MATERIAL PROPERTIES DATA SHEET

THIN | **DIGITAL**

The Digital print decor range is available for the high pressure decorative laminates produced by Arpa Industriale according to EN 438-3:2016. They consist 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 manifacturers.

	Decor		**Digital Print**
	Standard		**EN 438-3**

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	± 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	Revolutions	≥ 100
Resistance to immersion in boiling water	EN 438-2.12	Appearance	Rating	≥ 1
Resistance to water vapour	EN 438-2.14	Appearance	Rating	≥ 1
Resistance to dry heat (160 °C/20')	EN 438-2.16	Appearance - Gloss finish	Rating	≥ 1
		Appearance - Other finish	Rating	≥ 1
Resistance to wet heat (100 °C/20')	EN 438-2.18	Appearance - Gloss finish	Rating	≥ 1
		Appearance - Other finish	Rating	≥ 1
Dimensional stability at high temperatures	EN 438-2.17	Cumulative dimensional change	Longitudinal %	≤ 0.75
		Cumulative dimensional change	Transversal %	≤ 1.25
Resistance to impact with small diameter ball	EN 438-2.20	Spring force	N	≥ 15
Resistance to impact with large diameter ball	EN 438-2.21	Drop height Indentation diameter	mm mm	≥ 600 ≤ 10
Resistance to cracking	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	Rating	≥ 5
		Appearance - Group 3	Rating	≥ 4
Light fastness (Xenon-arc)	EN 438-2.27	Contrast	Grey scale rating	≥ 4
Electrostatic properties	EN 61340-4-1	Point to point resistance	Ω	$1 \times 10^9 \div 1 \times 10^{11}$
		Vertical resistance	Ω	$1 \times 10^9 \div 1 \times 10^{11}$
Density	EN ISO 1183	Density	g/cm^3	≥ 1,35
FIRE PERFORMANCES				
Reaction to fire	The reaction to fire of Digital Thin is related to the final composite panel where the laminate is bonded to a substrate. Since the test results also depend on the substrate, the adhesive and the bonding technique applied, the composite manufacturer is responsible for the correct execution of the test in accordance with the applicable standards and test methods required for the specific application field.			
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^3 ppm	0.020 - 0.035 0.015 - 0.030
	EN ISO 12460-3	Gas analysis	$mg/(m^2 \times h)$	0,3 ÷ 0,4
	EN 13986	Formaldehyde emission classification	Class	E1
Hygiene	NSF	NSF/ANSI 35	passing/not passing	passing
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^3	≤ 0,25
		Total Aldehydes	ppm	≤ 0,05
		4-Phenylcyclohexene	mg/m^3	≤ 0,0033
		Total respirable particles	mg/m^3	≤ 0,025
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/dm2	< 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 microbal growth
		Microbial growth - Textured finish	Rating	1 - slight and slow microbal growth

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.

Note to digital printing decoratives
For the chemical-physical characteristics of digital printing, the laminates with these decors 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.