

Determination of suitable referential substrates for coatings on wood-based substrates for determining their emission behaviour

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Summary

The harmonized standard DIN EN 14342 defines properties, requirements and appropriate test procedures for parquets and wooden floors. The implementation of this standard by the building authorities also includes health aspects into its scope of general building approval (allgemeine bauaufsichtliche Zulassung, abZ). This is based on the "Principles of approval of health assessments of building products for use in interior rooms" (DIBt Principles), which include the AgBB approach.

Emissions from building products are determined by way of test chamber measurements based on the standard series DIN (EN) ISO 16000. The "DIBt Principles" stipulate special test requirements, including the generation and treatment of samples, for testing floor coverings in the approval procedure. These provisions have so far referred to finished products that had been available to the end-user without any further treatment. Up to now, there has been no provision for parquet and other wooden flooring which was laid on site and surface-treated there. Hence, a product testing procedure was required that took into consideration both the substrate and the coating. The fact that coating systems can be applied to different parquets and wooden-based floors (thus to different species of wood) called for the stipulation of a substrate material to be uniformly applied to testing.

The goal of the project was to establish the suitability of substrate materials as referential substrates for the testing of coating systems. Thereby, it was to be made sure that a tested coating material would result in a product (coated floor) which, when processed on site and regardless of the substrate, met the requirements of the "DIBt Principles". Further criteria in choosing the substrate material are its local and temporary availability in constant quality, its relevance to its practical application as well as aspects of sample-making.

Several tests were performed for that purpose. Apart from determining emission-relevant wood constituents as well as the wetting and penetration behaviour, coating tests in order to determine the surface quality and the emission behaviour of coating materials on different substrates were carried out.

The results show that the species of pine as well as the materials glass, DC board and MDF are not suitable to serve as referential substrates. Oak is available in quality suitable for flooring purposes and can be coated under laboratory conditions in good surface quality. This species of wood is mainly used in the field of parquet thus enabling practice-oriented testing of coating materials. Organic acids are wood constituents in oak, which have an impact on emission. The results at hand show relatively little deviation within one assortment. Substrate-inherent emissions are hardly influenced by coatings. The available results hint at oak as a preferential material for coating tests.