MULTILAYER MODULAR FLOORING ASSOCIATION
VERBAND DER MEHRSCHICHTIG MODULAREN FUSSBODENBELÄGE E.V.

Technical Bulletin

TB 2

Installation of Multilayer Modular Floor Coverings (MMF)

(English Edition 12/2023)

Disclaimer

The references and statements in this bulletin do not claim completeness. They are intended as non-binding guidelines and additional information to the product-specific references. You are urged to obtain advice from the manufacturer/supplier of the flooring elements regarding the suitability of the selected products for the specific purpose of use as well as regarding installation thereof, however please be advised that this information material is not equivalent to specific advice provided by us but is based on general essential features of the flooring elements. In particular, this information material does not represent any quality assessment of individual manufacturers'/suppliers' products. The choice of flooring and the installation procedure are matter of your personal responsibility.

Contents

1. Introduction

What are MMF floor coverings?

Multilayer Modular Flooring (MMF): Floor covering as described in EN 16511, as well as other semi-rigid multilayer modular floor coverings for floating installation (e.g. “LVT, design flooring”, etc.). The multilayer flooring category includes multilayer, modular floor coverings with a variety of core layers (see below) and surface layers such as PVC, cork, PU, PET, etc.

Construction

MMFA Product Categories – Updated version, effective 20/11/2018

Product categories of multilayer modular floorings for floating installation to be covered by the MMFA, as defined during the joint MMFA Market Development & Technical Committees’ session in Cologne/Germany, November 20, 2018:

MMFA classifies floating multilayer modular floor coverings (MMF) as

WOOD – POLYMER – MIXED

WOOD
Wood core with polymer or cork surface.
All products with wood-based substrates (≥ 65 % content of wood particles/fibres in the core) with polymer or cork surface layer (cork thickness < 2.5 mm).

POLYMER
Polymer core with polymer surface.
Polymer or polymer-composite substrate with polymer surface layer and/or lacquer with two sub-categories:

– LVT: LVT click products

– Rigid Products: EPC, SPC – All other polymer products based on EPC or SPC (EPC: expanded polymer core, SPC: solid polymer core)

MIXED
All other constructions.
Please note: The category “Mixed”, for example, covers MMF modules using a click system and textile surface or those on a mineral core.

2. Preparing the subfloor

2.1. Requirements, properties and preparation of the subfloor structure

Mineral substrates (made of concrete or screeds) shall be permanently dry.
Substrates must generally be checked for installation maturity before laying floor coverings. For cement-based substrates, the maximum corresponding relative humidity in the system must not exceed 80 % (75 % in the case of heated substrates).
In German-speaking countries, the laying maturity is also defined by the CM method (calcium carbide method).
The moisture content must not exceed 2 % (or 1,5 % with underfloor heating). In the case of anhydrite screed with underfloor heating, the CM value of 0,3 % must not be exceeded. In the case of unheated anhydrite screed, the CM value of 0,5 % must not be exceeded. Manufacturer's specifications are always binding.
Please note that the requirements may be different in different countries. For a newly laid screed, follow your installer's guidelines for the start-up phase. In the case of underfloor heating, a heating protocol should be submitted; please request this.

2.1.1. Unevenness: The maximum height tolerance, according to DIN 18202 "Tolerances in building construction", table 3, line 4: 3 mm per linear meter or with tile edges 1 mm to 10 cm, must not be exceeded. More significant differences in height may need to be levelled out by filling the floor's entire surface.
Note: Please note the information from the flooring manufacturer.

2.1.2. Moisture-sensitive flooring systems (e.g. floor coverings with HDF core) require a permanently dry surface of the subfloor. For mineral substrates, this can be ensured by using a moisture barrier (water vapor control layer) that protects the flooring from damage caused by rising humidity. Particular care should be exercised to ensure that individual sheets of the water vapour control layer overlap by at least 20 cm to 30 cm and are taped vapour tight. Also the water vapour control layer has to be fixed vapour tight 3-4 cm above the underlay with the wall. If an underlay with integrated water vapour control layer is used particular care should be exercised to ensure that individual sheets of the underlay are taped vapour tight or the water vapour control layer overlap by at least 20 cm to 30 cm and is taped vapour tight. Also the water vapour control layer has to be fixed vapour tight 3-4 cm above the underlay with the wall. Moisture protection films can be either integrated into the underlay or be laid separately. In this regard, the thickness of the water vapor control layer itself is of no significance, but rather its type and quality. The ability to slow down the diffusion of water vapor is expressed by the sd value. The higher the sd value, the better the film or underlay protects the flooring from damage caused by rising damp. Based on practical experience, this value should be at least 75 m. Transparent polyethylene (PE) films with a thickness of 150 µm will typically achieve sd values of >75 m. The same applies to metalized plastic films with a thickness of >10 µm. The requirement of 75 m is valid for subfloors in a state of equilibrium moisture. It may be also helpful to use underlays with a textured surface to transport

humidity from subfloor to ambient air. When the subfloor shows a higher level of residual moisture (as mentioned in 2.1), appropriate measures must be taken before the installation of the floor in order to dry the subfloor. Basically, it is essential to collect information about the relevant requirements from the flooring suppliers and to follow them.

2.1.3. Installation over existing floor coverings: MMF floor coverings in categories WOOD, POLYMER and MIXED can generally be laid on existing floor coverings such as synthetic material, ceramic tiles*, slabs or stone floors which are fixed sufficiently, completely level and have no loose areas. These subfloors should also be covered with a foil spread out as a separating layer and emissions inhibitor. Existing wood planks, engineered wood boards, OSB panels, drywall elements, etc. must not be covered with PE foil acting as a vapour barrier. The area below the subfloor should also be sufficiently ventilated in an adequate way (back-vented skirting board).

*Note: Please take care if the specific joint width and depth can be covered by the used underlay or if levelling measures are necessary (see manufacturer or underlay producer instructions).

2.1.3.1. Textile floor coverings: As a rule, textile floor coverings such as carpeting, needle felt carpet etc., should be removed.

2.1.3.2. Wooden subfloor: In case of installation on a wooden subfloor, please first remove any existing floor covering. No signs of mould and/or insect infestations should be visible. Ensure the subfloor is levelled and any loose parts are nailed down. Apply a level floor or levelling compound on top for a perfect subfloor preparation. The crawl space under the plank floor must be sufficiently ventilated. Remove any obstacles from the crawl space and ensure sufficient ventilation (minimum 4 cm² total ventilation openings per 1 m² of flooring). The moisture content of the wood must not exceed 10 %.

3. Prior to installation

3.1. Inspecting the goods before laying

Check all flooring elements in daylight for visible faults. Boards showing visible defects before installation should not be used. Contact your supplier to report the defect according to the warranty conditions Please note: Boards that have already been installed will not be exchanged.

3.2 Storage and tempering

Leave the floor covering to temper in the same environmental conditions as the installation area for a period of approximately 48 hours[a)] prior to installation. Always store the boards flat and cross-stacked, in their original unopened boxes and at approx. 15-25 °C and between 35 % and maximum 65 % relative humidity.

a) If the temperature level of the boxes is on the same level of the room temperature shorter temper periods (e.g.12-24 h) are possible.

3.3 Tools required for installation

- Meter measure / measuring tape
- Pencil
- Angle measuring tool
- Utility knife
- Spacer wedge
- Laminate cutter
- Tapping block
- Rubber Hammer
- Saw
- Cutting machine
- Hand roller
- Optional: Metal saw for cutting metal rails to size, mitre-cutting saw for cutting the strips to size.

(List of tools that might be necessary. This list is not exhaustive and not all tools are needed depending on the type of MMF floors to be installed. Wear suitable protective equipment such as safety goggles, dust mask and gloves when sawing/cutting the planks.)

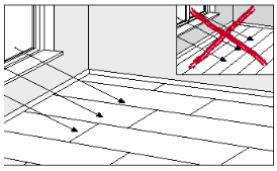
4. Underlays

Using an underlay (either loose-layed or pre-attached) can improve the essential properties of the flooring to optimize the performance of the entire flooring system. The choice of underlay should be in function of the usage requirements and the loading for the floor. If an additional underlay is foreseen under panels with pre-attached underlay, approval of the producer is necessary. For further safety information, please consult the comprehensive MMFA “Underlay Materials” Technical Bulletin TB1 at www.mmfa.eu.

5. Installation of the flooring

5.1 Laying direction

As a general rule, the boards should be laid in the same direction as the main light source. The laying direction should be adapted to the room proportions in narrow or long rooms. Narrow rooms can appear more spacious if the boards are laid crosswise. The flooring installation should be carried out according to the manufacturer’s instructions.



5.2 Laying the boards up to fixed components

In consideration of the size and geometry of the floor surface,

- for the direction of the long edges of the individual floor tile or planks, an expansion gap should be installed every 12 m
- for the direction of the short edges of the individual floor tiles or planks, an expansion gap should be installed every 8 m

Expansion gap profiles should generally be installed as follows:

- In doorways between rooms.
- In porch areas.
- Between offset adjoining rooms.
- Along the course of expansion gaps in the subfloor.

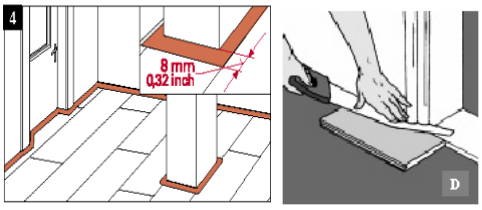
All expansion gaps must be left open up to the flooring surface. Generally, work from the left to the right. The springs of the panels face the wall. Lay the panels with the face towards the main light source of the room. In long and narrow rooms you can enhance the stability of the installed floor by laying in longitudinal direction.

Take great care when using installation tools and ensure that elements or connections are not damaged when interlocking. As a rule, the width of the panel of the first and last row must be at least 10 cm. Depending on the length of the panel the connection between 2 planks should be staggered by at least 25-40 cm.

5.3 Expansion gaps / floating installation

As MMF floor coverings expand and contract due to changes in ambient temperature or humidity conditions, the flooring should only be laid as a floating installation. Other installation methods must be authorized by the producer in written. Expansion gaps should be provided at all outside perimeters and around fixed objects such as kitchens, fireplaces, ovens and doorsteps, also between rooms or as a transition between two different surfaces, as well as in rooms that have complex shapes. Please use distance holders and remove them after finishing the installation. Door elements and door frames should be undercut to enable elements to be inserted underneath without force. As a rule of thumb: create an expansion gap of min. 1.5 mm per running meter of flooring on each side of the room (e.g. room width 5 m = 8 mm border joint on each side). Always ensure that this minimum distance is maintained. This expansion joint must never be filled with silicone or with electric cables. For safety and warranty reasons, it is essential to follow the manufacturer's specifications and recommendations.

<u>Please note: Floating floor coverings should never be fixed to the subfloor and to vertical elements such as doorframes, walls, pillars, pipes, …!</u>



5.4 Floor heating/cooling systems

MMF flooring can be laid in combination with floor heating and/or cooling systems. To guarantee the long-term and damage-free functioning of floor covering structures laid on surface heating systems, it is essential to plan the installation carefully regarding the choice of heating system, screed and floor covering. The supply and installation of the surface heating system must reflect the current state of the art and it must be commissioned by a specialist company in accordance with the corresponding standards and/or guidelines.

5.4.1 Installation

Floor temperature should not be below 15 °C.
The maximum allowed surface temperature is 29 °C.

Make sure the screed has been dried properly and a heating-up protocol is available (cf. 2.1)

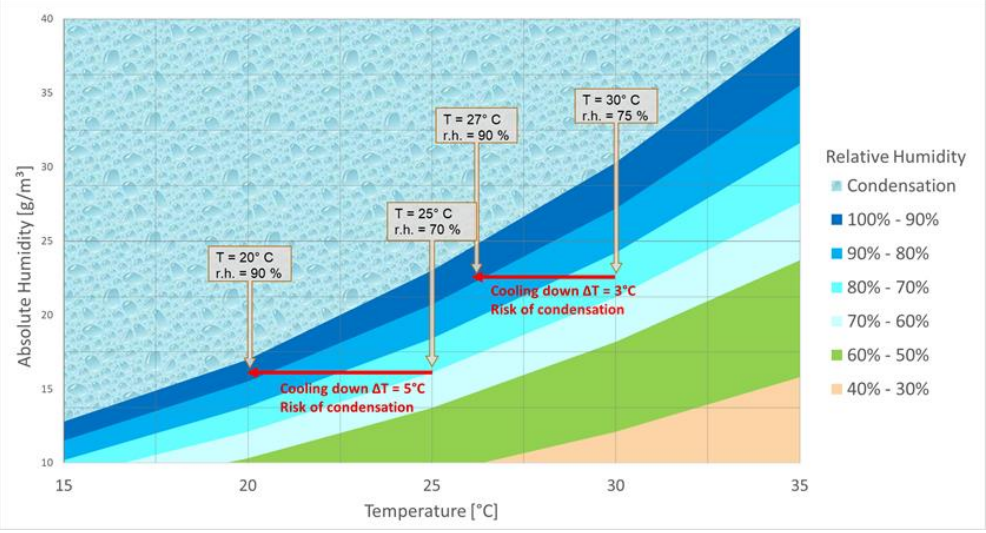
Make sure that the relative air humidity in the rooms is not too dry during the heating season to prevent gapping and warping.

A relative humidity of minimum 35 % must be guaranteed.
If necessary, use a humidifier. This is the case for ALL types of wooden based floor coverings.

Always avoid local heat accumulation under carpets or rugs left on the floor or by leaving insufficient space between furniture and the floor.

5.4.2 Floor cooling

More and more systems that combine heating and cooling are being installed in homes. For technical and physical reasons, heating in winter and cooling in summer in combination with organic floorings may cause problems, so manufacturer guidelines must always be followed. The installation instructions for floors on underfloor heating without cooling also apply here.
Floor cooling systems must have an advanced control and safety system to prevent internal condensation (dew point regulation). To avoid damage to the floor, the supply temperature of the cooling water must not be reduced below a specific temperature, the so-called dew point temperature. Lower temperatures will produce condensation in the floor and damage the floor covering: warping, distortion, swelling and gapping.
A thermal resistance (R-value) of ≤ 0,15 m^2K/W (floor + underlay together) is usually recommended for floor cooling.



5.4.3 Heating film

Always follow the manufacturer's instructions! Further guidelines for these applications can be found below.

An underlay must be used to level the floor, to insulate it, and – in particular – to embed the film elements and electrical connectors.
Usually, the following structure is applied: First, the
Moisture protection film for category WOOD (if not
integrated in the underlay material) and the underlay material, heating film, and modular floor covering.

For these systems the conditions that have to be fulfilled are:

- The heat must be distributed homogeneously across the entire floor to prevent any cold or warm zones.
- The heat radiates up and not down!
- The maximum surface temperature is not more than 29°C.
- The electrical connectors between the panels must be thin enough to be embedded in the underlay mat while maintaining their strength and electrical safety, also in the event of possible condensation or a leak.

A second type of heating system for renovation uses warm water pipes or electrical resistances embedded in single elements. These are usually insulation material elements, which may be combined with heat conduction plates.

All these aspects must be discussed with the distributor/installer of the heating system to ensure that he also takes responsibility in this matter.

5.5 Wet rooms and rooms with high moisture or high temperature

5.5.1 Wet rooms: Wet rooms such as pool areas or showers always have a draining system in the floor. As a general rule, floating MMF flooring systems are not suitable for wet rooms.

5.5.2 Rooms with high moisture: In rooms with high moisture – e.g. bathrooms, kitchens, entrance areas – or in other rooms that are not permanently exposed to high moisture, please make sure to avoid dampness/moisture going in the joints and gaps of the rooms. The manufacturer needs to declare his approval for the application of the MMF product in high moisture rooms.

5.5.3 Rooms with high temperature such as saunas

MMF floors in general are not suitable for this type of areas.

5.6 Installation around fireplaces or stoves

Heat protection plates should be installed in front of fireplaces and stoves to protect the floor covering from ember damage. For safety reasons these should be adequately sized and lay evenly on top of the flooring. Flooring can also be installed around the protection plates and not only under to avoid blocking by the stove weight.

Note: This Technical bulletin highlights existing application-oriented aspects only. A number of these aspects could be governed by national legislation/building regulations. Any country-specific legal requirements are binding and are to be observed at all times. Please contact your qualified specialist if there is any question open before installation.

6 Important notes

6.1 Dimensional changes caused by temperature and room climate changes

Multilayer modular floorcoverings respond to temperature and humidity changes with dimensional changes.

6.2 Conservatories

In conservatories or equivalent rooms with floor-to-ceiling and large overhead glazing, high temperatures may lead to a change of material properties, e.g. expansion behavior and higher flexibility. Therefore, it is essential to follow the manufacturer’s specifications and recommendations.

6.3 UV light source

Direct sunlight or strong artificial light over a long period of time can potentially lead to changes in the colour of the floor covering. Adequate screening can protect the MMF surface against premature fading.

6.4 Never use excessive force when joining boards!

7 Transition mouldings

7.1 Threshold strips, expansion and edge profiles

In doorways, for room dividing expansion joints and transition areas where different floor coverings meet, suitable expansion mouldings with sufficient clearance should be installed. Suitable edging profiles should also be installed next to patio doors and floor-to-ceiling window facades / windows reaching the floor.

7.2 Additional information on skirting boards

Since the dimensions of floating floor coverings can change depending on material composition, humidity and temperature, providing a dilatation joint between the wall and flooring is essential. The expansion gaps required can easily be covered with corresponding plinths. To avoid damage by condensation, ventilated skirting boards should be used for wooden substructures. Skirtings do not only look good; they also bring along practical advantages. Among other things, they result in a closed flooring surface perimeter, which allows easy cleaning and protects the walls from contamination and bumps, e.g. caused by dragging of chairs or other furniture. Skirtings are available in different shapes, colours and compositions. In addition to the conventional mounting options like screwing or nailing, some types of skirting are easily installed thanks to a convenient click system.

8 References

DIN EN 4725 – Warm water underfloor heating system

DIN EN 1264 – Water based surface embedded heating and cooling

DIN EN 18202 – Tolerances in building construction - Buildings

DIN EN 18299 – General rules applying to all types of construction work

DIN EN 18365 – Flooring work

EN 16511 – Loose-laid panels - Semi-rigid multilayer modular floor covering (MMF) panels with wear resistant top layer

MMFA Technical Bulletin 1– “Underlay materials under Multilayer Modular Floor Coverings (MMF) - Test Standards and Performance Indicators”

BEB Bundesverband Estrich und Belag e.V. (Federal Association of Screed and Floor Covering) leaflet – “Heated and non-heated flooring structures”

Note:

The provisions and figures contained in this technical bulletin do not in any way lay claim to completeness. They reflect as far as reasonably possible the current state of the art. They are meant to serve as nonbinding guidelines in conjunction with the installation instructions which apply specifically to the product in question. Warranty claims cannot be derived from the provisions of this text. If any doubt exists as to any of the provisions contained herein, the manufacturer/supplier of the respective MMF product should be consulted.

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