

Technical Information

RESOLAM^â 03

Slot insulation laminates, strips, channel sections (L + U)

TYPE	A thin laminate consisting of heat-resisting epoxy resin reinforced with several layers of aramid paper (Nomex®) (PA).
GENERAL PROPERTIES	<p>Good electrical and mechanical properties and very good thermal material properties.</p> <p>Temperature class F - H.</p>
APPLICATION	<p>Thin insulating material especially for use as slot insulation, slot liners, insulation between layers, intermediate inserts for electrical machines in the low to high output range.</p> <p>Slot inserts of highly flexible RESOLAM 03 are very easily fitted in position. For electrical and mechanical applications in electrical machines and equipment, operating even at high temperatures.</p>
SUPPLY	<p>STANDARD THICKNESS: 0,8 - 1,5 mm</p> <p>To special order surfaces are processed for better resistance to moisture and dirt-protection, usually by coating with clear tracking-resistant varnish.</p> <p>Channels and other sections</p> <p>The most common configurations are L- and U-channel sections. Micafil 's own manufacturing technology does not limit the length. Any other geometry of sections is possible to meet individual customer requirements.</p> <p>Straightness and flex</p> <p>The standard tests for these properties are practicable only under certain conditions. Resolam channel sections are supplied in dry condition in thermosealed plastic bags containing silicagel drying agent, which should not be opened. Once it is unpacked, geometry variations are closely dependent on the momentary moisture conditions and are also unavoidable on account of the high flexibility of PA paper.</p> <p>Testing of slot insulation</p> <p>In order to ensure maximum security against slot insulation failures, specimens of material and finished components are tested at regular intervals.</p>
STANDARDS	RESOLAM 03 is not covered by any national or international standard specifications at the present time.



MACHINABILITY

RESOLAM 03 is easily sawn, parted and drilled. It should be machined dry.

HUMIDITY

All raw materials on a fibre basis absorb humidity. However the electrical characteristics of PA paper are, comparatively speaking, only slightly influenced by the presence of humidity. On the other hand the influence of humidity on variations in length, particularly in the case of long components, is to be taken into account.

STORAGE

RESOLAM-channel sections are supplied in dry condition in thermosealed plastic bags containing silicagel drying agent, which should not be opened until shortly before use of their contents. Channel sections removed from their bags and stored at over 20% relative air humidity will absorb moisture and their length will increase by 0,5% to 1%, depending on ambient moisture content. Parts can be dried as follows:

- varnished parts: 70 - 80 °C (6 - 15h)
- unvarnished parts: 150 - 80 °C (2 - 3h)

Channel sections unpacked prematurely for special reasons (for example controls) should be resealed in plastic bags, containing active drying agent when no longer required.

Note:

For the thickness range 0,5 to 1,5 mm, consisting of one layer of aramid paper please ask for RESOLAM 02.

DIMENSIONS

Table 1: Standard Dimensions and Tolerances

			L-Channel		U-Channel	
			Standard dimensions	Tolerance	Standard dimensions	Tolerance
Length	L	mm	≤12'000	+3/-0	≤12'000	+3/-0
Breadth	Ba/Bi	mm	20 - 250	± 0,15	20 - 250	± 0,15
Height	H	mm	5 - 50	± 0,15	5 - 200	± 0,15
Wall thickness	s	mm	0,5 - 2,5	± 0,1	0,5 - 2,5	± 0,1
Inside radius	Ri	mm	3	± 0,2	1	± 0,2
Outside radius	Ra	mm	Ra = Ri+s	± 0,2	Ra = Ri+s	± 0,2
Angle ¹⁾	α	°	90	± 3	90	± 3

¹⁾ Indicated angles are exact only within the bending range. The material cannot be machined to other than standard thicknesses.

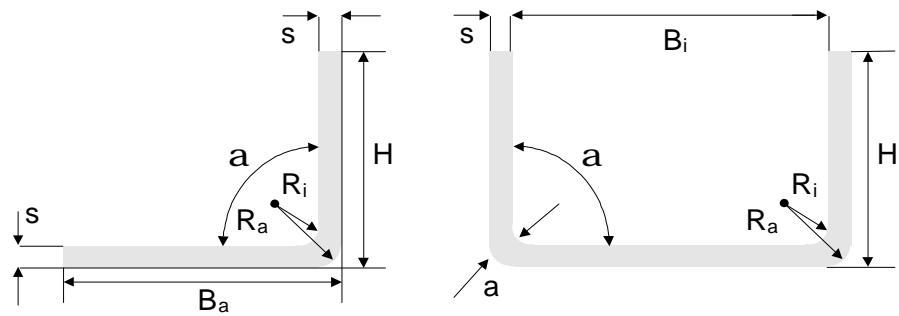


Table 2: Perpendicular test voltage ⊥

The test voltage at 50 Hz, 1 minute is applied in perpendicular direction. The voltage level considers the shape and the surface of the slot insulation as well as the necessary flashover distances.				
Test voltage	Thickness s in mm			
	< 1	≥ 1 - <1,2	≥ 1,2 - <1,5	≥ 1,5 - <2,0
50 Hz, 1 Min				
L – channel	10 kV · s	10 kV	12 kV	14 kV
U – channel	9 kV · s	9 kV	10 kV	12 kV

¹⁾ For very short edges (one-sided) H = 3 to 10 mm, the test voltage should be reduced to 80% of flashover voltage. No side electrodes are used for this test.

RESOLAM^â 03

	Properties		Standards	Units	Values
Composition	Several layers of Aramid Paper *)				
	*) Nomex 410: Product Du Pont de Nemours & Co.Inc. USA				
	Binder: Epoxy resin				
	Density:		ISO 1183	g/cm ³	0,8 - 1,3
Electrical properties	Electric strength \perp 50 Hz, 1 min.	23 °C	IEC 243	kV/mm	20
		90 °C			20
Mechanical properties	Tensile strength		ISO 527	N/mm ²	> 100
	Flexural strength	23 °C 150 °C	ISO 178	N/mm ² %	>110 > 50
Thermal Properties	Temperature class		IEC 85	°C	F - H

\perp perpendicular to layers

These properties have been determined by the above shown methods. The data given are valid for standard test specimen only. Unless otherwise specified, all data were measured at ambient temperature on specimen as manufactured and without particular treatment

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