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Fixing Porcelain and Vitrified Tiles to Internal Walls

There is an increasing trend towards fixing porcelain and vitrified tiles to walls. With differing manufacturing processes and materials, larger, thicker format tiles, complying with BS6431 are being produced. Porcelain and vitrified tiles, unlike porous bodied tiles, shrink in the firing process therefore certain allowances have to be made to dimensional accuracy in the manufacturing process.

Bearing this in mind, the Tile Association has drawn up the following advice for clients planning to use vitrified tiles.

1. Tile Types

Porcelain/Fully Vitrified Tiles

Fully vitrified tiles which can either be unglazed or glazed characterised by the tile's low water absorption below 0.5% (BI_a) Porcelain tiles are normally dry pressed using a body made from Kaolin clays, feldspar, silica and colouring oxides fired to around 1200 degrees.

Vitrified and Semi-Vitrified Tiles

Tiles, which can either be unglazed or glazed. Tiles in this category can be either dry pressed or extruded and have water absorption of between 0.5 to 3%(vitrified) Class BI_b – drypressed, and 3% to 6% (semi-vitrified), Class BII_a – dry pressed.

2. Tolerances

Current British & European Standards for ceramic tiles define tolerances for dimensions of tiles. These vary depending on tile type and size as shown below:

	Tolerance for porcelain tile (BI _a) or vitrified tile (BI)	Tolerance for glazed tile porous body (BIII) (non-lug)
10x10 cm tile	1mm	0.75mm
20x20 cm tile	1.5mm	1 mm
30x30 cm tile	1.8mm	1.5mm

Tolerances are also defined for centre curvature of tiles. These too vary depending on the type and size of tile.

	Tolerance for Porcelain tile (BIa) or vitrified tile (BI)	Tolerance for glazed tile porous body (BIII) (non-lug)
10 x 10 cm tile	.70 mm to -.70 mm	.70 mm to -.42 mm
20 x 20 cm tile	1.40 mm to -1.40 mm	1.40 mm to -.85 mm
30 x 30 cm tile	2.12 mm to -2.12 mm	2.12 mm to -1.27 mm

(Negative curvature values indicate concave tiles)

The tolerances for tile fixing set down within British Standard BS5385 for tile fixing are demanding and as a result of the differences in manufacturing and fixing tolerances, special consideration has to be given to fixing vitrified tiles to walls.

3. Tile Fixing

Full guidance is given in British Standard, BS5385 Wall and floor tiling. The following points should be remembered:

a) Background

- The ideal background is cement:sand rendering
- Weight restrictions for tiling onto plaster and plasterboard are defined in BS5385:1, i.e. 32 kg/m² on plasterboard, and 20 kg/m² on plaster
- The background to receive tiling should be fully cured, dry, clean, sound and nominally flat, such that when checked using a 2m straightedge, any gap under the straightedge should not exceed 3mm.

NOTE: Larger format tiles with a surface area greater than 0.1m² may need additional mechanical fixing when used above 3 metres.

b) Setting Out

Vitrified and porcelain bodied tiles are often polished for aesthetic purposes. The polishing process, which involves grinding, will reduce the thickness of the tiles and possibly the overall dimensions of the tile. Therefore extra care should be taken at the design stage and during installation.

- Tiles should not be butt jointed
- Pressed tiles should be spaced at a minimum of 3mm
- Extruded tiles should be spaced at a minimum of 5mm
- Rectified or calibrated tiles should be spaced at a minimum of 2mm

c) Fixing

- Lighting during tile fixing should be as close to the end use as possible
- Tolerances for surface flatness are defined in BS5385
- In a dry area a minimum area of contact of 75% should be achieved
- In wet areas solid bed fixing is required

d) Adhesives and Grouts

- Use a polymer enhanced adhesive meeting the requirements for a cementitious Class C2 adhesive defined in BS EN 12004
- Grout meeting the requirements of BS EN 13888 should be applied as defined in BS5385

For further advice contact the Tile Association on 0208 663 0946 or go www.tiles.org.uk