

MATERIAL and GRADE SELECTION GUIDE



Product	ASTM spec, generic or NEMA designation	IEEE Temp Class	Max Constant Operating Temp degrees F	Flame Resistance	Resin	Reinforcement	Standard colours	Sheet	Tube	Rod	Angles, Channels Square/Rect tube	Machined + Fabricated	General Purpose Electrical	General Purpose Mechanical	Typical Applications
Vulcanized Fibre / Fishpaper	ASTM D710	A	110C	UL94HB	cellulose	paper	grey / red / black / white	*	*	*	*	*	*	*	Washers, Spacers, Shims, Fuse Tubes, Barriers, Terminal Strips, Core Winding, Gap Spacers, Supports, Liners
Pressboard	various	A	various	various	cellulose	paper	light brown / black	*	*	*	*	*	*	*	
Transformer Board	various	A	various	various	synthetic / Lignin	Cellulose	light brown	*	*	*	*	*	*	*	
Paper Phenolic	NEMA X	B	250-280	various	phenolic	paper	light to dark brown / black	*	*	*	*	*	*	*	Bus Supports, Barriers, Brackets, Panels, Mountings, Terminal Strips in a variety of configurations in punched and machined parts available
	NEMA XX	B	250-280	various	phenolic	paper	light to dark brown / black	*	*	*	*	*	*	*	
	NEMA XXX	B	250-280	various	phenolic	paper	light to dark brown / black	*	*	*	*	*	*	*	
	NEMA XP	B	250-280	various	phenolic	paper	light to dark brown / black	*	*	*	*	*	*	*	
Cloth + Linen Phenolic	NEMA XPC	B	250-280	various	phenolic	paper	light to dark brown / black	*	*	*	*	*	*	*	Supports, Barriers, Shims, Spacers, Washers, Terminal Blocks, Guides Gears, Friction Plates, Wear Strips, Bushings, Pins
	NEMA C	A/B	250	UL94HB	phenolic	cloth	light to dark brown	*	*	*	*	*	*	*	
	NEMA CE	A/B	250	UL94HB	phenolic	cloth	light to dark brown	*	*	*	*	*	*	*	
	NEMA L	A/B	250	UL94HB	phenolic	linen	light to dark brown	*	*	*	*	*	*	*	
Glass Phenolic	NEMA LE	A/B	250	UL94HB	phenolic	linen	light to dark brown	*	*	*	*	*	*	*	Barriers, Supports, Terminal Blocks, Collars, Guides, Receptacle Plates, Coil Boards and other critical components requiring Hi-temp, Hi-voltage and FR-rated performance
	NEMA G3	F/H	350	UL94V0	phenolic		dark brown	*	*	*	*	*	*	*	
Glass Melamine	NEMA G5 / G9	B	280	UL94V0	melamine	glass cloth	grey / white	*	*	*	*	*	*	*	
Glass Silicone	NEMA G7	H	460	UL94V0	silicone		white	*	*	*	*	*	*	*	
Glass Epoxy	NEMA G10	B	280	UL94HB				*	*	*	*	*	*	*	Popular applications in PowerGen, Transformers, Power Distribution, Motors and Controls, Switchgear and Electronics as Bus Supports + Clamps, Bolt Insulation, Coil Blocks, Pole Collars, Barriers, Terminal Blocks, Wedges, Filler Strips and Arc Shields requiring lasting Thermal Endurance and Mechanical Strengths important to note that Brominated (FR) grades may not be suitable in some Rotating Devices
	NEMA FR4	B	280	UL94V0				*	*	*	*	*	*	*	
	NEMA G11	F	300	UL94HB	epoxy	glass cloth	various light to dark green, translucent thin sheets	*	*	*	*	*	*	*	
	hybrids	F/H	300++	various				*	*	*	*	*	*	*	
Glass Polyimide	hybrid	H	400++	UL94V0	polyimide	glass cloth	dark brown / wine	*	*	*	*	*	*	*	Polyimide resin systems are widely recognized for high Electrical values with high Mechanical value and lasting Thermal Endurance
Filament Wound Epoxy															Available in a variety of configurations where increased Bursting and Flexural strengths are desirable
Random Glass Epoxy	hybrid	various	various	various	epoxy	glass strand / cloth	various	*	*	*	*	*	*		
Unidirectional Glass Epoxy															
Glass Polyester	GPO1	B	266	HB	polyester	random glass mat	beige, white, brown	*	*	*	*	*	*	*	Class B general-purpose grade for Shims, Guides, Panels, Coil Blocks, Washers, Spacers
	GPO1	F	356	HB	polyester	random glass mat	white, beige, brown	*	*	*	*	*	*	*	Class F 155C grade popular in PowerGen and Transformer applications
	GPO1	H	428	HB	polyester	random glass mat	light brown to tan	*	*	*	*	*	*	*	Class H 180C grade popular in PowerGen and Transformer applications
	GPO3	B	266F Electrical / 320F Mechanical	UL94V0 above 0.093 thx	hybrid polyester	random glass mat	red, white, black	*	*	*	*	*	*	*	UL94V0 Flammability with Lo-Smoke and Toxicity formulations, high Track- and Arc-resistant values critical in numerous applications such as Coil Supports, Blocks, Shims, Pole Collars, Arc Chutes, Terminal Boards, Panels, Barriers and Mounting Boards
	Mold + Press Platen Insulation	no classification	450F to 550F	no rating assigned	hybrid polyester	random glass mat	various	*	*	*	*	*	*	*	Mold + Platen insulation with increased glass content formulated for high Compressive values and Dimensional stability, also popular in applications such as Strip Heater Barriers, Couplers, Control Mounts, Shims and Hot Runner insulation
	Glass Vinylester Structural + Electrical		various	no rating assigned	vinylester	random glass / rovings	beige, gray, olive	*	*	*	*	*	*	*	Available in molded and pultruded sheet, channels, angles and custom profiles for a wide variety of Structural, UV-resistant, Chemical resistant and FR-rated applications
Nomex	Aramid paper	H	400+	UL94V0	proprietary	-	off-white	*	*	*	*	*	*	*	Used in hi-temperature Electrical applications where high Electrical values, Dimensional Stability and versatility in punching, forming and bending are critical
Mylar	Polyethylene Terephthalate	B	300+	UL94VTM-2	PET	-	translucent smoky yellow to clear	*	*	*	*	*	*	*	A cost-effective, hi-performance Electrical film with good punching and die-cutting properties
Kapton	Polyimide film	H	500+	UL94V0	polyimide	-	translucent orange	*	*	*	*	*	*	*	Hi-performance Electrical film with high and lasting Electrical, Thermal and Arc resistance values, used as Barriers, Shields, Covers, Liners
Polyethylene, Polypropylene	LDPE, HDPE, PE, PP		180-250	various	poly	-	white, translucent, various colours	*	*	*	*	*	*	*	Cost-effective material in numerous Mechanical applications, punchable, machinable
Nylon, Acetal	Polyamide / Polyoxymethylene		180-195	HB, various	Polyamide / Polyoxymethylene	various	various	*	*	*	*	*	*	*	Cost-effective material in numerous Mechanical applications, punchable, machinable
Teflon	PTFE Polytetrafluoroethylene		500F	UL94V0	poly	-	white	*	*	*	*	*	*	*	Hi-temp and Lo-friction applications, punchable, machinable
Polycarbonate	PC		250+	UL94V0, various	poly	-	clear, also translucent finishes	*	*	*	*	*	*	*	Unmatched Optical Clarity, good Impact resistance, some grades FR-rated
PEEK	Polyether-ether-ketone		450+	UL94V0	poly	various	various	*	*	*	*	*	*	*	Hi-performance Engineered Thermoplastic offering strong, resilient Mechanical values in combination with hi-temp resistance and UL94V0 flammability