European Producers of Laminate Flooring

That's how laminate finds the appropriate underlay

New requirements for underlay materials underneath laminate floor coverings

European CEN/TS 16354 · EPLF technical bulletin for underlay materials

New standards for evaluating quality

After years of preparation in numerous working groups at the European level (CEN) and within the EPLF, the official framework governing underlay materials under laminate floor coverings was published for the first time ever at the end of 2013. EPLF was one of the leading forces on these standardisation efforts. EPLF also contributed in putting minimum requirements in place for underlays in order to serve satisfactory conditions under the laminate floor in the envisaged area of application.

Why laminate underlayment?

A laminate floor can only prove its qualities if the underlayment as a part of the entire flooring system functions optimally. The underlayment represents the connection between the laminate floor and the substrate, and should basically function in the following ways:

- *Ensure satisfactory installation*
  This includes levelling unevenness and creating a level installation surface so that a floating floor can be properly installed.

- *Protect the floor permanently*
  The requirements for suitable underlays are aimed at protecting the floor from daily wear and tear such as falling objects and walking, as well as shielding the floor from rising residual building moisture or damp.

- *Improve the properties of the floor*
  In addition to the reduction of impact sound and walking noise, the underlay also influences heat insulation and walking comfort.

Which sets of rules exist?

So far no technical rules existed, which described or standardised laminate underlayment. Some countries have legal requirements (such as the "Ü" sign; certification by construction supervision), but they mainly apply to fire classification, emission levels, acoustical performances, but not to overall technical performance characteristics. By the end of 2013 two applicable sets of rules were established that represent the state of the art:

- *The CEN/TS 16354 technical specifications*
  This official document of the European Committee addresses all relevant characteristics for laminate underlayment and, for the first time, defines binding appropriate testing methods to evaluate these characteristics. They ensure that product properties are tested according to a uniform set of criteria. The document CEN/TS 16354 also represents a preliminary step towards a possible European performance standard.

- *EPLF technical bulletin for underlay materials*
  The EPLF technical bulletin is based on CEN/TS 16354, extending the European document. In the bulletin all significant requirements, that are relevant for an underlay are explained and minimum performance levels are suggested. Additionally to the values of minimum requirements the bulletin also states guidelines to perform in more intensive areas of use.

Thanks to the CEN/TS 16354 and the EPLF technical bulletin all important benefits of underlay materials underneath laminate floor coverings are measurable and comparable for the first time.

The EPLF technical bulletin details a number of requirements necessary for an underlay material underneath laminate floor coverings. Below is a summary of these points.

1. Requirements based on the substrate / structure

1.1 Heated floors / Cooled floors ($R_{\lambda,B}$)

Generally, laminate floors are suitable for use on heated and cooled floors. To ensure efficient performance of the underfloor heating system, the underlayment should have a low thermal insulation, that means the total sum of the underlayment and the laminate flooring ($R_{\lambda,B}$) must stay below a maximum value.

Maximum allowed R value of the complete flooring system:
Heated floors: $R \leq 0.15$ m²K/W
Cooled floors: $R \leq 0.10$ m²K/W

1.2 Thermal insulation (R_{λ})

Laminate floors have a relatively low thermal insulation. On unheated substrates, an underlayment with a high thermal resistance (R_{λ}) can increase the thermal resistance of the entire flooring system significantly. Thereby, the surface temperature is increased.

Minimum requirement (only the underlayment):
$R_{\lambda} \geq 0.075$ m²K/W

1.3 Protection against unevenness (PC)

To protect the floor mechanically and for acoustic reasons, smaller uneven areas should be avoided. The underlayment should be able to compensate for minor occasional irregularities such as screed granules on the ground. The higher the PC value, the better this compensation functions.

Minimum requirement:
PC ≥ 0.5 mm

1.4 Protection against moisture (SD)

Wherever there is mineral substrate, protection against rising dampness or moisture is mandatory to prevent damage to the floor. This can be achieved with an additional water vapour control layer or with an appropriately equipped laminate underlay. The higher the SD value, the better the protection against rising dampness.

Minimum requirement:
SD ≥ 75 m

2. Requirements based on use

2.1 Protection against loads and usage (DL, CC, CS)

Daily use stresses floors and thus also underlays. Underlay materials must be able to withstand certain strains over their entire useful life:

- DL: Dynamic exposure caused by walking
- CC: Long-term exposure caused by static loads (furniture)
- CS: Temporary exposure caused by loads

Minimum requirement:
DL ≥ 10,000 cycles
CC ≥ 2 kPa
CS ≥ 10 kPa

Higher requirement:
DL ≥ 100,000 cycles
CC ≥ 20 kPa
CS ≥ 60 kPa

(Note: 10 kPa ~ approx. 1 t/m²)

2.2 Protection against falling objects (RLB)

In order to minimize the risk of damage to the laminate floor surface, the flooring system has to be able to absorb compression forces of short duration, e.g. falling objects, as far as possible. The higher the RLB value (impact loading) of the underlayment, the better the underlayment will minimize the damage to the laminate floor covering. The requirement for the underlayment is specified as the minimum drop height in cm.

Minimum requirement:
RLB ≥ 50 cm

Higher requirement:
RLB ≥ 120 cm

3. Requirements based on acoustics

3.1 Impact sound insulation (IS)

The noise of footsteps transmitted to the room below the floorcovering is generally known as impact sound. Laminate underlays with a high IS value can significantly reduce this impact sound when installed in combination with the floor.

Minimum requirement:
IS ≥ 14 dB

Higher requirement:
IS ≥ 18 dB

(Note: A reduction of the noise level by 10 dB corresponds to a 50% reduction of the perceived loudness to the human ear)

3.2 Reflected walking sound insulation (RWS)

Walking noise is understood as the noise heard in the same room when walking on the floor. It is generally called RWS. Suitable underlay materials can reduce the reflected walking sound noticeably. The testing standard is still being developed, so that so far there is no general test method. Once the new testing standard exists, specific recommendations for minimum requirements can be given. But today it can be said: The greater the RWS value, the better.