

Mosa.

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, is referred to the following publications:

- URL 35-101 - Installation of wall and floor tiles for regular applications (published in the Dutch language by IKOB-BKB);
- Guide for finishing floors - ceramic tiles, issued by SBR/WTCB.

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 and tile laying works.

Modular sizes and fabrication sizes

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 size' of 10 centimetres, 15 centimetres, or a multiple thereof.

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

Modular size	Fabrication size
10 x 10 cm	97 x 97 mm
15 x 15 cm	147 x 147 mm

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

Modular size	Fabrication size
45 x 45 cm	446 x 446 mm
60 x 60 cm	597 x 597 mm

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 size
55	295 x 295 mm
66	296 x 296 mm
77	297 x 297 mm
88	298 x 298 mm

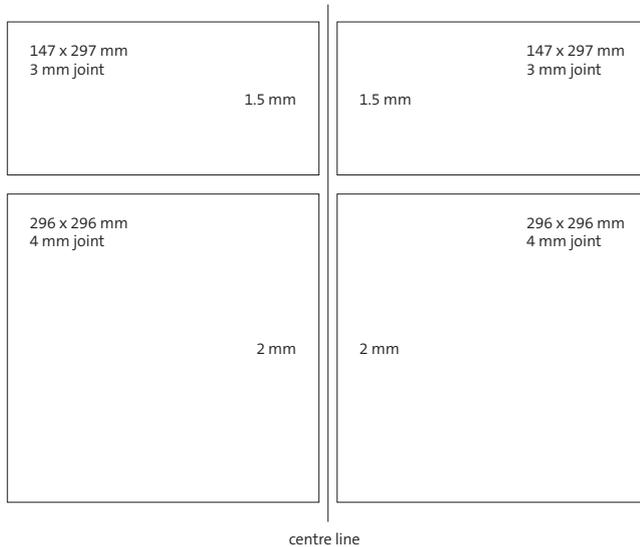
Before beginning a combined installation that includes modular floor and wall tiles, the installer must always verify the fabrication sizes of the tiles that are to be installed and adjust the grout line width accordingly.

Therefore fabrication tolerances must be taken into account at all times (for details, see the technical product sheets), which means that in the case of using patterns of wall and floor tiles, sometimes a wider joint (wider than 3 millimetres) has to be chosen with the (rectified) floor tiles, even if the wall and floor tiles are both calibre 77. In this way, these tolerances can be captured and a nice uniform result can be achieved.

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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 and floor 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 to 4 millimetres makes it possible to achieve a regular grouting pattern in conformance with 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, is referred to IKOB URL 35-101: §3 'Requirements for the substrate' or to DIN 18202.

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.

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 URL 35-101 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.

General properties and recommendations

Mosa wall tiles have a moisture absorption capacity > 10%, in conformance with EN 14411, type 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 have a glazed edge, with the exception of the articles of the series Scenes 30 x 60 centimetres (the item numbers 27010 and 27510), the series Murals Change and Murals Lines and the strips/listels. 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 used in a staggered pattern, however, due to the flatness tolerances in the substrate and the tile, any unevenness in the wall cannot be excluded (shadow effect). 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 centimetres from the wall.

Thin coved skirting

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

Installation of Ultragres tiles

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

General properties and recommendations

Mosa Ultragres tiles are unglazed and manufactured in accordance with EN 14411, type BIa with a moisture absorption capacity of $\leq 0.3\%$.

All Mosa Ultragres 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 C2, are to be used.

The adhesive contact area must be 80% at least. For the remaining 20%, the adhesive contact area must not be less than 50%.

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 45 x 45 centimetres or larger are rectified and have ground edges; these can therefore be modularly installed with a grout line width of 3 millimetres or with a minimum grout line width of 2 millimetres (if not installed modularly).

Pieces can be easily cut to size using a tile cutter with mobile breaking mechanism with sufficient support and a scoring wheel of 8 or 10 millimetres, 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.

Mosa Ultragres tiles meet strict flatness requirements, but to achieve a smooth, flat tile wall or floor the substrate must be almost perfectly flat and the installation must be carried out by a professional with expertise. When used in a staggered pattern, however, due to the flatness tolerances in the substrate and the tile, any unevenness in the wall cannot be excluded (shadow effect). 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 centimetres from the wall.

General installation advice

For walls in indoor areas

Floor tiles on light constructions can only be drilled using water cooled diamond drills to prevent tile breakage.

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 1 millimetres below the finished surface of the tile. This ensures an undamaged edge along the corner cut.

For floors in indoor areas

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 (1 N/mm²), are to be used.

When laying tiles in a wet mortar bed a contact layer is desirable for 30 x 30 centimetres tiles and necessary for tiles of 30 x 60 centimetres or larger. Mosa doesn't recommend to lay large sized tiles (> 30 centimetres) 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 30 x 60 centimetres 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 3 millimetres or 4 millimetres grout line.

Tile sizes 30 x 60 centimetres and larger (with ground edges) can be laid with a minimum grout line width of 2 millimetres.

Tile sizes 60 x 60 centimetres and larger are installed using a 10 or 15 millimetres 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%.

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.**

For floors in outdoor areas

Because Mosa unglazed Ultragres tiles are manufactured with the Ultragres procedure, in accordance with EN 14411, annex G, type Bla, with a water absorption of < 0.1% on the surface and ≤ 0.3% on the body, 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 an adhesive manufacturer.

As façade finish

Because Mosa unglazed Ultragres tiles are manufactured with the Ultragres procedure, in accordance with EN 14411, annex G, type Bla, with a water absorption of < 0.1% on the surface and ≤ 0.3% on the body, 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.mosa.com or contact telephone number +31 (0)43 368 92 29.

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;
- laboratoria.

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

** See among other things chapter 3.2, 3.6 and 6.8 of URL 35-101.

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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. A suitable tile grout will be classified, according to EN 13888, type CG2. 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.com for extensive advice and an instructional video on grouting and removal of old grout.

General questions

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The text for this installation advice 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 the latest research. This installation advice contains information about Mosa products, properties, and applications, and should not be construed as a guarantee based on the provided recommendations. Mosa accepts no liability based on the content of this document. For information concerning warranties and liability please refer to our General Conditions of Sales, Delivery, and Payment. No rights can be derived from the contents of this installation advice. We take no responsibility for typographical errors. For the latest version, see www.mosa.com.