

Abstract

DIBt-Project: „Development of the Fundamentals for the Evaluation and Up-dating of Constructive Inspection Regulations Concerning the Formaldehyde Release of Construction Materials: Wood-based Panels“

The DIBt-Guideline 100 regulates the formaldehyde release of wood-based panels. Published in 1994 by the German Institute of Building Technology (DIBt), the guideline are to be up-dated taking into consideration the technological progress and new European regulations and standards. The up-date shall regard new wood composites and test methods as well. For the preparation of this task, DIBt has initiated a research project commissioned to the Fraunhofer Institute for Wood Research WKI in Brunswick. An additional task of the project is the determination of the correlation between the DIN EN 717-1, the standard test method for the determination of the formaldehyde steady-state concentration of wood-based panels, and the EN ISO 16000-9, the test method for the determination of VOC emissions of construction materials.

The project was started in January 2009 and was finished in December 2010. The first task was the calculation of correlations between DIN EN 717-1 (chamber method) and the derived methods DIN EN 120 (perforator method) and DIN EN 717-2 (gas analysis method) for the wood-based panels particle board, fiber board, oriented strand board and plywood. The correlation coefficients of all correlations are sufficient and confirm the principal suitability of the derived test methods for internal and external production control. The correlation curves are used for the definition of threshold values recommended for the intended revisions of the DIBt guideline.

In the case of the perforator method, aberrations cannot be excluded for wood-based panels with very low formaldehyde emission values. To exclude misinterpretations, the determination of individual correlations is recommended. The gas analysis method shows no comparable aberration. Other derived test methods such as DIN EN 717-3 (flask method) or ISO 12460-4 (desiccator method) are not suitable for general testing of wood-based panels.

The formaldehyde emission of wood-based panels show a statistically firm correlation between values determined by EN 717-1 and EN ISO 16000-9. The correlation does not depend on the type of wood-based panel. The correlation factor is experimentally determined with 1.5 which is close to the calculated value of 1.42. The emissions of some other organic compounds (TVOC, some wooden VOC) show a sufficient correlation as well. Due to disturbing factors such as deviations in analysis, testing time and rate of formation a general correlation as been found for formaldehyde can be excluded.