

CALMICAGLAS® 2005, 0409

Description:

CALMICAGLAS® 2005 and CALMICAGLAS® 409 consist of mica paper based on calcined muscovite, glass cloth and thermosetting epoxy-novolac.

Properties:

CALMICAGLAS® 2005 and CALMICAGLAS® 409 are very flexible glass mica paper combinations, which can be easily wrapped in total width by hand or taped on automatic taping machines. After curing in a hot press an insulation with excellent dielectric, thermal, mechanical and chemical properties is obtained.

Application:

CALMICAGLAS® 2005 and CALMICAGLAS® 409 are used for the insulation of bars and coils of motors and generators up to highest output and nominal voltage.

CALMICAGLAS® 2005 and CALMICAGLAS® 409 are also suitable for the fabrication of moulded parts e. g. as commutator caps, tubes and cylinders.

The preheating cycle at minimum pressure ($< 0,3 \text{ N/mm}^2$), depending upon the size of the bars or coils, is given from 20 Minutes at 135° C up to 5 Minutes at 160° C . Please note, that a fast ascent of the pressure can influence the laminating quality. Kneading is not recommended. Curing is possible up to 180° C in combination with release-film VOTAFILM 2646.

Materials:

CALMICAGLAS® 2005 and CALMICAGLAS® 409 consist of mica paper based on calcined muscovite, glass-cloth and thermosetting epoxy-novolac.

Type 2005 is interleaved and is specially used when temperatures $> (30^\circ \text{ C})$ may occur during transportation or storage.

Formats:

Rolls: max. width 1000 mm

Tapes: from 10 mm width upwards

Type 2005 is supplied interleaved.

Storability:

min. 6 months at 20°C

min. 12 months at 5°C

Pressing condition: (to achieve formed stability):

e. g. : 1 hour, 160° C, 2 N / mm²

Temperature: 130° C - 180° C

Pressure: 2 - 3 N / mm²

Time: 8.0 - 0.5 hours

Full curing is achieved after 4 hours at 160° C.

Technical Data (as delivered)

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Properties	Test method	Unit	Value	Value	Value
Nominal thickness		mm	0.12	0.18	0.21
Tolerance		mm	± 0.01	± 0.03	± 0.02
Total substance	IEC 371-2	g/m ²	164 ± 14	258 ± 23	303 ± 29
Mica paper	IEC 371-2	g/m ²	75 ± 3	120 ± 8	150 ± 8
		%	45	46	49
Glass cloth	IEC 371-2	g/m ²	24 ± 1	33 ± 3	33 ± 3
		%	15	13	11
Resin content	IEC 371-2	g/m ²	65 ± 10	105 ± 15	120 ± 20
		%	40	40	40
Tensile strength	IEC 371-2	N/10mm	≥ 70	≥ 150	≥ 150
Volatile content (15 min 150° C)	IEC 371-2	%	≤ 1	≤ 1	≤ 1

Technical Data (after pressing 4 hours at 160° C)

Properties	Test method	Unit	Value	Value
Nominal thickness		mm	0.18	0.21
Thickness after pressing		mm	ca. 0.125	ca. 0.143
Number of layers per mm			8 ± 1	7 ± 1
Density	ISO 1183	g/cm ³	1.8 - 2.0	
Thermal conductivity		W/mK	0.25 - 0.30	
Linear thermal coefficient of expansion		1/K	ca. 10 x 10 ⁻⁶	
Flexural strength (23° C / 150° C)	ISO 178	MPa	≥ 200 / ≥ 150	
Dielectric strength (measured on plates 0.3 mm thick) at (23° C / 150° C)	IEC 243	kV/mm	≥ 50 / ≥ 45	
Dielectric constant (23° C -150° C)	IEC 250		4.5 - 5.3	
Tracking resistance	IEC 112		CTI 350	
Dielectric loss factor			≤ 10 x10 ⁻³	
23° C			≤ 25 x10 ⁻³	
90° C	IEC 250		≤ 100 x10 ⁻³	
155° C				
Thermal classification	IEC 216	°C	155 (F)	