

Mosa. Tiles.

General installation advice

General

For good tile installation a flat, stable substrate with sufficient load bearing capacity is required. For general guidelines and quality standards pertaining to the installation of wall and floor tiles and the substrate requirements, please refer to the following publications:

- URL 35-101 (dated 2009-03-16) – Installation of wall and floor tiles for regular applications (published in the Dutch language by IKOB-BKB)
- SBR/WTCB 468a.H.99-ISBN 90-5367-284-2

Additional information, concerning aspects such as flatness and the installation of tiles, can be found in the following DIN standards:

- DIN 18157 – Application of ceramic tiling using the thin-bed method
 - DIN 18202 – Tolerances in building construction - buildings
 - DIN 18352 – General technical specifications for building works - Tile laying works
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Modular dimensions and fabrication dimensions

The production of Mosa wall and floor tiles is based on fabrication dimensions intended for use with a modular system. The modular size is expressed in centimetres, while the fabrication size is expressed in millimetres.

Wall and floor tiles manufactured in accordance with the modular system can be combined within a room, allowing perfect alignment of the joints of the floor and the walls. To achieve this, the installer must work to a plan or 'modular dimension' of 10 cm, 15 cm or a multiple thereof.

Most wall tiles have fabrication dimensions with a calibre of 77, for example:

Modular dimensions	Fabrication dimensions
10x10cm	97x97mm
15x15cm	147x147mm

Rectified floor tiles have a calibre of 66 or 77, for example:

Modular dimensions	Fabrication dimensions
45x45cm	446x446mm
60x60cm	597x597mm

Non-rectified floor tiles may have other fabrication dimensions (=calibres), within the tolerances of the Mosa standard. The calibre code is shown on the floor tile packaging. Mosa pallets always contain tiles of a single calibre. Always use tiles of the same calibre when working on a single large surface.

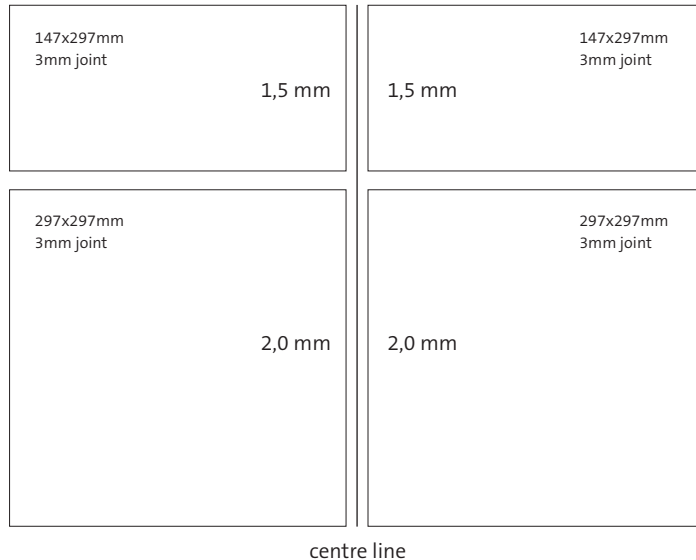
Calibre	Fabrication dimensions
55	295x295mm
66	296x296mm
77	297x297mm
88	298x298mm

Before beginning a combined installation that includes modular floor and wall tiles, the installer must always verify the fabrication dimensions of the tiles that are to be installed and adjust the grout line width accordingly.

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An example of a modular installation; the grout lines of the wall tiles are centred in alignment with the grout line for the floor tiles, measured from the centre of the grout line.



The dimensional stability of the rectified Mosa wall tiles makes it possible to achieve a regular grouting pattern in conformance with URL 35-101 group 1 if properly installed.

The dimensional stability of non-rectified Mosa wall and floor tiles with a recommended grout line width of 3-4mm makes it possible to achieve a regular grouting pattern in conformance with IKOB-BKB URL 35-101 group 2 if properly installed.

Dimensions, flatness and quality of walls and floors that are to be tiled

For dimensions and flatness tolerances of the substrate that is to be tiled, refer to URL 35-101:2009-03-16 §5 'Requirements for the substrate' or to DIN 18202:2005-10.

The substrate to be tiled must be sufficiently dimensionally stable, have a high compression and tensile strength, and be free of dirt, separators and cracks, in accordance with DIN 18352:2006-10.

Residual moisture percentages

The residual moisture percentage of the substrate has a great influence on the quality and the service life of both the adhesive and the grout. Excessively high moisture content can lead to weak adhesion, resulting in detachment of tiles and discolouration or hazing of the grout.

Installers must respect the adhesive manufacturer's specified maximum residual moisture percentage for the surface to be tiled. Additional information about the maximum allowable moisture percentage for the substrate can be obtained from URL35-101 (dated 2009-03-16) from IKOB-BKB.

Mixing powdered adhesive

Mix the adhesive in accordance with the manufacturer's instructions.

Follow the recommendations for the powder-to-water ratio and ripening time to achieve optimal performance and quality.

The 'open time' of the mixed adhesive must also be kept in mind. This is the period of time within which the adhesive can be used. Once the open time has been exceeded the adhesive will begin to break down and will lose its adhesive strength.

Water must not be added to adhesive that has become too dry, because doing so can have a severe negative impact on the quality of the adhesive. This can lead to adhesion problems in the long term.

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Installation of wall tiles

Installers must familiarise themselves with the latest techniques for the installation of wall tiles.

Wall tiles

Mosa wall tiles have a moisture absorption capacity >10% in conformance with EN 14411 class BIII and can be installed with any conventional tiling method, using any suitable mortar or adhesive.

Consult the tile adhesive manufacturer's installation instructions.

Adhesives suitable for glazed wall tiles are manufactured in accordance with EN 12004:

- paste adhesive, type D1 or higher
- powder adhesive, type C1 or higher

The adhesive contact surface for wall tiles must be at least 65%.

Pieces can be easily cut to fit using a tile cutter with Widia scoring wheel.

All Mosa wall tiles (with the exception of Linea LED and Murals Lines and Change) have a glazed edge. This makes it possible to create attractive corner solutions.

Mosa wall tiles meet strict flatness requirements, but to ultimately obtain a smooth, flat tiled wall the substrate must be almost perfectly flat and the installation must be carried out by a professional with expertise. When using skimming light, any unevenness in the wall may be accentuated. For this reason Mosa advises to install the light source at a distance of minimal 50 cm from the wall.

Rectified wall tiles

The rectified wall tiles can be mitred to achieve attractive outside corners. It is recommended that the saw blade depth be set 1mm below the finished surface of the tile. This ensures an undamaged edge along the corner cut and prevents possible splintering of the glaze.

Thin covered skirting

Due to its thickness, thin covered skirting can be installed using adhesive along with the wall tiles.

Natural stone strips

A white quick adhesive is recommended, to prevent adhesive from showing through light-coloured natural stone. Do not under any circumstances use an acid-based caulk! It is a good idea to protect these strips before grouting, by covering them with masking tape for example. This prevents possible contamination that may later be difficult to remove.

Strips with hollow reverse side

Strips with a hollow reverse side must be installed using a paste adhesive and a trowel with teeth no larger than 6x6 mm. The ribs of adhesive should be perpendicular to the long side of the strip. To further increase the adhesive contact, also place several dabs of adhesive on the hollow reverse side. In other words, the hollow reverse side does not have to be completely covered with adhesive.

Metallic-coloured wall tiles (10Thirty) and strips

Metallic-coloured strips must be protected before grouting, by covering them with masking tape for example, to prevent damage caused by sweeping and scraping motions.

Aluminium strips and decors

Aluminium strips and decors may only be installed in tile adhesive. To prevent damage from sweeping and scraping motions, these strips and decors have a protective film on the visible side. These strips and decors can be cut to size with a hacksaw; the cut edge must then be smoothed with a file.

Glass strips and decors

Glass strips and decors can be installed on the wall, as long as they do not come into contact with cement-based substances, such as a cement substrate or cementitious powder adhesives. The strong alkaline constituents in the concrete or cement can erode the glass.

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Installation of floor tiles

Installers must familiarise themselves with the latest techniques for the installation of floor tiles.

For floors in indoor areas

The Mosa floor tile product range can be broken down as follows:

- unglazed floor tiles, manufactured in accordance with EN 14411 class BIa with a moisture absorption capacity of <0.3%
- glazed floor tiles, manufactured in accordance with EN 14411 class BIb with a moisture absorption capacity of <3%

All Mosa floor tiles can be installed using any conventional tiling method, using any suitable adhesive and grout. Installers must consult the respective manufacturers to determine the suitability and obtain instructions for use of these products.

For floor tiles, only adhesives produced in conformance with EN 12004 type C may be used.

For floors that will be subjected to heavy loads and/or used in combination with underfloor heating, adhesives produced in conformance with EN 12004 type C2, which have a higher adhesion strength (1N/mm²), must be used.

When laying tiles in a wet mortar bed a contact layer is desirable for 30x30 cm tiles and necessary for tiles of 30x60 cm or larger. Mosa recommends that large sized tiles (>30 cm) not be laid directly in the mortar, as the mortar will shrink as it dries, creating a risk of damage or detachment of the tiles. If you nevertheless decide to lay the tiles in a wet mortar bed, the application of a contact layer is necessary for all large sized tiles.

The substrate must be sufficiently flat – and for tiles measuring 30x60 cm and larger must be perfectly flat – dimensionally stable, have a high compression and tensile strength, be permanently dry and free of dirt, separators and cracks.*

The modular sizes indicated include a 3mm or 4mm grout line.

Tile sizes 30x60 cm and larger (with ground edges) can be laid with a minimum grout line width of 2 mm.

When affixed with adhesive, at least 80% of the tiles must have an adhesive contact area of at least 80%. For the remaining 20%, the adhesive contact area must not be less than 50%.

Tile sizes 60x60 cm and larger are installed using a 15mm or 10mm half-round notched trowel in combination with the buttering floating method. In this case, at least 95% of the tiles must have an adhesive contact area of at least 95%. For the remaining 5%, the adhesive contact area must not be less than 80%.

Due to the random scattering pattern during the production process, the tile surface has a directional pattern. This can be taken into account when placing the tiles. An arrow on the reverse of the tile indicates this direction.

All tiles measuring 45x45 cm or larger are rectified and have ground edges; these can therefore be modularly installed with a grout line width of 3mm or with a minimum grout line width of 2mm (if not installed modularly).

Pieces can be easily cut to size using a tile cutter with mobile breaking mechanism with sufficient support and a Widia scoring wheel or with a water cooled diamond blade tile cutter.

Due to their extra strong top layer floor tiles in the colour Porcelain white are best cut using a water cooled diamond blade cutter.

Any expansion joints must be formed in accordance with the instructions of the constructor and/or the work specifications. Existing expansion joints in the subconstruction must be carried through in the tile installation **.

Due to the flatness tolerances of the substrate and the tile, a slight amount of unevenness in the tiled wall or floor cannot be ruled out when tiles are installed in a brickwork pattern. Any resulting shadows will be accentuated by raking light.

* For standards and recommendations, see IKOB-BKB, SBR and WTCB publications and DIN standards.

**See chapter 4.2 of URL35-101 (dated 2009-03-16)

For walls in indoor areas

Mosa porcelain floor tiles meet strict flatness requirements, but to achieve a smooth, flat tile wall the substrate must be sufficiently flat and the installation must be carried out by a professional with expertise. When using skimming light, any unevenness in the wall may be accentuated. For this reason Mosa advises to install the light source at a distance of minimal 50 cm from the wall.

All Mosa floor tiles can be installed using any conventional tiling method, using any suitable adhesive and grout. Installers must consult the respective manufacturers to determine the suitability and obtain instructions for use of these products.

For floor tiles, only adhesives produced in conformance with EN 12004 type C may be used.

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Pieces can be easily cut to size using a tile cutter with mobile breaking mechanism with sufficient support and a Widia scoring wheel or with a water cooled diamond blade tile cutter.

Due to their extra strong top layer floor tiles in the colour Porcelain white are best cut using a water cooled diamond blade cutter. To prevent tile breakage, XXL tiles on light constructions can only be drilled using a water-cooled diamond tipped drill.

Expansion joints must be formed in accordance with the instructions of the constructor and/or the work specifications. Existing expansion joints in the subconstruction must be carried through in the tile installation.

The rectified floor tiles can be mitred to achieve attractive outside corners. It is recommended that the saw blade depth be set 1mm below the finished surface of the tile. This ensures an undamaged edge along the corner cut.

For floors in outdoor areas

Because Mosa unglazed floor tiles are manufactured using the Ultragres procedure, in accordance with EN 14411 B1a, with water absorbency of <0.05% on the surface and water absorbency of $\leq 0.3\%$ on the underside, they are frost-proof and suitable for use in outdoor areas.

Achieving a good installation for outdoor applications is dependent on many factors. Among other things, strict requirements are placed on the construction of the substrate to be tiled, and matters such as slope, full bed adhesive application (100%) and the elimination of water intrusion risks at junctions and expansion joints are of great importance. Moreover, professional skill and the quality of the employed adhesive and grouting system determine, to a large degree, the final quality and durability of the tile work.

For all outdoor applications, Mosa recommends seeking technical advice from the adhesive manufacturer.

As façade finish

Because they are manufactured using the Ultragres procedure, in accordance with EN 14411 B1a, with water absorbency of <0.05% on the surface and water absorbency of $\leq 0.3\%$ on the underside, the tiles are frost-proof and suitable for use as a façade finish. Attachment and anchoring must be carried out in accordance with the instructions of the constructor and/or the work specifications.

When attached using an adhesive, the adhesive manufacturer's instructions must be strictly followed. In connection with the building physics boundary conditions, contact must always be sought with the adhesive manufacturer and supplier before dimension and colour choices are made.

For detailed information about façade systems, see www.mosafacades.nl or Mosa Facades bv; Tel: +31 (0)43-3688850; Fax: +31 (0)43-3688840.

Other specific applications

Wall and floor tiles can be installed on nearly all substrates and are suitable for a very diverse range of critical applications. These include, among others:

- gypsum board substrates
- wooden substrates (such as an existing wooden floor)
- wet areas
- laboratories

To obtain good adhesion to critical substrates, or to meet specific critical application requirements, it can be necessary to install a complete system consisting of, for example, a substrate, primer, waterproofing measures, sound- or shock-absorbent insulation material and tiles. In such cases, Mosa recommends seeking technical advice from an adhesive manufacturer.

Grouting

Grout the tiles with a suitable grout in accordance with the manufacturer's instructions.

Mix the grout in accordance with the manufacturer's instructions.

Follow the recommendations for the powder-to-water ratio and ripening time to achieve optimal performance and quality.

The 'open time' of the mixed grout must also be kept in mind. Once the open time has been exceeded the grout will begin to break down and will lose its adhesive strength. If exceeded, the grout may no longer be used.

Water must not be added to grout that has become too dry, because doing so can have a severe negative impact on the quality and colour.

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A suitable tile grout will be classified as type CG2 according to EN 13888. Where necessary, grout with increased wear resistance (type CG2Ar) should be used.

For use in sanitary rooms or rooms with higher waterproof or hygiene requirements, low water absorption grouts (type CG2WAr) should be used. These are grouts that have been mixed with high quality synthetic binders.

Before applying the grout all dust and contaminants must be removed from the tiles with a clean, damp sponge. The residual film of water will fill any small irregularities in the tile surface and will make grouting easier.

Now grout the tiles with a grout float, and remove as much excess grout from the tile surface as possible during the process. Then allow the grout lines to dry until they begin to take on a dull appearance. This can take 15 to 45 minutes. (Tip: Once you can touch the grout with a clean fingertip and no grout sticks to your finger, the grout is ready to be sponged off.)

Hereafter, rub entire tiled surface with a slightly dampened sponge float or a well-wrung sponge in a circular motion. This pre-rinsing gives the grout an attractive, uniform appearance and prevents residual grout from adhering to the tiles.

Attention: Use as little water as possible! If too much water is used during pre-rinsing, the grout lines can become saturated, reducing their quality and resulting in colour variances.

For sponging off the tiles Mosa recommends the use of a wash boy (elongated pail with extraction rollers) with clean water and a sponge float. The water must be changed very frequently.

Wet the sponge float in the wash boy and use the rollers to squeeze out the excess water. Slowly draw the sponge float diagonally across the tiles (this allows the sponge to pick up the residual grout).

Rinse the sponge float in the wash boy after every sponging and squeeze out the excess water again.

Repeat this process until the entire tiled surface is completely clean, and remember to change the water often.

After the tiles have been sponged off, the tiles can be rubbed dry with a cloth or paper towels.

Important

It is best not to cover the tiled surface until all the residual moisture from the adhesive and grout has evaporated. This can take 24 to 72 hours. Should it nevertheless be desirable or necessary to cover the surface, it is recommended that you do so with a breathable material and not with plastic sheeting. We strongly advise against covering with plastic sheeting until all the residual moisture has evaporated.

When there is a danger of excessively quick drying as a result of heat, draughts or other factors, the grout must be re-dampened several times to prevent cracking, discolouration and loss of quality.

See www.mosa.nl for extensive advice and an instructional video on grouting and removal of old grout.

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Grout colour advice – Matt Collection

When creating monochromatic walls with wall tiles from the Mosa Matt Collection®, the joint colour is very important. For a number of colours from the Mosa Matt Collection®, Mosa provides the following recommendations for the choice of joint colour:

Item no.	Description	Grout			
15810	porcelain white uni	Schönox WD Old White	Omnicol Omnifill 100WD white		
15820	grey uni	Schönox WD Silver grey		Eurocol WD 706 Manhattan	
15830	mouse grey uni			Eurocol WD 706 Grey	
15840	grey-beige uni				
15850	agate grey uni			Eurocol WD 706 Manhattan	Mapei Ultracolor Plus 113
15890	ivory black uni	Schönox WD Anthracite	Omnicol Omnifill 100WD anthracite	Eurocol WD 706 Anthracite	
15910	sand yellow uni		Omnicol Omnifill 100WD vanilla		
15920	Naples yellow uni				
15930	copper brown uni				Mapei Ultracolor Plus 142
15940	Sienna red uni		Omnicol Omnifill 100WD terra		Mapei Ultracolor Plus 143
15950	biscuit uni	Schönox WD Yasmin		Eurocol WD 706 Yasmin	
15960	dark warm grey	Schönox WD Dark grey			

- Installers should first review all the product and safety sheets to familiarise themselves with the product properties, instructions for use and safety guidelines prescribed by the various manufacturers.
- Before grouting it is always advisable to first perform a colour test.
- For a monochromatic finish, also choose a matching caulk colour.

For colours with no grout recommendation, we advise you to contact our Sales Support department for a list with contact information for grout vendors.

General questions

Sales Support: info@mosa.nl; Tel.: +31 (0)43 368 92 29; Fax: +31 (0)43 368 93 56

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The text for this installation advice sheet replaces all preceding versions and has been composed with the utmost care and in cooperation with the leading mortar and adhesive producers. All recommendations are based on current state-of-the-art knowledge. This installation advice sheet contains information about Mosa products, properties and applications, and therefore may not be used as a guarantee for the stated recommendations. Mosa will not be held responsible should this information be used as a guarantee. For warranties and liability we refer to our General Terms and Conditions of Sale. No rights can be derived from the contents of this installation advice sheet. Errors and price alterations excepted. For the most actual version see www.mosa.nl.