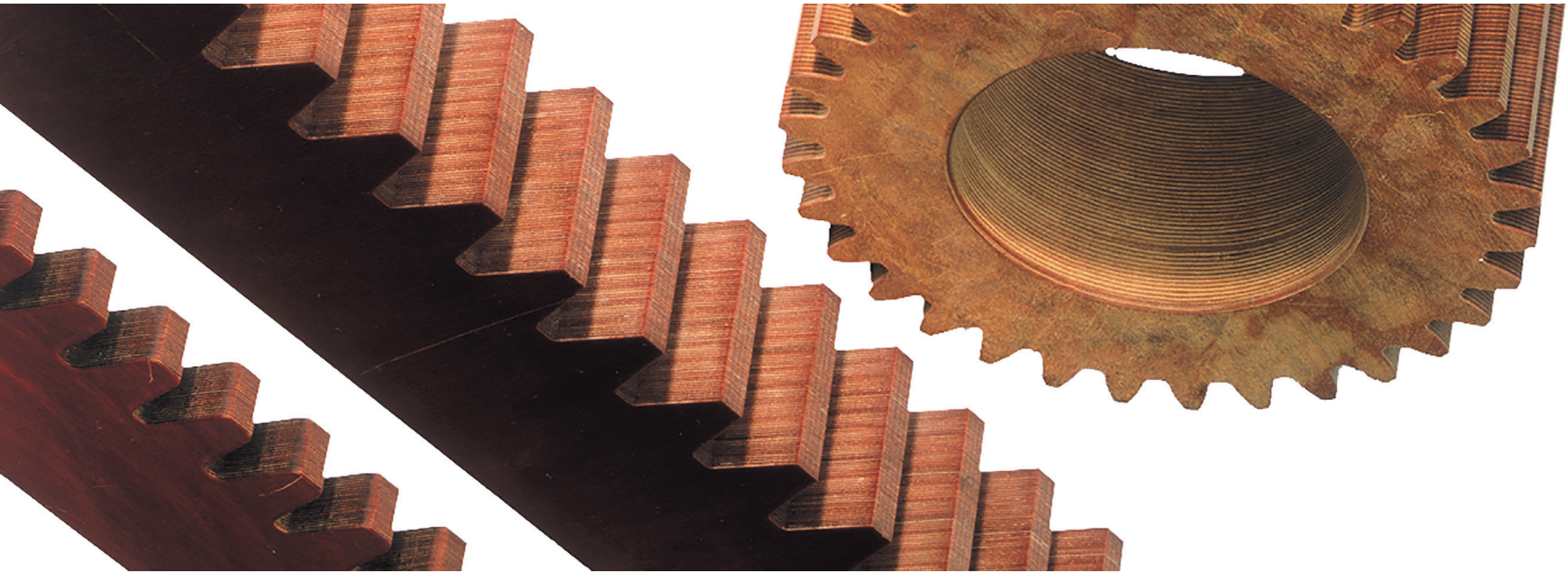


**Delignit**<sup>®</sup>   
naturally superior



# **DELIGNIT<sup>®</sup> SYNTHETIC RESIN COMPRESSED WOOD**

VERSATILE MATERIAL FOR TECHNICAL APPLICATIONS

# BRIEF PORTRAIT OF BLOMBERGER HOLZINDUSTRIE GMBH

**FROM THE OLDEST PLYWOOD MANUFACTURER** in the world to a high-tech material supplier.

Blomberger Holzindustrie GmbH develops, produces and sells ecological materials and system solutions made from renewable resources marketed under the brand name

**Delignit®**. As a renowned development, project and serial supplier of leading automotive groups, Blomberger Holzindustrie GmbH is the global market leader in cargo bay protection and cargo securing systems for light commercial vehicles.

With a product range and technical integration that is second to none, Blomberger Holzindustrie GmbH supplies numerous other technology sectors and acts for example as a worldwide system supplier of leading rail stock manufacturers. Delignit solutions have exceptional technical properties and are also used for trunk floors in factory halls and logistics centres, and to improve the security of buildings.



Premises of Blomberger Holzindustrie GmbH



# TRADITION. ECOLOGY. SYSTEM COMPETENCE.



- 04 **DELIGNIT® SYNTHETIC RESIN COMPRESSED WOOD**
- 06 **FESTHOLZ®**
- 08 **PANZERHOLZ®**
- 10 **PANZERHOLZ® PARTIALLY COMPRESSED**
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-SYNTHETIC RESIN COMPRESSED WOOD**
- 13 **SERVICES**
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- 15 **GUIDING PRINCIPLE**

## PRODUCT LINES - PERFECT FOR PROFESSIONAL USE

Delignit®-synthetic resin compressed wood is available in **TWO VERSIONS.**



### **FESTHOLZ®** **PREMIUM APPLICATIONS**

The cost-effective alternative to metal in machine, tool, appliances and mould production.



### **PANZERHOLZ®** **BASIC APPLICATIONS**

The cost-effective alternative to Festholz® in machine, tool, appliances and mould production.



- ▶ Low specific weight  
(50% lighter than aluminium, 80% lighter than steel)
- ▶ High strength and hardness,  
excellent abrasion and wear resistance
- ▶ Antistatic
- ▶ Corrosion-proof and resistant to oils  
and many other chemicals





Mould range in Festholz 8221 for forming presses



## FESTHOLZ®

**FOR HIGHEST STANDARDS** in machine, tool, appliance and mould production.

Special dimensions, customised blanks, blocks  
and finished parts according to drawings  
available on request

### SPECIAL PROPERTIES

- ▶ Antistatisch
- ▶ Resistant against oils and many commonly used acids and bases
- ▶ FFine-layer structure
- ▶ Noise-reduction properties
- ▶ Low expansion coefficient
- ▶ Low specific weight - approx. 1.37 g/cm<sup>3</sup>
- ▶ High elasticity, compressive strength, flexural modulus of elasticity; good coefficient of sliding friction
- ▶ High resin content
- ▶ Easy handling of finished parts
- ▶ Reduced water adsorption
- ▶ Self-lubricating, which means outstanding emergency running characteristics
- ▶ Temperature resistant from -200 to +100 °C

### DISPOSAL

- ▶ Wood waste class A2, disposal code 030105
- ▶ Easy disposal

### APPLICATIONS

Machine, tool, appliances and mould production

### WEAR RESISTANCE

To compare the wear resistance of materials, they must be tested with the same testing equipment. Thanks to its special structure, **Festholz®** offers good emergency running properties, as it is self-lubricating under low-load conditions. With external lubrication, it is possible to achieve good long-term lubrication under heavy-load conditions. The low expansion coefficient is similar to that of steel. This eliminates the risk of warping or gaps due to different expansion rates in linear arrangements with steel structures.

### GLUING

The faces to be glued must be dry and free of grease. The pressed blank layer must be removed. A rough finish improves adhesion. Veneer-to-veneer gluing only. Use screw clamps, presses and screwed connections. For details, see our technical data sheets.

### DIMENSIONS AND LAYER THICKNESS OF INDIVIDUAL TYPES

8221, Layer thickness: approx. 0.35 mm

- ▶ 2000 x 1000 mm: thickness 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 15, 17, 20, 22, 25, 27, 30, 32, 35, 37, 40, 42, 45, 47, 50, 52, 55, 57, 60, 62, 65, 67, 70, 72, 80, 82 mm
- ▶ 2500 x 1300 mm: thickness 15, 20, 30, 40, 50 mm

8231, Layer thickness: approx. 0.90 mm

- ▶ 2000 x 1000 mm: thickness 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 15, 17, 20, 22, 25, 27, 30, 32, 35, 37, 40, 42, 45, 47, 50, 52, 55, 57, 60, 62, 65, 67, 70, 72, 80, 82 mm

## MECHANICAL PROPERTIES

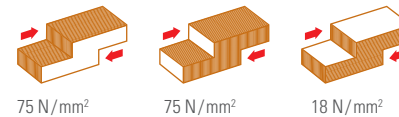
Type (factory standard)		8121	8131	8221	8231	8223	
Veneer layers per cm finished thickness approx.		25	11	25	11	22 <sup>5)</sup>	
Synthetic resin compressed wood		20217	20216	20227	20227	–	
Class (grain direction of veneers <sup>1)</sup> )		A	A	B	B	B	
DIN 53479 bulk density approx. (g/cm <sup>3</sup> )		1,37	1,37	1,37	1,37	1,37	
Bending strength DIN 53452 <sup>2)</sup>	(N/mm <sup>2</sup> )	⊥	290	240	190	190	150
			260	220	160	160	120
Impact resistance DIN 53453	(kJ/m <sup>2</sup> )	⊥	55	65	30	40	16
			45	50	20	20	12
Notched impact strength DIN 53453	(kJ/m <sup>2</sup> )		40	40	10	15	6
Tensile strength DIN 53455	(N/mm <sup>2</sup> )		210	200	120	120	85
Compressive strength DIN 53454	(N/mm <sup>2</sup> )	⊥	170	160	260	240	220
			–	–	150	130	–
Ball indentation hardness DIN 53456	(N/mm <sup>2</sup> )	⊥	120	120	200	150	250
Delamination load DIN 53463	(N)		5000	5000	4600	3600	5000
Bending modulus of elasticity DIN 53457	(N/mm <sup>2</sup> )	⊥	24000	22000	16000	17000	12500
			23000	20000	14000	14000	12000
DIN 53495 water absorption <sup>3)</sup> of 10 mm samples <sup>4)</sup>	%	3,5	4,0	2,5	3,8	2,0	

Notes: <sup>1)</sup> Class A: predominantly longitudinal veneers. Class B: cross-ply veneers (90°).

<sup>2)</sup> ⊥ perpendicular to layers. || parallel to layers. <sup>3)</sup> Synthetic resin compressed wood might swell when exposed to liquids.

<sup>4)</sup> Thick samples have a lower water adsorption rate than thin samples. <sup>5)</sup> Higher resin content for special applications.

Shear strength of type 8231:  
DIN 7707 Part 1 (mean)



Coefficient of sliding friction in $\mu\text{O}$	STEEL			
	Finished, dry	Finished, lubricated	Finished, lubricated with Molykote	
Bronze	Bz	0,18	0,07	
Grey cast iron	GG	0,24		
Copper	Cu	0,29		
Brass	Ms	0,18		
Polytetrafluoroethylene	PTFE	0,04	0,04	
Fluorinated ethylene-propylene (FEP)	FEP	0,08	0,08	
Polyamides	PA	0,3	0,06	
Phenoplasts	PF	0,2	0,1	
Low-density polyethylene	PE	0,2	0,1	
Festholz® type 8221	Fhz	0,18	0,11	0,08

Thermal properties  
of type 8231:

Linear expansion coefficient  
- 180 °C to + 60 °C  
parallel to layers (II)  
approx.  $9 \times 10^{-6}/\text{K}$   
perpendicular to layers  
approx.  $50 \times 10^{-6}/\text{K}$

Thermal conductivity at normal  
wood moisture content approx. 6%  
+ 60 °C = 0,256 W/K m  
+ 30 °C = 0,242 W/K m  
- 30 °C = 0,214 W/K m  
- 180 °C = 0,153 W/K m



Special dimensions, customised blanks, blocks  
and finished parts according to drawings  
available on request

## DELIGNIT®-PANZERHOLZ®

**COMPOSITE MATERIAL** for heavy-duty applications in machine, tool, appliances and mould production.

### SPECIAL PROPERTIES

- ▶ Antistatic
- ▶ Resistant against oils and many commonly used acids and bases
- ▶ Noise-reduction properties
- ▶ Low expansion coefficient
- ▶ Low specific weight - approx. 1.37 g/cm<sup>3</sup>
- ▶ High elasticity, compressive strength, flexural modulus of elasticity; good coefficient of sliding friction
- ▶ Easy handling of finished parts
- ▶ Temperature resistant from -200 to +100 °C

### DISPOSAL

- ▶ Wood waste class A2, disposal code 030105
- ▶ Easy disposal

### WEAR RESISTANCE

To compare the wear resistance of materials, they must be tested with the same testing equipment. Thanks to

its special structure, **Panzerholz®** offers good emergency running properties, as it is self-lubricating under low-load conditions. With external lubrication, it is possible to achieve good long-term lubrication under heavy-load conditions. The low expansion coefficient is similar to that of steel. This eliminates the risk of warping or gaps due to different expansion rates in linear arrangements with steel structures.

### VERLEIMUNG

**Delignit® Panzerholz®** is virtually free of pores so that solvents contained in the glue cannot penetrate the material. To glue **Delignit® Panzerholz®** sections to each other, use an adhesive with minimum water or solvent content. Good results can be achieved with resorcinol resins, such as Bakelite no. HL 283 plus hardener no. 183 or 184, or similar adhesives. Also suitable are two-component polyurethane adhesives. Observe the use instructions of the adhesive manufacturer. Prior to gluing, roughen

the surfaces. Gluing **Panzerholz®** cut edges to each other can be difficult. We therefore recommend performing preliminary trials.

### DIMENSIONS AND LAYER THICKNESS OF INDIVIDUAL TYPES

B 15, Layer thickness: approx. 0,9 mm

- ▶ 2130 x 1000 mm: thickness 4, 5, 6, 8, 10, 12, 15, 20, 25, 30, 35, 40, 50, 60 mm
- ▶ 1750 x 1750 mm: thickness 10, 15, 20, 25, 30, 35, 40 mm
- ▶ 2550 x 1400 mm: thickness 4, 5, 6, 8, 10, 12, 15, 20, 25, 30, 35, 40, 45, 50, 60 mm

B 25, Layer thickness: approx. 0,5 mm:

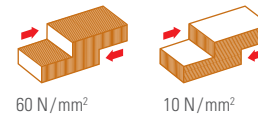
- ▶ 2130 x 1000 mm: thickness 5, 8, 10, 12, 15, 20, 25, 30, 35 mm

# MECHANICAL PROPERTIES

Delignit® Panzerholz® type Type designation in accordance with DIN 7707		B15 KP 20226	B25 KP 20226
Bulk density (g/cm³) DIN 53 479		1,35 - 1,40	1,35 - 1,40
Bending strength (N/mm²) DIN 53 452	II Schicht └ Schicht	165 180	165 180
Impact resistance (kJ/m²) DIN 53 453	II Schicht └ Schicht	25 50	25 50
Notched impact strength (kJ/m²) DIN 53 453	II Schicht └ Schicht	20 50	20 50
Tensile strength (N/mm²) DIN 53 455	II Schicht	125	130
Compressive strength (N/mm²) DIN 53 454	II Schicht └ Schicht	135 270	145 290
Ball indentation hardness (N/mm²) DIN EN ISO 2039-1	└ Schicht	230	230
Gap load N DIN 53 463	└ Schicht II Schicht	3.000	3.000
Modulus of elasticity (N/mm²) DIN 53 457 - bending GIN 53 457 - pressure	└ Schicht └ Schicht II Schicht	17.000 2.600 6.000	17.000 2.600 6.000
Coefficient of sliding friction (µG) against blank stainless steel plate II and against E 200 belt tensioner	└ Schicht II Schicht	0,2 - 0,3 0,14	0,2 - 0,3 0,14
Water absorption (in %) after 24h storage in water (sample: 50 x 50 x 30 mm) DIN 53 495		3,5	3,5
Coefficient of thermal conductivity W/mk (for temperatures from 20 to +40°C) (für Temperaturen von - 20 bis + 40°C)		0,29 - 0,32	0,29 - 0,32

## Shear strength of Panzerholz®:

DIN 7707 Part 1 (mean)



Coefficient of sliding friction in µQ		STEEL		
		Finished, dry	Finished, lubricated	Finished, lubricated with Molykote
Bronze	Bz	0,18	0,07	
Grey cast iron	GG	0,24		
Copper	Cu	0,29		
Brass	Ms	0,18		
Polytetrafluoroethylene	PTFE	0,04	0,04	
Fluorinated ethylene-propylene (FEP)	FEP	0,08	0,08	
Polyamides	PA	0,3	0,06	
Phenoplasts	PF	0,2	0,1	
Low-density polyethylene	PE	0,2	0,1	
Panzerholz®	Fhz	0,18	0,11	0,08

## Thermal properties of Panzerholz®:

Linear expansion coefficient

- 180 °C to + 60 °C

parallel to layers (II)

approx.  $9 \times 10^{-6}/K$

perpendicular to layers

approx.  $50 \times 10^{-6}/K$

Thermal conductivity at normal wood moisture content approx. 6%

+ 60 °C = 0,256 W/K m

+ 30 °C = 0,242 W/K m

- 30 °C = 0,214 W/K m

- 180 °C = 0,153 W/K m

Temperature resistance

- 200 °C to + 100 °C

## PANZERHOLZ® PARTIALLY COMPRESSED

PANZERHOLZ® partially compressed for bullet proofing, reinforcement against break-in, transformer production, and industrial floors that must meet high antistatic standards.

### SPECIAL PROPERTIES

- ▶ Antistatic
- ▶ Resistant against oils and many commonly used acids and bases
- ▶ Noise-reduction properties
- ▶ Low expansion coefficient
- ▶ Low specific weight, from 0,9 to 1,2 g/cm<sup>3</sup>
- ▶ High elasticity, compressive strength, flexural modulus of elasticity; good coefficient of sliding friction
- ▶ Easy handling of finished parts
- ▶ Self-lubricating, which means outstanding emergency running characteristics
- ▶ Temperature resistant from -200 to +100 °C

### DISPOSAL

- ▶ Wood waste class A2, disposal code 030105
- ▶ Easy disposal

### WEAR RESISTANCE

To compare the wear resistance of materials, they must be tested with the same testing equipment. Thanks to its special structure, Panzerholz® offers good emergency running properties, as it is self-lubricating under low-load conditions. With external lubrication, it is possible to achieve good long-term lubrication under heavy-load conditions. The low expansion coefficient is similar to that of steel. This eliminates the risk of warping or gaps due to different expansion rates in linear arrangements with steel structures.

### GLUING

The faces to be glued must be free of grease and dry (wood moisture content 6-12%). The pressed blank layer must be removed. A rough finish improves adhesion. Veneer-to-veneer gluing only. Use screw clamps, presses and screwed connections. For details, see our technical data sheets.

Special dimensions, customised blanks, blocks and finished parts according to drawings available on request

### DIMENSIONS AND LAYER THICKNESS OF INDIVIDUAL TYPES

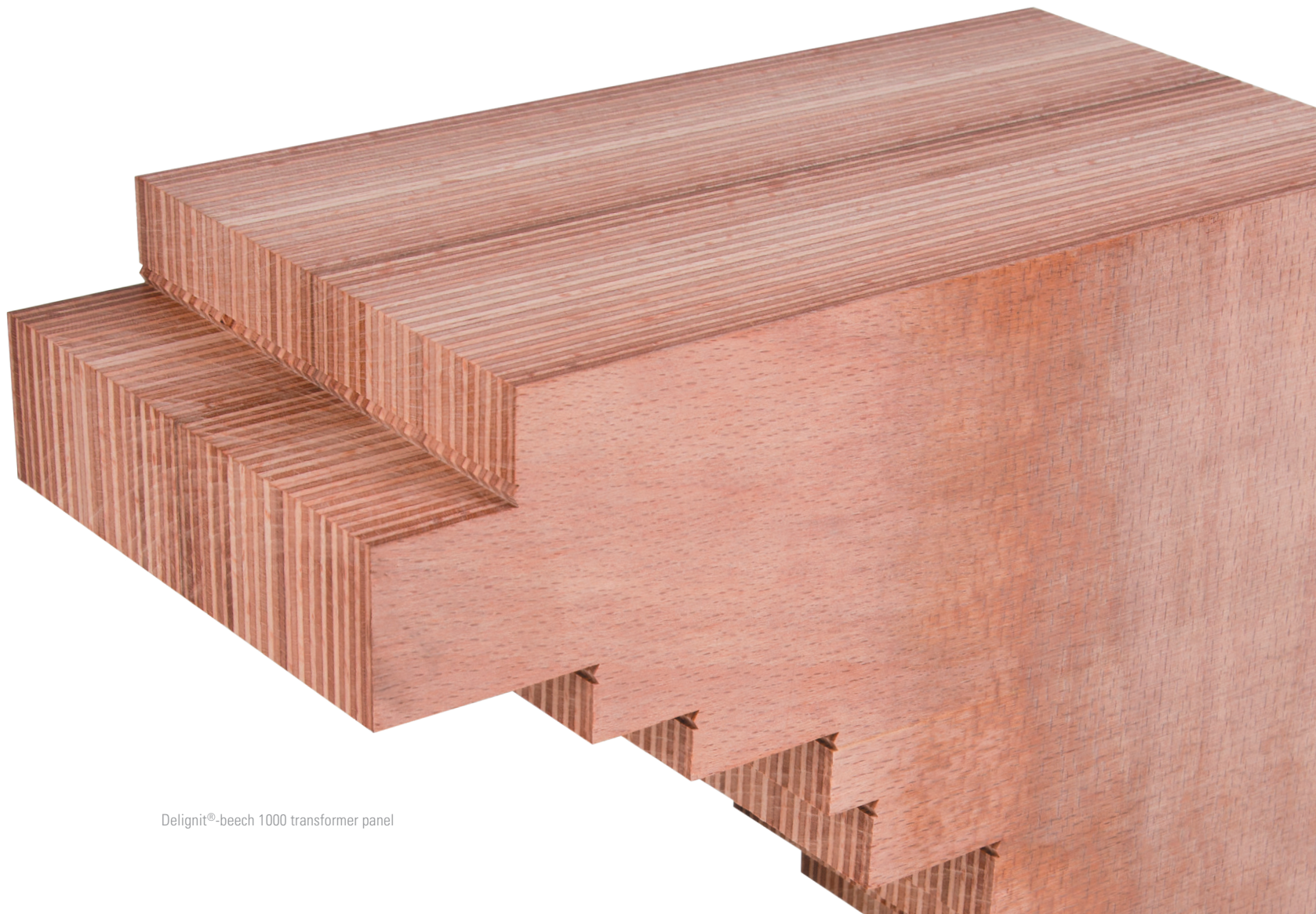
B12-09: density ca. 900 kg/m<sup>3</sup>

- ▶ 2130 x 1000 mm Layer thickness: 4, 5, 6, 8, 10, 12, 15, 20, 25, 30, 35, 40, 50, 60 mm
- ▶ 1750 x 1750 mm Layer thickness: 10, 15, 20, 25, 30, 35, 40 mm
- ▶ 2550 x 1400 mm Layer thickness: 4, 5, 6, 8, 10, 12, 15, 20, 25, 30, 35, 40, 45, 50, 60 mm

B12-12: density ca. 1200 kg/m<sup>3</sup>

- ▶ 2130 x 1000 mm Layer thickness: 5, 8, 10, 12, 15, 20, 25, 30, 35 mm





Delignit®-beech 1000 transformer panel

## SPECIFIC PROPERTIES OF DELIGNIT®-SYNTHETIC RESIN COMPRESSED WOOD

We are committed to **QUALITY DOWN TO THE LAST DETAIL.**

### TIMBER

Beech veneer, renewable material sourced from responsibly managed local forests, no use of illegally harvested timber, conforming to EUTR (EU Timber Regulation), PEFC certification of products: at least 70% of wood from PEFC-certified forests, Brinell hardness HB3 34 N/mm, offering strength, hardness and wear resistance properties that are significantly better than those of other timber products.

### FINISH

The pressed blank surface finish of **Delignit®** synthetic resin compressed wood is not suitable for decorative purposes.

### STRUCTURE

Veneer structure, laminated wood  
Class A: grain parallel  
Class B: grain parallel and perpendicular

### INSIDE LAYERS

Beech veneers, large knots and cracks removed prior to gluing

### TOLERANCES

Not sanded: 1.0 mm to 30 mm +/- 20% of nominal thickness;  
from 30 mm: +/- 10% of nominal thickness  
Sanded: -0 / +0.6 mm  
Sanding through veneer layers permissible

### FREE OF SILICONE

We have taken precautions to ensure that our **Delignit®** wood products do not come into contact with silicone, and thus do not emit silicone.

### QUALITY CONTROL

Quality assurance and control, tolerances and technical data in accordance with EN 13986. Formaldehyde emission class E1 (conforming to German Chemicals Ordinance). Ambient conditions might affect the dimensions of synthetic resin compressed wood.

Low-emission synthetic resin compressed wood: for this test according to EN 13986, the permissible limit measured according to EN 717-2 is 3.5 mg/m<sup>2</sup>\*h.

As we use extra low-emission resin, our products have emission values of around 0.1 mg/m<sup>2</sup>\*h, which corresponds to less than 3% of the permissible emission limit.

# DELIGNIT®-SERVICES

## YOUR ONE-STOP SERVICE PROVIDER

### PRE-SALES-SERVICE

- ▶ Product advice on site / by phone
- ▶ Provision of samples and product presentation on site
- ▶ References
- ▶ Written performance declarations
- ▶ Homepage
- ▶ Layout production
- ▶ Product development

### AFTER-SALES-SERVICE

- ▶ Complete product documentation
- ▶ Certificates  
(with reference to original certificate upon ordering)

### LIEFER-SERVICE

- ▶ Threaded sockets
- ▶ Screws

### CERTIFICATES / APPROVALS

- ▶ Quality management: ISO 9001
- ▶ Sustainability: PEFC, etc.
- ▶ Energy management: ISO 50001
- ▶ EUTR (EU Timber regulation)
- ▶ Bonding certification: DIN 6701, class A2
- ▶ Environmental management: ISO 14001





## VALUED SYSTEM SUPPLIER – THE DELIGNIT® COMPLETE PACKAGE

**LEADING SUPPLIER** of technical products and system solutions based on Delignit®, an environmentally friendly material.

As an established manufacturer of wood-based materials, we act as a system supplier for durable floors and other construction solutions for harsh industrial environments. We cover the entire spectrum from development and application technology to material production, finishing and system component assembly, through to logistics and after-sales. In the development of new solutions, we work closely with our customers.

Thanks to our manufacturing know-how and expertise in material, application and system technology, we are able to offer products that combine various properties and parameters. Our customers thus have the option to obtain tailor-made solutions from a single supplier.

Our quality management system is certified according to DIN EN ISO 9001. As part of our

quality management, we constantly assess the quality of our products with a view to continuous improvement. This approach enables us to achieve the best possible solution for any application and the highest level of customer satisfaction.



## THE GUIDING PRINCIPLE BEHIND DELIGNIT®

**SINCE 1893. MADE IN GERMANY.** Leader in beech plywood technology.

- ▶ **Delignit®** has its origins in beech hardwood veneer and comes in panels.
- ▶ **Delignit®** is an environmentally friendly construction material for custom-engineered system solutions.
- ▶ **Delignit®** is available for just-in-time delivery in fully finished and assembled units.
- ▶ We develop and produce **Delignit®**.



Blomberger Holzindustrie premises at the time of its first expansion; left: office and factory buildings dating from 1907; right: villa built in 1902

## BY USING WOOD, WE PROTECT THE FUTURE OF OUR PLANET - THINK NATURE - THINK DELIGNIT®

Wood is a unique renewable material and energy resource. In contrast to other materials, it is CO<sub>2</sub>-neutral over its life cycle. When disposed through incineration, the same amount of carbon dioxide is released as the tree absorbed over its lifetime.

First and foremost however, wood is an important carbon sink. By turning beech lumber into **Delignit®**

plywood, CO<sub>2</sub> is eliminated from the atmosphere and stored in the material: one cubic metre of **Delignit®** plywood contains approx. 350 kg of carbon dioxide. This corresponds to a CO<sub>2</sub> equivalent of around 1.3 tons. The locally sourced beech lumber from which **Delignit®** is made is among the toughest and most durable timbers available.

It weighs just 1/10 of structural steel, but offers 1/3 of its strength. The beech round lumber used in the production of **Delignit®** is sourced from local, responsibly managed forests. These are forests in which much more wood grows than is harvested within a given period of time.





We produce according to German, European and international standards and certification systems. Our customers therefore know that they can at all times rely on the product quality and operational safety of Delignit<sup>®</sup>, as the material meets the highest standards.

**BLOMBERGER HOLZINDUSTRIE GMBH**

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