

THERMAL CLASS	INSULATION TYPE	MWS PROD CODE	NEMA STANDARD (MW 1000)	INSULATION CHARACTERISTICS	GENERAL APPLICATIONS
105°C	Plain Enamel – Available 41 – 44 gauge	PE	NONE	Plain Enamel, known as oleoresinous enamel, was one of the first film insulations developed more than 75 years ago and is still in use today in a variety of electronic components. Plain Enamel wires are manufactured to single-build dimensional standards.	Relays and coils. Avoid using in presence of synthetic solvents.
	Formvar	F	MW 15 (RD) MW 18 (SQ & RECT)	Formvar Enamel is made from vinyl acetal resins produced as a smooth uniform film. Formvar has excellent mechanical properties such as abrasion resistance and flexibility. The film will withstand excessive elongation without rupture. When stressed during winding, Formvar has a tendency to craze upon contact with solvents such as toluol, naphtha, xylol, etc. Therefore, it should be given an annealing preheat prior to varnish application. Formvar can be removed mechanically or chemically during terminal preparation	Motors, random wound coils, oil filled and dry transformers, armature and generator winding where "tough" film may be required
	Polyurethane Bondable Formvar Bondable Polyurethane Nylon Bondable	PB FB PNB	MW 3 MW 19 MW 29	Bondable magnet wire is insulated copper wire with a superimposed film of thermoplastic bonding material. The heat or solvent sensitivity of this material makes possible the winding of coils of unusual shapes since the wire may be bonded turn to turn.	Self-supporting coils, voice coils, encapsulated coils, relays, yoke coils
130°C	Polyurethane Nylon* – No Longer Available	PN	MW 28		
155°C	Polyurethane 155*	P155	MW 79	Polyurethane-155 is a 155°C thermal class solder strippable insulation produced primarily 30 AWG and finer with quick soldering characteristics at 390°C.	Motors, R.F. coils, relay, encapsulated coils, ignition coils, solenoids, low voltage transformers, layer and precision wound coils.
	Polyurethane Nylon 155*	PN155	MW 80	Polyurethane Nylon-155 is similar to the 155°C Polyurethane with the additional Nylon overcoat to improve the abrasion resistance and heat shock characteristics for coil and motor windings. Produced 10 AWG to 55 AWG, soldering temperatures are 430°C for 10 – 23 AWG, and 390°C for 24 – 55 AWG.	Appliance motors, relays, timer and clock coils, encapsulated coils, solenoids, toroid coils, random wound coils.

155°C	Polyurethane 155 Bondable Polyurethane Nylon 155 Bondable	PB155 PNB155	MW 131 MW 136	Bondable magnet wire is insulated copper wire with a superimposed film of thermoplastic bonding material. The heat or solvent sensitivity of this material makes possible the winding of coils of unusual shapes since the wire may be bonded turn to turn.	Self-supporting coils, voice coils, encapsulated coils, relays, yoke coils
180°C	Polyurethane 180*	P180	MW 82	Polyurethane-180 combines the thermal properties of a class 180°C insulation, while offering low temperature solderability at 390°C (24 AWG and finer).	Automotive relays, ignition coils, transformers and solenoids.
	Polyurethane Nylon 180*	PN180	MW 83	Polyurethane Nylon-180 offers excellent abrasion resistance for ferrite core coils and transformers, while exhibiting high temperature thermal stress and low temperature solderability at 430°C (14 – 23 AWG) and 390°C (24 AWG and finer).	Relays, pulse transformers, toroid coils, small appliance motors.
	Polyester-imide	PT	MW 30	Polyester-imide magnet wire is insulated with a Class H modified polyester resin. It has excellent thermal endurance, solvent resistance and exhibits a low coefficient of friction to improve windability. It requires mechanical or chemical stripping.	Appliance and tool motors, continuous operation coils, subfractional instrument and servo motors solenoids.
	Polyester Nylon*	PTN	MW 76	Polyester Nylon is a film insulation with a modified polyester basecoat and a nylon topcoat. Typical of a dual coat construction, advantage is taken of the high thermal properties of the polyester and the mechanical properties of the nylon.	Fractional and integral horsepower motors, coils and relays, control and dry transformers, encapsulated coils, D.C. field coils.
	Solderable Polyester*	SPT	MW 77	Solderable Polyester magnet wire is an ester-imide insulated wire which solders at 470°C. Since thermoplastic flow values equal or exceed 280°C, the insulation has shown excellent promise in transfer molding applications.	Special transformer coils, automotive coils, electronic coils.
	Solderable Polyester Nylon*	SPTN	MW 78	Solderable Polyester-Nylon magnet wire is a two-part insulation system in which ester-imide basecoat is overcoated with nylon. This wire solders at 455°C. The construction may be considered a substitute for applications where ester-imide insulation wire is used, with the added features of improved solvent resistance and improved windability.	Shaded-pole motor coils, special control coils, automotive coils.
	Polyurethane 180 Bondable Polyurethane Nylon 180 Bondable	PB180 PNB180	NONE MW 137	Same characteristics of the PB155 and the PNB155, but with the added thermal endurance of the Polyurethane and Polyurethane Nylon 180 base insulation.	Self-supporting coils, voice coils, encapsulated coils, relays, yoke coils

180°C	Polyester-imide Bondable*	PTB	NONE	Self-bonding polyester actually describes a number of possible constructions of polyester base insulation with a thermoplastic bond coat. The bond coat may be epoxy, polyester or polyamide. Keep in mind for design purposes that the addition of the bond coat does add one overall build level to the wire dimension	Television yoke coils, clutch and brake coils, helical and toroidal coils.
	Polyester-amide-imide Bondable*	APT	NONE		
200°C	Solderable Polyester Bondable*	SPTB	NONE		
	Glass Fibers Dacron Glass	GLASS DGLAS	MW 44 (RD) MW 43 (SQ & RECT) MW 45 (RD) MW 46 (SQ & RECT)	Both glass and dacron glass are a served filament on the magnet wire conductor. They are available as unvarnished or varnished with organic or silicone varnishes. The fibers may be served over bare conductor or over film constructions. The glass is a continuous filament glass yarn and the dacron glass is a combination of glass and polyester fibers. The advantage of the glass is its high resistance to overload burnout and the advantage of the dacron glass is its abrasion resistance and better flexibility than glass. The dacron glass can be purchased fused and unvarnished.	Dry transformers, Class B motors.
	Polyester 200*	PT200	MW 74	Polyester-200 is a modified theic-polyesterimide one-part system. It has high temperature thermal properties and good chemical resistance. Normally produced in sizes 34 -56 AWG.	Motors, small coils, transformers.
	Polyester A / I Topcoat*	APT	MW 35 (RD) MW 36 (SQ & RECT)	Polyester-amide-imide magnet wire is a two-part insulation consisting of a modified polyester basecoat with a superimposed amide-imide outer coating. This wire exhibits exceptional windability, heat shock resistance, and ability to withstand overloads. Chemical resistance to most solvents and insulating varnishes is extremely good. It is not softened by refrigerants and extractions are essentially zero.	Fractional and integral horse power motors(hermetic and open), automotive and hand tool armatures, dry type transformers.
	Polyester A / I Polyamideimide	APT IG	MW 35 MW 73	For inverter duty applications, this insulation is designated for use in motors that may be subject to voltage spikes. Available in sizes 14 – 30 AWG.	Rotating machines, Fractional and Integral HP Motors, Hermetic Motors, DC Motors, Power Tools, Dry Transformers, Electronic Coils.
	Polytetrafluoroethylene (Teflon*)	TEFLON	NONE	Teflon** has high heat resistance and excellent resistance to most solvents, acids and corrosive chemicals and a high dielectric constant.	Miniature rotating components and windings where severe environments are encountered.

240°C	Polyimide – ML*	ML	MW 16 (RD) MW 20 (SQ & RECT)	<p>ML is a film insulation made of polyimide resins. It is a Class 240°C thermal rated insulation with exceptional resistance to chemical solvents and burnout. The outstanding thermoplastic flow of over 400°C and its ability to withstand excessive overloads extends the use of magnet wire in extreme conditions. ML is unaffected by prolonged exposure to varnish solvents and its compatible with virtually all systems.</p>	<p>Fractional and integral horsepower motors, high temperature continuous duty coils and relays, hermetic and sealed units, heavy duty hand tool motors, encapsulated coils.</p>
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