

Limited Fire Hazard Decorative Laminate

Grade: LSM21

Data Sheet

Issue: 2004-01

DESCRIPTION

LSM21 is a Limited Fire Hazard decorative laminate constructed from a glass phenolic core (MICAM's LSM20) surfaced with a decorative layer of melamine. A range of colours and patterns are available on the decorative side. The patterns include wood, marble and stone reproductions. LSM21 exists in two variants, "S" and "N". The standard product is LSM21-S. Listed general properties apply to LSM21-S. LSM21-N offers alternative behavioural characteristics in fire resisting designs. Both variants have exceptional reaction to fire performance. LSM21 is used in the LSB series of bonded composites.

THICKNESS

0.7mm to 3mm as standard other thicknesses available on request. Panels may be sprung into position, the thickness of panel used depends on the radius of curvature.

SHEET SIZE

Up to: 2440mm x 1220mm, can be made to specific panel size.

GENERAL CHARACTERISTICS

FIRE	OTHER
Flame retardant, low smoke and low toxic fume	Graffiti resistant
IMO: Class C Division; DNV: F-16716	Wear resistant
EC Type Examination; DNV: MED-B-1307	Resistant to most air & environmental pollutants
Class 1 (BS 476-7) and Class O (inc LSB200)	Impact resistant with " Safe Break " properties
Compliant to BS 6853 : 1999 Category Ia	Low water absorption
Compliant to Railtrack GM/RT2120	Easy to machine, cuts without shattering
Fire resistant (dependent on design)	Range of colours and textures

APPLICATIONS

Suitable for use where excellent fire performance is required. LSM21 is flame retardant, low smoke and low toxic fume. The LSM20 core also supplies fire resistance in suitable constructions. The "S" and "N" variants offer different behaviour in fire resisting designs - contact MICAM for advice. In addition to excellent fire performance LSM21 delivers the exceptional physical durability and graffiti resistance of a melamine resin surface. LSM21 is therefore the ideal choice for the decorative surface of lightweight panels and composites. Its fire resisting properties offer protection to substrates allowing it to be applied directly over existing surfaces thereby upgrading both the decorative nature and the fire performance of the surface in a single operation. LSM21 has found application in:-

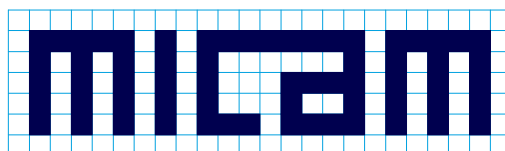
- Decorative fire barriers on railway rolling stock
- Lightweight aluminium honeycomb composites on ships (Product LSB100)
- Class O composites using standard cellulosic cores such as MDF in building (Product LSB200)
- Table tops
- Over-lamination of multi-layer paint (and other) surfaces, (good life cycle costs).

GENERAL PROPERTIES - LSM21	UNITS	VALUE LSM21	TEST METHOD
RELATIVE DENSITY		1.9	-
OPERATING TEMPERATURE	°C	<90	-
WATER ABSORPTION	mg (3 mm)	30	BS 2782-430 A

MECHANICAL PROPERTIES - LSM21	UNITS	VALUE	TEST METHOD
FLEXURAL STRENGTH	MPa	200	BS 2782-1005
FLEXURAL MODULUS	GPa	12	BS 2782-1005
FLEXURAL STRENGTH	MPa	100	BS 2782-1003
FLEXURAL MODULUS	GPa	22	BS 2782-1003
IMPACT RESISTANCE FLATWISE (lengthwise)	kJm ⁻²	75	BS 2782-359
IMPACT RESISTANCE EDGEWISE (lengthwise)	kJm ⁻²	227	BS 2782-359
COMPRESSIVE STRENGTH	MPa	300	BS 2782 345A
CO-EFFICIENT OF THERMAL EXPANSION	K ⁻¹	1.5 x 10 ⁻⁵	ASTM D696
THERMAL CONDUCTIVITY	Wm ⁻¹ K ⁻¹	0.63	ASTM C177



The information contained herein has been obtained under laboratory conditions and are typical or average values and do not constitute a specification, guarantee or warranty. Results may vary under different processing conditions or in combination with other materials. The data is believed to be reliable but all suggestions or recommendations for use are made without guarantee. You should thoroughly and independently evaluate materials for your planned application and determine suitability under your own processing conditions before commercialization.



FIRE PERFORMANCE - LSM21	UNITS	VALUE	TEST METHOD
SPREAD OF FLAME	Class	1	BS 476-7 (WARRES 61101)
FIRE PROPAGATION	°C/min (nominal)	i ₁ 2.8; I 8.0	BS 476-6 (WARRES 61102)
FLAMMABILITY TEMPERATURE INDEX	°C	>350	BS 4589-3
LIMITING OXYGEN INDEX	%	>70	BS 4589-2
SMOKE EMISSION (1.2mm)	m ² /"burn area"	Ao(ON) 1.2; Ao(OFF) 1.4	BS 6853 D8.4 (LUL C5323)
SMOKE EMISSION (3mm)	m ² /"burn area"	Ao(ON) 2.1; Ao(OFF) 2.3	BS 6853 D8.4 (LUL C6785)
SMOKE INDEX	dimensionless	5.8	NES 711 (WARRES L12990)
TOXIC FUME EMISSION	dimensionless	R 0.54	BS 6853 B.2 (RAPRA CTR36739)
TOXICITY INDEX	dimensionless	3.35	NES 713 (WARRES L12991)
FIRE RESISTANCE (3mm - indicative only)	Integrity minutes	>60	BS 476-20 (LPC TE 89432)

FIRE PERFORMANCE - LSM21 (on Al sheet)	UNITS	VALUE	TEST METHOD
SMOKE EMISSION (1.2mm)	m ² /"burn area"	Ao(ON) 2.1; Ao(OFF) 2.5	BS 6853 D8.4 (LUL C7125)

FIRE PERFORMANCE - LSB100	UNITS	VALUE	TEST METHOD
SPREAD OF FLAME & HEAT EMISSION (LSM21-S 1.2mm)	kWm ⁻² MJm ⁻² MJ kW	CFE >50.3 Qsb unmeasurable Qt 0.13 Qp 0.55	IMO FTP Code Annex 1 Part 5 (WARRES 111620)
SPREAD OF FLAME & HEAT EMISSION (LSM21-N 1.2mm)	kWm ⁻² MJm ⁻² MJ kW	CFE >50.5 Qsb unmeasurable Qt 0.09 Qp 0.45	IMO FTP Code Annex 1 Part 5 (WARRES 113977)

FIRE PERFORMANCE - LSB200	UNITS	VALUE	TEST METHOD
SPREAD OF FLAME (1.2mm)	Class	1	BS 476-7 (WARRES 300906)
FIRE PROPAGATION (1.2mm)	°C/min (nominal)	i ₁ 3.4; I 9.0	BS 476-6 (WARRES 300905)
SPREAD OF FLAME (0.8mm)	Class	1	BS 476-7 (WARRES 301621)
FIRE PROPAGATION (0.8mm)	°C/min (nominal)	i ₁ 1.4; I 11.6	BS 476-6 (WARRES 301622)

SYSTEM & PRODUCT APPROVALS & COMPLIANCES

Approved by NSAI to I.S. EN ISO 9001:2000 Reg. No. 19.0675.
 Product approved by MCA generally and specifically for over-lamination of existing surfaces
 Product approved by DNV as Class C division, certificate numbers F-16716 & MED-B-1307
 Product approved to NES705A category A1.
 Product approved to DPA BR1326(A) Class C
 Complies with BS 6853:1999 Category Ia
 Complies with GM/RT2120



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