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

Technical Bulletin

TB 2

Installation of Multilayer Modular Floor Coverings (MMF)

(English Edition – updated 05/2020)

Disclaimer

The references and statements in this bulletin make no claim to 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**…….....4

2. **Preparing the subfloor**…….5
   2.1. Requirements, properties and preparation of the subfloor structure
      2.1.1. Unevenness
      2.1.2. Moisture-sensitive flooring systems
      2.1.3. Installation over existing floor coverings
         2.1.3.1. Textile floor coverings
      2.1.4. Wooden subfloor

3. **Prior to installation**……6
   3.1. Inspecting the goods before laying
   3.2. Storage and acclimatisation
   3.3. Tools required for installation

4. **Using underlays**……7
   4.1. Using an underlay

5. **Installation of the flooring** ……..7
   5.1. Laying direction
   5.2. Laying the boards up to rising components
   5.3. Expansion joints / floating installation
   5.4. Floor heating/cooling systems
      5.4.1. Installation
      5.4.2. Floor cooling
      5.4.3. Heating film
   5.5. Wet rooms and rooms with high moisture
      5.5.1. Wet rooms
      5.5.2. Rooms with high moisture
   5.6. Installation around fireplaces or stoves

6. **Important notes**……10
   6.1. Dimensional changes caused by temperature and room climate changes
   6.2. Conservatories
   6.3. UV light source
   6.4. Never use excessive force when joining boards together

7. **Transition mouldings**……..11
   7.1. Threshold strips, room dividing joints and patio doors
   7.2. Additional information on skirting boards

8. **References**……..…12

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 multi-layer flooring category includes multi-layer, 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:

Floating multilayer modular floor coverings (MMF) are currently classified by MMFA 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 substrates 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**
Even in old floors there is always a risk of moisture rising dampness or condensation in subfloors, so it is necessary to ensure that an efficient moisture barrier is installed. Subfloors must be permanently dry. On concrete subfloors consider the maximum humidity less than 75% RH when measured by a hygrometer/probe, or conduct calcium chloride moisture tests to ensure that moisture emission levels are less than 3 lbs/1000ft2/24 hours (USA and Canada), or using a CM Test, the moisture content should not exceed 2 % (or 1.5 % with underfloor heating); for anhydrite screed should not exceed 0.5 % (or 0.3 % with underfloor heating) Please note that the requirements may differ in different countries. For newly installed screed, follow the guidelines of your installer for the start-up period. In case of underfloor heating, a heating protocol should be presented; please ask for it.

2.1.1. **Unevenness:** the maximum height tolerance according to norm DIN 18202 “Tolerances in building construction”, table 3, line 4, 3mm per linear meter or with tile edges 1mm to 10cm, must not be exceeded. Larger differences l, height may need to be levelled out by filling the entire surface of the floor. Note: please note the information from the flooring manufacturer.

2.1.2. **Moisture-sensitive flooring systems** (e.g. floor coverings with MDF / HDF core) require a permanently dry surface. 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 damp. 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. 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 absolutely necessary 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 1, 2 or 3 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).

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

2.1.4. **Wooden subfloor:** In case of installation on a wooden subfloor, please remove any existing floor covering first. No signs of mould and/or insect infestations should be visible. Make sure 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 make sure there is 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 acclimatisation**

Leave the floor covering to acclimatise in the same environmental conditions as the installation area for a period of at least 48 hours 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.

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
- Bevel
- 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)

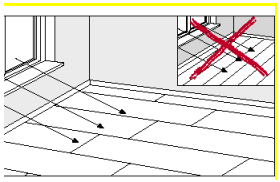
4. Underlays

4.1. **Using an underlay** can improve important properties of the flooring in order to optimize the performance of the entire flooring system. The choice of underlay should be in function of to the usage requirements and to the loading for the floor. For further information, also regarding safety and warranty aspects, please consult the comprehensive MMFA "Underlay Materials" Technical Bulletin at www.mmfa.de.

5. Installation of the flooring

5.1. **Laying direction**

As general rule, the boards should be laid in the same direction as the main light source. In narrow or long rooms, the laying direction should be adapted to the room proportions. 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 rising components**

In consideration of the size and geometry of the floor surface, expansion joint profiles should generally be installed as follows:

- On surfaces larger than 12 m in direction of the length of the individual floor covering planks.
- On surfaces larger than 8 m in the direction of installation travel.
- In doorways between rooms.
- In porch areas.
- Between offset adjoining rooms.
- Along the course of expansion joints in the subfloor.

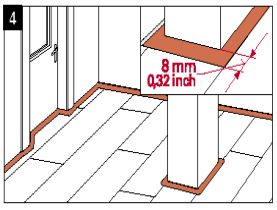
All expansion joints must be left open up to the flooring surface. Generally work from the left to the right. The springs of the panels face the wall. Lay the panels with the face towards the main light source of the room. In long and narrow rooms you can enhance the stability of the installed floor 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 butt joints (cross joints) should be staggered by at least 25-40 cm.

5.3. **Expansion joints / 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, fire places, 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.

Please note: Floating floorcoverings should never be fixed to the subfloor!



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 with regard to 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 heating criteria.

5.4.1. **Installation**

Switch the heating off completely until the floor temperature is below 18°C. After laying your floor, you must restart the heating gradually (5°C per day). The maximum allowed contact temperature is 27°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.

At 18-22°C, 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, of course.

It is important that floor cooling systems are equipped with an advanced control and safety system in order 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 certain 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 heat resistance (R value) of less than or equal to 0.09m²K/W (floor + underlay) is normally recommended for floor cooling. For floor cooling in case of slightly higher heat resistance a certain loss of capacity must be taken into account. The lower the R value, the better!

5.4.3. Heating film (only for special solutions)

Heating films or other “new” systems on the screed or wooden subfloor are not always suitable. MMFA class 1 floorings with a rigid core are more suitable, whereas flexible and heat sensitive floor coverings are not. Always follow the manufacturer’s instructions! Further guidelines for these applications can be found below.

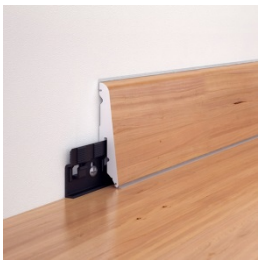
An underlay must be used to level the floor, to insulate it and – in particular – to embed the film elements and electrical connectors. Usually, the following structure is applied: First the underlay, then the heating film and then the modular floor.

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 contact temperature is not more than 27°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 frames. These are usually polystyrene

panels which may be combined with metal plates. We consider these systems to be more reliable because they ensure a more homogeneous distribution of heat, provide heat insulation under the underfloor heating, have good contact and provide a stable subfloor under the modular floor. The above-mentioned notes still apply, but they are easier to fulfil here.



All these aspects must be discussed with the distributor/installer of the heating system to ensure that he also takes his 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 fooring.

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. **Treshold 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, it is particularly important to provide a dilatation joint between wall and flooring. The expansion joints required can easily be covered with corresponding plinths. In order to avoid damage by condensation, ventilated skirting boards should definitely 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 protect 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 – “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”

MMFA – MULTILAYER MODULAR FLOORING ASSOCIATION
(Verband der mehrschichtig modularen Fußbodenbeläge e.V.)
Mittelstr. 50
33602 Bielefeld
Germany
Tel.: +49 521 96533-35
Fax: +49 521 96533-11
E-Mail: info@mmfa.eu
Web: www.mmfa.eu

The leaflet ‘Installation of Multilayer Modular Floor Coverings (MMF)’ is available on the Internet as PDF file at www.mmfa.eu for free download.

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.