

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
Gross density g/cm³ DIN 53 479		1,35 – 1,40	1,35 – 1,40	Gap load N DIN 53 463	⊥ layer layers	3.000	3.000
Flexural strength N/mm² DIN 53 452	layers	165	165	Shear strength N/mm²	layers	10	15
	⊥ layer	180	180		⊥ layer	60	70
Impact resistance kJ/m² DIN 53 453	layers	25	25	Elasticity module N/mm² DIN 53 457 - bending GIN 53 457 - pressure	⊥ layer	17.000	17.000
	⊥ layer	50	50		⊥ layer	2.600	2.600
Notch impact resistance kJ/m²⁺ DIN 53 453	layers	20	20		layers	6.000	6.000
	⊥ layer	50	50	Sliding friction coefficient · μG 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
Tensile strength N/mm² DIN 53 455	layer	125	130	Water uptake in %³ after 24h storage in water (specimen: 50 x 50 x 30 mm) DIN 53 495		3,5	3,5
Compressive strength N/mm² DIN 53 454	layers	135	145	Heat coefficient W/mk (for temperatures from -20 to +40°C) ⁵		0,29 – 0,32	0,29 – 0,32
	⊥ layer	270	290	Dimensions (mm) (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
Bullet indentation hardness N/mm² DIN EN ISO 2039-1	⊥ layer	230	230				

- Caution:** For more demanding requirements please see our Delignit[®]-Protect 2.0 compound material for higher bullet resistance classes.
- Processing:** Panzerholz[®] contains no metal inserts and can therefore be processed with normal carpentry machines (carbide cutting edges). Panzerholz[®] 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:** Format tolerances (Length, width) in accordance with DIN EN 2768-1 c,
Thickness tolerance: in accordance with EN 315 but at least +/- 0.5 mm
- 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[®] 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

¹⁾ The longitudinal axis of the test specimen runs parallel to the main grain direction.

















²⁾ The longitudinal axis of the test specimen runs at right angles to the main grain direction.

³⁾ Thicker test specimens can result in lower, thinner samples and larger percentual water absorption.
Delignit[®] Panzerholz[®] can swell up as a result of damp.

⁴⁾ Values deviating from DIN 7707 for gross density, bullet indentation hardness and the E-module.

⁵⁾ Thermal conductivity for temperature range -50 to -196°C on enquiry. Solidity and E-module grow at temperatures below zero.

⁵⁾ 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	Bullet speed [m/s] // energy [joules]	Delignit® Panzerholz® thickness
KP 2006 KP 2007 KP 2206	EN 1063 DIN 1522 / 1523 BRV 1999				
1	1		.22 lr // 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

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FMJ	Steel full metal jacket	C.I.P.	Permanent International Commission for the Proof of Small Arms
FMJ*)	Copper full metal jacket	TDCC	C.I.P. dimension sheets
CB	Conical tip	DAG	RUAG Ammotec, Germany
RN	Round tip	Geco	RUAG Ammotec, Germany
PB	Pointed tip	MEN	Metallwerk Elisenhütte Nassau, Germany
FN	Flat tip	Nammo	Nammo AS, Norway
L	100% lead	FNB	FN Herstal, Belgium
SC	Soft lead core	Speer	Federal Cartridge Company, USA
FeC	Iron core	1)	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