Conforms
3		Min. class B(V)	**Class-A(V)** No visual change	

c. Low Concentration (L):

Specimen Number	**Characteristic/ Test**	**Requirements**	**Test Results**	**Remark**
1	i) Hydrochloric Acid solution 3% (v/v)	Min Class LB(V)	**Class-LA(V)** No visual change	
2		Min Class LB(V)	**Class-LA(V)** No visual change	Conforms
3		Min Class LB(V)	**Class-LA(V)** No visual change	
1	ii) Citric acid Solution 100 gm/l	Min Class LB(V)	**Class- LA(V)** No visual change	
2		Min Class LB(V)	**Class- LA(V)** No visual change	Conforms
3		Min Class LB(V)	**Class- LA(V)** No visual change	
1	iii) Potassium Hydroxide Solution 30gm/l	Min Class LB(V)	**Class- LA(V)** No visual change	
2		Min Class LB(V)	**Class- LA(V)** No visual change	Conforms
3		Min Class LB(V)	**Class- LA(V)** No visual change	

d. High Concentration (H):

Specimen Number	**Characteristic/ Test**	**Requirements**	**Test Results**	**Remark**
1	i) Hydrochloric Acid Solution 18% (v/v)	Min Class HB(V)	**Class-HA(V)** No visual change	
2		Min Class HB(V)	**Class-HA(V)** No visual change	Conforms
3		Min Class HB(V)	**Class-HA(V)** No visual change	
1	ii) Lactic Acid Solution 5% (v/v)	Min Class HB(V)	**Class- HA(V)** No visual change	
2		Min Class HB(V)	**Class- HA(V)** No visual change	Conforms
3		Min Class HB(V)	**Class- HA(V)** No visual change	

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Specimen Number	Characteristic/ Test	Requirements	Test Results	Remark
1	iii) Potassium Hydroxide Solution 100gm/l	Min Class HB(V)	**Class- HA(V)** No visual change	Conforms
2		Min Class HB(V)	**Class- HA(V)** No visual change	
3		Min Class HB(V)	**Class- HA(V)** No visual change	

(ii) Determination of Resistance to stains

Reference Standard : ISO: 10545 (Part - 14) - 2015

a. Stain Leaving Trace:

Specimen Number	Characteristic/ Test	Requirements	Test Results	Remark
1	**Green Staining Agent** in light oil (Cr_2O_3 in light oil), for all tiles except green colored tiles	Min Class 3	**Class 5**	Conforms
2		Min Class 3	**Class 5**	
3		Min Class 3	**Class 5**	

b. Stain having chemical/oxidizing action:

Specimen Number	Characteristic/ Test	Requirements	Test Results	Remark
1	**Iodine**, 13gm/l solution in alcohol	Min Class 3	**Class 5**	Conforms
2		Min Class 3	**Class 5**	
3		Min Class 3	**Class 5**	

c. Stain Forming a film:

Specimen Number	Characteristic/ Test	Requirements	Test Results	Remark
1	**Olive oil**	Min Class 3	**Class 5**	Conforms
2		Min Class 3	**Class 5**	
3		Min Class 3	**Class 5**	

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C. Chemical Property

(iii) Determination of Lead and Cadmium given off by tiles

Reference Standard : ISO: 10545 (Part - 15) - 2021

Lead Release (mg/l & mg/dm²)

Specimen Number	Characteristic/ Test Parameter	Requirements	Test Results	Remark
1	Mass of lead Extracted per unitof Surface ṗA(Pb), mg/dm²	0.8 mg/dm²	Not Detected (Detection Limit 0.005)	Conforms
2	Mass of lead Extracted per unitof Surface ṗA(Pb), mg/dm²	0.8 mg/dm²	Not Detected (Detection Limit 0.005)	
3	Mass of lead Extracted per unitof Surface ṗA(Pb), mg/dm²	0.8 mg/dm²	Not Detected (Detection Limit 0.005)	

Cadmium Release (mg/l & mg/dm²)

Specimen Number	Characteristic/ Test Parameter	Requirements	Test Results	Remark
1	Mass of cadmium extracted per unitof Surface ṗA(Cd), mg/dm²	0.07 mg/dm²	Not Detected (Detection Limit 0.005)	Conforms
2	Mass of cadmium extracted per unitof Surface ṗA(Cd), mg/dm²	0.07 mg/dm²	Not Detected (Detection Limit 0.005)	
3	Mass of cadmium extracted per unitof Surface ṗA(Cd), mg/dm²	0.07 mg/dm²	Not Detected (Detection Limit 0.005)	

Conformity Statement: The Sample provided by the Party for testing as per ISO 13006: 2018, Conforms the Requirements of the Specifications mentioned and other test methods used.

Opinion and Interpretation: Not Applicable

Reviewed By

Karan Singh

For, Hexiqon Laboratory

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Paritra Singh

(Authorised Signatory)

Note:
1. This report, in full or in part, shall not be published, advertised, used for any legal action, unless prior permission has been secured from the CEO of Laboratory.
2. This test report is ONLY FOR THE SAMPLE TESTED.

.....End of Report.....