

Wood-Textile-Folded Structures

Folded structures made of textile carrier with rigid applications

Motivation

In a world that is constantly becoming more open, discretion and differentiation are becoming more and more difficult, but also more important. In areas of our working world, private and public life, discretion zones are necessary, which are created by setting up portable, self-supporting protective walls. The walls should be customisable in size and shape and foldable for transport. Applications can be seen indoors, e.g. foldable partitions for open plan offices, and outdoors, e.g. privacy screens for hazardous areas.

Research Goal

The goal was to develop wood/textile folded structures that can be set up temporarily for the purpose of noise protection, privacy protection or spatial delimitation. The wood/textile folded structures should be self-supporting and are characterised by a small packing volume and lightweight construction.

Solution Approach

Multi-layer wood-textile composites were developed by using origami mathematics. The textile serves as a two-dimensional hinge for the finished construction. Depending on the technical requirements, a corresponding functional layer (e.g. wood or plastic elements) must be fixed to the upper side of the textile. The folding kinematics are determined by the geometry of the rigid wooden elements.

Results

- ✓ Folding movements could be created by combining flexible textile materials with rigid wooden elements.
- ✓ With this composite material, a self-supporting structure is possible.
- ✓ The option of installing acoustic elements makes it possible to increase sound absorption.
- ✓ Aesthetic design by combining textile, wood and origami folding



Project Partners

- Institut für Holztechnologie Dresden gemeinnützige GmbH (IHD)
- Hochschule für nachhaltige Entwicklung Eberswalde (HNEE), Fachbereich Holzingenieurwesen, Innovationswerkstatt Holz (iWH)

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