



## Technical Position Paper

### **Laminate flooring**

#### **– Floor coverings with a good ecological profile**

Laminate floor coverings are high quality floor covering materials which can be used for the decorative design of interiors. They are easy to install, long-lasting, durable, easy to care for and offer good value for money. Laminate floor coverings are produced on an industrial basis. There are a range of application classes to cover different planned uses. These floor coverings consist mainly of the natural material wood and have numerous advantageous characteristics.

In addition to their positive functional characteristics, laminate floor coverings have an ecological profile which makes them products that are both non-harmful to health and environmentally friendly. The following information is intended to provide further details about these characteristics in a brief and easy to understand form. It is based on the author's many years of scientific and expert consultancy experience with these flooring materials at the Fraunhofer-Institut für Holzforschung (Germany).

#### **Composition: An environmentally friendly product made of wood**

The core board of a laminate flooring is made of high-density wood fiber boards (HDF). HDF boards consist of about 90% wood fiber and some 10% environmentally friendly glue resin. The top side covering on the HDF boards is generally made up of several layers of high-quality paper impregnated with transparent melamine resin. The underside is covered with backing paper. Laminate floor coverings are therefore made mainly of the fibers from the renewable raw material wood, along with a relatively minor amount of synthetic resin. They are manufactured in modern production plants which fully meet today's requirements in respect of emissions and environmental protection measures. Many of the plants also have their own energy and heat production systems. The positive life-cycle environmental performance data of wood-based materials therefore apply in principle to laminate floor coverings.



The melamine resin used for the impregnation of the surface layer paper is water-based, which means that it contains no organic solvents and once cured, it provides a surface which is extremely resistant to chemicals, water, organic solvents, light and temperature. The top side covering also contains the decorative paper, without which the great diversity of attractive design ideas would not be possible. The decors are printed using modern technology with inks and pigments which are not harmful to health. The top surface layer of the floorcovering panel contains a natural mineral-based substance (»Corundum«) which provides extra protection against wear. The back side of the panel could be provided with drumsound reducing underlayment, if required. All the components of laminate floor coverings are produced without any additions of pesticides, organo-chlorinated compounds and harmful heavy metals. Moreover, the surface layers do not contain any plasticizing agents either.

Laminate floor coverings are long-lasting and wear resistant products. These floor coverings can easily be replaced or repaired thanks to the glueless click connections nowadays commonly used. These floor coverings can be disposed of as bulk waste without any problems as they are suitable for material or thermal recycling. Therefore, uplifted laminate flooring is not “special waste“ which is expensive to dispose of.

### **Emission: Odorless and very low emission of harmful substances**

Laminate floor coverings are odorless and very low on emissions. This is a consequence of both their composition and the manufacturing process involved. Recent investigations by the Fraunhofer-Institut have demonstrated that the level of emissions of organic substances from these floor coverings is negligible. This result is hardly surprising because the production process does not involve any organic solvents. Occasional traces of volatile constituents contained in the wood can sometimes be detected, but even these disappear after a short time. The underlay materials installed under the laminate floor coverings are also low on emissions and, if properly installed, have no impact at all on the indoor air.

Another well-known air pollutant is formaldehyde. Although this substance is contained in melamine resin, it is irreversibly fixed in the resin structure upon curing. Emissions of formaldehyde from finished laminate floor coverings are therefore well below the legal requirements. Numerous measurements on modern laminate floor coverings are revealing emission values comparable to the formaldehyde emissions of natural wood. Laminate floor coverings therefore have no or only a negligible impact in terms of polluting indoor air with odors and harmful substances. The floor coverings themselves do not absorb any of these substances.

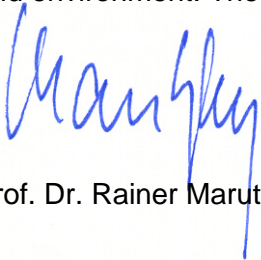
### **Hygiene: Easy to clean and suitable for allergy sufferers**

Laminate floor coverings are produced – as described above – without pesticides, organo-chlorinated compounds and harmful heavy metals. There is therefore no chance that users even come into contact with these harmful substances. These hardwearing floor coverings are very easy to keep clean. Dirt and dust can be quickly and completely removed from the smooth surface of laminate flooring by brushing, vacuum cleaning or damp cleaning, keeping the floor in an absolutely clean and perfect hygienic condition. In addition, the non-porous surface layer is a hostile environment for the induction and development of dust mites and other allergy-inducing microorganisms. In combination with their good care and cleaning characteristics, therefore, this makes these floor coverings particularly ideal for allergy sufferers.

### **Summary: Laminate flooring are very environmentally products**

In summary, it can be concluded that laminate floor coverings are also high quality products in ecological terms as well. They are produced on an industrial scale using modern production technology and are mainly containing fibers from natural wood. The additional constituents are also of an environmentally friendly nature. Laminate floor coverings are very advantageous in all functional aspects of their application,

and they largely met the actual requirements in relation to the protection of health and environment. These favorable characteristics are highlighted in the table below.



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Braunschweig, September 2007

**Table:** Summary of ecologically relevant characteristics of laminate floor coverings

<b>Characteristic</b>	<b>Summarized assessment</b>
Composition	<ul style="list-style-type: none"> <li>- Contains up to 90% wood fiber</li> <li>- Water-based resins</li> <li>- No biocides and organo-chlorinated containing additives</li> <li>- No harmful heavy metals</li> <li>- Surface layers do not contain any flexibilisation agents</li> </ul>
Product profile	<ul style="list-style-type: none"> <li>- Environmentally friendly production</li> <li>- Full recycling materials in production cycle</li> <li>- Favorable life-cycle environmental performance data</li> </ul>
Emissions	<ul style="list-style-type: none"> <li>- Very low formaldehyde emissions</li> <li>- Negligible VOC emissions</li> </ul>
Hygiene	<ul style="list-style-type: none"> <li>- Easy to clean and maintain</li> <li>- Advantageous in terms of allergy sensitivity</li> </ul>
Disposal	<ul style="list-style-type: none"> <li>- Long-lasting and wear resistant</li> <li>- Suitable for material or thermal recycling</li> </ul>