INNOVATIVE CONSTRUCTION
WITH CATTAIL AS RAW MATERIAL
EFFICIENT COMBINATION OF COMPONENT FUNCTIONS

Currently, conventional building construction systems are based on a multi-layer wall structure, in which usually a separate material layer is necessary for each required function. For example, pillars are used for load transfer, an insulation layer for thermal protection, a fire-proofing panel for fire protection and a foil for moisture protection.

Particularly the outer layer is often damaged over time (e.g. by the installation of sockets) – sometimes followed by severe moisture damage. Furthermore, the multi-layer wall construction is very time-consuming and cost-intensive and additionally complicates subsequent dismantling and recycling.

The typha plate – a magnesite-bound, sustainable building material made of cattail – represents a promising alternative to the materials used in conventional building construction: It often allows a much slimmer wall structure, performing static functions as well as thermal, moisture and fire protection tasks at once.

For inquiries, consulting or a non-binding offer you are welcome to contact us at any time. For further information please refer to:

www.ibp.fraunhofer.de/en/typha

The cattail cultivation and its environmental benefits have already been proven within the context of a pilot project funded by the German Federal Foundation for the Environment (DBU – Deutsche Bundesstiftung Umwelt).

funded by

www.dbu.de

Typha plates fulfil both static and insulating tasks in one layer.
PRODUCT PROPERTIES

Due to its special structural properties, the cattail (Latin: typha) allows the production of building materials offering a combination of insulation and load-bearing effect, which is unique in the market.

The particular suitability of the cattail leaf mass is based on the structure of the plant: the leaves have a fiber-reinforced, stable supporting tissue filled with a soft open-cell spongy tissue thus ensuring astonishing statics and an excellent insulation.

This results in a range of beneficial product characteristics:

- excellent fire protection (no smoldering)
- good acoustic protection and thermal insulation (especially in summer)
- mold resistance (relatively diffusion-open and capillary-active)
- simple processing with all common tools
- potential for a variety of products (e.g. OSB-substitute, sandwich)
- excellently suitable as interior insulation for old building stock
- relatively insensitive to production fluctuations.

PRODUCT DEVELOPMENT AND PRODUCTION

In collaboration with Dipl.-Ing. Werner Theuerkorn, a highly interesting mineral-bound isotropic board material was developed – and has already been used and tested in a wide variety of applications.

For the fabrication of the plates, relatively large similar particles are produced first – by retaining the leaf structure without defibration. Subsequently, the particles are bonded with mineral adhesive (e.g. magnesite) under low pressure to form plates (this manufacturing process requires comparatively little energy).

By using magnesite as an adhesive, excellent fire protection properties can be achieved. Additionally, the material can easily be returned to the material cycle by dispensing with further additives such as biocides.
CULTIVATION AND ENVIRONMENTAL PROTECTION

Due to its global availability, enormous yield and economic efficiency, the cattail is predestined as a raw material for industrial application. Typha crops are insensitive, long-term and natural monocultures, producing 15 to 20 tons dry matter per hectare annually.

The creation of cattail fields and the associated rewetting of fen soils, flood plains, etc. can have a variety of positive ecological effects:

- water purification in case of over-fertilization or pollution
- reduction of CO₂-emissions by peat extraction
- protection against soil erosion
- creation of water retention areas and flood plains
- creation of valuable biotopes for fauna typical of fenlands (harvest in winter)

FURTHER ADVANTAGES

In addition, typha offers many ecological, economic and social benefits:

- preservation and creation of employment in structurally weak regions through income opportunities for small and medium-sized companies and agriculture
- second pillar of conventional agriculture or third pillar for a regional product including a small-scale plant (since being relatively tolerant towards production fluctuations)
- lucrative unsubsidized agriculture, achievable in the medium term
- regional product supply
- no competition with food production
- returnability to the material cycle (»Cradle to Cradle«)

3 Cattail grows fast and can easily be cultivated worldwide.

4 Harvesting of the cattail takes place in winter.
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