

# STANDARD

High pressure decorative laminates (HPL), less than 2 mm thick, according to EN 438-3:2005 or EN 438-8:2005, 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 thin laminates are normally intended for bonding to supporting substrates, normally wood based, to produce panels by the composite manufacturers.

They are available in the standard HGS, ATS and VGS types and in the flame retardant HGF, ATF and VGF types.

	Decor		Plain colours	Printed decors	Iridescent colours	Vertical
	EN 438 classification		HGS - HGF	HGS - HGF	ATS - ATF	VGS - VGF
	Standard		EN 438-3	EN 438-3	EN 438-8	EN 438-3

PROPERTIES	TEST METHOD	PROPERTY OR ATTRIBUTE	UNIT	VALUES
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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	0,5 ≤ t ≤ 1,0: ± 0,10
			mm	1,0 < t < 2,0: ± 0,15
	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	≥ 150 ≥ 350	≥ 100 ≥ 200	N/A N/A	≥ 50 ≥ 150
Resistance to immersion in boiling water	EN 438-2.12	Appearance - Gloss finish Appearance - Other finish	Rating			≥ 3 ≥ 4	
Resistance to water vapour	EN 438-2.14	Appearance - Gloss finish Appearance - Other finish	Rating			≥ 3 ≥ 4	
Resistance to dry heat (180°C/20')	EN 438-2.16	Appearance - Gloss finish Appearance - Other finish	Rating	≥ 3 ≥ 4		N/A N/A	≥ 3 ≥ 4
Resistance to wet heat (100°)	EN 12721:1997	Appearance - Gloss finish Appearance - Other finish	Rating	≥ 3 ≥ 4		N/A N/A	≥ 3 ≥ 4
Dimensional stability at elevated temperatures	EN 438-2.17	Cumulative dimensional change	Longitudinal % Transversal %	≤ 0,55 ≤ 1,05			≤ 0,75 ≤ 1,25
Resistance to impact with small diameter ball	EN 438-2.20	Spring force	N	≥ 20			≥ 15
Resistance to impact with large diameter ball	EN 438-2.21	Drop height Indentation diameter	mm mm	≥ 800 ≤ 10		N/A	≥ 600 ≤ 10
Resistance to cracking under stress	EN 438-2.23	Appearance	Rating			≥ 4	
Resistance to scratching	EN 438-2.25	Appearance	Rating	≥ 3			≥ 2
Resistance to staining	EN 438-2.26	Appearance - Group 1 & 2 Appearance - Group 3	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		N/A	≥ 3
Density	EN ISO 1183	Density	g/cm <sup>3</sup>			≥ 1,35	

### FIRE PERFORMANCES

Reaction to fire	The Reaction to Fire of this product is related to the final composite panel where the laminate is bonded to a substrate. The results may be different depending on the substrates and bonding techniques applied. The Reaction to Fire testing of the composite panel is under the responsibility of the panel manufacturer.						
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### 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 <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	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 <sup>3</sup>	≤ 0,22
		Total Aldehydes	ppm / ppb	0,043 / 43
		Total Phthalates	mg/m <sup>3</sup>	≤ 0,01
		Total Particles	mg/m <sup>3</sup>	≤ 0,02
Contact with food - Overall migration	EN 1186-3 EN 1186-3 EN 1186-14 EN 1186-14	3% acetic acid 24h at 40°C 50% ethanol 24h at 40°C 95% ethanol 24h at 40°C isooctane 24h at 40°C	mg/dm <sup>2</sup>	< 10 < 10 < 10 < 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 microbial growth
		Microbial growth - Textured finish	Rating	1 - slight and slow microbial growth

#### Disclaimer

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