

Positioning and Installing Jura Limestone and Solnhofen Natural Stone

Thick bed installation (using bonding processes)

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1.0 Material:

1.1 Jura limestone slabs: visible surface are sawed; honed, polished, embossed, blasted, bush-hammered, rippled, striated, brushed

1.1.2 Solnhofen Natural Stone slabs:

assorted by thickness: 7-9 mm, 9-12 mm and 13-30 mm

equal thickness: 7 mm, 10 mm, 13 mm, 16 mm, and 20 mm.

visible surface rough edged; partially honed, brushed, finely honed, matt polished.

The thickness of the slabs is determined by its function, format, method of installation, and subsurface.

1.2 Pozzonalnic Portland cement CEM II/B-P in accordance with DIN 1164, part 1 or special elements with a trass content of $\geq 40\%$

These bonding agents whose suitability is determined by the manufacturer, are used against possible colorization. It is especially recommended for grey-blue and grey-yellow mixed Jura limestone floors as well as Solnhofen Natural Stone with finely honed and polished matt surfaces.

1.3 Washed sand as a supplement according to DIN 4226-1 with grain 0-4 or 0-8 for single grain mortar; fine, sieved sand

1.4 Dry mortar whose suitability is determined by the manufacturer.

- 1.5 Joint mortar whose suitability is determined by the manufacturer,
- 1.6 Joint sealing compounds and primers for extension joints whose suitability is determined by the manufacturer
- 1.7 Heat insulating materials according to DIN 18164, Part 1, 18161, Part 1, and 18174
- 1.8 Sound insulating according to DIN 18164, Part 2, and 18165, Part 2
- 1.9 Structural steel grids with a mesh width of 50 x 50mm and a thread diameter of 2mm
- 1.10 Contact and bonding agents, primer.

2.0 Substructure, laying surface

- 2.1 The subsurface must be stable, load bearing, sufficiently dry, free of cracks, impurities and loose debris. The levelness must be in accordance with DIN 18202.
- 2.2 Rooms that are subject to humidity or in areas that have a high risk of moisture collection require waterproof sealants or non-accumulating protection against seepage water.
- 2.3 Heat and sound protection measures require the installation of thermal and noise absorption material.
- 2.4 All floor constructions on insulating layers must comply with DIN 18560. Load distribution layers/screeds located on insulation layers and/or floor heating systems must have a minimum thickness of 45mm.

Please comply with the information provided by the Professional Association of the German Tile Trade (member of the Central Association of the German Construction Industry):

Ceramic tiles and pavers, natural stone and concrete engineered stone on heated floor constructions

Ceramic tiles and pavers, natural stone, and concrete engineered stone on insulated floor constructions

Extension joints in cladding and coverings made of tiles and slabs.

German Natural Stone Association (DIN) BTI 2.1 of floor coverings

The readiness for covering a screed can be determined by using a CM device:

<2.0% on a non heated cement screed

<0.5% on non heated anhydride screed

Screeds covering heating systems are to be gradually heated and cooled before installation.

3.0 Terms of construction:

3.1 Construction is only possible at temperatures of 5 degrees Celsius and above.

3.2 Damaging factors such as driving rain and direct sunlight should be avoided.

4.0 Laying, setting and Installation:

The back side of the slabs and tiles need to be clean and adhesive.

4.1.interior floor coverings

4.1.1 Installation in connection with concrete and cement screed:

The subsurface must be properly dry, stable, and free of separating agents. If the floor covering is on a foundation in thick bed form, the mortar should be made at a mixture ratio of pozzolanic Portland cement to additive of 1:4 Dry mixed mortar according to point 1.4 can also be used. The applied mortar must have a paste like consistency with a thickness of 1-2 cm. Slabs are to be installed under "wet in wet" conditions. Individual slabs should be given trowel marks to avoid shrinkage. There are no hollow spaces to be left underneath the set tile. In order to guarantee sufficient adhesiveness between the stone coverings and mortar as well as between the mortar and the covering's subsurface, a contact and bonding agent or a primer should be applied. (see ill. 1)

Height adjustment is necessary to be executed in a separate layer with equal mortar quality and mixture, but in thicker consistency.

4.1.2 Installation on insulated and separation layers:

A 45mm thick floating screed (with or without reinforcement) as a load distribution layer is to be used on insulated layers before installation. Please comply with DIN 18560-2. (See ill. 2)

4.1.3 Illustration 3 shows a "wet in wet" method. Installation should only be made in small segments at a time that can be completed without interruption.

4.1.4 When installing on sealing or separating layers the thickness of the mortar bed must be at least 45 mm. A 0-8 grain is to be used as a supplement

4.1.5 Stairs and window sills:

Steps and height adjustment in accordance with point 4.1.1

5.0 Joints:

5.1 Joints for interior application that are sealed with mineral based joint mortar are to be laid out in 60cm side length formats with a general width of 3 mm. Above 60 cm edge length broader joints may be necessary. The width can vary with the length of the side. Joints should be compensated for permissible tolerance.

5.2 Joints should remain open as long as possible to allow for sufficient drying time, generally more than one week. This is especially important for coverings on separating layers. Please follow the manufacturer's instructions when working with quick hardening mortar. During this time, the floor should not be walked on or loaded in any way to avoid any damage and staining of the open joints.

All coverings or cladding should be slightly moistened before grouting. Please follow the manufacturer's indications when dealing with premixed mortar.

Coverings or claddings with quarry rough, slightly honed, sand blasted, bush hammered, brushed or sawn surfaces should be grouted in small segments to avoid grout residue. Surfaces are to be thoroughly cleaned immediately after grouting.

6.0 Expansion Joints

6.1 The layout for expansion joints are determined by the overall construction planning

6.2 Expansion joints must correspond with the room's spatial geometry, expected movement and be appropriately spaced. Normally, sections of up to 40 square meters should be applied on screeds. The edges of each screed should not exceed 8 meters and the aspect ratio of the edges should be smaller than 2:1. Additionally, expansion joints are to be installed wherever there are wall connections, doorways and additional widths as well as wall coverings. (See ill. 2/3)

6.3 Separation joints and expansion joints in the screed must connect at the same location and in sufficient thickness to the covering or cladding using joint sealing compounds or joint profiles.

6.4 Joint sealants are to be used according to the manufacturer's specifications. Before applying sealants, please provide for clean joints. In some cases a suitable primer is to be applied according to manufacturer's instructions.

6.1 Instructions for expansion joints are taken from the information sheet "Expansion Joints in Claddings and Coverings in form of tiles and slabs" from the ZDB.

6.2 When installing expansion joints, they must correspond with the room's spatial geometry, expected movement and be appropriately spaced. On screeds covering insulation and separating layers, installations are generally made in areas with a maximum of 40 m². Note that the side length of each screed area should be 8m at the highest and the side ratio should be smaller than 2:1. Additionally, expansion joints are to be installed wherever there are wall connections, doorways with expected width changes, as well as, wall coverings. (See ill. 4/5)

6.3 Separation joints and expansion joints in the screed must connect at the same location and have sufficient width to the covering or cladding making sure of appropriately closing them with joint sealing compounds or joint profiles.

6.4 Joint sealants are to be processed according to the manufacturer's specifications. Before applying sealants, please provide for clean joints. In some cases a suitable primer is to be applied according to manufacturer's instructions.

7.0 Initial Use and Safeguards:

7.1 Floors should not be used before ample time for hardening of the sealants and grout has been given. Normally, the duration of hardening time is no less than 7 days after grouting. High point loads require a hardening time of at least 28 days.

The drying period is dependent on the site's climatic situation which could take even more than 28 days. It is important to allow proper drying time in order to constitute an adhesive bond between the covering slab and grout.

Please comply with manufacturer's instructions when dealing with quick hardening grout.

7.2 In case a special protection is required, please use non-staining, non-coloring, absorbent and diffusible materials.

8.0 Special Instructions:

8.1 The introduction of de-icing agents and scratching contaminants should be avoided through the implementation of sufficiently sized door mats, grids or similar applications.

8.2 Due to moisture absorption, freshly laid tiles may become darker or duller in color. This will disappear during the drying process. It also applies in case of exposure to wetness in future situations, for example, during cleaning in bathing.

9.0 Cleaning and Care:

Please refer to information sheet "Recommendations for Cleaning and Care of Coverings and Claddings made from Jura Limestone and Solnhofen Natural Stone Slabs and Tiles." It is recommended that a copy of this information sheet be handed out to the owner.

10.0 References to Norms, guidelines and information sheets

For a listing of all above-mentioned categories regarding the processing of Jura Marble and Solnhofen Natural stone slabs and tiles, please refer to separate document.

Additional stipulations may be required depending on the construction or design of the finished product