Fax: (079): 22822052



सीएसआईआर-केन्द्रीय काँच एवं सिरामिक अनुसंधान संस्थान (वैज्ञानिक तथा औद्योगिक अनुसंधान परिषद) नरोडा केन्द्र, नरोडा इन्डस्ट्रीयल एस्टेट- अहमदाबाद - ३८२३३० (भारत)

CSIR-Central Glass & Ceramic Research Institute (COUNCIL OF SCIENTIFIC & INDUSTRIAL RESEARCH) NARODA CENTRE, NARODA INDUSTRIAL ESTATE, AHMEDABAD-382 330 (INDIA)

TEST CERTIFICATE

Sample Regn. No. 20170404-008

Date : 04.2017

GC/NC/13998 / Sr. No.

2627

Issued to

M/s Simola Vitrified Pvt. Ltd.

B/h Nelco Ceramics

Ref. No.: GC/NC/TST-Misc/2017

Old Ghuntu Road, Lakhdhirpur Morbi (Guj.) -363 642.

Date

27th April, 2017

Customer Ref. No. with Date Nil, dated 03.04.2017

SAMPLE DESCRIPTION AS PER: Glaze Vitrified (Porcelain) tiles (20 mm thickness), 600mm x 600mm as

CUSTOMER'S LETTER

submitted by the party.

VISUAL OBSERAVATION: Glazed Floor tiles

TEST DESIRED:

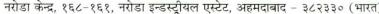
S. No.	TEST	Standard
1.	Water absorption (%)	
2.	Modulus of Rupture (MOR) N/mm ²	1
3.	Breaking Strength (N)	1
4.	Scratch Hardness surface (Mohs' Scale)	
5.	Thermal shock resistance	
6.	Bulk Density (gm/cc)	IS 15622 : 2006
7.	Co-efficient of Thermal Expansion	13 13022 . 2000
8.	Straightness of Sides	1
9	Rectangularity	ı
10.	Surface Flatness	1
11.	Chemical resistance	1
12	Skid resistance / Slipperiness	
13	Moisture Expansion	Lab . Std. Method

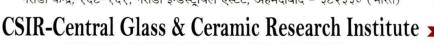
RESULTS

S.No.	Test Conducted	Test Results	Remarks
1.	Water absorption (% by mass)	i) 0.16 ii) 0.17 iii) 0.18 iv) 0.16 v) 0.18 Average 0.17	Based on the results of water absorption the tested tiles conformed to $Gr.Blb$ ($0.08\% \le 3$ %) of IS 15622 : 2006. Further test results were derived as per requirements of $Gr.Blb$

S. No.	Test Conducted	Test Results	Test Requirements As per IS 15622: 2006	Remarks
2.	Modulus of Rupture (MOR) N/mm ² Span length = 580 mm Average thickness of the tiles measured = 19.81 mm	i) 38.9 ii) 39.2 iii) 38.3 iv) 39.5 v) 39.1 vi) 39.4 vii) 38.7	(Gr. B lb) Average 38 N/mm ² Individual 35 N/mm ² , minimum	Passed the test
,		Average: 39.0 N/mm ²		

(वज्ञाानक तथा आघाागक अनुसधान पारषद) नरोडा केन्द्र, १६८–१६१, नरोडा इन्डस्ट्रीयल एस्टेट, अहमदाबाद – ३८२३३० (भारत)





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2

Sl. No.: GC/NC/ 13998 /2627

Date : 27.04.2017

S. No.	Test Conducted	Test Results	Test Requirements As per IS 15622: 2006	Remarks
3.	Breaking Strength (N) Span length = 580 mm Average thickness of the tiles measured = 19.81 mm	i) 8513.9 ii) 8275.9 iii) 8097.4 iv) 8021.8 v) 7710.7 vi) 8153.2 vii) 7857.4 Average: 8090.0 N	(Gr. B lb) For thickness > 7.5 mm 1200 N, minimum	Passed the test
4.	Scratch Hardness (Mohs'Scale)	No. 7	(Gr. B lb) For Commercial application, 6 minimum Home application 5, minimum	Passed the test
5.	Thermal Shock resistance	None of the tiles as tested showed any defects on surface at the end of the 10^{th} cycle.	(Gr. B lb) Tiles specimens should not show any visible defect when subjected to thermal shock resistance test as per test method IS 13630: 2006 (Part 5) with immersion	Passed the test
6.	Bulk Density ((gm/cc)	i) 2.306 ii) 2.303 iii) 2.298 iv) 2.308 v) 2.293 Average 2.302	IS 13630 (Part – 2) : 2006	
7.	Co-efficient of Linear Thermal Expansion from ambient Temperature to 100oC	L = 4.4956 (10 ⁻⁶ K ⁻¹) B = 4.6883 (10 ⁻⁶ K ⁻¹)		Passed the test
8.	Straightness of Sides (facial sides) The maximum deviation from Straightness in percent related to the corresponding work sizes.	+ 0.05 % (max.) - 0.08 % (max.)	(Gr. B lb) S > 410 cm ² ± 0.1 %	Passed the test
9.	Rectangularity The maximum deviation from rectangularity in percent related to the corresponding work sizes	+ 0.10 % (max.) - 0.10 % (max.)	± 0.1%	Passed the test
10	Surface Flatness The maximum deviation from flatness in percent (a) Centre of curvature related to diagonal calculated from Work size.	+ 0.17 % (max.)	± 0.2%	Passed the test
4	(b) Edge of curvature related to The corresponding work size	+ 0.10 % (max.) - 0.14 % (max.)	± 0.2 %	Passed the test
	(c) Warpage related to the diagonal calculated from the Work size	+ 0.09 <mark>% (</mark> max.) - 0.06% (max.)	± 0.2%	Passed the test

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S. No.	Test Conducted	Test results	Test Requirements As per IS 15622: 2006	Remarks
11	Chemical resistance Five test specimens were treated with following solns.			
	1. Household Chemicals a) Ammonium Chloride soln. (100gm / I) b) Standard Cleaning Agent Soln., (as per procedure)	No visual changes observed after immersion for 6 hrs., pencil lines removed with soft dry cloth. No visual changes observed after immersion for 6 hrs., pencil lines removed with soft dry cloth.	"Class – AA " min. "Class – AA " min.	Conformed to "Class – AA" Conformed to "Class – AA"
	2. Swimming Pool Salts a) Sodium Hypochlorite soln., (20 mg / I)	No visual changes observed after immersion for 6 hrs ., pencil lines removed with soft dry cloth.	"Class – AA " min.	Conformed to "Class – AA"
	b) Copper Sulphate Soln., (20 mg / l)	No visual changes observed after immersion for 6 hrs., pencil lines removed with soft dry cloth.	"Class – AA " min	Conformed to "Class – AA"
	3. Acids a) Hydrochloric acid soln., 3 % (v/v)	No visual changes observed after immersion for 7 days, pencil lines removed with soft dry cloth.		Conformed to "Class – AA"
	b) Citric acid soln., (100 gm / I)	No visual changes observed after immersion for 6 hrs., pencil lines removed with soft dry cloth.		Conformed to "Class – AA"
	4. Alkali Potassium hydroxide soln., (200gm /l)	No visual changes observed after immersion for 7 days, pencil lines removed with soft dry cloth.		Conformed to "Class – AA"

S. No.	Test Conducted	Test Results	Test Method
12.	thoroughly by wet cloth follow	desistance ace: Tile surface was cleane wed by dry cloth and ensured that a and dry at the time of testing.	d at
	b) <u>Direction of Test</u>	Coefficient of Friction μ	As per ISO 10545 Part - 17
	1) Parallel to sides (4 measurements)	1) 0.83 2) 0.78 3) 0.77 4) 0.79	
	2) Diagonal to sides (4 measurements)	5) 0.76 6) 0.75 7) 0.76 8) 0.76	



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S.No.	Test Conducted	Test Results	Remark
13	Moisture expansion in (mm / mtr.)	i) 0.0 ii) 0.0	
	m (mm) many	iii) 0.0	Passed
		iv) 0.0	the test
		v) 0.0	
		vi) 0.0	
		vii) 0.0	

Verified by

Signature

Name

Designation: Sr. Tech. Officer (3)

Authorized Signatory

Signature

Name

: Dr. Satyendra Nath Misra

Designation : Scientist-in-Charge