PRODUCT TECHNICAL DATA SHEET

SOLID | **SOLID STANDARD**

High pressure decorative laminates (HPL), having thickness 2 mm or greater, according to EN 438-4:2005 or EN 438-8:2005, 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.
They are available in the standard CGS and ATS and in the flame retardant CGF and ATF types.

			Plain colours	Printed decors	Iridescent colours
	Decor				
	EN 438 classification		CGS/CGF	CGS/CGF	ACS/ATF
	Standard		EN 438-4	EN 438-4	EN 438-8

PROPERTIES	TEST METHOD	PROPERTY OR ATTRIBUTE	UNIT	VALUES		
SURFACE QUALITY						
Surface quality	EN 438-2.4	Spots, dirt and similar surface defects	mm^2/m^2	≤ 1		
		Fibres, hairs and scratches	mm/m^2	≤ 10		
DIMENSIONAL TOLERANCES						
Dimensional tolerances	EN 438-2.5	Thickness tolerance	mm	2,0 ≤ t < 3,0: ± 0,20		
			mm	3,0 ≤ t < 5,0: ± 0,30		
			mm	5,0 ≤ t < 8,0: ± 0,40		
			mm	8,0 ≤ t < 12,0: ± 0,50		
			mm	12,0 ≤ t < 16,0: ± 0,60		
			mm	16,0 ≤ t < 20,0: ± 0,70		
			mm	20,0 ≤ t < 25,0: ± 0,80		
			mm	25,0 ≤ t: ± 1,40		
	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	2,0 t < 6,0: ≤ 8		
			mm/m	6,0 ≤ t < 10,0: ≤ 5		
			mm/m	10,0 ≤ t: ≤ 3		
GENERAL PROPERTIES						
Resistance to surface wear	EN 438-2.10	Initial Point	Revolutions	≥ 150	≥ 100	N/A
		Wear value	Revolutions	≥ 350	≥ 200	N/A
Resistance to immersion in boiling water	EN 438-2.12	Mass increase - 2 ≤ t < 5 mm	%	CGS e ATS ≤ 5,0 - CGF e ATF ≤ 7,0		
		Mass increase - 5 ≤ t mm	%	CGS e ATS ≤ 2,0 - CGF e ATF ≤ 3,0		
		Thickness increase - 2 ≤ t < 5 mm	%	CGS e ATS ≤ 6,0 - CGF e ATF ≤ 9,0		
		Thickness increase - 5 ≤ t mm	%	CGS e ATS ≤ 2,0 - CGF e ATF ≤ 6,0		
		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		N/A
		Appearance - Other finish	Rating	≥ 4		N/A
Resistance to wet heat (100°)	EN 12721:1997	Appearance - Gloss Finish	Rating	≥ 3		N/A
		Appearance - Other finish	Rating	≥ 4		N/A
Dimensional stability at elevated temperatures	EN 438-2.17	Cumulative dimensional change - 2 ≤ t < 5 mm	Longitudinal %	≤ 0,40		
		Cumulative dimensional change - 5 ≤ t mm	Longitudinal %	≤ 0,30		
		Cumulative dimensional change - 2 ≤ t < 5 mm	Transversal %	≤ 0,80		
		Cumulative dimensional change - 5 ≤ t 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	h 1400 / d ≤ 10		h 800 / d ≤ 12
		Indentation diameter - 6 ≤ t mm with 1.8 m drop height	mm	h 1800 / d ≤ 10		h 800 / d ≤ 12
Resistance to crazing	EN 438-2.24	Appearance	Rating	≥ 4		
Resistance to scratching	EN 438-2.25	Appearance - Smooth Finishes	Rating	≥ 2		≥ 2
		Appearance - Textured Finishes	Rating	≥ 3		≥ 2
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		N/A
Flexural modulus	EN ISO 178	Stress	Mpa	≥ 9000		
Flexural strength	EN ISO 178	Stress	Mpa	≥ 80		
Density	EN ISO 1183	Density	g/cm^3	≥ 1,35		
FIRE PERFORMANCES						
Reaction to fire / CGS and ACS types	EN 13501	Classification - 2 mm ≤ t < 6 mm	Classification	D-s1,d0 (metal frame)		
		Classification - t ≥ 6 mm	Classification	C-s1,d0 (metal frame)		
		Classification - t ≥ 2,5 mm	Classification	D-s2,d0 (wood frame)		
Reaction to fire / CGF and ACF types	EN 13501	Classification - t ≥ 2,5 mm	Classification	B-s1,d0 (metal frame)		
		Classification - 3 mm ≤ t < 6 mm	Classification	C-s2,d0 (metal frame and wood frame)		
		Classification - t ≥ 6 mm	Classification	B-s1,d0 (metal frame and wood frame)		
OTHER PROPERTIES						
Thermal resistance / conductivity	EN 12664	Thermal resistance / conductivity	W/mK	0,2 to 0,5		
Formaldehyde emission	EN 717- 1	Chamber method	mg/m^3	0,020 - 0,035		
			ppm	0,015 - 0,030		
	EN 717- 2	Gas analysis	$mg/(m^2 \times h)$	0,2 - 0,4		
	EN 13986	Classification	Rating	E1		
Volatile Organic Chemical Emissions	GGPS.002 Greenguard Children & School Standard according to US California Dept. of Health Services (CA section 01350)	Individual VOCs	TLV / CA chronic REL	≤ 1/100 / ≤ 1/2		
		Formaldehyde	ppm / ppb	0,0135 / 13,5		
		TVOC	mg/m^3	≤ 0,22		
		Total Aldehydes	ppm / ppb	0,043 / 43		
		Total Phthalates	mg/m^3	≤ 0,01		
		Total Particles	mg/m^3	≤ 0,02		
Contact with food - Overall migration	EN 1186-3	3% acetic acid 24h at 40°C	mg/dm^2	< 10		
	EN 1186-3	50% ethanol 24h at 40°C		< 10		
	EN 1186-14	95% ethanol 24h at 40°C		< 10		
	EN 1186-14	isooctane 24h at 40°C		< 10		
Contact with food - Formaldehyde specific migration	EN 13130-23	3% acetic acid 24h at 40°C	mg/kg	< 15		
Evaluation of micro-organisms action	EN ISO 846	Microbial growth - Smooth finish	Rating	0 - no microbal growth		
		Microbial growth - Textured finish	Rating	1 - slight and slow microbal growth		

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 sol