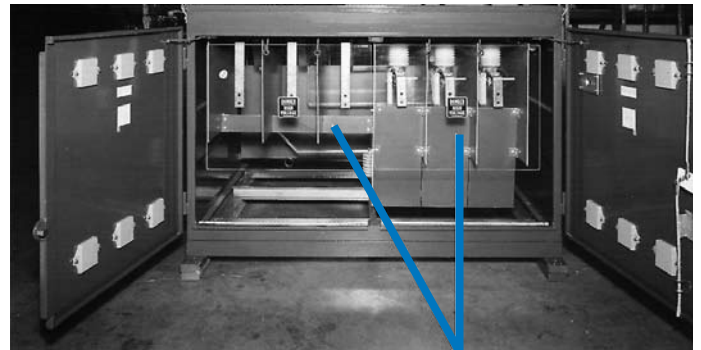


Grade UTR Arc/Track & Flame Resistant Laminate

- 1,000 Minutes Track Resistance
- Electrically Insulating
- Highly Flame Resistant
- Low Smoke & Smoke Toxicity
- UL® Recognized
- NEMA Grade GPO-3

Grade UTR is a fiberglass reinforced thermoset polyester material. It is available in sheet form as well as a wide selection of channel, angle, and tube sizes. These materials are the industry standard for flame and arc/track resistant electrical insulation. In addition, the excellent combination of high strength, flame resistance, and low smoke generation has given it application in many other areas such as transit and marine where safe, yet economical materials are required. Additional information and samples can be obtained through Röchling Glastic Composites Customer Service or your local authorized distributor.



Low-Profile Switchgear Cabinet – Interphase and end barriers are fabricated from Grade UTR Laminate.

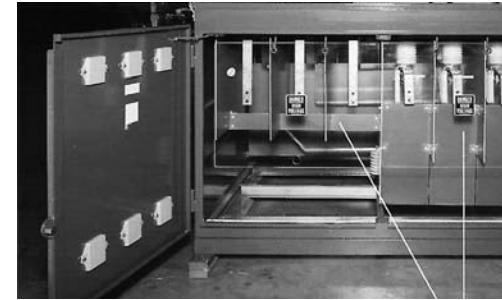
	UNIT	Procedure	Typical Value ¹
General Information			
Part Number			1491, 1494, 1497
Standard Color			White, Red, Black
NEMA Grade Li 1-1989		NEMA LI-1	GPO-3
Mechanical Properties			
Tensile Strength	Psi	ASTM D638	7,800
Tensile Modulus	Psi X 10 ⁶	ASTM D638	1.7
Flexural Strength	Psi	ASTM D790	22,100
Flexural Strength – 130°C	Psi	ASTM D790	13,100
Compressive Strength	Psi	ASTM D695	33,100
Shear Strength	Psi	ASTM D732	11,600
IZOD Impact Strength (notched)	ft. lb./in.	ASTM D256	8.9
Water Absorption	% by wt.	ASTM D570	0.4
Specific Gravity	–	ASTM D792	1.81
Electrical Properties			
Electrical Strength – Perpendicular S/T in air	V _{pm}	ASTM D149	450
Electrical Strength – Perpendicular S/T in oil	V _{pm}	ASTM D149	584
Electrical Strength – Parallel S/S in oil	kV	ASTM D149	47
Arc Resistance	Sec.	ASTM D495	180
Inclined Plane Track Resistance – 1/8" thick		ASTM D2303	1,000
IEC Track Resistance (CTI)	V.	UL746A	>600
UL High Voltage Track Rate	In./Min.	UL746A	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	Ohm x 10 ¹²	ASTM D257	3.1





Grade UTR

Flame & Smoke Characteristics			
UL Subject 94	0.94" & Thicker Less than 0.93"	UL94	VO
Oxygen Index	%O ₂	D2863	39
Flame Resistance		ASTM D229-II	
Ignition Time	sec.	—	85
Burn Time	sec.	—	49
Tunnel Test			
Flame Spread		ASTM E 84/UL	25
Smoke Density		723	115
Fuel Contributed			0
Cone Calorimeter			
Time to Ignition	Sec.		109
Peak Rate of Heat Release	kW / m ²		168.6
Heat Release Rate @ 300 sec.	kW / m ²	ASTM E 1354	77.2
Caloric Content	MJ / kg		7.13
Average Smoke Extinction Area	m ² / kg		336.1
Radiant Panel Flame Spread		ASTM E 162	11
Specific Optical Density of Smoke		ASTM E662	
			Non-Flaming Flaming
Ds @ 4.0 min. (Average)			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; and referenced in MIL-M-14G	Material: Hydrogen Chloride Aldehydes as HCHO Ammonia Carbon Monoxide Carbon Dioxide Oxides of Nitrogen as NO ₂ Cyanides of HCN	ppm	0 4 0 220 3,275 10 0
Thermal Properties			
Coefficient of Thermal Expansion	in/in/°C X 10 ⁻⁵	ASTM D696	2
Thermal Conductivity	BTU/HR/Ft ² /In/°F	ASTM C177	1.9



¹Typical average values for 0.063" thick laminate. Properties vary with material thickness and form.

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