

Selecting the Best Plastic for Your Application

Thermoplastic vs. Thermoset Plastics used in molding toroid mounts and headers come in two broad categories, thermoset and thermoplastic. Thermoset plastics include epoxies, phenolics and Diallyl Phthalate (DAP) that are known for their environmental stability and ability to tolerate over 750° F without melting. Thermoplastics include nylon, polypropylene, polycarbonate, polyester (Valox, Rynite), LCP (Vectra) and PPS (Ryton) that will begin to melt if they experience temperatures above 500° F for an extended period. The chemistry that gives thermoplastics a lower melting point also makes them less expensive to mold, providing a cost advantage over thermoset plastics.

Thermoplastics are widely used in applications that do not experience temperatures above 500° F, except for a few seconds during the winding lead to terminal and component to PCB soldering process. There are trade offs between the two plastic types that must be considered. The mount may be less expensive if molded from thermoplastic but will require pre-tinning the winding leads and careful heat management while soldering the leads to the mount and soldering the mount to the circuit board. The thermoset mounts can be more expensive, but with self-stripping magnetic wire, several terminations can be soldered at once and the wire will not need to be stripped or pre-tinned, possibly making the overall cost of producing the component lower. In addition, with RoHS requirements that remove lead, plastics will be experiencing higher solder temperatures that will push the limits of thermoplastics.

This table is for reference only and is intended to provide general information about the materials. The various plastic types within the thermoplastic or thermoset categories will have individual characteristics that relate to moldability, roughness, brittleness, flexibility, thermal expansion, moisture absorption, dielectric constant, volume resistivity, and cost. Current material performance information can be found at the material manufacturer's web site. All of the plastic materials used in Lodestone Pacific bobbins, toroid mounts and headers are UL Approved and traceable to the UL Recognized material manufacturer. Lodestone Pacific can provide certifications of materials based on the UL file No. for the materials as found on the materials "UL Yellow Card." RoHS and REACH Certification on all materials in this table are available from our On-Line REACH Database.

www.lodestonepacific.com/reach

Material Type	Mat'l Code	Mfg	Mfg Web Site	Trade Name	UL Card No.	UL Flameability	System Class **	RoHS Compliant	Halogen Free
THERMOSET									
Phenolic	PH	Sumitomo	www.sumitomo-chem.co.jp	PM-9630	E41429	UL94-VO	N (200°C)	Yes	No
Phenolic	PH2	Sumitomo	www.sumitomo-chem.co.jp	PM-9820	E41429	UL94-VO	N (200°C)	Yes	No
Phenolic	PH3	Chang Chun	www.ccp.com.tw	T357 / T373J / T375J	E59481	UL94-VO	F (155°C)	Yes	No
Phenolic	PH4	Hitachi	www.hitachi.us	CP-J-8700	E42956	UL94-VO	F (155°C)	Yes	No
Diallyl Phthalate	DAP	Synress-Amico	www.electricity-tool.com	5562	E48036	UL94-VO	F (155°C)	Yes	No
Diallyl Phthalate	DAP2	Cosmic	www.cosmic.vcar.com	D72	E64213	UL94-VO	F (155°C)	Yes	No
Diallyl Phthalate	DAP3	Sumitomo	www.sumitomo-chem.co.jp	52-70-70	E123472	UL94-VO	F (155°C)	Yes	No
Diallyl Phthalate	DAP4	Wah Hong	www.wahhong.com	WH-9100	E150608	UL94-VO	B (130°C)	Yes	No
THERMOPLASTICS									
Glass Filled Nylon	GFN	DuPont	www.dupont.com	FR50	E41938	UL94-VO	F (155°C)	Yes	No
Glass Filled Nylon	GFN1	DuPont	www.dupont.com	HTNFR52630NH	E41938	UL94-VO	F (155°C)	Yes	Yes
Glass Filled Nylon	GFN2	DuPont	www.dupont.com	70G33L	E41938	UL94-HB	F (155°C)	Yes	No
Glass Filled Nylon	GFN3	DuPont	www.dupont.com	132F/101L (Zytel)	E41938	UL94-V2	B (130°C)	Yes	No
Glass Filled Nylon	GFN4	RTP	www.rtpcompany.com	RTP205FR	E84658	UL94-VO	F (155°C)	Yes	No
Glass Filled Nylon	GFN5	DSM Co.	www.dsm.com	TE250F8 (Stanyl)	E172082	UL94-VO	B (130°C)	Yes	No
Glass Filled Nylon	GFN7	Ginar Tech	www.ginar.com	AN4720SN	E154352	UL94-HB	B (130°C)	Yes	No
Glass Filled Nylon	GFN8	Assend	www.ascendmaterials.com	Vydyne 909	E70062	UL94-VO	F (155°C)	Yes	No
Polyethylene	PET	DuPont	www.dupont.com	FR530 (Rynite)	E41938	UL94-VO	N (200°C)	Yes	No
Polyethylene	PET2	DuPont	www.dupont.com	RE19041 (Rynite)	E41938	UL94-VO	N (200°C)	Yes	Yes
Poly Butylene	PBT	Chang Chun	www.ccp.com.tw	4130	E59481	UL94-VO	B (130°C)	Yes	No
Polyphenylene	PPS	Phillips	www.philips.com	R-4 (Ryton)	E54700	UL94-VO	F (155°C)	Yes	No
Polyphenylene	PPS2	Poly Plastics	polyplasticproduct.com	1140	E109088	UL94-VO	B (130°C)	Yes	No
Liquid Crystal	LCP	Sumitomo	www.sumitomo-chem.co.jp	E4008	E54705	UL94-V0	F (155°C)	Yes	Yes
Liquid Crystal	LCP2	Ticona	www.ticona.com	6130L (Zenite)	E344082	UL94-VO	N (200°C)	Yes	Yes
Liquid Crystal	LCP3	Nippon	www.negamerica.com	HM402	E91944	UL94-VO	F (155°C)	Yes	Yes

Notes:

- * Not all products are available in all materials. Material lots are traceable to the plastic manufacturer. Percent of Re-Grind at or below manufacturer's recommendations. Material specifications available at www.lodestonepacific.com/reach
- ** Insulation System Class Temperature is for use as mechanical support. Review specific insulation systems to determine if the material is suitable as a ground insulation or as mechanical support at a higher temperature class.