Utilization of Small Diameter Timber

Forest Stewardship through the manufacture of Solid Timber products
Patrick Clark
Wooden Haus Supply

406 212 0388

European Timber Products:
Manufacturing, utilization and opportunities in Montana
Wooden Haus Supply: Specialist for innovative building products made from wood
**Wooden Haus Supply** European/USA Partner firms
- Hasslacher Noritec Holzindustrie - Austria
- Rema Holzindustrie - Austria
- Steico Wood Fiber - Germany/Poland
- KLH CLT - Austria/USA
- Global Wholesale Supply - USA
Agenda

Wooden Haus Supply

Timber Product Mix for a Full System Built Timber Solution

- Cross Laminated Timber (CLT)
- Duo/Trio Lam
- Glulam Timber
- KVH
- Brettstapel/Solid Timber Ceiling and Roof
- Dreischichtplatten/3 Ply Panel
- Wood Fiber Insulation
STEICO Munich (GER)

STEICO Headquarters Feldkirchen / Munich

- Worldwide sales management and corporate control
- Unique construction system for innovative timber constructions
- Broadest assortment of the whole industry
- Leader in technical development and client services
- Close cooperation with universities. Sponsor of international timber frame construction developments
Employees: 1,300

Headquarter: Feldkirchen near Munich

Locations: 6 including 3 production sites

Annual turnover: About USD $250 Million (2016); $226 Million (2015)

Sales: Worldwide

Logistic: Mixed truck and container loads, insulating and constructional materials

Investments: $60 Million for a new STEICO LVL production plant (increase of capacity in planning process)

$12 Million for another production plant for wood fiber board of wet process
Czarnków (PL)

World’s largest production site for ecological insulation

- Location: ca. 60 km (37.2 miles) from Poznan
- Size: ca. 50 ha. (123.5 acres)
- 8 production lines for wood fibre insulation with more than 2 million m³ (70.6 million cubic ft) capacity p.a.
- Europes largest line for I-joist with 25 mio. rm (82 million linear feet) capacity
- Around 730 Employees
- 350 Trucks per week, 120 trucks on peak days
- Main production site for insulation material and beams
STEICO SE – Development of Turnover in Mio €

Revenues

2015
189 Mio €

2016
209 Mio €
STEICO SE – Breakdown of Sales by Markets in 2016

- Germany: 39%
- Great Britain/ Ireland: 14%
- France: 14%
- Remaining Southern & Western Europe: 8%
- Scandinavia: 5%
- Alpine Region: 5%
- Italy: 5%
- USA: 5%
- Middle East/GCC Region: 2%
- Remaining Eastern Europe: 2%
- RoW (Asia, PAK, AUS, NZL, JPN): 1%
STEICO SE – Development of Turnover (USA)
Intergrated Micro Wood Fiber Plant
Wood Fibre Insulation History

- Wood Fibre Insulation has been in Europe and the U.S. for over 70 years.
- U.S. products were once used for structural sheathing prior to OSB.
- U.S. products are now used for cover board in commercial roofing, sound board and some sheathing.
- There were once around 20 fiberboard plants in the U.S. & Canada – now there only 4.
- European use of fiberboard/ wood fibre insulation is surging with the growth curve of energy efficient and healthy buildings.
- Renovation market is also significant in Europe as families keep houses for generations.
- The differences between U.S. and European products is significant.
- The target markets for European style wood fibre insulation are: Passive/ High Performance Homes, Timber Frame Construction, CLT Construction.
History - Growth of Wood Fibre Insulation

The graph shows the growth of Wood Fibre Insulation from 1986 to 2016, with revenue in millions. The data indicates a significant increase in revenue from 1986 to 2016.
Product Range Overview

Wood fiber boards – wet process

Wood fiber boards – dry process

Flexible wood fiber boards

Wood fiber & cellulose injection insulation
Production Processes

EN13171

The Wet Process
- Wood own binding materials
- Bulk density 16.9 lb/f³
- Water vapor diffusion resistance factor $\mu$: 5
- R value 3
- Higher Density/ Lower R value/ higher $u$ value

The Dry Process
- Additional binding materials (3-5%)
- Bulk density 11.25 – 13.1 lb/f³
- Water vapor diffusion resistance factor $\mu$: 3
- R value 3.5
- Lower Density/ Higher R value/ lower $u$ value
Wet Process

Wood chips

Defibration

Mixed with water to form paste

Possible addition of additives

Mechan. presses

Return of wood dust and board remains

320°-383 F
160 – 195°C

Drying

Sawing and milling

Return of pressed-out water

Water treatment

STEICO

www.steico.com
Wet Process Ingredients

- Wood Fibre/ Natural Resins
- Water
- Paraffin
  - principal user: candle industry
- Aluminium sulphate
  - flocking agent
  - further areas of use: flocking agent in the water treatment, backing agent in the food industry
- Silicate
  - binding mechanism: CO$_2$-absorption and water loss
  - further areas of use: binding agent in mineral colours and paper
Dry Process – Wood Fibre Boards
Dry Process Ingredients

- **Wood Fibre/ Natural Resin**

- **Ammonium Phosphate**
  - function: fire retardant agent
  - mineral salt out of the elements nitrogen (N) and phosphorus (P)
  - further areas of use: fertilizer / food industry

- **Polyolefin Fibre**
  - function: binding agent
  - textile fibre from the clothing industry

- **Paraffin Wax**
  - principal user: candle industry

- **Polyurethane Resin**
Chips/ Fibers Routed to Processing
Dry Board Processing – Rolled/ Compressed to Thickness
Why Wood Fibre Insulation?

Wood is a Natural Insulator

- Low Thermal Conductivity
- High Specific Heat Capacity
- High density Insulation
Phase Shift is defined as the time span between the highest external temperature and the highest internal temperature. In this example, the highest temperature is at 2:00 PM and the highest internal temperature at 2:00 AM. This equates to a 12hr Phase Shift.

With this level of performance, a portion of the heat stored in the insulation components is returned to the external air. Internal temperature will never reach that of the external air.

How does this work in practice.....
Installation and Detailing
Flexible Insulation Board
Flexible Insulation Board
Case study
Flexible Insulation Board

Isoflex-Cut
Installation and Detailing
Installation and Detailing
Installation and Detailing

Vapor Open Roof System

Rigid Wood Fibre Insulation – either wet or dry process

Flexible Wood Fibre Insulation

Membrane
Installation and Detailing
Weathering protection during the building phase
Loose fibre

🌿 Packaging / Delivery

🌿 PE-bag 15 kg
🌿 ~ 2.5 bag per m³
Loose fibre
Loose fibre

Injection lance
Pressure Resistant Board

STEICO therm
stabile Wärmedämmung

STEICO therm internal
Innendämmung aus Holzfasern

STEICO universal
Unterdach- und Wandbauplatte

STEICO special
Holzfaser-Dämmssystem

STEICO floor
Fußboden-Dämmssystem

STEICO protect
Holzfaser-Dämmplatte

STEICO underfloor
Parkett- und Laminatbodenunterlage

STEICO isorel
vielseitige Holzfaserplatte
Installation
Installation
Floor systems

in combination with timber floor boards
Case Study
Installation and Detailing
Case Study
**PRODUCTION PLANT DATA**

<table>
<thead>
<tr>
<th>Raw material</th>
<th>softwood (like spruce, fir, pine)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wood (without bark)</td>
<td>PMDI (for rigidboards)</td>
</tr>
<tr>
<td>Binder</td>
<td>Option: Bico-fibers (for flexible boards)</td>
</tr>
<tr>
<td>Hydrophobic additive (for special applications)</td>
<td>paraffin emulsion</td>
</tr>
<tr>
<td>Fire retardant (depending on density)</td>
<td></td>
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</tbody>
</table>

| Site                                   | approx 6,500 m² (70,000 sq.ft.)   |
| (for the production line without warehouse, infrastructure etc.) | approx 150 m x 42 m (500 ft x 140 ft.) |
| Masterboard width                      | approx. 2,400 to 2,600 mm (8.0 – 8.5 ft.), depending on final board size |

| Rigid board – Capacity                 | 36 – 72 m³/h (1,270 – 2,540 cu.ft./hour) |
| (depending on density and thickness)   |                                    |
| Throughput                             | up to 7 t/h (7.7 ton/hour) wood      |

| Option: flexible board – Capacity     | 45 – 75 m³/h (1,585 – 2,648 cu.ft./hour) |
| (depending on density and thickness)  |                                    |
| Throughput                             | up to 3 t/h (3.3 ton/hour) wood       |
HASSLACHER Group

Founded in 1901 by Jakob HASSLACHER
400 Mio. EUR Turn-over
1,600 employees at 8 locations in 4 countries
Headquarter: Sachsenburg/Carinthia/Austria
HASSLACHER Group
Production sites

AUSTRIA
Sachsenburg
Stall im Mölltal
Hermagor
Preding

GERMANY
Magdeburg
Kleinheubach

SLOVENIA
Bohinjska Bistrica

RUSSIA
Malaya Vishera
<table>
<thead>
<tr>
<th>Product Type</th>
<th>Quantity</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annual Production</td>
<td></td>
<td></td>
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<tr>
<td><strong>ANNUAL PRODUCTION</strong></td>
<td></td>
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<tr>
<td>ANNUAL PRODUCTION</td>
<td></td>
<td></td>
</tr>
<tr>
<td>750,000 m³</td>
<td></td>
<td>SCHNITTHOLZ  SAWN TIMBER  SEGATI</td>
</tr>
<tr>
<td>160,000 m³</td>
<td></td>
<td>HOBELWARE  SURFACED TIMBER  PERLINE E PIALLATI</td>
</tr>
<tr>
<td>100,000 m³</td>
<td></td>
<td>KONSTRUKTIONSVOHOLZ  FINGER JOINTED STRUCTURAL TIMBER  LEGNO MASSICCIO DA COSTRUZIONE</td>
</tr>
<tr>
<td>150,000 m³</td>
<td></td>
<td>BRETTSPERRHOLZ  CROSS LAMINATED TIMBER  PANNELLI X·LAM</td>
</tr>
<tr>
<td>45,000 m³</td>
<td></td>
<td></td>
</tr>
<tr>
<td>90,000 t</td>
<td></td>
<td>PELLETS  PELLETS  PELLET</td>
</tr>
<tr>
<td>1,000,000 PIECES</td>
<td></td>
<td>PALETEN &amp; VERPACKUNGSLOSUNGEN  PALLETS &amp; PACKAGING SOLUTIONS  BANCALI &amp; SOLUZIONI DI IMBALLAGGIO</td>
</tr>
<tr>
<td>1,500,000 m²</td>
<td></td>
<td>SCHALUNGSPLATTEN  SHUTTERING BOARDS  PANNELLI PER CASSEFORME</td>
</tr>
<tr>
<td>90 GWh</td>
<td></td>
<td>WÄRME  HEAT  CALORE</td>
</tr>
<tr>
<td>80 GWh</td>
<td></td>
<td>STROM  ELECTRICITY  ENERGIA ELETTRICA</td>
</tr>
<tr>
<td>1,000,000 PIECES</td>
<td></td>
<td>PIECES  PALETTEN &amp; VERPACKUNGSLOSUNGEN  PALLETS &amp; PACKAGING SOLUTIONS  BANCALI &amp; SOLUZIONI DI IMBALLAGGIO</td>
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<tr>
<td>1,500,000 m²</td>
<td></td>
<td>SHUTTERING BOARDS  PANNELLI PER CASSEFORME</td>
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From Wood to Wonders.
From Wood …
... to Wonders.
... to Wonders.
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... to Wonders.
... to Wonders.
Why Central European Products?

Log Diameter: average 280 mm/11"

- High yield
- High volume of 200 mm and wider lumber
- Large widths of side boards possible
- Example 380 mm log
COMPREHENSIVE PRODUCT RANGE

ALL FROM ONE SOURCE

SCHNITTHOLZ
SAWN TIMBER
SEGATI

HOBEWARE
SURFACED TIMBER
PIROLITE E PIALLATE

KONSTRUKTIONSVOLLHOLZ GLT™
FINGER JOINTED STRUCTURAL TIMBER
LEGNO MASSICCIO DA COSTRUZIONE

BALKENSCHTICHOLZ DUO/TRIO
LAMINATED BEAMS DUO/TRIO
TRAVI DUO/TRIO

BREITTSCHICHTHOLZ
GLUE LAMINATED TIMBER
LEGNO LAMELLARE

BREITTSCHICHTHOLZ
SPEZIALPRODUKTE
SPECIAL PRODUCTS
PRODOTTI SPECIALI

PELLETS
PELLETS
PELLET

PELLETS & VERPACKUNGSLÖSUNGEN
PALLETS & PACKAGING SOLUTIONS
BANCALI & SOLUZIONI DI IMBALLAGIO

BREITTSCHICHTHOLZ
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SPECIAL PRODUCTS
PRODOTTI SPECIALI

SCHALLUNGSPLATTE
SHUTTERING BOARDS
PANNELLI PER CASSEFORME

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SCHALLUNGSPLATTE
SHUTTERING BOARDS
PANNELLI PER CASSEFORME
ALL FROM ONE SOURCE
ALL ON ONE TRUCK

- Glue laminated timber special components
- Cross laminated timber
- Finger jointed structural timber
- Solid timber ceiling system
- Sawn timber
- Surfaces timber
- Duo/Trio

Additional items:
- Shuttering boards
- Pellets
- Special products
- Pallets

From wood to wonders.
CROSS LAMINATED TIMBER

NORITEC X-LAM

THE CONSTRUCTION MATERIAL OF THE FUTURE
From wood to wonders.

www.hasslacher.com
CROSS LAMINATED TIMBER
NORITEC X-LAM
THE CONSTRUCTION MATERIAL OF THE FUTURE

ADVANTAGES
+ No modular dimensions, order size = invoiced size
+ Highest precision joinery work
+ Sanded surface with all qualities
+ Flexible sizes up to 3.20 x 20.0 m
CROSS LAMINATED TIMBER
NORITEC X-LAM
THE CONSTRUCTION MATERIAL OF THE FUTURE
SOLID TIMBER CEILING SYSTEM

THE HIGH-PERFORMANCE CEILING SYSTEM
ADVANTAGES

+ Cost-effective system for flat ceilings
+ High load capacity and rigidity
+ Fast delivery times
+ Also available as an acoustic ceiling
GLUE LAMINATED TIMBER

ENGINEERED WOODEN BEAMS
From wood to wonders.

www.hasslacher.com
GLUE LAMINATED TIMBER
ENGINEERED WOODEN BEAMS
ADVANTAGES

+ Broad product range
+ All strength categories
+ Wood types: spruce/fir, pine, larch, birch
+ Widths from 80 mm to 280 mm, block bonding
+ Heights from 80 mm to 4,000 mm
+ Lengths up to 41 m
+ All forms possible, incl. 3-dimensional
GLUE LAMINATED TIMBER

ENGINEERED WOODEN BEAMS
LAMINATED BEAMS

DUO/TRIO

DIMENSIONALLY STABLE AESTHETICS
LAMINATED BEAMS
DUO/TRIO
DIMENSIONALLY STABLE AESTHETICS

LAMINATED BEAMS OF FURNITURE QUALITY

+ Top quality surfaces
+ Use of heartwood-free, cut raw lamellas
+ Wide range of cross-sections
+ Various types of wood possible
LAMINATED BEAMS
DUO/TRIO
DIMENSIONALLY STABLE AESTHETICS
+ Joinery systems available at all our plants
+ Fast and easy assembly at the construction site
+ Competent contact partners ensure accurate and cost-effective finishing
FINGER JOINTED STRUCTURAL TIMBER

GLUED LAMINATED TIMBER BEAMS

THE INDIVIDUALLY CERTIFIED SECURITY GUARANTEE
FINGER JOINTED STRUCTURAL TIMBER
GLUED LAMINATED TIMBER BEAMS
THE INDIVIDUALLY CERTIFIED SECURITY GUARANTEE

BROAD PRODUCT RANGE
+ Cross-section heights from 80 mm to 300 mm
+ Cross-section heights from 60 to 160 mm
+ Lengths from 2.5 m to 18.0 m
+ Wood types: spruce/fir, pine, Douglas fir
+ Block profile on request
+ Pressure impregnation possible
+ From spring 2017: joinery work at customer request
FINGER JOINTED STRUCTURAL TIMBER
GLUED LAMINATED TIMBER BEAMS
THE INDIVIDUALLY CERTIFIED SECURITY GUARANTEE

+ Each item is checked
+ Online quality assurance instead of random sampling
+ Like glue laminated timber, glue laminated timber beams can be measured and wood construction costs saved
SURFACED TIMBER

VERSATILITY FOR INSIDE AND OUTSIDE SURFACES
ADVANTAGES

+ Versatile application possibilities for both inside and outside areas
+ The correct sorting and quality for each use, comprehensive product range
+ Can be combined with all other products from the HASSLACHER group
+ Certified product quality: member of the Association of the European Planing Industries
SURFACED TIMBER

VERSATILITY FOR INSIDE AND OUTSIDE SURFACES
PELLETS
SUSTAINABLE ENERGY FROM NATURE

BRINGING NATURE INTO BALANCE WITH PELLETS
+ This natural heating material is made from pure dried sawdust and wood shavings pressed with purely biogenic pressing additives
+ Pellets are carbon-neutral and during the burning process, they release the same quantity of CO₂ as was absorbed by the tree during growth
+ The supply is 100% guaranteed, independent of oil and gas and always available in sufficient quantities
+ Local softwood from the region based on 100% sustainable forestry
SHUTTERING BOARDS

NATURAL BEAUTY FOR CONCRETE SURFACES
ADVANTAGES

+ Low cost due to high level of repeat uses
+ Sanded surfaces for perfect results
+ Closed structure to prevent cracks and ensure dimensional stability
+ High product lifespan thanks to all-round glued border
SAWN TIMBER

BOARDS WHICH MEAN THE WORLD
SAWN TIMBER PRODUCTS

- Lamellas for glue laminated timber
- Lamellas for laminated beams and finger jointed structural timber, heartwood-separated or heartwood-free
- Rough-planed timber
- Window scantlings, window lamellas and finer jointed products
- Slats, poles and posts
- Wooden beams
- Side board products for packers and industrial processors
- Cm products
- Sawmill by-products
From wood to wonders.
SPECIAL PRODUCTS

A SOLUTION FOR EVERY CHALLENGE
SPECIAL PRODUCTS
A SOLUTION FOR EVERY CHALLENGE

SPECIAL PRODUCTS
+ Large façade elements
+ Edge-glued decking boards with refined surfaces
+ Mini laminated beams
+ Rounded pillars
+ Wood-concrete composite systems
SPECIAL PRODUCTS
A SOLUTION FOR EVERY CHALLENGE
SPECIAL PRODUCTS
A SOLUTION FOR EVERY CHALLENGE
SPECIAL PRODUCTS
A SOLUTION FOR EVERY CHALLENGE
FROM WOOD TO WONDERS BY INNOVATION!

BIRCH GLUE LAMINATED TIMBER
FROM WOOD TO WONDERS BY INNOVATION.
BIRCH CROSS LAMINATED TIMBER
FROM WOOD TO WONDERS BY INNOVATION.
EXCELLENT SURFACE
FROM WOOD TO WONDERS BY INNOVATION. 

X-FIX WOOD-WOOD CONNECTOR SYSTEM
CONCENTRATED ENERGY

WITH REGIONAL ADDED VALUE FOR THE FUTURE
HASLACHER NORICA TIMBER generates 80 GWh from wood fuel. This includes waste wood such as bark, off-cuts, wood chip, branches etc. This corresponds to an electricity consumption of 16,000 households i.e. the size of a town such as Spittal an der Drau.
Production of:
Glue laminated timber
Laminated beams duo/trio
Surfaced timber
Sawn timber
Sawmill by-products
Electricity and heat from 2 CHP systems
Electricity from photovoltaic plant

HASSLACHER Holding GmbH
Management & administration
HASSLACHER DRAULAND Holzindustrie GmbH
Production sawmill
NORITEC Holzindustrie GmbH
Planing mill & glue laminated timber plant
HASSLACHER Energie GmbH: biomass cogeneration
NORICA TIMBER Vertrieb GmbH: sales

Employees: approx. 380
From wood to wonders.

www.hasslacher.com
Thank You For Your Time

Any Questions?

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