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HEXIQON LABORATORY PVT. LTD.

Plot No. 8, Shayona Estate Part-2,
Bh. Silver Oak Engineering Collage,
Nr. AUDA Water Tank, Gota,
Ahmedabad-382481 Gujarat, INDIA.
Email : hexiqonlab@gmail.com
Mb.: +91 8487878021, +91 9879444222
CIN : U86905GJ2023PTC140980

Test Report

Test Report No.: **HL/MT/230814002**

ULR No.: TC1171223000000321F

Issued To: SELLWIN INTERNATIONAL

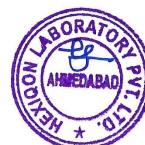
Issue Date: 15-09-2023

TEST REPORT OF TILE

Name of Agency : SELLWIN INTERNATIONAL
Address : SURVEY NO. 76P, PLOT NO.1, S-2, 2ND FLOOR, CITY POINT COMPLEX,
HALVAD ROAD, MAHENDRANAGAR, MORBI- 363642, GUJARAT, INDIA
Sample Name : Pressed Ceramic Tiles (Glazed Porcelain Tiles)
Make : SELLWIN CERAMIC
Sample Code : Not Mentioned
Sample Received on : 14-08-2023 **Date of Start of Testing :** 14-08-2023
Analysis End On : 15-09-2023

SAMPLE DETAILS

Type : Dry Pressed Ceramic Tiles water absorption ($E_b \leq 0.5 \%$)
Group : Bla (Annexure-G)
Nominal Size (N) : 1200 x 600 x 8.6 mm (Rectified)
Work Size : 1200 x 600 mm
Nature of Surface : Glazed(GL) Glossy
Quantity of sample : 40 Pieces
Batch No./Lot No. : 231007
Date of Manufacturing : 07-08-2023
Design : ONYX BLUE
Indication of First Quality : Provided (Premium)
Country of Origin : India
Any Other Information : Declared Thickness 8.6 mm
Total Weight of Box : 27.5 kg Approx per box
Specification : **EN 14411: 2016 Ceramic tiles- Definition, classification, characteristics, assessment and verification of constancy of performance and marking**
Reference Standards : EN ISO: 10545 (Part - 2, 3, 4, 5, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16) with Latest Edition , CEN/TS 15209, EN ISO: 1182: 2020, EN 12004-2 : 2017, CEN/TS : 16165: 2016



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A. Determination of Dimensions and Surface Quality

Reference Standard : EN ISO: 10545 (Part - 2) - 2018

(a) Dimensions

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

a) Description of tiles :	Glazed Ceramic Tiles					
b) Number of Specimen:	10 Whole Tiles					
c) Nominal Size:	1200	x	600	x	8.6	mm
d) Work Size:	1200	x	600	x	8.6	mm
e) Thickness:	8.6	mm				
f) Instruments Used:	Vernier Caliper					

Average Size Lengthwise

Number of Specimens

Parameters	1	2	3	4	5	6	7	8	9	10
Individual Size (mm) side 1 Lengthwise	1200.06	1200.14	1200.08	1200.22	1200.10	1200.00	1200.20	1200.16	1200.14	1200.10
Individual Size (mm) side 2 Lengthwise	1200.12	1200.18	1200.02	1200.16	1200.14	1200.06	1200.12	1200.08	1200.22	1200.18
Average Size of each Specimen(mm) Both Sides Lengthwise	1200.09	1200.16	1200.05	1200.19	1200.12	1200.03	1200.16	1200.12	1200.18	1200.14
Average Size of 10 specimens (mm) Lengthwise	1200.124 mm									
Deviation of the average size of each specimen from the work size (mm) Lengthwise	0.090	0.160	0.050	0.190	0.120	0.030	0.160	0.120	0.180	0.140
Deviation of the average size for the average of 10 specimens (mm) Lengthwise	0.124 mm									
Deviation of the average size of each specimen from the work size (%) Lengthwise	0.007	0.013	0.004	0.016	0.010	0.002	0.013	0.010	0.015	0.012
% Deviation of the average size from the average of 10 Specimens Lengthwise	0.010 %									
Deviation of the average size of each specimen from the average of 10 specimen (mm) Lengthwise	-0.034	0.036	-0.074	0.066	-0.004	-0.094	0.036	-0.004	0.056	0.016
Deviation of the average size of each specimen from average of 10 specimens (%) Lengthwise	-0.003	0.003	-0.006	0.005	0.000	-0.008	0.003	0.000	0.005	0.001

Remark: Conforms

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A. Determination of Dimensions and Surface Quality

Reference Standard : EN ISO: 10545 (Part - 2) - 2018

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

a) Description of tiles :	Glazed Ceramic Tiles					
b) Number of Specimen:	10 Whole Tiles					
c) Nominal Size:	1200	x	600	x	8.6	mm
d) Work Size:	1200	x	600	x	8.6	mm
e) Thickness:	8.6	mm				
f) Instruments Used:	Vernier Caliper					

Average Size Widthwise

Number of Specimens

Parameters	1	2	3	4	5	6	7	8	9	10
Individual Size (mm) side 1 Widthwise	600.12	600.04	600.14	600.16	600.02	600.14	600.10	600.26	600.06	600.22
Individual Size (mm) side 2 Widthwise	600.20	600.08	600.22	600.24	600.06	600.20	600.16	600.18	600.12	600.18
Average Size of each Specimen(mm) Both Sides Widthwise	600.16	600.06	600.18	600.20	600.04	600.17	600.13	600.22	600.09	600.20
Average Size of 10 specimens (mm) Widthwise	600.145 mm									
Deviation of the average size of each specimen from the work size (mm) Widthwise	0.160	0.060	0.180	0.200	0.040	0.170	0.130	0.220	0.090	0.200
Deviation of the average size for the average of 10 specimens (mm) Widthwise	0.145 mm									
	Required Value: ± 2.0 mm									
Deviation of the average size of each specimen from the work size (%) Widthwise	0.027	0.010	0.030	0.033	0.007	0.028	0.022	0.037	0.015	0.033
% Deviation of the average size from the average of 10 Specimens Widthwise	0.024 %									
	Required Value: ± 0.6 %									
Deviation of the average size of each specimen from the average of 10 specimen (mm) Widthwise	0.015	-0.085	0.035	0.055	-0.105	0.025	-0.015	0.075	-0.055	0.055
Deviation of the average size of each specimen from average of 10 specimens (%) Widthwise	0.002	-0.014	0.006	0.009	-0.017	0.004	-0.002	0.012	-0.009	0.009

Remark: Conforms

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A. Determination of Dimensions and Surface Quality

Reference Standard : EN ISO: 10545 (Part - 2) - 2018

(iii) Measurements of Thickness

a) Description of tiles :	Glazed Ceramic Tiles					
b) Number of Specimen:	10 Whole Tiles					
c) Nominal Size:	1200	x	600	x	8.6	mm
d) Work Size:	1200	x	600	x	8.6	mm
e) Thickness:	8.6	mm				
f) Instruments Used:	Micrometer					

Thickness Parameters	Number of Specimens									
	1	2	3	4	5	6	7	8	9	10
Thickness (mm) Position 1	8.55	8.67	8.44	8.55	8.65	8.45	8.53	8.45	8.60	8.45
Thickness (mm) Position 2	8.65	8.53	8.50	8.69	8.68	8.65	8.50	8.51	8.65	8.47
Thickness (mm) Position 3	8.52	8.49	8.60	8.68	8.51	8.53	8.59	8.47	8.69	8.54
Thickness (mm) Position 4	8.56	8.50	8.63	8.50	8.47	8.47	8.66	8.53	8.68	8.58
Average Thickness (mm)	8.570	8.548	8.543	8.605	8.578	8.525	8.570	8.490	8.655	8.510

Average Thickness of 10 specimens (mm) all positions **8.559 mm**

Deviation of the average thickness of each tile from the work size thickness(mm)	-0.030	-0.053	-0.057	0.005	-0.023	-0.075	-0.030	-0.110	0.055	-0.090
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Deviation of the average thickness from the average of 10 specimens (mm) **-0.041 mm**

Required Value: ± 0.5 mm

Deviation of the average thickness of each specimen from the work size (%)	-0.349	-0.610	-0.669	0.058	-0.262	-0.872	-0.349	-1.279	0.640	-1.047
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% Deviation of the average thickness from the average of 10 Specimens **-0.474 %**

Required Value: ± 5.0 %

Remark: Conforms

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A. Determination of Dimensions and Surface Quality

Reference Standard : EN 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	0.16	-0.07	0.12	-0.06	0.08	0.26	-0.14	-0.21	0.14	0.07
Straightness of sides (mm) side 2	0.03	-0.22	0.08	-0.01	-0.31	0.23	-0.11	-0.21	0.13	-0.03
Maximum deviation of Straightness of both sides (mm)	0.26 mm		Required Value: ± 1.5 mm							
Maximum deviation from straightness related to the corresponding work size (%)	-0.31 mm		Required Value: ± 0.5 %							
	0.022 %									
	-0.026 %									

(b) Widthwise	1	2	3	4	5	6	7	8	9	10
Straightness of sides (mm) side 1	0.03	-0.19	0.15	0.08	-0.11	-0.18	0.02	-0.12	0.12	-0.17
Straightness of sides (mm) side 2	-0.04	0.01	0.17	-0.12	-0.04	-0.22	0.01	-0.08	-0.07	-0.09
Maximum deviation of Straightness of both sides (mm)	0.17 mm		Required Value: ± 1.5 mm							
Maximum deviation from straightness related to the corresponding work size (%)	-0.22 mm		Required Value: ± 0.5 %							
	0.028 %									
	-0.037 %									

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	0.05	-0.14	0.22	0.46	-0.12	-0.28	-0.10	0.02	-0.30	0.40
Rectangularity (mm) side 1	0.37	0.07	0.18	-0.34	-0.04	0.28	0.20	0.03	0.58	0.51
Maximum deviation of Rectangularity of both sides (mm)	0.58 mm		Required Value: ± 2.0 mm							
Maximum deviation from Rectangularity related to the corresponding work size (%)	-0.34 mm		Required Value: ± 0.5 %							
	0.048 %									
	-0.028 %									

(b) Widthwise	1	2	3	4	5	6	7	8	9	10
Rectangularity (mm) side 1	0.32	0.10	0.14	-0.24	0.02	0.04	0.18	0.22	-0.14	-0.24
Rectangularity (mm) side 2	0.19	0.35	-0.09	0.24	-0.15	0.31	0.06	0.12	-0.06	-0.06
Maximum deviation of Rectangularity of both sides (mm)	0.35 mm		Required Value: ± 2.0 mm							
Maximum deviation from Rectangularity related to the corresponding work size (%)	-0.24 mm		Required Value: ± 0.5 %							
	0.058 %									
	-0.040 %									

Remark: Conforms

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A. Determination of Dimensions and Surface Quality **Reference Standard : EN 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	0.35	-0.71	-0.54	0.28	0.60	-0.71	-0.91	-0.51	-0.26	0.09
Centre curvature (mm) Diagonal 2	0.00	-0.31	0.15	-0.62	-0.26	0.52	-0.39	-0.87	-0.66	-0.50
Maximum centre curvature related to the diagonal work size (mm)	0.60 mm			Required Value: ± 2.0 mm						
	-0.91 mm									
Maximum centre curvature related to the diagonal calculated from work size (%)	0.045 %			Required Value: ± 0.5 %						
	-0.068 %									

Remark: Conforms

B. Edge Curvature of Length

(a) Lengthwise	1	2	3	4	5	6	7	8	9	10
Edge curvature(mm) side 1	0.22	0.28	0.31	-0.49	-0.46	-0.57	-0.43	-0.60	-0.06	0.27
Edge curvature(mm) side 2	-0.44	0.40	-0.25	-0.29	-0.05	0.32	-0.16	-0.33	0.27	0.30
Maximum edge curvature related to the corresponding work size (mm)	0.40 mm				Required Value: ± 2.0 mm					
	-0.60 mm									
Maximum edge curvature related to the corresponding work size (%)	0.033 %				Required Value: ± 0.5 %					
	-0.050 %									

C. Edge Curvature of Width

(b) Widthwise	1	2	3	4	5	6	7	8	9	10
Edge curvature(mm) side 1	0.48	0.04	-0.32	-0.03	-0.31	0.00	-0.33	0.33	-0.62	-0.60
Edge curvature(mm) side 2	-0.32	-0.56	0.53	0.31	-0.05	-0.05	-0.05	-0.37	-0.17	0.50
Maximum edge curvature related to the corresponding work size (mm)	0.53 mm	Required Value: ± 2.0 mm								
	-0.56 mm									
Maximum edge curvature related to the corresponding work size (%)	0.088 %	Required Value: ± 0.5 %								
	-0.093 %									

Remark: Conforms

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A. Determination of Dimensions and Surface Quality **Reference Standard : EN 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	0.95	0.52	-0.47	0.21	-0.28	0.16	-0.15	-0.16	-0.31	0.48
Warpage (mm) side 2	0.78	0.91	0.51	0.08	0.11	-0.24	-0.12	0.83	0.11	0.77
Maximum warpage related to the diagonal from work size (mm)	0.95 mm		Required Value: ± 2.0 mm							
	-0.47 mm									
Maximum warpage related to the diagonal from work size (%)	0.071 %		Required Value: ± 0.5 %							
	-0.035 %									

E. Warpage

(b) Widthwise	1	2	3	4	5	6	7	8	9	10
Warpage (mm) side 1	-0.53	-0.50	0.44	0.44	-0.12	-0.49	0.05	0.46	0.08	-0.03
Warpage (mm) side 2	-0.90	0.46	-0.66	-0.60	-0.36	-0.48	-0.98	0.13	-0.15	-0.79
Maximum warpage related to the diagonal from work size (mm)	0.46 mm		Required Value: ± 2.0 mm							
	-0.98 mm									
Maximum warpage related to the diagonal from work size (%)	0.034 %		Required Value: ± 0.5 %							
	-0.073 %									

Remark: Conforms



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A. Determination of Dimensions and Surface Quality

Reference Standard : EN ISO: 10545 (Part - 2) - 2018

(vii) Measurements of Surface Quality

- a) Description of tiles : Glazed Ceramic Tiles
 b) Number of Specimen: 20 Whole Tiles
 c) Nominal Size: 1200 x 600 x 8.6 mm
 d) Work Size: 1200 x 600 x 8.6 mm
 e) Thickness: 8.6 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 : EN ISO: 10545 (Part - 3) - 2018

Sample Size: 200x200x8.6mm

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	763.42	763.67	0.0327
2	768.87	769.08	0.0273
3	759.10	759.32	0.0290
4	772.49	772.73	0.0311
5	765.14	765.37	0.0301
6	756.36	756.62	0.0344
7	770.92	771.13	0.0272
8	769.12	769.32	0.0260
9	775.22	775.48	0.0335
10	767.57	767.78	0.0277
11	760.21	760.46	0.0329
12	773.54	773.79	0.0323

Average Water Absorption of the all specimens
tested in %

0.0304 %

Required Value Max. 0.5 %

Individual Max. Value of Water Absorption of the
Specimen in %

0.0344 %

Required Value Max. 0.6 %

Remark: Conforms

(ii) Modulus of Rupture

Reference Standard : EN 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/mm ²) 3Fl ₂ /2bh ²
1	878.5	580	300	8.14	38.45
2	842.0	580	300	8.09	37.31
3	889.5	580	300	8.11	39.22
4	854.0	580	300	8.07	38.03
5	867.0	580	300	8.15	37.85
6	861.5	580	300	8.10	38.08
7	873.0	580	300	8.12	38.40

Average Breaking Load, N

866.50 Newton

Average Modulus of Rupture, N/mm²

38.19 N/mm²

Required Value: 35 N/mm²

Individual Minimum Modulus of Rupture, N/mm²

37.31 N/mm²

Required Value: 32 N/mm²

*Note : Testing has been done on cut tiles, test specimen size (600x300 mm)

Remark: Conforms

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(iii) Breaking Strength

Reference Standard : EN 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	878.5	580	300	1698.43
2	842.0	580	300	1627.87
3	889.5	580	300	1719.70
4	854.0	580	300	1651.07
5	867.0	580	300	1676.20
6	861.5	580	300	1665.57
7	873.0	580	300	1687.80

Average Breaking Load, N **866.50** Newton

Average Breaking Strength, N **1675.23** Newton Required Value: Min 1300 Newton

*Note : Testing has been done on cut tiles, test specimen size (600x300 mm) Remark: Conforms

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

Reference Standard : EN ISO: 10545 (Part - 5) - 2000

Specimen Number	Dropping height of the ball (h1) mm	Indentation or Cracking	Coefficient of restitution of Specimen
1	1000	No Indentation or Cracking	0.784
2	1000	No Indentation or Cracking	0.775
3	1000	No Indentation or Cracking	0.783
4	1000	No Indentation or Cracking	0.789
5	1000	No Indentation or Cracking	0.773

Average Coefficient of Restitution of the all
specimens tested **0.781**

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

Remark: Conforms

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(v) Determination of Slip Resistance :

Reference Standard : CEN/TS 16165 : 2016

Slipperiness (PTV)	1	2	3	4	5
	22	24	24	22	22

Average Slipperiness (PTV) **23** PTV (Wet) Slider **96** R rating : **R 9**

Remake: Conforms

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

Reference Standard : EN ISO: 10545 (Part - 7) - 2000

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	3
2	150	No	NA	
3	600	Yes	2	
4	750	NA	NA	
5	1500	NA	NA	
6	2100	NA	NA	
7	6000	NA	NA	
8	12000	NA	NA	

Resistance to surface abrasion of glazed tiles
intended for use on floors

Class 2, Failure occurred at 600 Revolutions

Required Vale: NA

Remark: Conforms

(vii) Determination of Tactility

Reference Standard : CEN/TS 15209

Observation: No Tactile surface observed, Plane Surface observed.

Remake: Conforms

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(viii) Determination of Linear Thermal Expansion

Reference Standard : EN 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°C in mm	Required	Results
a. Coefficient of linear thermal expansion, ambient to 100°C, Specimen 1	25.17	26.1	0.004	NA	2.15×10^{-6}
b. Coefficient of linear thermal expansion, ambient to 100°C, Specimen 2	25.22	28.3	0.004	NA	2.21×10^{-6}
Average Coefficient of linear thermal expansion, ambient to 100°C				NA	2.18×10^{-6}

Remark: Conforms

(ix) Determination of Resistance to Thermal Shock

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

i) Water Absorption Coefficient: 0.0304 %

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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(x) Determination of Moisture Expansion

Reference Standard : EN 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	100.220	100.220	100.221	100.220	0.00000
2	100.224	100.224	100.226	100.225	0.00998
3	100.250	100.250	100.252	100.251	0.00998
4	100.416	100.416	100.418	100.417	0.00996
5	100.277	100.277	100.278	100.277	0.00000
Average Moisture Expansion (mm/m)					0.00598
Maximum Value of Moisture Expansion (mm/m)			0.00998	Required Value	Max. 0.6 mm/m

Remark: Conforms

(xi) Determination of Craze Resistance for glazed tiles

Reference Standard : EN ISO: 10545 (Part - 11) - 2000

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

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

Remark: Conforms

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(xii) Determination of Reaction to fire:

Reference Standard : EN ISO: 1182: 2020

Observation: All tiles under observation conforms to **Class A1** when tested Non-combusible Test of method prescribed.

Remake: Conforms

(xiii) Determination of Frost Resistance

Reference Standard : EN ISO: 10545 (Part - 12) - 2000

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	Cracks	Crazing
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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(xv) Small Colour Differences

Reference Standard : EN ISO: 10545 (Part - 16) - 2012

****NOT APPLICABLE**

As EN ISO 10545-16 is only applicable to plain coloured glazed or unglazed tiles.

C. Chemical Property

(i) Determination of Chemical Resistance

Reference Standard : EN 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	Conforms
2		Min. class B(V)	Class-A(V) No visual change	
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	Conforms
2		Min. class B(V)	Class-A(V) No visual change	
3		Min. class B(V)	Class-A(V) No visual change	

c. Low Concentration (L):

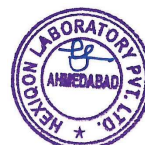
Specimen Number	Characteristic/ Test	Requirements	Test Results	Remark
1	i) Hydrochloric Acid solution 3% (v/v)	As per Manufacturer	Class-LA(V) No visual change	Conforms
2		As per Manufacturer	Class-LA(V) No visual change	
3		As per Manufacturer	Class-LA(V) No visual change	
1	ii) Citric acid Solution 100 gm/l	As per Manufacturer	Class- LA(V) No visual change	Conforms
2		As per Manufacturer	Class- LA(V) No visual change	
3		As per Manufacturer	Class- LA(V) No visual change	
1	iii) Potassium Hydroxide Solution 30gm/l	As per Manufacturer	Class- LA(V) No visual change	Conforms
2		As per Manufacturer	Class- LA(V) No visual change	
3		As per Manufacturer	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)	As per Manufacturer	Class-HA(V) No visual change	Conforms
2		As per Manufacturer	Class-HA(V) No visual change	
3		As per Manufacturer	Class-HA(V) No visual change	
1	ii) Lactic Acid Solution 5% (v/v)	As per Manufacturer	Class- HA(V) No visual change	Conforms
2		As per Manufacturer	Class- HA(V) No visual change	
3		As per Manufacturer	Class- HA(V) No visual change	

*Note : "(V)" stands for normal classification

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

*Note : "(V)" stands for normal classification

(ii) Determination of Resistance to stains

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

a. Stain Leaving Trace:

Specimen Number	Characteristic/ Test	Requirements	Test Results	Remark
1	Green Staining Agent in light oil (Cr2O3 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	
4		Min Class 3	Class 5	
5		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	
4		Min Class 3	Class 5	
5		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	
4		Min Class 3	Class 5	
5		Min Class 3	Class 5	



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C. Chemical Property

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

Reference Standard : EN 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 unit of Surface $\rho_A(\text{Pb})$, mg/dm ²	0.8 mg/dm ²	Not Detected (Detection Limit 0.005)	
2	Mass of lead Extracted per unit of Surface $\rho_A(\text{Pb})$, mg/dm ²	0.8 mg/dm ²	Not Detected (Detection Limit 0.005)	Conforms
3	Mass of lead Extracted per unit of Surface $\rho_A(\text{Pb})$, mg/dm ²	0.8 mg/dm ²	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 unit of Surface $\rho_A(\text{Cd})$, mg/dm ²	0.07 mg/dm ²	Not Detected (Detection Limit 0.005)	
2	Mass of cadmium extracted per unit of Surface $\rho_A(\text{Cd})$, mg/dm ²	0.07 mg/dm ²	Not Detected (Detection Limit 0.005)	Conforms
3	Mass of cadmium extracted per unit of Surface $\rho_A(\text{Cd})$, mg/dm ²	0.07 mg/dm ²	Not Detected (Detection Limit 0.005)	

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(xiv) Determination of Bond Strength/Adhesion:

Reference Standard : EN : 12004-2: 2017

Type of Adhesive

I. Cementitious Adhesives (C)

1). Normal Setting Adhesives

- a) Initial Tensile adhesion strength
- b) Tensile adhesion strength after water immersion
- c) Tensile adhesion strength after heat ageing
- d) Tensile adhesion strength after freeze - thaw cycle
- e) Open time : Tensile adhesion Strength
- f) Slip

Observed Value

Required Value

1.36 N/mm ²	≥ 0.5 N/mm ²
0.85 N/mm ²	≥ 0.5 N/mm ²
0.87 N/mm ²	≥ 0.5 N/mm ²
0.85 N/mm ²	≥ 0.5 N/mm ²
0.87 N/mm ²	≥ 0.5 N/mm ²
0.21 mm	≤ 0.5 mm

2). Fast setting adhesives

- a) Early Tensile adhesion strength
- b) Open time : Tensile adhesion Strength
- c) Initial Tensile adhesion strength
- d) Tensile adhesion strength after water immersion
- e) Tensile adhesion strength after heat ageing
- f) Tensile adhesion strength after freeze - thaw cycle
- g) Slip

1.40 N/mm ²	≥ 0.5 N/mm ²
1.21 N/mm ²	≥ 0.5 N/mm ²
1.38 N/mm ²	≥ 0.5 N/mm ²
0.83 N/mm ²	≥ 0.5 N/mm ²
0.99 N/mm ²	≥ 0.5 N/mm ²
0.71 N/mm ²	≥ 0.5 N/mm ²
0.24 mm	≤ 0.5 mm

II. Dispersion Adhesives (D)

- a) Initial Shear adhesion strength
- b) Shear adhesion strength after heat ageing
- c) Open time : Tensile adhesion Strength
- d) Adhesion strength after water immersion
- e) Adhesion strength at elevated tempratures
- f) Slip

1.74 N/mm ²	≥ 1.0 N/mm ²
1.49 N/mm ²	≥ 1.0 N/mm ²
1.39 N/mm ²	≥ 0.5 N/mm ²
1.24 N/mm ²	≥ 0.5 N/mm ²
1.45 N/mm ²	≥ 1.0 N/mm ²
0.23 mm	≤ 0.5 mm

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III. Reaction Resin Adhesives (R)

a) Initial Shear adhesion strength	2.60 N/mm ²	≥ 2.0 N/mm ²
b) Shear adhesion strength after water immersion	2.45 N/mm ²	≥ 2.0 N/mm ²
c) Open time : Tensile adhesion Strength	1.32 N/mm ²	≥ 0.5 N/mm ²
d) Shear adhesion strength after Thermal Shock	2.37 N/mm ²	≥ 2.0 N/mm ²
e) Slip	0.22 mm	≤ 0.5 mm

Remark: Conforms

Conformity Statement: The Sample provided by the Party for testing as per EN 14411: 2016, Conforms the Requirements of the Specifications mentioned and other test methods used.

Opinion and Interpretation: Not Applicable

Reviewed By



Karan Singh



For, Hexiqon Laboratory Pvt. Ltd.



(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.....