Definition of Terms: TMT, Thermowood

Wood modification

Modification of wood is the persistent change of wood with view of wood improvement for increasing its durability against fungal attack as well as for enhancing its dimensional stability and strength. Procedures include thermal and chemical modification as well as depositing resins (Holz-Lexikon, DRW-Verlag 2008).
The professionally correct term is thermally modified timber, technically abbreviated as TMT; thermowood is used synonymously, but is not defined or proprietary. ThermoWood® is the trademark for procedures and products of the International Thermowood Association. The normative basis for TMT is the European technical specification CEN/TS 15679:2007 "Thermally Modified Timber – Definitions and characteristics".

Seating elements (Gubi barstool) made of thermally modified veneers subjected to several stages of treatment, in outdoor weathering (thermal treatment by IHD and OWI, manufactured by REHOLZ)

Definition and operating principle

TMT or thermowood is timber that has been treated at temperatures of usually 160-230° at reduced oxygen concentration and whose properties have permanently been changed across its entire crosssection (see CEN/TS 15679).
Thermal modification is a partial pyrolysis in a low-oxygen atmosphere. It results in changing the chemical composition of the timber, more precisely of the cell wall: degradation of hemicelluloses (from 140-150 °C), α-cellulose (above 150 °C), degradation and partial restructuring of the lignin (an increase in the relative lignin share), expulsion of volatile accessories (resins, etc.). Organic acids, for example, occur as degradation products; the pH-values decreases. A significant effect is the clear reduction in the number of OH-groups (hydroxyl groups).

TMT as a semi-finished product

The result of TMT manufacture is modified round and sawn timber. TMT is characterised by the wood species, grading, its manufacturer, procedures and stages of treatment and has a specific property profile. Generally, TMT can be considered as an innate "group of wood species" and particular TMT as a technically generated "wood species".
Compared to natural timber, TMT distinguishes by an increased resistance against wood-destructive fungi, by improved dimensional stability, lower equilibrium moistures as well as darker color shades. As a rule, an increasing intensity in the modification treatment (high-temperature level) will result in decreasing stability.

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Institut fuer Holztechnologie
gemeinnuetzige GmbH

Zellescher Weg 24
01217 Dresden · Germany

+49 351 4662 0
+49 351 4662 211
info@ihd-dresden.de
www.ihd-dresden.com

Contact persons

Thermal Modification
Dr. rer. silv.
Wolfram Scheiding
+49 351 4662 280
wolfram.scheiding@ihd-dresden.de