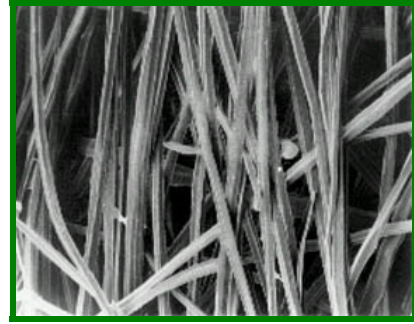


Natural fibre composites

Biomimetic Principle



Straw



Straw fibre mat from steam explosion

Fibres from annual plants compare favourably with glass fibres in terms of specific stiffness and strength. They provide sustainable and recyclable alternatives for a wide range of composite applications. In plants, these fibre structures are pre-strained in tension, minimising the risk of compression failure.

Plant fibres, principally flax and hemp, are being examined with a view to replacing glass fibre in low priced products, especially building materials. Glass fibre, when used in cement boards and phenolic boards, for example, cannot be recycled, nor can it be incinerated. By using plant fibres and natural matrix materials, boards might be used as fuels after their serviceable life as structural materials has ended. The fibres can be produced by crops grown in the European Union

Plant fibres have an additional advantage in that they are resilient: they slowly return to shape after being crushed, whereas artificial fibres do not, so a board produced from natural fibres would be more damage tolerant

Further Information:

Papers:

Hepworth, D. G., J. F. V. Vincent, et al. (2000). "The penetration of epoxy resin into plant fibre cell walls increases the stiffness of plant fibre composites." Composites Part a-Applied Science and Manufacturing **31**(6): 599-601.

Hepworth, D. G., D. M. Bruce, et al. (2000). "The manufacture and mechanical testing of thermosetting natural fibre composites." Journal of Materials Science **35**(2): 293-298

Websites:

<http://www.rdg.ac.uk/Biomim/projects.htm>

Applications

Construction industry, including fibre boards..

Current Commercial Development

Not yet developed