

## PRODUCT DATA SHEET

### Delignit®-Panzerholz® Protect

A DIN 7707-compliant hardened panel material made of a combination of synthetic resin and hardwood with a hardened structure.

Areas of use: **Delignit®-Panzerholz® Protect**

Bullet resistance, break-in resistance, explosive effect resistance for walls and ceiling coverings.



















#### Technical data (mean values)

Delignit® Panzerholz® Type Type designation in accordance with DIN 7707		B15 KP 20226	B25 KP 20226	Delignit® Panzerholz® Type Type designation in accordance with DIN 7707		B15 KP 20226	B25 KP 20226
<b>Gross density g/cm<sup>3</sup></b> DIN 53 479		1,35 – 1,40	1,35 – 1,40	<b>Gap load N</b> DIN 53 463	⊥ layer    layers	3.000	3.000
<b>Flexural strength N/mm<sup>2</sup></b> DIN 53 452	layers	165	165	<b>Shear strength N/mm<sup>2</sup></b>	layers	10	15
	⊥ layer	180	180		⊥ layer	60	70
<b>Impact resistance kJ/m<sup>2</sup></b> DIN 53 453	layers	25	25	<b>Elasticity module N/mm<sup>2</sup></b> DIN 53 457 - bending GIN 53 457 - pressure	⊥ layer	17.000	17.000
	⊥ layer	50	50		⊥ layer	2.600	2.600
<b>Notch impact resistance kJ/m<sup>2+</sup></b> DIN 53 453	layers	20	20		layers	6.000	6.000
	⊥ layer	50	50	<b>Sliding friction coefficient·μG</b> Against blank stainless steel plate II and against E 200 belt tensioner	⊥ layer    layers	0,2 – 0,3 0,14	0,2 – 0,3 0,14
<b>Tensile strength N/mm<sup>2</sup></b> DIN 53 455	layer	125	130	<b>Water uptake in %<sup>3</sup></b> after 24h storage in water (specimen: 50 x 50 x 30 mm) DIN 53 495		3,5	3,5
<b>Compressive strength N/mm<sup>2</sup></b> DIN 53 454	layers	135	145	<b>Heat coefficient W/mk</b> (for temperatures from -20 to +40°C) <sup>5</sup>		0,29 – 0,32	0,29 – 0,32
	⊥ layer	270	290	<b>Dimensions (mm)</b> (other sizes up to 5,900 x 530 mm on request)		2.550 x 1.400 2.130 x 1.000 1.750 x 1.750	2.500 x 1.300 2.130 x 1.000
<b>Bullet indentation hardness N/mm<sup>2</sup></b> DIN EN ISO 2039-1	⊥ layer	230	230				

- Caution:** For more demanding requirements please see our Delignit<sup>®</sup>-Protect 2.0 compound material for higher bullet resistance classes.
- Processing:** Panzerholz<sup>®</sup> contains no metal inserts and can therefore be processed with normal carpentry machines (carbide cutting edges). Panzerholz<sup>®</sup> is threaded (3-4x thread diameter). The screw pull-out resistance is 10 times that of pinewood and three times that of oak.
- Explosion resistance:** As from 35 mm sheet thickness for a DM51 hand grenade with an amplified explosive charge (5 cm distance)
- Product design**
- B15:** 1.8 mm thick beech veneers are compressed under high pressure to approx. 0.9 mm.  
**B25:** 1.0 mm thick beech veneers are compressed under high pressure to approx. 0.5 mm.  
 Due to the finely layered structure the share of artificial resin and the sheet become more homogeneous.
- Thickness:** 4 – 100 mm and thicker sheets glued together from partial thicknesses
- Tolerances:** + / - 1 mm in Length and Width      - 0 / + 0,6 mm in thickness
- Surfaces:** Irregular dark colouring without optical demands.
- Quality assurance:** Quality and technical data in accordance with DIN 7707. Formaldehyde emissions class E05 (corresponds to the regulations of the Chemicals Ordinance).
- Delays:** Freedom from distortion is not an assured feature. For more demanding freedom of distortion requirements, thicker sheets can be made from partial thicknesses to minimise possible warping.
- Storage:** Under certain conditions, our beech-based Delignit<sup>®</sup> special materials can react to climatic influences such changes in humidity and temperature with changes in shape (swelling up, shrinking and distortion). Specifically, it is not to be expected that our materials are free of distortion and we therefore cannot guarantee this. We must therefore expressly exclude any complaint on the basis of distortion. Please observe our processing and handling instructions for our products at [www-delignit.com](http://www-delignit.com)

<sup>1)</sup> The longitudinal axis of the test specimen runs parallel to the main grain direction.  
<sup>2)</sup> The longitudinal axis of the test specimen runs at right angles to the main grain direction.  
<sup>3)</sup> Thicker test specimens can result in lower, thinner samples and larger percentual water absorption.  
 Delignit<sup>®</sup> Panzerholz<sup>®</sup> can swell up as a result of damp.  
<sup>4)</sup> Values deviating from DIN 7707 for gross density, bullet indentation hardness and the E-module.  
<sup>5)</sup> Thermal conductivity for temperature range -50 to -196°C on enquiry. Solidity and E-module grow at temperatures below zero.  
<sup>5)</sup> Wärmeleitfähigkeit für Temperaturbereich -50 bis -196°C auf Anfrage. Bei Minus Temperaturen steigen Festigkeit und E-Modul an.

Classes	Weapon type and bullet	Calibre // munition bullet type		
---------	------------------------	---------------------------------	--	--

KP 2006 KP 2007 KP 2206	EN 1063 DIN 1522 / 1523 BRV 1999			Bullet speed [m/s] // energy [joules]	Delignit® Panzerholz® thickness
1	1		.22 Ir // Lead	360 // 169	15
2	-		9 mm Luger // DM41	360 // 518	-
3	2		9 mm Luger // DM41	415 // 689	30
4	3		.357 Mag. // Full metal jacket, cone tip, lead	430 // 943	35
	4		.44 Rem. Mag. // Full metal jacket, cone tip, lead	440 // 1510	45 / 22 + 22 25 + 20
5	-		.357 Mag. // Solid brass	580 // 1194	-
6	-		7,62 x 39 // Full metal jacket, pointed tip, ferrous core	720 // 2074	45 + 45
7	5		.223 Rem. 5,56 x 45 // Penetrator SS 109	950 // 1805	60
	6		.308 Win. 7,62 x 51 // Full metal jacket, pointed tip, lead	830 // 3289	30 + 35 + 30
8	-		7,62 x 39 // Full metal jacket, pointed tip HK, Brand (BZ)	740 // 2108	57 + 57
9	7		.308 Win. 7,62 x 51 // Full metal jacket, pointed tip, HK, (P 80)	820 // 3177	70 + 70
10	-		7,62 x 54R // Full metal jacket, pointed tip HK, Brand (32)	860 // 3846	-
11	-		.308 Win. // Full metal jacket, pointed tip, Nammo AP 8	930 // 3633	-
12	-		.308 Win. // Swiss P AP	810 // 4166	-
13	-		.50 Browning // Swiss P, Penetrator	930 // 18595	-
14	-		14,5 x 114 // Full metal jacket, pointed tip, HK, Brand (32)	911 // 26308	-

xx + xx airgap between panels ≥ 10 mm

FMJ Steel full metal jacket C.I.P. Permanent International Commission for the

**BLOMBERGER HOLZINDUSTRIE GMBH**

32817 Blomberg – Deutschland – Postfach 11 53 – Tel.: +49 (0) 5235 / 966-0 – Fax: +49 (0) 5235 / 966-351

w w w . d e l i g n i t . c o m

FMJ*)	Copper full metal jacket	TDCC	Proof of Small Arms
CB	Conical tip	DAG	C.I.P. dimension sheets
RN	Round tip	Geco	RUAG Ammotec, Germany
PB	Pointed tip	MEN	RUAG Ammotec, Germany
FN	Flat tip	Nammo	Metallwerk Elisenhütte Nassau, Germany
L	100% lead	FNB	Nammo AS, Norway
SC	Soft lead core	Speer	FN Herstal, Belgium
FeC	Iron core	1)	Federal Cartridge Company, USA
			Both calibres are to be used
			In these stages
SCP	Soft lead core with steel penetrator	2)	Twist length 178 mm ± 5%
HC	Hard steel core	3)	Twist length 254 mm ± 5%
WC	Wolfram carbide	4)	Twist length freely selectable
FMs	100% brass	5)	Test run with a 7.5 mm crossover
I	Incendiary	6)	Freely selectable shot distance Suitable Hits are to be assured with regard to speed, oscillation and point of impact
		K	Handgun
		L	Rifles/shotguns