

MATERIAL PROPERTIES DATA SHEET



SOLID | SILVERLAM

High pressure decorative laminates (HPL), having thickness 2 mm or greater, according to EN 438-4:2005, consisting of a surface of decorative paper(s), on one or both sides, 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.

When these laminates are self-supporting they are ready for installation. Silverlam Solid 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 Solid is physiologically safe and hygienic for food contact and environmentally friendly.

	Decor	Plain colours	Printed decors
	EN 438 classification	CGS/CGF	CGS/CGF
	Standard	EN 438-4	EN 438-4

PROPERTIES	TEST METHOD	PROPERTY OR ATTRIBUTE	UNIT	RESULTS
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SURFACE QUALITY

Surface quality	EN 438-2.4	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	± 0.20 for thickness 2.0 ≤ t < 3.0
			mm	± 0.30 for thickness 3.0 ≤ t < 5.0
			mm	± 0.40 for thickness 5.0 ≤ t < 8.0
			mm	± 0.50 for thickness 8.0 ≤ t < 12.0
			mm	± 0.60 for thickness 12.0 ≤ t < 16.0
			mm	± 0.70 for thickness 16.0 ≤ t < 20.0
	mm	± 0.80 for thickness 20.0 ≤ t < 25.0		
	mm	± 1.40 for thickness 25.0 ≤ t		
	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	≤ 8 for thickness 2.0 ≤ t < 6.0	
		mm/m	≤ 5 for thickness 6.0 ≤ t < 10.0	
		mm/m	≤ 3 for thickness 10.0 ≤ t ≤ 3	

GENERAL PROPERTIES

Resistance to surface wear	EN 438-2.10	Initial Point	Revolutions	≥ 150
		Wear value	Revolutions	≥ 350
Resistance to immersion in boiling water	EN 438-2.12	Mass increase - 2 ≤ t < 5 mm	%	CGS ≤ 5 - CGF ≤ 7
		Mass increase - 5 ≤ t 1 mm	%	CGS ≤ 2 - CGF ≤ 3
		Thickness increase - 2 ≤ t < 5 mm	%	CGS ≤ 6 - CGF ≤ 9
		Thickness increase - 5 ≤ t 1 mm	%	CGS ≤ 2 - CGF ≤ 6
		Appearance - Gloss Finish	Rating	≥ 3
		Appearance - Other finish	Rating	≥ 4
Resistance to water vapour	EN 438-2.14	Appearance - Gloss Finish	Rating	≥ 3
		Appearance - Other finish	Rating	≥ 4
Resistance to dry heat (180°C/20')	EN 438-2.16	Appearance - Gloss Finish	Rating	≥ 3
		Appearance - Other finish	Rating	≥ 4
Resistance to wet heat (100')	EN 12721:1997	Appearance - Gloss Finish	Rating	≥ 3
		Appearance - Other finish	Rating	≥ 4
Dimensional stability at elevated temperatures	EN 438-2.17	Cumulative dimensional change - 2 ≤ t < 5 mm	Longitudinal %	≤ 0.40
		Cumulative dimensional change - 5 ≤ t 1 mm	Longitudinal %	≤ 0.30
		Cumulative dimensional change - 2 ≤ t < 5 mm	Transversal %	≤ 0.80
		Cumulative dimensional change - 5 ≤ t 1 mm	Transversal %	≤ 0.60
Resistance to impact with large diameter ball	EN 438-2.21	Indentation diameter - 2 ≤ t < 6 mm with 1.4 m drop height	mm	≤ 10
		Indentation diameter - 6 ≤ t 1 mm with 1.8 m drop height	mm	≤ 10
Resistance to crazing	EN 438-2.24	Appearance	Rating	≥ 4
Resistance to scratching	EN 438-2.25	Appearance - Smooth Finishes	Rating	≥ 2
		Appearance - Textured Finishes	Rating	≥ 3
Resistance to staining	EN 438-2.26	Appearance - Group 1 & 2	Rating	≥ 5
		Appearance - Group 3	Rating	≥ 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
Flexural Modulus	EN ISO 178	Stress	Mpa	≥ 9000
Flexural strength	EN ISO 178	Stress	Mpa	≥ 80
Density	EN ISO 1183	Density	g/cm <sup>3</sup>	≥ 1.35

FIRE PERFORMANCES

Reaction to fire The reaction to fire of Solid Silverlam is related to the final application. The fire performance evaluation depends on the current rules and the adopted test method for the specified field of application. In case of interest, the reaction to fire of Solid Silverlam shall be asked by the customer to the producer.

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>	0.020 - 0.035
	EN 717- 2	Gas analysis	mg/(m <sup>3</sup> × h)	0.015 - 0.030
	EN 13986	Classification	Rating	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
		4-Phenylcyclohexene	mg/m <sup>3</sup>	≤ 0.0033
		Total respirable particles	mg/m <sup>3</sup>	≤ 0.025
Contact with food - Overall migration	EN 1186-3	3% acetic acid 24h at 40°C		1.2
	EN 1186-3	50% ethanol 24h at 40°C	mg/dm <sup>2</sup>	1.3
	EN 1186-14	95% ethanol 24h at 40°C		1.3
	EN 1186-14	isooctane 24h at 40°C		< 1
EN 13130-23	3% acetic acid 24h at 40°C	mg/ka	5.3	6.7
Evaluation of antimicrobial activity	JIS Z 2801	Antimicrobial activity after 24 hours at 35°C	bacterial viability Log reduction % reduction	> 3.6 > 99.0

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 and before putting into use the finite element. In case of thick laminate with the protective film on both sides, it must always be removed from both sides at the same time. In any case, the removal must be made within six months from the date of shipment by Arpa Industriale. Arpa Industriale cannot be responsible for the misuse of the laminates covered with the protective film, nor for the consequences for non-recommended applications.

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