

MATERIAL PROPERTIES DATA SHEET



THIN | SILVERLAM POSTFORMING

High pressure decorative laminates (HPL), less than 2 mm thick, according to EN 438-3:2005, consisting of a surface of decorative paper(s) impregnated with aminoplastic resins and a core made of layers of kraft paper impregnated with phenolic thermosetting resins. All the layers are bonded together with simultaneous application of heat (approximately 150°C) and high specific pressure (> 7 MPa) to obtain a homogeneous non-porous material with increased density.

These laminates include the special characteristic of formability and are normally intended for bonding to supporting substrates, normally wood based, to produce panels by the composite manufacturers. Silverlam Postforming is the innovative Arpa HPL able to inhibit the growth of bacteria across its whole surface. It is microbiologically tested and boasts an antibacterial protection system (Bacteria Blocker), even in case of bacteria such as MRSA (Methicillin-Resistant Staphylococcus Aureus) and E-Coli (Escherichia Coli) responsible for several difficult-to-treat infections. Laboratory testing has proven the prevention of bacterial growth.

Silverlam Postforming is physiologically safe and hygienic for food contact and environmentally friendly.

Decor	EN 438 classification	Plain colours	Printed decors
	Standard		
		EN 438-3	EN 438-3

PROPERTIES	TEST METHOD	PROPERTY OR ATTRIBUTE	UNIT	VALUES
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**SURFACE QUALITY**

Surface quality	EN 438-4	Spots, dirt and similar surface defects	mm <sup>2</sup> /m <sup>2</sup>	≤ 1
		Fibres, hairs and scratches	mm/m <sup>2</sup>	≤ 10

**DIMENSIONAL TOLERANCES**

Dimensional tolerances	EN 438-2.5	Thickness tolerance	mm	± 0.10 for thickness 0.5 ≤ t ≤ 1.0
			mm	± 0.15 for thickness 1.0 < t < 2.0
	EN 438-2.6	Length and width	mm	+ 10 / - 0
	EN 438-2.7	Straightness of edges	mm/m	≤ 1.5
	EN 438-2.8	Squareness	mm/m	≤ 1.5
	EN 438-2.9	Flatness (measured on full-size sheet)	mm/m	≤ 60

**GENERAL PROPERTIES**

Resistance to surface wear	EN 438-2.10	Initial Point Wear value	Revolutions Revolutions	≥ 150 ≥ 350	≥ 100 ≥ 200
Resistance to immersion in boiling water	EN 438-2.12	Appearance - Gloss Finish Appearance - Other finish	Rating Rating	≥ 3 ≥ 4	
Resistance to water vapour	EN 438-2.14	Appearance - Gloss Finish Appearance - Other finish	Rating Rating	≥ 3 ≥ 4	
Resistance to dry heat (180°C/20')	EN 438-2.16	Appearance - Gloss Finish Appearance - Other finish	Rating Rating	≥ 3 ≥ 4	
Resistance to wet heat (100°)	EN 12721:1997	Appearance - Gloss Finish Appearance - Other finish	Rating Rating	≥ 3 ≥ 4	
Dimensional stability at elevated temperatures	EN 438-2.17	Cumulative dimensional change Cumulative dimensional change	Longitudinal % Transversal %		≤ 0.55 ≤ 1.05
Resistance to impact with small diameter ball	EN 438-2.20	Spring force	N		≥ 20
Resistance to impact with large diameter ball	EN 438-2.21	Drop height Indentation diameter	mm mm		≥ 800 ≤ 10
Resistance to cracking under stress	EN 438-2.23	Appearance	Rating		≥ 4
Resistance to scratching	EN 438-2.25	Appearance	Rating		≥ 3
Resistance to staining	EN 438-2.26	Appearance - Group 1 & 2 Appearance - Group 3	Rating Rating		≥ 5 ≥ 4
Light fastness (Xenon-arc)	EN 438-2.27	Contrast	Grey scale rating		≥ 4
Resistance to cigarette burns	EN 438-2.30	Appearance	Rating		≥ 3
Formability	EN 438-2.32	Radius Radius	L (parallel to fibre direction) mm T (right angles to fibre direction) mm		≤ 10 x times nominal thickness ≤ 20 x times nominal thickness
Resistance to blistering	EN 438-2.34	Time to blister Time to blister	Seconds - nominal thickness < 0.8 mm Seconds - nominal thickness ≥ 0.8 mm		≥ 10 ≥ 15
Density	EN ISO 1183	Density	g/cm <sup>3</sup>		≥ 1.35

**FIRE PERFORMANCES**

Reaction to fire The Reaction to Fire of applied laminate is related to the final composite panel where the laminate is bonded to a substrate. The results may be different depending on the substrates, the glue and the bonding techniques applied. The Reaction to Fire testing of the composite panel is under the responsibility of the panel manufacturer.

**OTHER PROPERTIES**

Thermal resistance / conductivity	EN 12664	Thermal resistance / conductivity	W/mK	0.2 to 0.5
Hygiene	NSF	NSF/ANSI 35	passing/not passing	pass
Formaldehyde emission	EN 717-1	Chamber method	mg/m <sup>3</sup> ppm	0.020 - 0.035 0.015 - 0.030
	EN 717-2	Gas analysis	mg/(m <sup>2</sup> x h)	0.2 - 0.4
	EN 13986	Classification	Classification	E1
Volatile Organic Chemical Emissions	Greenguard Certification Low Chemical Emission UL 2818 according to EPA TO-17 e ASTM D 6196 EPA TO-11A e ASTM D 5197	Individual VOCs	TLV	≤ 0.1
		Formaldehyde	ppm	≤ 0.025
		Total VOC	mg/m <sup>3</sup>	≤ 0.25
		Total Aldehydes	ppm	≤ 0.05
Contact with food - Overall migration	EN 1186-3	3% acetic acid 24h at 40°C	mg/dm <sup>2</sup>	1,2
	EN 1186-3	50% ethanol 24h at 40°C		1,2
	EN 1186-14	95% ethanol 24h at 40°C		1,3
Contact with food - Formaldehyde specific migration	EN 1186-14	isooctane 24h at 40°C		< 1
	EN 13130-23	3% acetic acid 24h at 40°C	mg/kg	5,3
Evaluation of antimicrobial activity	JIS Z 2801	Antimicrobial activity after 24 hours at 35°C	bacterial viability Log reduction % reduction	> 3,6
				> 99,9

**Note to digital printing decoratives**  
For the chemical-physical characteristics of digital printing, the laminates with these decoratives may present a limitation in the applications, such as the repeated and intense contact with water or vapour. Customers are asked to contact the Customer Service Arpa Industriale to evaluate the best solution.

**Note to laminates with adhesive protective film**  
The protective films are designed for temporary surface protection against dirt, scratches and tool marks; they are not designed for protection against corrosion, humidity or chemicals. The laminates covered with the protective film shall be stored in a clean, dry place at room temperature (optimum 20°C), avoiding weathering and UV exposure. The protective film must be removed from the surface of the laminates after the application and before putting into use the finite element. In any case, the removal must be made within six months from the date of shipment by Arpa Industriale. Pay close attention to heating in case of postforming. The Customer has to test the postforming process conditions and carry a trial prior to go in a full scale production. Arpa Industriale cannot be responsible for the misuse of the laminates covered with the protective film, nor for the consequences for non-recommended applications.

**Disclaimer**  
The Product Technical Sheets provide all the technical information relevant to the performance of the product as tested by Arpa Industriale or certified testing agencies. Arpa Industriale maintains the right to change and alter the product composition and production process and thereby the performance characteristics of the product at all times, as reported to the Arpa Industriale website. Customers and end-users of the product are requested to check for the latest technical information regarding the products performance on the website of Arpa Industriale before application. In any case, Arpa Industriale, in every contractual relationship, will refer only to the technical information published on its website. Arpa Industriale will not assume any liability if the end-user or customer refer to any other technical information of the products.