

Delignit[®]
naturally superior



DELIGNIT[®] - RAILFLOOR

VERSATILE SYSTEM FLOOR SOLUTIONS FOR RAIL VEHICLES

BRIEF PORTRAIT OF BLOMBERGER HOLZINDUSTRIE GMBH

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

Blomberger Holzindustrie GmbH develops, produces and sells ecological materials and system solutions from renewable raw materials under the brand name **Delignit®**. As a recognized development, project and serial supplier of leading automotive groups, Blomberger Holzindustrie GmbH is, among other things, world market leader for supplying the automotive industry with cargo bay protection and cargo securing systems for light commercial vehicles.

With an industry-wide variety of applications and manufacturing range, Blomberger Holzindustrie GmbH serves numerous other technology sectors, for example: as a worldwide system supplier of reputable rail stock manufacturers. Delignit® solutions have exceptional technical properties and are further, among other things, used as trunk floors, building equipment and security solutions.



Aerial photograph Blomberger Holzindustrie GmbH

TRADITION. ECOLOGY. SYSTEM COMPETENCE.



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DELIGNIT®-RAILFLOOR

THE RAILWAY VEHICLE INDUSTRY places high demands on floors e.g. fire protection, noise protection and low weight. **Delignit®-Railfloor** products are designed modularly and provide the optimal combination of the required material properties.

Especially high demands are made of construction and materials used in public transport, especially in rail vehicles. With growing population densities and rising environmental awareness, the proportion of track sections in tunnels and tubes is constantly increasing. To ensure a sufficiently large time frame for rescuing injured people in the event of a fire, the use of low-flammable and low-emission materials when constructing rail vehicles is of the utmost importance. **Delignit®-Railfloor** system solutions perfectly combine fire and emission protection with properties such as sound and thermal insulation and vibration reduction.

Delignit®-Railfloor products meet the highest fire protection requirements, such as HL3 according to EN TS 45545-2:2013 (Europe).



Delignit®-Railfloor installed in a city train



CNC-machined floor panel for driver's cab

PRODUCT LINES – PERFECT FOR PROFESSIONAL USE

DELIGNIT®-RAILFLOOR IS AVAILABLE IN THREE PRODUCT LINES

with features which well-known rail vehicle manufacturers rely on.

THE PROFESSIONAL PACKAGE

The **Delignit®-Railfloor** Professional line combines the highest fire protection requirements with weight-optimised inlays. In addition to the standard products, this variant is characterised by increased vibration protection and a lower heat transfer coefficient. We are happy to arrange the right specification and processing already during the design phase. Also with heating elements on request. Together with our customers, we find the optimal variant and offer cost-efficient optimised solutions. We are supported here by complete control of the production chain - from the beech log to the finished wooden composite board. We also provide all variants with special technical solutions such as heating elements. Please contact us.

THE CLASSIC & PREMIUM PACKAGES

The **Delignit®-Railfloor** Classic and Premium lines are characterised by high efficiency and at the same time flexibility. According to the specifications of our customers, we coordinate the optimal fire project-oriented. This means that no resources are wasted. The same applies for sound insulation as well as for vibration protection and heat transmission. Thanks to our modular system and the use of different materials, our customers can achieve optimum efficiency in their desired specification.

DELIGNIT®-RAILFLOOR

- ✓ BEST IN CLASS
- ✓ FIRE PROTECTION
- ✓ SUSTAINABLE WOOD SOURCES
- ✓ HUMIDITY PROTECTION
- ✓ FUNGAL PROTECTION
- ✓ WEIGHT-OPTIMISED
- ✓ SOUND-OPTIMISED



THE MODULAR PRINCIPLE

THE **DELIGNIT®-RAILFLOOR-PROGRAM** provides a variety of ways to optimally adapt the product to customer requirements.

Delignit®-Railfloor

- ▶ Core made of Delignit® material
- ▶ 750 kg/m³
- ▶ The economical and ecological basis

Delignit®-Railfloor Plus

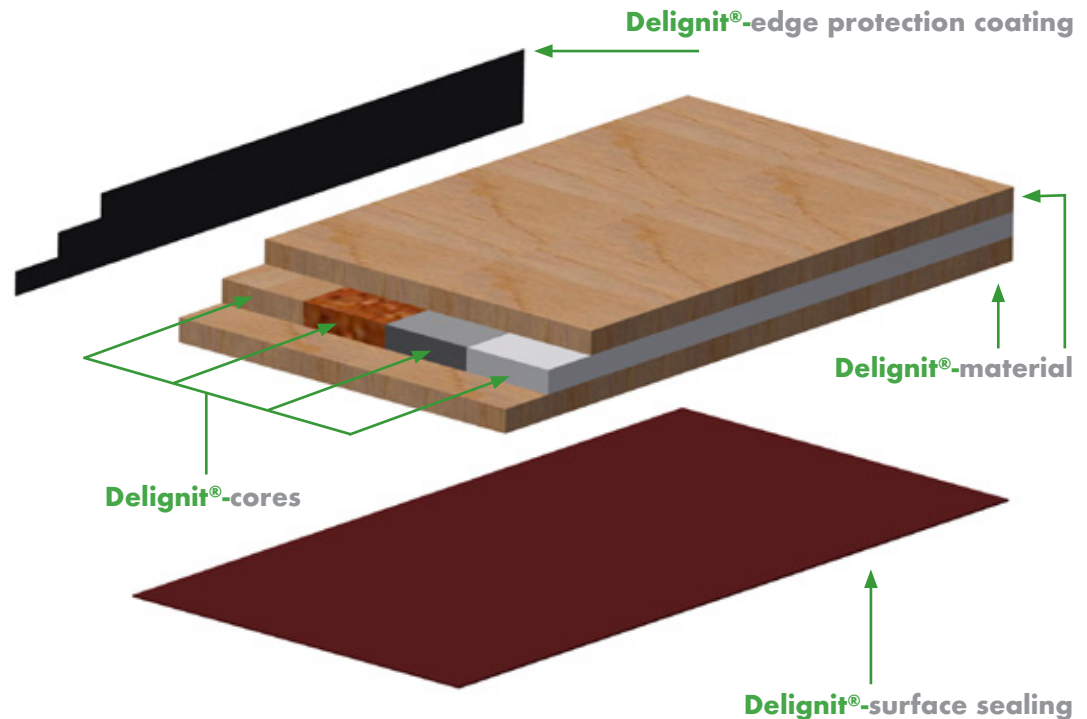
- ▶ Core made of cork-rubber granulate
- ▶ 650 kg/m³
- ▶ Improved sound and vibration insulation with lower weight

Delignit®-Railfloor Silent

- ▶ Core made of heavy foil
- ▶ 2000 kg/m³
- ▶ The optimal solution for increased requirements for sound and vibration damping

Delignit®-Railfloor Light

- ▶ Core made of PET foam
- ▶ 80 kg/m³
- ▶ The optimal solution for increased requirements for weight optimisation in the vehicle



DELIGNIT®-WATERPROTECT

THE OPTIMAL PROTECTION for the subsequent processing of the Delignit® material

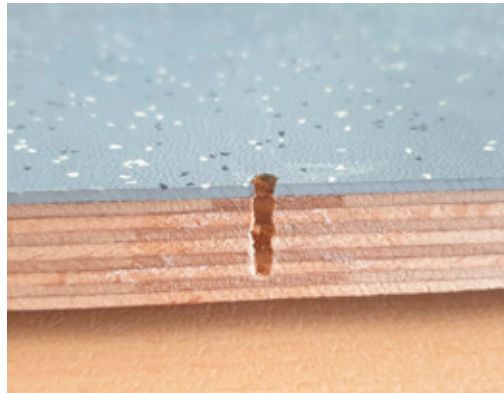
Moisture is a challenge for products made from wood-based raw materials. poses a challenge. If moisture penetrates the the wood, it begins to swell, which in turn leads to further which leads to further moisture penetration points. As delivered, **Delignit®-Railfloor** is

is optimally protected against moisture: Film coatings and edge coatings and edge protection varnish penetration of moisture into the wood material. For subsequent drilling and/or machining, Blomberger Holzindustrie GmbH now offers **Delignit®-Waterprotect**.

This extremely low-viscosity not only protects the surface of a material surface of a material, but also penetrates the capillaries of the wood and and impregnates them sustainably.



Protection of a borehole with Delignit® WaterProtect



Impregnated borehole after water ingress



Non-impregnated borehole after water ingress

SPECIFIC PROPERTIES AND FEATURES

QUALITY RIGHT UP TO THE DETAILS is a matter of course for us.

SUPPORT PLATE

For special safety requirements for passenger transport: the special properties of the beech wood (*Fagus sylvatica*) enable the **Delignit®** material to be used in technologically demanding applications. The high degree of hardness of the beechwood, combined with the readiness to absorb chemical constituents via aqueous solutions, enable the natural wood material to be refined. This makes **Delignit®** ideal for applications where static load-bearing capacity in conjunction with fire protection plays a decisive role. These features, combined with other materials, make **Delignit®** materials an ideal, flexible and efficient solution for rail vehicle construction.

SURFACE LAYERS

Beech veneer or birch veneer, quality II/III according to EN 635-2 (other qualities on request), both sides sharpened, directly resined or filmed.

GLUING

EN 314-2 (class 2 for indoor and protected outdoor application as a supporting component in the wet area), optically dark glue joints.

MOISTURE CONTENT

The moisture content of the **Delignit®-Railfloor** products is 6-8%.

DIMENSIONS

Standard dimensions 1250/1500/1550 x 2500/2550 mm; the fibre direction of the face veneers toward the first-mentioned dimension can be rotated. Large format boards of up to 3100 mm on request.

TOLERANCES

Thickness according to EN 315, length and width according to DIN ISO 2768-m Machining tolerances: in accordance with DIN ISO 2768-1 m (medium), deviating from the standard minimum tolerance of +/- 0.3 mm.

QUALITY ASSURANCE

Quality monitoring, quality, tolerances and technical data in accordance with EN 13986:2015. Formaldehyde emission class E1 (complies with the regulations of the Chemicals Ordinance). The dimensions of beech multiplex can change under climate influences.

SILICON-FREE

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

OVERVIEW OF DELIGNIT®-RAILFLOOR RANGE

DELIGNIT®-RAILFLOOR-Products always provide the optimal solution - both technically and tailored to the investment volume.

Product name	Density (kg/m ³)	Fire & smoke certification. DIN EN 45545-2	Sound insulation (ISO 140)	Modulus of elasticity [N/mm ²]		Bending strength [N/mm ²]		Heat conductivity $\lambda = W / (mK)$
				lengthwise	crosswise	lengthwise	crosswise	
Railfloor Classic	750	HL 1	30	9.100	5.900	89	66	0,102
Railfloor Classic Plus	730	HL 1	32	6.500	3.800	72	43	0,109
Railfloor Classic Silent	960	HL 1	34	7.000	3.800	65	45	0,089
Railfloor Classic Light	480	HL 1	30	4.500	3.000	50	35	0,272
Railfloor Premium	750	HL 2	30	9.100	5.900	89	66	0,102
Railfloor Premium Plus	730	HL 2	32	6.500	3.800	72	43	0,109
Railfloor Premium Silent	960	HL 2	34	7.000	3.800	65	45	0,089
Railfloor Premium Light	480	HL 2	30	4.500	3.000	50	35	0,272
Railfloor Professional	820	HL 3	31	9.100	5.900	89	66	0,091
Railfloor Professional Plus	790	HL 3	33	6.500	3.800	72	43	0,101
Railfloor Professional Silent	1020	HL 3	35	7.000	3.800	65	45	0,080
Railfloor Professional Light	520	HL 3	30	4.500	3.000	50	35	0,267

Example values for a panel thickness of 18 mm

USEFUL FACTS ABOUT FIRE PROTECTION

DELIGNIT®-RAILFLOOR-Products ensure fire protection in all classes.

TESTS ACCORDING TO DIN EN 45545

The European standard EN 45545 is divided into 7 parts.

PART 1 (EN 45545-1) contains the basic definitions and the general rules on how railway vehicles are classified by types of operation and design, as well as fire protection objectives.

OPERATING CLASS

OPERATING CLASS 1: Vehicles that, by design, are not suitable for underground sections (tunnels) or elevations.

OPERATING CLASS 2: Vehicles that, by design, are suitable for underground sections (tunnels) or elevations; the emergency stations or railway stations must be reachable within a short driving time.

OPERATING CLASS 3: Vehicles that, by design, are suitable for underground sections (tunnels) or elevations; the emergency stations or railway stations must be reachable within a long driving time.

OPERATING CLASS 4: Vehicles that, by design, are suitable for underground sections (tunnels) or elevations; no evacuation possibility.

VEHICLE CONSTRUCTION CLASS

PART 2 (EN 45545-2) describes and classifies the requirements for the fire behaviour of materials and components.

Rail vehicles are also divided into construction classes in addition to the operating classes:

- ▶ Vehicles for part of automatic driving and which have no emergency personnel on board (abbreviation „A“)
- ▶ Double decker vehicles (abb. „D“)
- ▶ Sleeper cars (abb. „S“)
- ▶ Standard vehicles (abb. „N“) for all other vehicles
- ▶ Freight wagons are excluded from the standard.

Operating class	Vehicle construction class			
	A	D	S	N
1	HL1	HL1	HL2	HL1
2	HL2	HL2	HL2	HL2
3	HL2	HL2	HL3	HL2
4	HL3	HL3	HL3	HL3

THE DELIGNIT®- SERVICE PACKAGE

YOUR ONE-STOP-SERVICE PROVIDER

PRE-SALES

- ▶ Application-related advice
- ▶ Product development
(incl. special superstructures, surfaces)
- ▶ Preparation of product documentation
(incl. certification)
- ▶ Project management (incl. CAD, layout, statics)
- ▶ Provision of prototypes and samples
- ▶ Offer service

DELIVERY-SERVICE

- ▶ Production and delivery Just in time
- ▶ Provision of project documentation
(incl. certificates)
- ▶ Painting
- ▶ Pre-assembly of accessories such as Vibration elements, thread inserts etc.

AFTER-SALES-SERVICE

- ▶ Spare parts supply
- ▶ Support for refurbishment measures

CERTIFICATIONS / APPROVALS

- ▶ Quality management: ISO 9001:2015
- ▶ Sustainability: incl. PEFC
- ▶ Energy management: ISO 50001
- ▶ EUTR (EU Timber regulation)
- ▶ Product certification: incl. fire protection, sound insulation
- ▶ Bonding certification: DIN 6701, Klasse A2
- ▶ Environmental management: ISO 14001
- ▶ Welding certification EN 15085-2



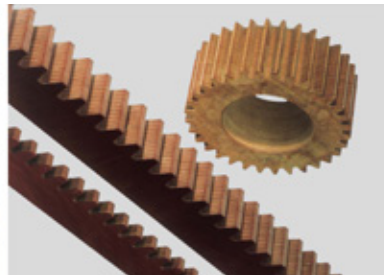
VALUED SYSTEM SUPPLIER – THE DELIGNIT®- COMPLETE PACKAGE

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

Starting from our origins as a manufacturer of wood-based materials today we are a valued system supplier for robust and durable furnishings with a focus on floor with a focus on flooring solutions and other equipment. We cover the entire spectrum from development and application technology to material production and finishing as well as the assembly of system components through to logistics and after sales. For the future, too, we will the joint develop-

ment of innovative application innovative application solutions with our customers. By contributing our manufacturer know-how in terms of material materials, application and system expertise, all the individual all individual parameters can be freely combined and can be directly influenced. This gives our customers the customers the opportunity to obtain a wide range of from a single source. Our quality management system is certified according to certified according to

DIN EN ISO 9001. Within the framework of our quality management, we strive to monitor the quality and quality of our products and to improve them and to improve them permanently. This with the objective of to achieve the best possible solution and thus the highest customer satisfaction.



DER DELIGNIT® GUIDING PRINCIPLE

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 customengineered 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 CO₂-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, CO₂ 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 CO₂ 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 struc-

tural 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.

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We always produce in accordance with German, European and international standards and approvals. In this way, we give our customers the guarantee of product and operational safety of Delignit[®] at the highest quality level.

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