

## **FITMENT OF TILES**

1. The Board as per its policy permits the use of reputed brands only where the manufacturer has the necessary certification. In case of the Greater Mohali, the vitrified tiles being fitted are of Somany / Johnson make both are leading tile manufacturers. The bath room and kitchen tiles are of Kajaria and Somany makes. This is as per allottees choice approved whilst show casing the sample flat in Jan 2009.

2. **Fitment:** The process of fitment of tiles in the flats is initiated once the other activities such as aluminium work, plastering of walls, laying of conduits etc are completed. As a practice after laying the tiles a layer of POP is put to ensure that the tiles are not damaged. During this process the following is ensured:

- (a) Tiles are of the approved pattern no and make.
- (b) Tiles laid are of same batch no / lot.
- (c) The slope is correct and bottom layer is prepared correctly.
- (d) The four corners of the tiles are matching with the corners of the adjoining tiles.

3. **Handing Over:** The tiles do remains in this condition till the time we get a request from the allottee for taking over of the flats. This period may extend from 06 months to 02 years. Once the flat is being prepared for handing over, the POP is removed along with other finishing works. The tiles found damaged / chipped are removed and replaced with new tiles. This is from where the issue starts.

- (a) The replaced tiles shade variation is vibrant due to the time gap between fixing of the old tile and the new tile. Though the tile fitted is of same company same pattern no. The batch no and year of manufacturing may be different.
- (b) This variation does get toned down to certain extent with regular usage, this is what the tile manufacturer claim.
- (c) The site offices do keep the matching shades which are changed after taking clearance / approval from the allottees.
- (d) This process was further modified to allow the allottee greater say in the replacement of tiles. The PD and staff have been directed not to replace the damaged tiles at their own initiative as the colour issue was becoming a contentious matter. The Project Staff and Contractor have been directed to offer the sample of tiles to the allottee prior to replacement. The damaged / broken tile will be replaced with a tile of allottee's choice.

4. **Manufacturing Limitations:** All the tiles are sourced from IS certified company. The ISO specifications are spelt out on IS-15622:2006 and permit variation in shade of same design number. Copy of IS specification is attached as Annex-A. The primary reasons are as follows:-

- (a) The manufacturing process has a limitation that once a lot has been produced, similar shades cannot be reproduced due to variables in manufacturing process and due to this there will be marginal variation.

(b) Generally the same lot should not have variation, but this also can not be totally ruled out as in the same pack, some times slight variations are observed. This is because of temperature variations in the production line.

(c) Slight variations are also permitted in the thickness of the tiles as per the specifications of the company.

5. **Allottees Observations:** The HQ AFNHB / site office have received some representation from the allottees, accusing the board that sub-standard materials has been used, where as this contention is not true. The material being put is of the approved brand and pattern number as selected by the allottees during inspection of sample flat. This variation is due to the manufacturing limitations as would be evident from the IS specifications.

6. **The Way Forward:** It is the endeavor of the board to satisfy all our allottees. At the same time it is our request to understand the limitations in the process of manufacturing. The contractors though have kept additional quantities but in the process have got utilized. Certain initiatives have been taken by the board.

(a) Negotiating with the manufacturer to provide the closet matching shades.

(b) The contractor has been directed to procure the matching shades from the near by areas and where ever appropriate have them available for replacement.

(c) The flats where the variation is vibrant, the allottees are offered the matching shades available at site and the same are replaced after their concurrence.

(d) The Project team has been directed to replace damaged tiles if any, with tile as chosen by the allottee.

(e) The allottee can bring replacement tiles of his choice in case he is not satisfied with the tiles available at site with the Project staff / contractor and cost of the same will be reimbursed by the Project Director at site.

7. This is an issue which is not limited to the project but is an issue which other projects also face. We are hopeful that we will be able to provide the best possible solution available keeping in mind the limitations.

Table 9 (Concluded)

Characteristics (1)	Requirements (2)	Method of Test, Ref to Part of IS 13630 (3)
iii) <i>Straightness of sides</i> <sup>2)</sup> ( <i>Facial sides</i> ): The maximum deviation from straightness, in percent related to the corresponding work sizes	±0.15	Part 1
iv) <i>Rectangularity</i> <sup>2)</sup> : The maximum deviation from rectangularity in percent related to the corresponding work sizes	±0.15	
Tile with spacer lugs	±0.15	
v) <i>Surface flatness</i> : The maximum deviation from flatness, in percent:		
a) Centre curvature, related to diagonal calculated from the work sizes	±0.22	
b) Edge curvature, related to the corresponding work size	±0.22	
c) Warpage, related to the diagonal calculated from the work sizes.	±0.22	
vi) <i>Surface quality</i>	Minimum 95 percent of tiles shall be free from visible defects that would impair the appearance of a major area of tiles.	
<b>B) Physical Properties</b>		
i) Water absorption, percent by mass	≥ 10 percent, when the value exceeds 20 percent this shall be indicated by the manufacturer. (Average 10 percent)	Part 2
ii) Modulus of rupture, in N/mm <sup>2</sup>	Average 12 for thickness < 7.5 mm Average 15 for thickness ≥ 7.5 mm	Part 6
iii) Breaking strength, in N	200 for ≤ 7.5 mm thickness, <i>Min</i> 500 for > 7.5 mm thickness, <i>Min</i>	
iv) Moisture expansion, in mm/m	0.04	Part 3
v) Scratch hardness of surface (Mohs)	3, <i>Min</i>	Part 13
vi) Co-efficient of linear thermal expansion from ambient temperature to 100°C	$9 \times 10^{-6} \text{ K}^{-1}$ , <i>Max</i>	Part 4
vii) Thermal shock resistance	10 cycles, <i>Min</i>	Part 5
viii) Crazing resistance <sup>3)</sup>	4 cycles @ 7.5 bar, <i>Min</i>	Part 9
<b>C) Chemical Properties</b>		
i) Resistance to staining of glazed tiles	Class I, <i>Min</i>	Part 8
ii) Resistance to household chemicals and swimming pool water cleansers except to cleansing agents containing hydrofluoric acid and its compounds	Class AA, <i>Min</i>	
iii) Resistance to acids and alkalis (with the exceptions of hydrofluoric acid and its compounds)	Required if agreed, according to the chemical resistance class indicated by the manufacturer.	

<sup>1)</sup> For tiles having one or more adjacent glazed tiles.

<sup>2)</sup> Not applicable for tiles having curved shapes.

<sup>3)</sup> Certain decorative effects may have a tendency to craze. These shall be identified by the manufacturer, in which case the crazing test is not applicable.

Table 12 (Concluded)

Characteristics  (1)	Surface of the Product(s)				Method of Test, Ref to Part of IS 13630  (6)
	S ≤ 90 cm <sup>2</sup> (2)	90 < S ≤ 190 cm <sup>2</sup> (3)	190 < S ≤ 410 cm <sup>2</sup> (4)	S > 410 cm <sup>2</sup> (5)	
vii) Thermal shock resistance	10 Cycles, <i>Min</i>				Part 5
viii) Frost resistance	Required				Part 10
ix) Impact resistance	Required				Part 14
x) Bulk density, in (g/cc)	2.2, <i>Min</i>				Part 2
<b>C) Chemical Properties</b>					
i) Resistance to household chemicals and swimming pool water cleansers except to cleansing agents containing hydrofluoric acid and its compounds:  Unglazed tiles	Required				} Part 7
ii) Resistance to acids and alkalies (with the exceptions of hydrofluoric acid and its compounds):  Unglazed tiles	Required <sup>1)</sup>				

<sup>1)</sup> Not applicable for tiles having curved shapes.

<sup>2)</sup> Because of firing, slight variations from the standard colour are unavoidable. This does not apply to intentional irregularities of colour variation of the face of pressed tiles of low water absorption (which can be unglazed, glazed or partly glazed) or to the colour variation over a tile area, which is characteristic for this type of tile and desirable. Spots or coloured dots which are introduced for decorative purposes are not considered a defect.

<sup>3)</sup> If the hue becomes slightly different this is not considered to be chemical attack.

## 6 MARKING AND DESIGNATION

### 6.1 Marking

Ceramic tiles and/or their packaging shall be marked as follows:

- Name and address of the manufacturer and/or trade-mark and the country of origin,
- Batch number/date of manufacture, and
- Designation of tiles as per 6.3.

### 6.2 BIS Certification Marking

The tiles may also be marked with the Standard Mark.

6.2.1 The use of the Standard Mark is governed by the provisions of the *Bureau of Indian Standards Act, 1986* and the Rules and Regulations made thereunder. The details of conditions under which a licence for use of the Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

### 6.3 Designation

Tile shall be specified according to the following examples:

Pressed tile, GL                      B III M 15 cm × 15 cm  
(W 148 mm × 148 mm)