

Material consisting of layers of Kraft paper impregnated with thermosetting resins and an outer layer, on one or both sides, of decorative paper impregnated with aminoplastic resins; all bonded together by means of high heat and high pressure. The antimicrobial technology uses silver ions inherent antibacterial properties to provide continuous integrated antibacterial activity to the decorative surface of Lamishield.

PROPERTY	TEST METHOD (EN 438: 2016)	PROPERTY or ATTRIBUTE	UNIT (max or min)	VALUES	
<b>Thickness</b>	EN 438-2.5	thickness	mm	$0.6 \leq t \leq 1.0$ $\pm 0.10$ $1.0 < t \leq 1.8$ $\pm 0.15$ $2.0 < t < 3.0$ $\pm 0.20$ $3.0 < t < 5.0$ $\pm 0.30$ $5.0 < t < 8.0$ $\pm 0.40$ $8.0 < t < 12.0$ $\pm 0.50$ $12.0 < t < 16.0$ $\pm 0.60$ $16.0 < t < 20.0$ $\pm 0.70$ $20.0 < t < 25.0$ $\pm 0.80$ $25.0 < t$ to be agreed	
				$0.6 < t < 1$ $\leq 60$ $1.0 < t < 1.8$ $\leq 60$	
<b>Flatness</b>	EN 438-2.9	maximum deviation *	mm/m	one decorative side $2.0 \leq t \leq 5.0$ $\leq 50$	
				two decorative sides $2.0 \leq t < 6.0$ $\leq 8.0$ $6.0 \leq t < 10.0$ $\leq 5.0$ $10.0 \leq t$ $\leq 3.0$	
<b>Length and width</b>	EN 438-2.6	length and width	mm	+ 10 / - 0	
<b>Straightness of edges</b>	EN 438-2.7	maximum deviation	mm/m	1.5	
<b>Squareness</b>	EN 438-2.8	maximum deviation	mm/m	1.5	
<b>Resistance to surface wear</b>	EN 438-2.10	wear resistance	revolutions	IP $\geq 150$ <sup>1</sup>	
<b>Resistance to immersion in boiling water</b>	EN 438-2.12	appearance	<sup>2</sup> rating gloss finish other finishes	$\geq 3$ $\geq 4$	
		mass increase	%	CGS	CGF
				$2 \leq t < 5$ $\leq 5$ $5 \leq t$ $\leq 2$	$\leq 7$ $\leq 3$
		thickness increase	%	$2 \leq t < 5$ $\leq 6$ $5 \leq t$ $\leq 2$	$\leq 9$ $\leq 6$
				surface appearance gloss finish surface appearance other finishes edge	rating

PROPERTY	TEST METHOD (EN 438: 2016)	PROPERTY or ATTRIBUTE	UNIT (max or min)	VALUES
Resistance to dry heat (160 °C)	EN 438-2.16	appearance gloss finish	rating	≥ 3
		appearance other finishes		≥ 4
Resistance to wet heat (100 °C)	EN 438-2.18	appearance gloss finish	rating	≥ 3
		appearance other finishes		≥ 4
Dimensional stability at elevated temperature	EN 438-2.17	cumulative dimensional change	<sup>2</sup> % max L	0.55
			% max T	1.05
			% long. % transv.	2 ≤ t < 5 ≤ 0.40 ≤ 0.80
			% long. % transv.	5 ≤ t ≤ 0.30 ≤ 0.60
Resistance to impact by small-diameter ball	EN 438-2.20	spring force	<sup>2</sup> N (min)	20 **
Resistance to impact by large diameter ball	EN 438-2.21	drop height	mm	2 ≤ t < 6    ≥ 1400
		indentation diameter	mm	6 ≤ t        ≥ 1800
				≤ 10 mm
Resistance to crazing (thick laminates)	EN 438-2.24	appearance	rating	≥ 4
Resistance to scratching	EN 438-2.25	force smooth finish	rating	≥ 2
		force textured finish		≥ 3
Resistance to staining	EN 438-2.26	appearance groups 1 and 2	rating	5
		appearance group 3		≥ 4
Lightfastness	EN 438-2.27	contrast	grey scale rating	≥ 4
Resistance to water vapour	EN 438-2.14	appearance gloss finish	rating	≥ 3
		appearance other finishes		≥ 4
Thermal conductivity	EN 12664: 2001	-	W/mK	0.25
Coefficient of linear thermal expansion	ASTM D 696	-	°C <sup>-1</sup>	L ≅ 1.6 x 10 <sup>-5</sup> T ≅ 3.5 x 10 <sup>-5</sup>
Flexural strength	EN ISO 178	stress	MPa	≥ 100
Flexural modulus (E)	EN ISO 178	stress	MPa	≥ 10000
Density	ISO 1183	density	g/cm <sup>3</sup>	≥ 1.35

<b>Antimicrobial activity</b>	ISO 22196:2011	After 24 hours, the growth reduction rate of the microbes inoculated on the decorative surface is > 99.9%***
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\* Provided that the laminate is stored in the manner and conditions recommended by the manufacturer.

\*\* Valid only for thickness  $\geq 0.9$  mm.

<sup>1</sup> For smooth finishes and some plain colours, performances are greater than the minimum requirements settled by the standard.  
For structured finishes with dark printed colours, performances may be lower than minimum values required by the standard.  
For further information please contact the Customer Service.

<sup>2</sup> For laminates having nominal thickness lower than 2 mm.

\*\*\* HPL laminate material typically exhibits an innate antibacterial property although this property is recognised to dissipate with time, therefore, analysis of recently manufactured laminate should be preceded by an artificial aging stage to cause the dissipation of the innate antibacterial property and to avoid a false positive result. Aging of laminate material can be affected by dry heat and/or leaching by submersion in water. So, all the test specimens which the result refers to, were artificially aged prior to testing, so that the parameter or reduction of test bacteria against control allows the antibacterial activity of treated melamine decorative surface to be attributed to the presence of active ingredient (Ag<sup>+</sup>).

For the postforming grade, refer to the HPL PF Informative Technical Sheet of Print HPL Postforming available on Abet Laminati website.

***FIRE REACTION***

Note: Lamishield has a good reaction to fire properties but its performance depends on the standard required, the field of application, the thickness and the assembly of the laminate. Therefore, for information on the available certifications, it is recommended to contact the commercial service.