

Northern Railway

Headquarters Office,
Baroda House,
New Delhi.

No. 10/ W/O/Poily/Building

Date:01.07.2015.

Chief Engineer's Circular No. 625

Sub: Selection of Ceramic/Vitrified tiles.

Floor and wall tiles of appropriate design, colour and texture enhance the touch and feel of a building. However the aesthetic improvement potential may not be fully achieved if proper tiles are not selected. It is quite often noticed that vitrified tiles are discoloured and degenerate to show up grey patches, not only at joints but also on the main surface of tile.

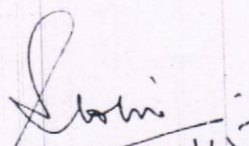
In public areas there is need to choose good tiles having wear resistance and anti-skid properties (where required), modern design, elegant colour combination and scheme of laying, etc.

In Northern Railway Unified Schedule of Rates-2010, description of items pertaining to Tiles mentions that the tiles have to conform to IS: 15622 and should be from manufacturers approved by Railway. However, colour, shades, design, etc. should be as approved by Engineer-in-charge.

The purpose of issue of this circular is to provide information to the field officers/staff and to guide them in taking informed decisions in selection of tiles and operation of USSOR items 095025, 095026 & 095027.

1. Types of Pressed Ceramic/Vitrified Tiles:

- a. **Ceramic Wall Tiles:** These tiles have High Water Absorption. These falls in Group B-III classification as per IS 13712:2006. Detailed specifications are covered in IS 15622:2006. Due to high water absorption, these tiles tend to stain after contact with liquids. These are generally suitable for areas which are not likely to be wetted frequently.
- b. **Ceramic Floor Tiles:** These tiles have Medium Water Absorption. These falls in Group B-II classification as per IS 13712:2006. Detailed specifications are covered in IS 15622:2006. These have less strength and low hardness. Due to medium water absorption, these tiles are prone to lesser stain after contact with liquids. These are generally suitable for areas which are not likely to be wetted frequently and where foot traffic is low.
- c. **Ceramic Porcelain Tiles:** These tiles have Low Water Absorption. These are hard, resistant to stains & scratches, etc. These falls in Group B-Ib classification as per IS 13712:2006. Detailed specifications are


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covered in IS 15622:2006. These are suitable for heavy foot traffic areas.

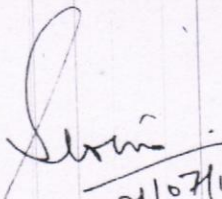
- d. **Ceramic Vitrified Tiles:** These tiles have Very Low Water Absorption. These are very extremely strong and durable. These falls in Group B-Ia classification as per IS 13712:2006. Detailed specifications are covered in IS 15622:2006. Due to very low water absorption and other properties, these tiles are suitable for very heavy foot traffic areas.

These are mainly of the following types:

- (i) **Soluble salt** vitrified tiles. These tiles are manufactured using Soluble Salt Technology in which the unfired tile body is given a liquid colour screen-printing to create the design on the tile. With this technology 2 - 2.7mm print are penetrated into the tile. Once the tiles have been fired and polished in order to create a glossy surface, approximately 0.7mm of the soluble print is shaved off, leaving a total print penetration of only 1 to 2 mm.
- (ii) **Double charge** vitrified tiles are fed through a press that prints the pattern with a double layer of pigment, 3 to 4 mm print which is thicker than other types of tile. These tiles have a long-wearing tile surface, suitable for foot traffic, heavier than soluble salt vitrified tile.
- (iii) **Full body** vitrified tiles have pigment in entire body (thickness) of the tile. This makes chips and scratches less noticeable and makes this an ideal choice for commercial places.
- (iv) **Glazed** vitrified tiles (GVT) have a glazed surface. They offer a wide variety of design, art work and surface textures like wood grain, bamboo, slate or stone. This is normally used for premium decorative flooring properties.

2. **Selection of Ceramic/Vitrified Tiles:**

- a. Tiles from reputed manufactures and conforming to IS: 15622 should only be used. The names of manufactures (minimum 3 nos.) should be approved by Sr. DEN/Co-ordination for inclusion in tender documents. As per CE/G letter no. 74-W/O/Pt. XXVII/WA, dated 15.04.15 (Para 8.0) operation of similar brands may be done with the approval of CE/P&D.
- b. While selecting colour, design, etc., latest catalogue of the manufacturer may be referred to and put on record.


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- c. For ceramic tiles there is wide spread usage of highlighter tiles. In upper class waiting halls, wall cladding for facade improvement, etc., suitable highlighter tiles can be used.
- d. All tiles should be of 1st quality. Different manufacturers follow different practice to distinguish these tiles. 1st quality tiles are being marketed as Premium Tiles, Luxury Tiles etc. Whereas, 2nd quality tiles are marketed as Standard/Regular Tiles. There should be awareness of such practice at all levels.
- e. Vitrified tiles normally do not get stained but acid application may leave marks leading to requirement of pre-mature replacement. Therefore cleaning with acid should be prohibited. Cleaning staff should be educated for the same.
- f. Northern Railway CE Circular No. 617 should be referred to, for standard finish of flooring to be adopted in various areas of buildings.
- g. Only qualified/trained/experienced mason should be allowed to do the work of fixing of tiles. In this connection circular no. 622 may be referred to.

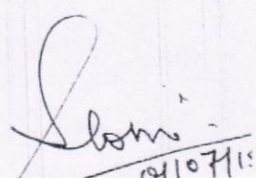
3. **Clarification on USSOR items:**

The USSOR items 095025, 095026 & 095027 presently mention only vitrified tiles without any further classification as given in para 1(d) above. It is clarified that under these items only "**Double charge**" vitrified tiles shall be used henceforth.

4. **Laying Procedure:**

- a. All concealed pipes for plumbing/wiring should be fixed in advance before laying the tiles.
- b. Suitable slope on floor as per functional requirement should be given.
- c. Tiles should be cut with Disc cutter rather than using tongs.
- d. Tiles with design can only be laid in a certain orientation, the same should be ensured by mock up before laying.
- e. At corners, bevel cutting of tiles should be done (if possible) to avoid exposure of side of tile.
- f. Joints of tiles should be filled with matching coloured grout.

This is issued with approval of Principal Chief Engineer.


(S.K. Lohia)

Chief Engineer (P&D)