

# Usability of Thermally Modified Timber for Load-bearing and Reinforcing Purposes

## Usability

The use of TMT (thermally modified timber) for load-bearing applications is only permissible, if its usability for such purposes has been proven appropriately. The reasons for that are particularly

- its usually reduced strength, and therefore its load-bearing capacity, as well as the altered behaviour of rupture of TMT as compared to untreated wood,
- the absence of statically secured values for calculations and measurements,
- the requirements of construction law: TMT is not to be regarded as a regulated construction product since its properties substantially deviate from regulated construction products<sup>1</sup>.

*1) On a European level, the usability of TMT in load-bearing applications is currently not permitted for formal reasons as long as no strength profile is available. The strength profiles as specified in EN 338 and the allocation of wood species to them (acc. to EN 1912) apply to native species of wood only.*

In Germany, proof of usability for load-bearing and reinforcing purposes can be provided by

- load tests of structural components of playground toys acc. to DIN EN 1176,
- tests and proof within the scope of a single-case approval (German abbrev. "ZiE") by a lower building authority,
- tests and proof within the scope of a general building supervision approval (German abbrev. "abZ") by Deutsches Institut für Bautechnik Berlin (DIBt).

Thereby, strength values that have been established with the help of small, clear samples must not be applied to the dimensioning of load-bearing and reinforcing structural components.

These limitations also apply to „subordinate“ building constructions of timber, e.g., to carports, and to staircases and self-supporting balconies. Staircases explicitly represent a load-bearing application, exposed to dynamic stress (e.g., by persons jumping or falling) and to high static load (e.g., by moving furniture). This also applies to staircase steps screwed onto panels and only partially resting on them. Neither self-supporting and attached balconies nor those with load-bearing components of TMT are permissible without any proof of usability. Only to the extent that the staircase or balcony flooring is supported over its entire surface, there will be no restrictions to the application of TMT from the load-bearing aspect.

The individual federal state construction ordinances (LBO) provide for differing regulation as to when a structural component is to be regarded as a load-bearing component. This is usually the case if or when a structural part, e.g., terrace flooring, is arranged higher than 0.5 m above solid ground (soil, concrete slab).

The experts of IHD and of the accredited test laboratory of the Entwicklungs- und Prüfabor Holztechnologie GmbH (EPH) are available for further information and consultancy regarding special cases of application as well as for material and product testing.

## Test, Application and Product Standards

A project on the standardisation of thermally modified timber (TMT) was performed in 2006 under the direction of DIN e. V. Thereby, more than 250 test, application and product standards from the field of wood were reviewed with regard to their relevance to TMT and critical items or deficits were determined. The need for clarification and adaptation became obvious especially with view to the requirements or specifications of wood moisture in correlation with dimensions and strengths.

The notes that resulted do not only serve standardisation efforts, but appear to be useful tools for the users of standards, e.g., in planning, in designing scopes of performance or in drafting purchase, supply or works contracts. A 2007 follow-up project especially focused on the requirements of CE marking and of the Building Products Act.

Reports can be obtained from DIN ([www.din.de](http://www.din.de)) or IHD ([www.ihd-dresden.de](http://www.ihd-dresden.de)).



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