

Micam's **EM42** is a limited fire hazard laminate which is a glass-fibre reinforced epoxy resin composite material. It is produced by a high temperature and high pressure process which produces a high strength void-free laminate suitable for a range of applications including electrical insulation and building construction applications.

General Applications

EM42 is suitable for use in electrical and mechanical applications specifically where there is a need for good reaction to fire, electrical performance or a high strength and impact resistant construction. **EM42** is also an intrinsically fire resistant material and finds use in fire barrier/containment applications.

General Characteristics

EM42 is a cream coloured laminate available in a range of thicknesses from 0.8mm to 100mm and in sheet sizes 920x1220 and 1220x1220mm. Other sheet sizes are available on request.

EM42 exhibits both excellent reaction to fire and fire resistance. It is a flame retardant, low smoke and low toxic fume, material. It also has exceptional resistance to penetration when exposed to high power DC arcing.

EM42 can be drilled and machined easily and then converted to machined components and assemblies.

	units	value	test method
GENERAL PROPERTIES			
Relative Density		2.0	ISO 1183-A
Water Absorption	mg(3mm)	12	IEC 62-1
Temperature Rating	Class	B (130°C)	IEC 60085
Coefficient of Thermal Expansion	K ⁻¹	1.2 x 10 ⁻⁵	ASTM D696
ENVIRONMENTAL PROPERTIES			
Phosphorous and halogen free		yes	
REACH compliant, contains no SOVHCs		yes	
RoHS COMPLIANT		yes	
Waterproof		yes	
Suitable for outdoor applications without painting or sealing		yes	
MECHANICAL PROPERTIES			
Flexural Strength – warp direction	MPa	145	ISO 178
Tensile Strength – warp direction	MPa	90	ASTM D638
ELECTRICAL PROPERTIES			
Insulation Resistance	MΩ	> 10 ⁴	IEC 60167
Insulation Resistance	Ω	> 10 ¹⁰	IEC 60167
Volume Resistivity	Ωcm	> 10 ¹¹	IEC 60093

Reaction to Fire

The results of testing to EN 45545-2 protocols are shown in the table for both 6mm (first value) and either 25mm or 50mm (second value) thickness. (The upper end thicknesses are limited to the maximum permitted by the standard/equipmentation).

standard	parameter	value	report	Comment
ISO 5658-2	CFE	36.1	ICL/H16/6557	The data shows that EM42 complies with, (amongst others), requirements of the EN 45545-2 R1 and R7 test sets at the highest performance (HL3) level. A formal assessment confirming this is available; ICL/LR16/11/012.
		38.4	ICL/H16/6558	
ISO 5660-1 (50kWm ⁻²)	MARHE	26.9	ICL/H16/6559	
		15.0	ICL/H16/6560	
ISO 5659-2 (50kWm ⁻² nf)	Ds/VOF4	119.1/26.3	ICL/H16/6561	
		78.8/4.7	ICL/H16/6563	
(now) EN 17084 Method 1	CIT ₄ /CIT ₈	0.013/0.018	ICL/H16/6562	Previously EN 45545-2 C.2 (50kWm ⁻² nf)
		0.010/0.021	ICL/H16/6564	

Some supplementary fire performance information is shown in the table. Further information to now withdrawn historical standards and codes can be made available on request.

standard	parameter	value	report	Comment
ISO 4589-2	LOI	76.1	SNPE 12873-06A	BS 476-6 and BS 476-7 performance satisfies "Class O" requirements under England and Wales Building Regs.
EN 60695-2	Ignitability	<2s at 960C	SNPE 12873-06B	
BS 476-7	Class	1	WARRES 55743	
BS 476-6	i ₁ /I	0.0/5.6	WARRES 55744	

FIRE RESISTANCE

Fire resistance is a design/system property and not solely a material property. EM42 exhibits fire resistance both perpendicular to and parallel to, the laminate plane. At 12mm it has achieved in excess of 30 minutes integrity and 15 minutes insulation in an electrical bus-bar penetration of a fire partition and at 100mm it has achieved over 60 minutes integrity and 60 minutes insulation.

DC POWER ARC RESISTANCE

DC power arc resistance is a design/system property and not solely a material property. EM42 exhibits high power arc resistance and has found application on several DC traction railway systems. It is a material selected by London Underground Ltd for arc resisting applications. A specific information sheet, available from MICAM, exists for this specialised area of use.

QUALITY SYSTEM APPROVAL

Certified by NSAI to I.S. ENISO 9001:2015 Reg. No. IE-19.0675.