

LIGNOVISIONEN

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Holz: Rohstoff – Werkstoff – Energiequelle der Zukunft

Wood: Raw material – Material – Source of energie for the future

Holz ist der wichtigste nachhaltig verfügbare Massenrohstoff und das eröffnet ihm damit eine führende Rolle im Wettstreit der Werkstoffe. Durch die traditionelle Prägung des Holzes als Alltagswerkstoff werden die Zukunftsperspektiven des Holzes aber oft nicht erkannt. Der vorliegende Band 2 von LIGNOVISIONEN gibt das Fachsymposium „Holz – Rohstoff, Werkstoff, Energieträger der Zukunft“ im Rahmen des Internationalen BOKU Kongresses 2001 „Leben und Überleben – Strategien für die Zukunft“ wieder. Exemplarisch wird darin aufgezeigt, wie Holz zu einem der wichtigsten Werkstoffe für das Leben und Überleben der Menschheit wird.

Wood is the most important sustainable mass raw material available. As wood has always been a traditional material used in everyday life, we do not immediately realize its importance for the future. It was the target of the symposium „Wood – Raw Material and Source of Energy for the Future“, which was organized within the International BOKU Congress „Life and Survival –Strategies for the Future“, to point out the future importance of wood. The present issue 2 of LIGNOVISIONEN summarizes this symposium, where the potential of wood was demonstrated and selected innovative developments were discussed.

... mehr Information / more info:

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Holz – ein Werkstoff der Superlative. Technologien und Holzanwendungen an den Grenzen der Werkstoffmöglichkeiten

von Alfred Teischinger

Holz gilt sowohl mengenmäßig als auch anderer Kriterien wegen als bedeutendster nachhaltig verfügbarer Massenrohstoff der Menschheit. Die allgemeine Vertrautheit des Menschen mit dem Holz lassen jedoch die Bedeutung des Holzes für den Menschen nur allzuleicht vergessen. Ein historischer Rückblick zur Holzverwendung zeigt die Superlative in Holz deutlich auf und innovative Technologien lassen erkennen, dass Holz auch in Zukunft wieder an Bedeutung gewinnen wird. Zu Beginn der 70er Jahre des vorigen Jahrhunderts hat Holz jedoch einen absoluten Tiefpunkt erlebt. Die Zeit war geprägt vom Glauben an alles technisch Machbare, Energie und Ressourcen schienen als schier unerschöpflich. Der Bericht des Club of Rome zur Lage der Menschheit, der 1972 unter dem Titel „Die Grenzen des Wachstums“ zum Bestseller wurde und die folgenden Erdölkrisen rüttelten die Menschheit im Hinblick auf die Begrenztheit der Ressourcen auf. Mit dem Auftauchen der Begriffe wie „nachhaltige Entwicklung“ und „nachwachsende Rohstoffe“ kam es zu einer Renaissance des Holzes.

Wood – material of superlatives. Technologies and wood applications at the limits of the material

Due to the amounts available and to other criteria, WOOD is the most important sustainable mass raw material of mankind. Though man is very familiar with the material wood and knows about its importance, the value of wood for mankind is often forgotten. Many an epochal technical and technological development is closely related to wood or to the application of wood, e.g. increasing mobility on land and sea by developing the timber raft, the dug-out canoe and the seaworthy sailing vessel which sounded the bell for the age of discovery. Not to forget the invention of the wheel - unknown to some very advanced civilisations - which depended on wood as well as the development of aviation which was only made possible by the invention of the light-weight plywood. Only years later, plywood was replaced in aviation by the light-metal material aluminium. During World War Two an aeroplane - the Spruce Goose - made of plywood was planned and built later that could not be captured on the enemy's radarscope. That transport plane which still is one of the biggest planes regarding its measurements (length, wing-span of about 100 m, etc.) shows the potential of wood.

In many other fields, wood initiated technological developments, e.g. the first wooden plough which enhanced people's nutritional basis, wood as an energy source, wood supporting the railway systems - the railroad sleepers or the wooden telegraph poles - important for the development of telecommunication.

The efficiency of wood can already be seen in the living tree: The highest trees in the world are up to 100 m high and thus prove that a timber construction with a span of 100m is absolutely realistic. The oldest trees may become 5000 years old due to the continuous regeneration of the growth layer. Therefore trees are among the biggest and oldest living beings on earth.

It seems to be justified to apply all these superlatives to the utilisation of wood, e.g. hall constructions: One of the most famous and biggest timber constructions of that kind is the Tacoma Dome (a self-supporting timber shell construction, diameter 160m), an industrial hall in Vienna with suspenders of 107 m or the Olympic Hall in Lillehammer (110 x 265 m self-supporting).

Also in bridge building wood could regain its former supremacy, e.g. at about 1766 the wood bridges by the Swiss architect U. Grubenmann had a free span of more than 60m and a total length of up to 120m.

An essential step in the utilisation of wood was taken when the materials known as fibre board, plywood, chipboard, etc were developed. These developments have become a starting point for the most versatile use in furniture making, interior decoration and fittings and in the building and construction industry.

The basic idea of these wood based materials is to surmount the natural dimensions of the tree and the anisotropic properties of wood. In most application fields an isotropic and homogeneous surface material is demanded or a material with best-possible properties for the specific use. Such materials that are also strengthened with reinforced fibres and optimised for their specific use are known as „Engineered Wood Products“ and have conquered many fields of application.

Wood composite materials especially those combined with natural fibres are only at the beginning of a development which is forward-looking with respect to the optimised use of the material, to sustainability and to the possibility of recycling. An Austrian company has successfully conquered the car industry by the development of a workable wood fibreboard which is reinforced with hemp-fibre. That type of fibreboard is used as the carrier material for inside door panelling, roof panelling, for dashboards, etc. After many years of technical development the dashboard in a car is again made of a sustainable natural material (for pragmatic-technical reasons and for reasons of safety resp.) - finally it has become a „wooden dashboard“ again and thus an example for the development of WOOD into a HIGH-TECH material of the future.