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The **innovative potential** and  
the **barriers for applying**  
**plant fibre composites** in  
**new fields of the industry**

Klaus Schroeder  
industrial designer MDD



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## Plant fibre composites

### The process

conditioned plantfiber (e.g. hamp)

blended with plastic fibres

wooven to soft mats

heated and pressed in metal form

cut and finished / surface treated



Plant fibre product development network

DESIGN/**NORD**

Design development

Research & prototyping

Distribution

Engineering



FORCE  
INSTITUTTET

**ENOVA** - Danmark

**" plastconsult**

DESIGN/**NORD**

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# DESIGN/NORD

Thinking design



.... using the design process as a key to innovation

[www.designnord.dk](http://www.designnord.dk)

# Manufacturing research



## GLOBAL DENKEN – LOKAL HANDELN



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Light weight city bus seat



## Sales points



### Enova bus seat

A new concept for citybus passenger seats

DESIGNED FOR TOMORROWS CHALLENGES TO PUBLIC TRANSPORT

- light-weight construction
- environmentally optimized
- dynamic ergonomics
- easy to install
- new interior design
- easy to service
- web-integration
- comfort concept

Designed by DESIGN/NORD

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## Plant fibre pro's and con's

**Positive weight/strength ratio**

**3D geometries allow new mechanical and visual designs**

**Competitive part price**

**Sound- and thermal insulation**

**Soft edges when broken**



**Heavy tooling costs**

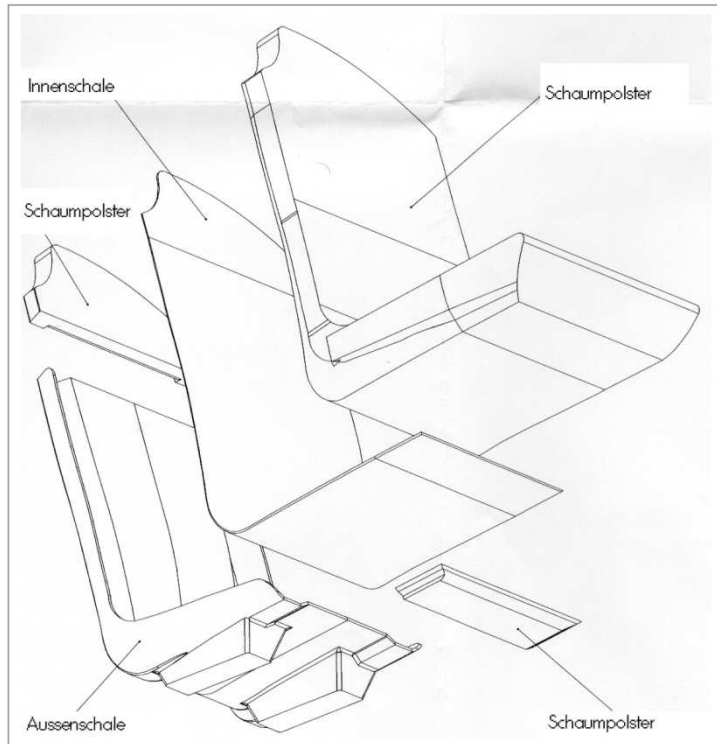
**One sided surface treatment**

**Lack of suppliers for minor scale production**

**Know-how limited to automotive industry**



## Engineering & prototype tooling



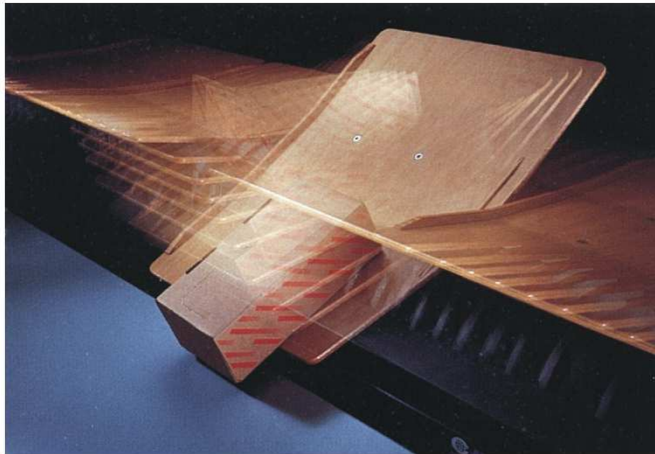
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Test- and presentation mockups



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## Plant fibre sorting tray



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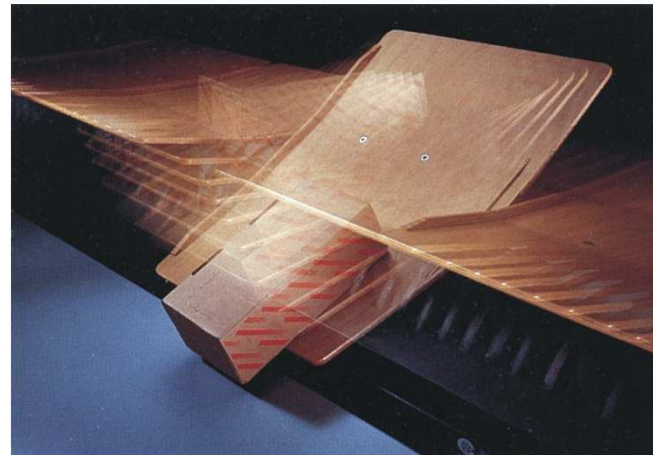
## Plant fibre benefits

**Minimized weight / energy consumption**

**3D geometries give less friction**

**Competitive part price**

**Sound insulation**



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## Perspectives



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