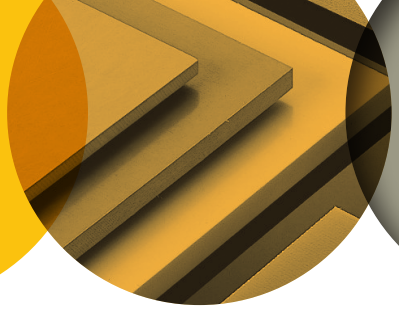
Röchling
UTR (GPO-3)

POLYESTER GLASS LAMINATE

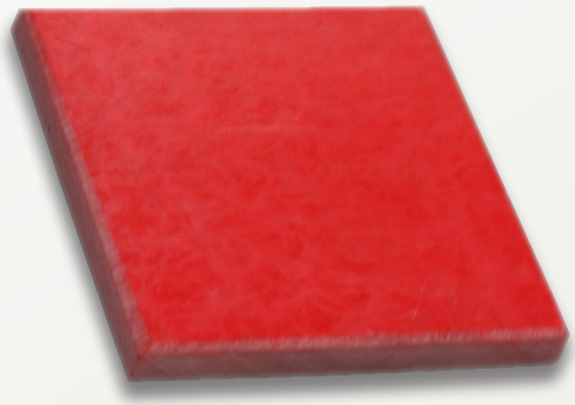
Flame resistant laminate for electrical insulation



UTR
Polyester Glass
Laminate

GENERAL DESCRIPTION

Röchling UTR is manufactured from fibreglass reinforced thermoset polyester resins. It is UL® recognised and the industry standard for flame and arc/track resistant electrical insulation. Manufactured to provide a combination of high strength, flame resistance and low smoke generation. Available in sheet form and a selection of channel, angle and tube sizes.



FEATURES & BENEFITS

- High mechanical strength for structural support
- UL® temperature index: 130°C electrical and 160°C mechanical
- Low smoke and smoke toxicity
- Easily fabricated
- More cost effective than most high pressure laminates
- Outperforms phenolic grades, often replacing the more exotic epoxies and silicones
- NEMA Grade GPO-3

APPLICATIONS

- Electrical insulation components for motors, generators and switchgear

GENERAL INFORMATION	
Material	Fibreglass reinforced thermoset polyester resins
Colour	Red

TECHNICAL DATA	NORM	UNITS	VALUE
General			
NEMA Grade Li 1-1989	NEMA LI-1		GPO-3
Military Specification			MIL-I-24768/6
IEC Specification			UP GM 203
Mechanical			
Tensile Strength	ASTM D638	Psi	7,800
Tensile Modulus	ASTM D638	Psi X 10^6	1.7
Flexural Strength	ASTM D790	Psi	22,100
Flexural Strength @ 130°C	ASTM D790	Psi	13,100
Compressive Strength	ASTM D695	Psi	33,100
Shear Strength	ASTM D732	Psi	11,600
IZOD Impact Strength (notched)	ASTM D256	ft. lb./in.	8.9
Water Absorption	ASTM D570	% by wt.	0.4
Specific Gravity	ASTM D792		1.81

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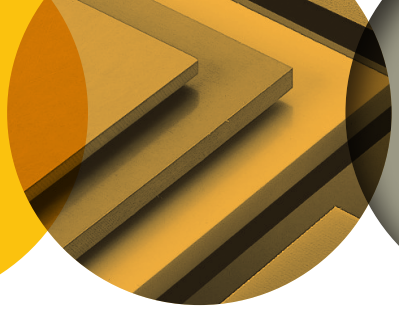

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TECHNICAL DATA			NORM	UNITS	VALUE
Electrical					
Electrical Strength - Perpendicular S/T in air			ASTM D149	Vpm	450
Electrical Strength - Perpendicular S/T in oil			ASTM D149	Vpm	584
Electrical Strength - Parallel S/S in oil			ASTM D149	kV	47
Arc Resistance - ⅛"			ASTM D495	Sec.	180
¼" @ 2.gkV Inclined Plane Track Resistance - ⅛" thick			ASTM D2303		1,000
IEC Track Resistanct (CTI)			UL746A	V.	>600
UL High Voltage Track Rate			UL746A	In./Min.	0
Permittivity, 60 Hz			ASTM D150		4.1
Dissipation Factor, 60 Hz			ASTM D150		4.1
Permittivity, MHz			ASTM D150		0.013
Dissipation Factor, MHz			ASTM D150		0.010
Insulation Resistance			ASTM D257	$\Omega \times 10^{12}$	3.1
Thermal					
Coefficient of Thermal Expansion			ASTM D696	$in/in/^0CX10^{-5}$	2
Thermal Conductivity			ASTM C177	BTU/HR/Ft²/In/°F	1.9
UL Temperature Index	Electrical		UL 746B	°C	130
	Mechanical		UL 746B	°C	160
UL Recognition File Number					E81928
Flame and Smoke Characteristics					
UL Subject 94			UL94	0.093"	VO
Oxygen Index			D2863	$\%0_2$	39
Flame Resistance	Ignition Time	½" Thick	ASTM D229-II	sec	85
	Burn Time			sec	49
Tunnel Test	Flame Spread		ASTM E 84/UL 723		25
	Smoke Density				115
	Fuel Contributed				0
Cone Calorimeter	Time to Ignition		ASTM E 1354	Sec.	109
	Peak Rate of Heat Release			kW/m²	168.6
	Heat Release Rate @ 300 seconds			kW/m²	77.2
	Caloric Content			MJ/kg	7.13
	Average Smoke Extinction Area			m²/kg	336.1
Radiant Panel Flame Spread			ASTM E162		11

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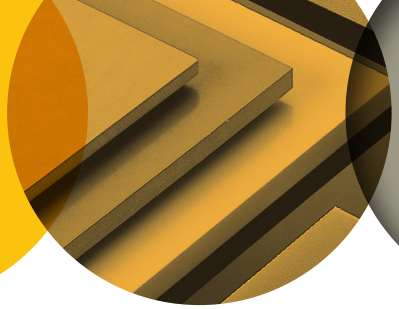

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TECHNICAL DATA		NORM	UNITS	VALUE	
Specific Optical Density of Smoke				Non-Flaming	Flaming
	Ds @ 4.0 min. (Average)	ASTM E662		0.3	10.7
	Dm (corr) (Average)			3.1	128.4
Composition of Smoke					
Procedure reported in U.S. Testing Co. Report #83413 of the Bureau of Ships; & referenced in MIL-M-14G	Hydrogen Chloride		ppm	0	
	Aldehydes as HCHO			4	
	Ammonia			0	
	Carbon Monoxide			220	
	Carbon Dioxide			3,275	
	Oxides of Nitrogen as NO_2			10	
	Cyanides of HCN			0	

MATERIAL SPECIFICATIONS
Standard Width x Length (mm)
1220 x 2440
Standard Nominal Thickness (mm)
0.8 to 50

SIZING & AVAILABILITY

The above table shows the most commonly requested products in this range. Should you require something outside of these parameters, please contact your local sales representative or our customer service team.

MACHINING & FABRICATION

Insulect's manufacturing capabilities form a key part of the trusted service we offer our customers. Our two modern, well equipped facilities – in Brisbane and Melbourne – work with a wide range of electrical, thermal and mechanical materials – including plastics, composites and cellulose-based products.

We offer short run, specialty or volume based machining and fabrication for almost any application and can produce cut-to-order sheets or finished components. Coupled with our highly-trained and experienced team, we are able to deliver on the most complex of customer requirements.

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