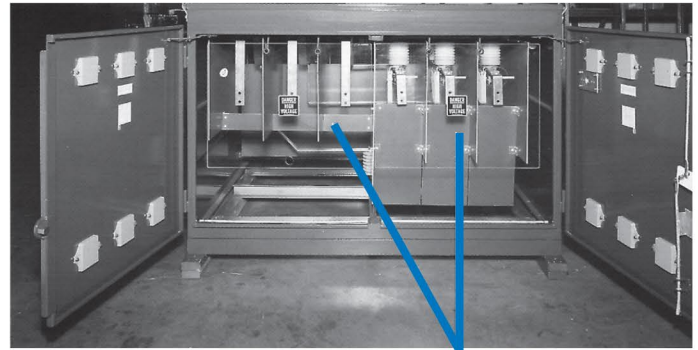


# Grade UTR Arc/Track & Flame Resistant Laminate

- 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 <sup>1</sup>
<b>General Information</b>			
Part Number	1491, 1493, 1494, 1495, 1497		
Standard Color	White, Red, Black		
NEMA Grade Li 1-1989	NEMA LI-1	GPO-3	
<b>Mechanical Properties</b>			
Tensile Strength	Psi	ASTM D638	8,000
Tensile Modulus	Psi X 10 <sup>6</sup>	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
<b>Electrical Properties</b>			
Electrical Strength – Perpendicular S/T in air	V <sub>pm</sub>	ASTM D149	450
Electrical Strength – Perpendicular S/T in oil	V <sub>pm</sub>	ASTM D149	584
Electrical Strength – Parallel S/S in oil	kV	ASTM D149	47
Arc Resistance	Sec.	ASTM D495	180
Inclined Plane Track Resistance – ¼" thick @ 2.5 kV		ASTM D2303	1,000
IEC Track Resistance (CTI) @ 3 mm thickness	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	0.013
Permittivity, MHz	–	ASTM D150	4.1
Dissipation Factor, MHz	–	ASTM D150	0.010
Insulation Resistance	Ohm x 10 <sup>12</sup>	ASTM D257	3.1

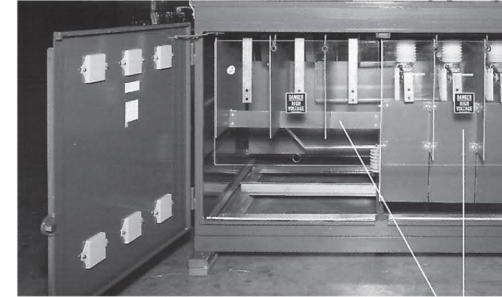




# RÖCHLING

## Grade UTR

Flame & Smoke Characteristics			
UL Subject 94	0.094" & Thicker	UL94	VO
Oxygen Index	%O <sub>2</sub>	D2863	35
Flame Resistance		ASTM D229-	
Ignition Time	sec.	II	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	Sec.		109
Peak Rate of Heat Release	kW / m <sup>2</sup>	ASTM E 1354	168.6
Heat Release Rate @ 300 sec.	kW / m <sup>2</sup>		77.2
Caloric Content	MJ / kg		7.13
Average Smoke Extinction Area	m <sup>2</sup> / 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		0
	Aldehydes as HCHO		4
	Ammonia		0
	Carbon Monoxide	ppm	220
	Carbon Dioxide		3,275
	Oxides of Nitrogen as NO <sub>2</sub>		10
Cyanides of HCN		0	
Thermal Properties			
Coefficient of Thermal Expansion	in/in/°CX10 <sup>-5</sup>	ASTM D696	2
Thermal Conductivity	BTU/HR/Ft <sup>2</sup> /In/°F	ASTM C177	1.9
UL Temperature Index			
– Electrical	°C	UL 746B	130
– Mechanical	°C	UL 746B	160
UL Recognition File Number	—	—	E81928



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

Röchling Glastic Composites  
 4321 Glenridge Road  
 Cleveland, OH 44121 USA  
 Tel: 216-486-0100  
 Fax: 216-486-1091  
[www.glastic.com](http://www.glastic.com)

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