MATERIAL PROPERTIES DATA SHEET

LAVAGNA and MAGNETICO

High pressure decorative laminates (HPL), less than 2 mm thick, according to EN 438-3:2016 or EN 438-9:2013, 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 intented for bonding to supporting substrates, normally wood based, to produce panels by the composite manifacturers.
The non-porous surface of these types of laminate makes them suitable to writing for educational purposes and communication with the common chalks or dry wipe board markers.
The Magnetic type includes a thin metal layer in the core which makes it ideal as magnetic labels support and for holding sheets of paper with the use of magnets. The ability to retain the magnets does not change over time.

Decor			**Lavagna**	**Magnetico**
EN 438 classification			**VGS**	**HTS**
Standard			**EN 438-3**	**EN 438-9**

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	0,9 ± 0,10	1,0 ± 0,18
	EN 438-2.6	Length and width	mm	+ 10 / - 0	+ 10 / - 0
	EN 438-2.7	Straightness of edges	mm/m	≤ 1,5	≤ 1,5
	EN 438-2.8	Squareness	mm/m	≤ 1,5	≤ 1,5
	EN 438-2.9	Flatness (measured on full-size sheet)	mm/m	60	100
GENERAL PROPERTIES					
Resistance to surface wear	EN 438-2.10	Initial Point	Revolutions	≥ 150	
Resistance to immersion in boiling water	EN 438-2.12	Appearance - Gloss finish	Rating	≥ 3	≥ 1
		Appearance - Other finish	Rating	≥ 4	≥ 1
Resistance to water vapour	EN 438-2.14	Appearance - Gloss finish	Rating	≥ 3	
		Appearance - Other finish	Rating	≥ 4	
Resistance to dry heat (160 °C/20')	EN 438-2.16	Appearance - Gloss finish	Rating	≥ 3	≥ 1
		Appearance - Other finish	Rating	≥ 4	≥ 1
Resistance to wet heat (100 °C/20')	EN 438-2.18	Appearance - Gloss finish	Rating	≥ 3	
		Appearance - Other finish	Rating	≥ 4	
Dimensional stability at elevated 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	n.a.
Resistance to impact with large diameter ball	EN 438-2.21	Drop height Indentation diameter	mm mm	≥ 600 ≤ 10	≥ 1000 ≤ 10
Resistance to cracking under stress	EN 438-2.23	Appearance	Rating	≥ 4	
Resistance to scratching	EN 438-2.25	Appearance - Gloss finish	Rating	≥ 2	
		Appearance - Other 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	
Electrostatic properties	EN 61340-4-1	Point to point resistance	Ω	$10^9 \div 10^{11}$	
		Vertical resistance	Ω	$10^9 \div 10^{11}$	
Density	EN ISO 1183	Density	g/cm^3	≥ 1,35	
FIRE PERFORMANCES					
Reaction to fire	The reaction to fire of Lavagna and Magnetico 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					
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	Classification	Class	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 VOCs	mg/m^3	≤ 0,25	
		Total Aldehydes	ppm	≤ 0,05	
		4-Phenylcycloexene	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/dm^2	< 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 - nessuna crescita microbica	
		Microbial growth - Textured finish	Rating	1 - leggera e lenta crescita microbica	

Notes to laminate Magnetic
- Considering the wide variety of sizes and magnetic capacities, we recommend to get the suitable kind of magnet that best support the paper sheets holding.
- In order to avoid problems during processing, the cutting and the application of the panel, perfectly sharp tools shall be used to avoid chipping. Before you start cutting, preliminary tests should be performed to identify the gear you need.
- Please note that during the panel cutting or machining, sparks.can be given off.
- The dust produced during the cutting should not be mixed with normal powder in the pneumatic lines for the presence of metal particles. Electrical equipment and lighting systems explosion proof must be adopted.

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.
Arpa Industriale cannot be responsible for the misuse of the laminates covered with the protective film, nor for the consequences for non-recommended applications.