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उत्पाद मैन्युअल
प्रेस्सेड सिरेमिक टाइल्स के लिए
आई एस 15622:2017 के अनुसार

PRODUCT MANUAL
PRESSED CERAMIC TILES
ACCORDING TO IS 15622:2017

विभिन्न उत्पादों के लिए भारतीय मानक ब्यूरो) अनुरूपता मूल्यांकन (विनियम, 2018 की योजना -I के तहत प्रमाणन के संचालन में एकरूपता और पारदर्शिता के लिए इस उत्पाद मैनुअल का उपयोग सभी क्षेत्रीय / शाखा कार्यालयों और लाइसेंसधारियों द्वारा संदर्भ सामग्री के रूप में किया जाएगा। दस्तावेज़ का उपयोग बीआईएस प्रमाणन प्राप्त करने के इच्छुक संभावित आवेदकों द्वारा भी किया जा सकता है।

This Product Manual shall be used as reference material by all Regional/Branch Offices & licensees to ensure uniformity of practice and transparency in operation of certification under Scheme-I of Bureau of Indian Standards (Conformity Assessment)Regulations,2018 for various products. The document may also be used by prospective applicants desirous of obtaining BIS certification.

1.	**मानक संख्या** **IS No.**	:	IS 15622 : 2017
	शीर्षक **Title**	:	Pressed Ceramic Tiles
	संशोधनों की संख्या **No. of amendments**	:	2
2.	**नमूना दिशानिर्देश** **Sampling Guidelines**		
a)	**कच्चा माल** **Raw material**	:	Nil Note: This section indicates the requirements for raw material (if specified in the IS) for which compliance is to be established during Grant of Licence/Change in Scope of Licence/ Factory Surveillance
b)	**समूहीकरण दिशानिर्देश Grouping Guidelines**	:	Please refer to Annex-A
c)	**नमूने का परिमाण** **Sample Quantity**	:	50 Tiles for all tests Note: This section indicates the quantity of the sample of the product and/or the raw material (if applicable), required to be sent to the laboratory for testing, for the purpose of Grant of Licence/Change in Scope of Licence/ Factory Surveillance (incase of market surveillance, effort may be made to procure therequired quantity of product sample, as far as possible since raw material sample may not be available in market)

d)	**परीक्षण अनुरोध में घोषित किए जाने वाले पैरामीटर** **Parameters to be Declared in Test Request**		- Same as the scope of licence
3.	**परीक्षण उपकरणों की सूची** **List of Test Equipment**	:	Please refer to Annex-B
4.	**निरीक्षण और परीक्षण की स्कीम** **Scheme of Inspection and Testing**	:	Please refer to Annex-C
5.	**एक दिन में संभावित परीक्षण** **Possible tests in a day**		
	a) Shapes and sizes (Clause 5.1 & 5.2) b) Spacer lugs (Clause 5.3) c) Dimensions and surface quality (Clause 6) d) Scratch hardness of surface (Mohs') (Clause 6) e) Slip resistance / co-efficient of friction (Clause 6) Note: This section is for the guidance of BIS Certification Officers/Technical Auditors of BIS Authorized Outside Surveillance Agencies (OSAs) during factory inspection to provide readyreference regarding the tests which can be witnessed during the inspection in the factory by the officer/auditor.		
6.	**लाइसेंस का दायरा /Scope of the Licence:**		
	Licence is granted to use Standard Mark as per IS 15622 : 2017 with the following scope:		
	Name of the product	Pressed Ceramic Tiles	
	Water absorption	Group B Ia/ Group B Ib/ Group B IIa/ Group B IIb/ Group BIII	
	Nature of tile surface	- Smooth/ Profiled/ Wavy/ Decorated/ Finished in any other way - Glazed (GL) - Glossy/ Matt/ Semi-Matt - Unglazed (UGL).	
	Nature of surface Finish	Polished (P)/ Semi-Polished (SP)/ Unpolished (UP)/ Special finish such as metallic or lustre	
	Nature of edge finish	Rectified (R)/ Unrectified (UR).	
	Spacer lugs	With or without	
	Sizes	Modular (M)/coordinating size (work size) or Non-modular (NM)/ Nominal Size (work size)	
	Application	Wall/Floor application	

ANNEX A
Grouping Guidelines

1. IS 15622 : 2017 covers Pressed Ceramic Tiles with following classification based on various aspects :
   i) Water absorption : Group B Ia/ Group B Ib/ Group B IIa/ Group B IIb/ Group BIII
   ii) Nature of tile surface
      a) Smooth, Profiled, Wavy, Decorated or Finished in any other way,
      b) Glazed (GL) - Glossy, Matt or Semi-Matt, and
      c) Unglazed (UGL).
   iii) Nature of surface Finish
      a) Polished (P), Semi-Polished (SP), Unpolished (UP), and
      b) Special finish such as metallic or lustre (As agreed between the manufacturer and the purchaser).
   iv) Nature of edge finish – Rectified (R), Unrectified (UR).
   v) With or without spacer lugs.
   vi) Sizes – Modular (M)/coordinating size (work size) or Non-modular (NM)/Nominal Size (work size).
2. Considering the above following grouping guidelines for GOL/Inclusion have been developed based on water absorption groups only which is categorized as follows:

Water Absorption Group	**Thickness**	**Samples to be drawn to cover all sizes**
B III	< 7.5 mm	One sample shall be drawn with or without spacer lugs of any size to cover all sizes in the group. Separate samples of tiles shall be drawn for Glazed (GL) and Unglazed (UGL) variety.
	≥ 7.5 mm	
B II a	All	
B IIb	All	
B Ia	All	
B Ib	All	

   i) If sample of floor tiles is tested from a water absorption group then non-floor tiles may be included without further testing.

   ii) If sample of Polished (P) tiles is tested, then Semi-polished (SP) and Unpolished (UP) tiles may be included without further testing.

   iii) If sample of Rectified (R) tiles is tested, then Unrectified (UR) tiles may be included without further testing.

3. The Scope of Licence may be restricted based on the Manufacturing and Testing capabilities of the manufacturer.

4. During operation of license, BOs shall ensure that all the varieties covered in the licence are tested in rotation, to the extent possible.

ANNEX B

List of Test Equipment

(INDICATIVE LIST, FOR GUIDANCE ONLY)

Sl No	Test used in with clause reference	Test Equipment
1	Shapes and sizes (Clause 5.1 & 5.2)	- Vernier caliper - Micrometer /Screw gauge - Measuring tape and Steel scale
2	Spacer lugs (Clause 5.3)	- Vernier caliper - Measuring tape and Steel scale
3	**Dimensions and surface quality (Clause 6, Table 5, 6, 7, 8 & 9)**	
a)	Length and Width	- Vernier caliper - Measuring tape and Steel scale
b)	Thickness	- Micrometer /Screw gauge or any other suitable apparatus
c)	Straightness of sides	- Steel square - Apparatus for measurement of straightness of sides and rectangularity fitted with dial gauge as per Fig 1 of IS 13630 (Part 1) : 2019 - Calibrating plate of steel/aluminium
d)	Rectangularity	
e)	Surface flatness	- Apparatus for measurement of surface flatness as per Fig 2 of IS 13630 (Part 1) with three dial gauges etc. - Calibrating plate of metal and glass (Minimum 10 mm thick) - Metal straight edge - Thickness feeler gauge
f)	Surface quality	- Fluorescent lighting of colour temperature to 6000 K to 6500 K - Meter scale or other suitable means of measurement - Light meter
4	**Physical properties (Clause 6, Table 5, 6, 7, 8 & 9)**	
a)	Water absorption, percent by weight	- Drying oven - Heating apparatus of inert material

	Bulk density	- Source of heat - Weighing balance - Distilled water - Desiccator with Silica gel - Chamois leather - Wire loop - Halter and Basket - Vacuum chamber and Vacuum system to maintain a pressure of 10 ± 5 kPa
b)	Modulus of rupture Breaking strength	- Drying oven - Recording gauge - MOR Testing apparatus as per Fig 1 of IS 13630 (Part 6) : 2019
c)	Moisture expansion	- Direct reading gauge (minimum travel of 10 mm and LC 0.01mm) - Reference bar of Nickel steel (invars) - Kiln - Vernier caliper - Constant temperature hot water bath
d)	Scratch hardness of surface (Mohs')	- Reference minerals as per Mohs' Scale
e)	Coefficient of linear thermal expansion from ambient to 100 ° C	- Suitable calibrated thermal expansion apparatus with heating rate of 5 ± 1 °C as per clause 3.1 of IS 13630 (Part 4) : 2019 - Desiccator - Drying oven - Vernier caliper
f)	Thermal shock resistance	- Low temperature water bath with water flow of 4 liter/ min - Drying oven - Stop watch
g)	Impact Resistance - Coefficient of Restitution	- Ball release apparatus as per Fig 1 of IS 13630 (Part 14) : 2019 - Electronic timing device - Chrome Steel Ball (19 ± 0.05 mm Dia) - Humidity chamber - Epoxide resin adhesive - Apparatus for measurement of surface water absorption of concrete blocks or slabs as per Fig 3 of IS 13630 (Part 14) : 2019

h)	Coefficient of friction (applicable for tiles intended for use on floor)	For Test method as per IS 18433 (Part 1) - - Pendulum tester (fig 1 of IS 18433-1) - Slider - Accessories Or, For Test method as per IS 18433 (Part 1) – - Testing footwear - Test Apparatus with Safety Equipment (fig 2 of IS 18433-2) - Lubricant - Flooring test piece - AC
i)	Crazing Resistance	- Steam autoclave or directly heated autoclave of volume suitable to keep Tiles and specimens - Suitable Stains (1% solution of aqueous methylene blue) - Damp cloth
j)	Resistance to surface abrasion of glazed tiles Class I to Class V (Applicable for floor application only)	- Abrasion testing machine as per clause 5.1 of IS 13630 (Part 11) : 2019 with suitable abrasive loads - White fused aluminum oxide conforming to the grain size requirement of Grit No. 80 of Table 1 of IS 11643 - 20 ml of de-ionized or distilled water - Fluorescent viewing box with fluorescent light of colour temperature 6000 K to 6500 K and of size 61 cm x 61 cm x 61 cm - Drying oven - Weighing balance - Protractor
k)	Frost Resistance	- Drying oven - Weighing balance - Container (for impregnation by Capillarity) - Vacuum pump (Capable of lowering than air pressure by 40 ± 2.6 KPa in a tank) - Freezer (operating temperature range +5 °C to -5 °C) - Chamois leather - Demineralized water

<table>
<tr><td>l)</td><td>Resistance to deep abrasion of unglazed tiles, volume of material removed per cubic millimeter (Applicable for floor application only</td><td>- Aluminium Oxide (Grain size requirement of Grit no 80 of Table 1 of IS 11643)
- Abrasion apparatus as per clause 5.1 and as depicted in Fig 1 of IS 13630 (Part 12) : 2019
- Measuring gauge</td></tr>
<tr><td>5</td><td colspan="2">Chemical properties (Clause 6, Table 5, 6, 7, 8 & 9)</td></tr>
<tr><td rowspan="3">A</td><td>Resistance to staining of glazed tiles</td><td rowspan="3">Chemicals required:
1. Stains
• Methylene Blue (10 g/l)
• Potassium Permanganate Solution (10 g/l)
2. Household chemicals - Ammonium Chloride Solution (100 g/l)
3. Swimming Pool Salts
• Sodium Hypochlorite Solution (20 g/l)
• Copper Sulphate Solution (20 g/l)
4. Acid and Alkalis
• Hydrochloric Acid Solution, 3% (v/v), prepared from concentrated acid (ρ = 1.19 g/ml).
• Citric Acid Solution (100 g/l)
• Potassium Hydroxide Solution (200 g/l)
5. Cleaning Agents
• Anhydrous Sodium Carbonate: 33%(m/m)
• Sodium Perborate: 7%(m/m)
• Sodium silicate solution of density 1.33 g/cm^3: 7% (m/m)
• Commercial Sodium Oleate soap flakes: 30%(m/m)
• Distilled water of de-ionized water: 23%(m/m)
Apparatus:
- Vessel with lid made of borosilicate glass
- Cylinder of borosilicate glass
- Drying oven
- Sealing material
- White cloth made of cotton or flax
- Chamois leather
- Weighing balance
- Pencil of HB Hardness
- Electric lamp of 40W (White Inside).</td></tr>
<tr><td>Resistance to household chemicals and swimming pool water cleansers except to cleansing agents containing hydrofluoric acid and its compounds – Glazed tiles</td></tr>
<tr><td>Resistance to acid and alkalis (with the exception of hydrofluoric acid and its compounds – Glazed tiles</td></tr>
<tr><td>B</td><td>Resistance to Staining of Unglazed Tiles</td><td>Chemicals required:
1. Stains</td></tr>
</table>

	Resistance to household chemicals and swimming pool water cleansers except to cleansing agents containing hydrofluoric acid	• Green Paste Staining Agent • Red Paste Staining Agent (Only applicable for Green coloured tiles) • Iodine, 13 g/l solution in alcohol
	and its compounds – Unglazed tiles	• Olive Oil 2. Household Chemicals - Ammonium Chloride Solution (100 g/l)
	Resistance to acid and alkalis (with the exception of hydrofluoric acid and its compounds – Unglazed tiles	3. Swimming Pool Salts, Sodium hypochlorite solution, 20 mg/l prepared from technical grade sodium hypochlorite with about 13 percent (m/m) of active chloride. 4. Acid and Alkalis- Low Concentration • Hydrochloric acid solution, 3% (v/v) prepared from concentrated acid (ρ = 1.19 g/ml) • Citric acid solution, 100 g/l • Potassium Hydroxide solution, 30 g/l 5. Acid and Alkalis- High Concentration • Hydrochloric acid solution, 18% (v/v) prepared from concentrated acid (ρ = 1.19 g/ml) • Lactic acid solution, 5% (v/v) • Potassium Hydroxide solution, 100 g/l 6. Cleaning Agents • Hot water at a temperature of 55 ± 5 °C • Weak Cleaning agent- A commercial agent not containing abrasive, with a pH of 6.5 to 7.5 • Strong Cleaning agent- A commercial agent containing abrasive, with a pH of 9 to 10 • Hydrochloric acid solution, 3% (v/v) prepared from concentrated acid (ρ = 1.19 g/ml) • Potassium Hydroxide • Acetone Apparatus: - Vessel with lid made of borosilicate glass - Drying oven - Sealing material - White cloth made of cotton or flax - Chamois leather - Weighing balance - Electric lamp of 40 W (White Inside).

C	Determination of Lead and Cadmium given off by Glazed tiles	- Atomic absorption spectrometer of any other suitable method or equipment can be used for the analysis of lead and cadmium from the solution - Silicone sealant in a tube or dispenser - Impervious Cover - Detergent - White cloth - Measuring cylinder - Grade 2 distilled water - Glacial acetic acid

ANNEX C
SCHEME OF INSPECTION AND TESTING

1. QUALITY ASSURANCE PLAN

1.1 It is expected that during operation of BIS licence, manufacturers will implement a Quality Assurance Plan (QAP) i.e. a plan of regular testing and in-process controls, designed to ensure that the product bearing theStandard Mark conforms to all requirements of the Indian Standard.

1.2 The manufacturers shall define a Quality Assurance Plan (QAP) defining the control unit (i.e. lot/batch etc.), the levels of control (i.e. the frequency and number of samples for conducting the different tests as per the Indian Standard) and declare the arrangement for testing i.e. whether in-house or subcontracting/sharing for each applicable test and submit the same to BIS Branch Office for information. The manufacturer shall comply with the QAP and maintain test records in accordance with para 2.1.

1.3 **RECOMMENDED LEVELS OF CONTROL/CONTROL UNIT**:

1.3.1 For the guidance of manufacturers, the recommended definition of control unit is : All the tiles manufactured continuously in a week or part thereof from the same batch of raw materials and under similar conditions of manufacturing (Vitrification process/Glazing process) shall constitute a control unit.

1.3.2 For the guidance of manufacturers in preparing the Quality Assurance Plan, recommended levels of control are given in **Table 1**. Manufacturer has the discretion of declaring their own levels of control or accept the levels of control given in this document.

1.3.3 The manufacturer shall ensure inspection and testing as per the Quality Assurance Plan submitted by them on the whole production of the factory which is covered by this plan.

2. ENSURING COMPLIANCE THROUGH TESTING- manufacturers shall ensure compliance of their products to all the requirementsof the Indian Standard for which they may have in-house test facilities. However, there is no obligation to maintain in-house laboratory. Licensee may use alternative arrangements for tests of the production as per the declared QAP. Various alternatives are available for operation of BIS certification as given below and the relevant guidelines for availing such relaxations by the manufacturers, as amended from time to time, are to be referred :

i) Shared testing resources like common facility,

ii) Cluster based testing facility,

iii) Sub-contracting to outside laboratories which may either be:

a) BIS recognised/empanelled laboratories, or

b) Any accredited laboratory as per ISO/IEC 17025

2.1 **TEST RECORDS**- The manufacturers shall maintain test records for the tests carried out (either in-house or at a sub-contracted or at shared test facility) to establish conformity of the product to the Standard for operation of licence. For the tests being subcontracted or conducted at a shared test facility, test results issued by the laboratories or test facilities, shall be made available for inspection by BIS.

3. PACKING AND MARKING - The Standard Mark as given in the Schedule of the licence shall be marked on the ceramic tiles and/or their packaging, provided always that the material so marked conforms to each requirement of the specification.

3.1 Marking shall be done as per Clause 8 of IS 15622:2021.

3.2 **Additional Marking requirements**: Additionally, the following shall also be marked on product or package :

a) "For BIS certification details please visit www.bis.gov.in"

4. REJECTION - The production which conforms to the Indian Standard and covered under the scope of this licence shall be marked with the Standard Mark. Disposal of non-conforming product shall be done in such a way so as to ensure that there is no violation of provisions of BIS Act,2016.

TABLE 1

(Recommended Levels of Control by BIS- for Guidance Only)

(1)				(3)		
Test Details				**Levels of Control**		
Cl.	**Requirement**	**Test Methods**		**No. of Sample**	**Frequency**	**Remarks**
		Clause	**Reference**			
4	Classification	4.1 to 4.4	IS 15622	Firm to have adequate in-process controls to check compliance of this parameter as per the tolerances given in the Indian Standard. However, appropriate records shall be maintained by the manufacturer for evidenceof conformity.		
5.1	Shapes and Sizes	5.1 and 5.2	IS 15622			
5.3	Spacer Lug	5.3.1 and 5.3.2	IS 15622			
6	**REQUIREMENTS**					
	1) DIMENSIONS AND SURFACE QUALITY	Table 5 to 9	IS 15622	-	-	-.
	a) Length and Width	2	IS 13630 (Part 1)	Firm to have adequate in-process controls to check compliance of this parameter as per the tolerances given in the Indian Standard. However, appropriate records shall be maintained by the manufacturer for evidenceof conformity.		
	b) Thickness	3	IS 13630 (Part 1)			
	c) Straightness of sides	4	IS 13630 (Part 1)			
	d) Rectangularity	5	IS 13630 (Part 1)			
	e) Surface flatness	6	IS 13630 (Part 1)			
	f) Surface Quality	7	IS 13630 (Part 1)			
	2) PHYSICAL PROPERTIES	Table 5 to 9	IS 15622	-	-	-
	a) Water Absorption	Table 5 to 9	IS 13630 (Part 2)	As per clause 4 of IS 13630 (Part 2)	Each control unit	-

	b) Modulus of rupture	Table 5 to 9	IS 13630 (Part 6)	As per clause 5 of IS 13630 (Part 6)	Each control unit	-
	c) Breaking Strength		IS 13630 (Part 6)	As per clause 5 of IS 13630 (Part 6)	Each control unit	-
	d) Moisture expansion		IS 13630 (Part 3)	Five	Once in a month for each type of tile	-
	e) Scratch hardness of surface		IS 13630 (Part 13)	Three	Each Control Unit	-
	f) Coefficient of linear thermal expansion from ambient temperature to 100 ^{0}C		IS 13630 (Part 4)	Two	Once in a month for each type of tile	-
	g) Thermal shock resistance		IS 13630 (Part 5)	Five	Once in a month for each type of tile	-
	h) Impact resistance- Coefficient of restitution		IS 13630 (Part 14)	Five	Once in three months for each type of tile	-
	i) Slip Resistance/ Coefficient of Friction (For floor tiles)		IS 18433 (Part 1) or, IS 18433 (Part 2)	Five	Once in a month for each type of tile	-
	j) Crazing resistance		IS 13630 (Part 9)	Five	Each Control Unit	-
	k) Resistance to surface abrasion of glazed tiles (For floor tiles)		IS 13630 (Part 11)	19 Test Specimens	Once in a month for each type of tile	-
	l) Frost resistance (Applicable for Groups B Ia, B Ib, B IIa and B IIb)		IS 13630 (Part 10)	As per clause 4 of IS 13630 (Part 10)	Once in a month for each type of tile	-

	m) Resistance to deep abrasion of unglazed tiles (For floor tiles and applicable for Groups B Ia, B Ib, B IIa and B IIb)		IS 13630 (Part 12)	Five	Once in a month for each type of tile	-
	n) Bulk Density (Applicable for Groups B Ia and B Ib)		IS 13630 (Part 2)	As per clause 4 of IS 13630 (Part 2)	Each control unit	-
6	a) Resistance to Staining	Table 5 to 9	IS 15622	-		
	i) For Glazed Tiles	-	IS 13630 (Part 8)	Five test specimen	Once in three months for each type	-
	ii) For Unglazed Tiles (Only for Group B Ia)	-	IS 13630 (Part 7)			
	b) Resistance to household chemicals and swimming pool water cleansers except to cleansing agent containing hydrofluoric acid and its compounds (Table 5 to 9 of IS 15622) -					
	i)For Glazed Tiles	-	IS 13630 (Part 8)	Five test specimen for each solution	Once in three months for each type	-
	ii) For Unglazed Tiles (Only for Group B Ia)	-	IS 13630 (Part 7)			Required, if agreed according to the chemical resistance class indicated by the manufacturer.
	c) Resistance to acid and alkalis (With the exception of hydrofluoric acid and its compounds) (Table 5 to 9 of IS 15622) -					
	i) For Glazed Tiles	-	IS 13630 (Part 8)	Five test specimen for each solution	Once in three months for each type	-
	ii) For Unglazed Tiles (Only for Group B Ia)	-	IS 13630 (Part 7)			Required, if agreed according to the chemical resistance class indicated by the manufacturer.
6	d) Determination of Lead and Cadmium given off by Glazed tiles	-	IS 13630 (Part 16)	Three	Once in three months for each type	-