



# Introducing the Acacia Fibreboard

High-quality • Sustainable • Low Carbon Footprint

# Acacia Fibreboard

High-quality · Sustainable · Low Carbon Footprint



First prototypes of Acacia Fibreboard of 2021

Researchers of the INM - Leibniz Institute for New Materials in Germany and the University of Namibia (UNAM) have developed and prototyped an eco-friendly, sustainably sourced fibreboard with remarkable technical qualities:

## High-grade:

Namibian Acacia fibreboards are made from hardwood and are high in silicate. They are therefore heavy as well as dense and can be used for heavy duty and weight bearing purposes in the construction sector.

## Low carbon footprint:

The production of the binder made from Namibian sands and additives emits 4 times less CO<sub>2</sub> compared to cement.

**Sustainable:** Utilising Namibian encroacher bush helps restore degraded savanna in the country.

## Inflammable, rainproof, termite-resistant

## Proudly Namibian:

the chipped and milled Namibian encroacher bush is combined with an inorganic binder made from Namibian sand high in silicon dioxide and a biopolymer for which Camelthorn pods, for example, can be used (Namibinder® technology).

# Acacia Fibreboard a closer look



## Environmentally friendly

Utilising Namibian encroacher bush as a resource for the board contributes to the restoration of degraded savanna. Currently, only a fraction of the available resource is used and thus land restoration is slow.

The production of the binder emits 4 times less CO<sub>2</sub> compared to cement. Therefore, the Acacia fibreboard has a far smaller carbon footprint than conventional alternatives.

Free of formaldehyde and other additives that are associated with health issues.



## Heavy-duty, weight bearing, rainproof and termite resistant

Fibreboards are available in different qualities, from general purpose in dry environment (categories P1 to P3) to heavy-duty weight bearing purposes such as floors or roofs in wet environments (categories P6 and P7).

Depending on the ratio of binder to fibres, the Acacia fibreboards can cover a wide range of applications from furniture (P2) to load-bearing components in house building and outdoor use (P7). They can be rainproof and therefore suitable for building roofs. The University of Namibia (UNAM) tests have shown that the boards are also termite resistant.

## Tests have shown the following mechanical properties:

### Bending test (according EN 310, classification EN 312)

Elastic modulus: 2.2 GPa (> type P2) – 4.4 GPa (> type P7)

Bending strength: 11 MPa (> type P1) – 20 MPa (> type P6)

### Transverse tensile test (acc. EN 319, classification EN 312)

Transverse tensile strength: 1.2 MPa – 3.6 MPa (> type P7)



## Flame-resistant

Due to its composite materials, the Acacia fibreboard is inflammable: Tests have shown it withstands temperatures up to 1100 °C for over one hour. It has self-extinguishing properties through its ability to develop foam glass – an advantage over phenolic resin-based fibreboards.



Globally, prices for sustainable building materials are soaring and consumers are pushing for environmentally friendly options. This situation creates opportunities for the fireproof Acacia fibreboard made from 100 per cent Namibian resources. The next step is for investors to build a pilot production line.



## The global market:

demand for sustainable resources



Innovative and sustainable building materials will shape construction in the future. Building materials will have to be efficient, durable, sustainable and risk-free. Refinement of concrete, for example, is high on researchers' priority lists: One new development is carbon concrete, a composite of concrete and carbon fibres, and thus stronger, lighter, and more durable than conventional concrete – and with a smaller carbon footprint.

Fibreboards are also under scrutiny. Wood prices are soaring as sawmills are finding additional off-take markets for their shavings: Increasingly, sawmill shavings are used for energy pellets or insulation products. At the same time, restrictions on the use of forest-grown wood reduces their availability.

Demand for fibreboards, however, is rising as more and more people enjoy formalised living situations and buy furniture and building materials. As the trend to build with wood is supported by climate policy, it is likely to last.



The Acacia fibreboard with Namibinder is a real, ecologically sound alternative to cement-bonded panels on global markets.

Dr. Rainer Schräggle, CEO  
Technologica GmbH



## The Namibian market: furniture, houses and more

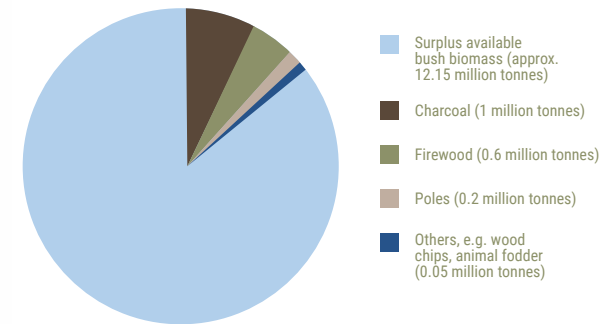
While the Namibian market is small compared to potential international off-take, there are several interesting domestic application possibilities for the Acacia fibreboard, such as furniture. With the board being suitable for heavy duty use as well as fireproof, it can find its place in low-cost housing. This could address the immense shortage of housing in the country, especially in the low-cost sector, and reduce devastating house fires. The use of the Acacia fibreboard could even introduce the global trend of luxury tiny or module houses to Namibia.

## Restoring bush encroached savanna

In Namibia, up to 45 million hectares are considered bush encroached. Thorny bushes, mainly Acacia species, cover land which should be savanna grasslands. Bush encroachment has reached a critical point where it compromises the provision of key ecosystem services such as groundwater recharge, biodiversity, livestock production and tourism – important pillars of Namibia's economy.

### Regrowth and utilisation of bush biomass in Namibia 2020 (t/a)

Annual re-growth of woody biomass is estimated approx. 14 million tonnes. Only 1.85 million tonnes per year are currently utilised. This is less than 20 per cent of the annual re-growth.



## Beyond charcoal: utilising Namibian encroacher bush

Encroacher bush is a sustainable raw material with existing reference value chains. Namibia is developing a biomass industry for material use of the resource. The Acacia fibreboard is a promising opportunity to add value to an abundant resource. Boards could be produced in Namibia for national, regional and international markets.

A Biomass Hub, which connects harvesters, producers, and off-takers, is a key strategy in industry development. Such a hub uses large volumes of bush-based biomass to produce different products and commodities for local and international markets. Most importantly, a hub allows producers, processors and off-takers to benefit from synergies. Production of the Acacia fibreboard can profit from a hub's interconnectivity, and the economies of scale involved.

**The vision for the Acacia fibreboard is that demand for affordable, formaldehyde-free chip boards in Europe could drive production of this environmentally friendly alternative in Namibia.**



### How consumers in Europe can drive sustainability in Namibia: the case of FSC

The charcoal sector is a very dynamic industry in Namibia. The country currently ranks among the top five charcoal exporting countries in the world, with an export volume of 210,000 tonnes in 2021 (up from 120,000 tonnes in 2018). International certification, especially through the Forest Stewardship Council (FSC), has been a crucial driver for the charcoal industry in Namibia over the past years. Consumers in Europe want to barbeque on FSC certified charcoal: International market demand for certified charcoal has increased to a point at which processors and distributors do not buy uncertified produce anymore. Consequently, Namibia has experienced a staggering 600 per cent growth of FSC certified area over the past years and has developed a domestic FSC standard. Today, 1.6 million hectares of Namibian savanna are FSC certified. Through this certification system, consumers in Europe directly increase job standards, sustainability in harvesting and traceability of charcoal in Namibia.

#### Project Partners:



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‘Working closely with the Bush Control and Biomass Utilisation Project implemented by GIZ, we are looking for industrial cooperation partners from Germany and Europe across the entire value chain who want to get involved and will take the next step with us.’

Dr.-Ing. Carsten Becker-Willinger, Head Innovation Center INM - Leibniz Institute for New Materials, Saarbrücken, Germany



#### Namibia Material Competence Development Initiative

The development of the Acacia fibreboard is a result of the Namibia Material Institute Competence Development (NaMiComp) initiative. NaMiComp is part of the German Government and Federal States Programme (German: Bund-Länder-Programm, BLP), which is implemented by Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH on behalf of the Federal Ministry for Economic Cooperation and Development (BMZ). The project and its procurements are financed by the BMZ and co-financed by the federal state of Saarland. More information at <https://bund-laender-programm.de/en>

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We are always looking for opportunities to add value to encroacher bush for the benefit of Namibia and Namibians. With the Acacia fibreboard we can tap into the buying power of international markets while creating jobs locally and restoring land at the same time. N-BiG is committed to supporting market development through technical support, facilitation of harvesting, capacity building, support to research and development and more.’

Progress Kashandula, CEO, N-BiG, Windhoek, Namibia



#### Namibia Biomass Industry Group

The Namibia Biomass Industry Group (N-BiG) is committed to support market development. N-BiG represents a wide range of members from the private and public sectors who are actively involved in the Namibian bush-biomass sector. The organisation's mission is to drive innovation and technology development and offer technical expertise on biomass value chains.

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We are optimising the steps to produce the Namibinder at a larger scale. The process is very successful. Now we want to up-scale and step out of the lab. We are looking forward to working with industrial level partners.’

Hatago Stuurmann, Researcher at UNAM Southern Campus, Keetmanshoop, Namibia



# Contacts

## **Namibia Biomass Industry Group (N-BiG)**

Progress Kashandula, CEO  
5 von Braun Street, Windhoek, Namibia  
p.kashandula@n-big.org  
www.n-big.org

## **INM - Leibniz Institute for New Materials gGmbH**

Dr.-Ing. Carsten Becker-Willinger,  
Head Innovation Center INM  
Campus D2 2, 66123 Saarbrücken,  
Germany  
carsten.becker-willinger@leibniz-inm.de  
www.leibniz-inm.de

## **University of Namibia (UNAM)**

Dr. Likus Daniel,  
Head Science and Technology Division  
340 Mandume Ndemufayo Avenue,  
Windhoek, Namibia  
daniels@unam.na  
www.unam.edu.na