Summary of the final report B15197

History of charring rate measurement of wood and wood materials at HFM @ TUM

HFM has, as part of their research and testing activities since about 1990, performed many tests to the measurement methods of the charring rate. Closer inspection, however, showed that information in the test reports that would be desirable for standardization of such measurements is partially insufficient. E.g. detailed material information and detailed instructions for the installation of the samples are wanting. This is especially true for samples that are uneven by their nature due to the material of wood or have strong deformations in the fire test.

Based on these experiments, some of which differ significantly in terms of the test conditions, the tested material and the measuring methods used, in this research project a detailed test proposal could be made.

Basically, the future tests should be performed according to EN instead according to DIN. EN 1363-1 is significantly more detailed than DIN 4102-8. However, there are gaps in two standards that need to be closed with respect to the procedure for charring rate determination. The European standard has not enough special information as to the exact run of the test and especially the measurement. The aspects that are mentioned in the European standard still are manifold and provide a good basis for further development of a test method for charring rate determination.

DIN 4102 Part 8 used as a reference in the past does not meet the requirements that are to be placed on a fully applicable standard. While the German standard gives more detailed information on the structure of a certain test furnace, no further information can be found in this standard about the conduct of the test and the measurement of the charring depth.

<u>Determination of a specific measurement method</u>

The method "charring depth determination after test end" is used in the developed proposal for a test specification. Nevertheless, this method could not be compared systematically with other procedures under the project. Currently no certain procedure can be proved superior to other methods.

To be able to finalize on a particular procedure, test series must be performed on the competing methods. In each case the same timber or the same wood based material would have to be examined by all methods in the same furnace by the same staff. Once a sufficient number of test results are present, the measurement accuracy of each method and its repeatability and reproducibility can be determined, and ultimately the best method in comparison can be selected.

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