



Flame-Resistant Electrical Insulation Laminates

Grades UTS 141 & 1478

- NEMA GPO-2
- High Strength
- Flame-Resistant Meets UL94 V0
- Cost-Effective
- Outstanding Punchability
- Asbestos-Free

Grades UTS 141 & 1478 are NEMA GPO-2 fiberglass-reinforced laminates that meet UL94 V0 flame-resistance standards. They are ideal for applications requiring flame and heat resistance, as well as applications requiring higher retention of properties after heat aging.

Grade UTS 141 is a NEMA Class F material with a temperature index of 130° C Electrical and 130° C Mechanical. Grade UTS 1478 is a NEMA Class F material with a temperature index of 130° C Electrical and 160° C Mechanical.

They are both available in a standard red color. Both grades are easily fabricated, offering an exceptional capability for punching in their thinner thicknesses. Grade 141 is available from $\frac{1}{32}$ through $\frac{1}{16}$ inch thick. Grade 1478 is available from $\frac{3}{32}$ through $\frac{1}{2}$ inch thick.

Grades 141 & 1478 laminates are ideal for a wide variety of applications, including intricate punchings for switches, switch plates, controls, control panels and terminal boards.





Grades UTS 141 & 1478

	UNIT	ASTM/UL Number	Grade UTS	Grade UTS
General Information				
Part Number			1478	141
Standard Color			Red	Red
Mechanical Properties				
NEMA Grade Li 1-1989			GPO-2/GPO-2P	GPO-2
Military Specification	–	–	L-P 509/GPO-2	–
Tensile Strength	Psi	D638	8,900	8,000
Tensile Modulus	Psi X 10 ⁶	D638	1.9	1.3
Flexural Strength	Psi	D790	24,600	18,000
Flexural Strength – 130°C	Psi	D790	14,900	6,000
Flexural Modulus	Psi X 10 ⁶	D790	–	1.2
Compressive Strength	Psi	D695	39,000	30,000
Shear Strength	Psi	D732	13,400	14,000
IZOD Impact Strength (notched)	ft.lb./in.	D256	10.7	8.0
Water Absorption	% by wt.	D570	0.6	0.8
Specific Gravity	–	D792	1.8	1.8
Electrical Properties				
Electrical Strength – Perpendicular S/T in Air	Vpm	D149	433	300
Electrical Strength – Perpendicular S/T in Oil	Vpm	D149	567	–
Electrical Strength – Parallel S/S in Oil	kV	D149	51	40
Arc Resistance	Sec.	D495	130	130
IEC Track Resistance (CTI) @ 3 mm thickness	V.	UL746A	>600	>600
UL High Voltage Track Rate	In./Min.	UL746A	0	–
Permittivity, 60 Hz	–	D150	4.1	4.5
Dissipation Factor, 60 Hz	–	D150	.011	.05
Permittivity, MHz	–	D150	3.9	–
Dissipation Factor, MHz	–	D150	0.10	–
Insulation Resistance	Ohm x 10 ¹²	D257	270	–
Flame Resistance Properties				
UL Subject 94	–	UL94	VO	VO
UL Hot Wire Ignition	Sec.	UL746A	300+	–
UL High Amp Ignition	# Exposure	UL746A	200+	–
Oxygen Index	%O ₂	D2863	36	–
Ignition Time	Sec.	–	81	75
Burn Time	Sec.	–	48	85
Thermal Properties				
Coefficient of Thermal Expansion	In/In/°C x 10 ⁻⁵	D696	2	2
Thermal Conductivity	BTU/HR/Ft ² /In/°F	C177	1.8	–
UL Temperature Index – Electrical	°C	UL 746B	130	130
– Mechanical	°C	UL 746B	160	130
UL Recognition File Number	–	–	E81928	E23525



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