

Magnet Wire Insulation Guide

THERMAL CLASS	INSULATION TYPE	MWS PRODUCT CODE	NEMA STANDARD (MW1000)	IEC STANDARD (60317)	FEDERAL SPECIFICATION (JW 1177)
105°C	Plain Enamel	PE	NONE	NONE	NONE
	Formvar*	F	MW 15 (RD) MW 18 (SQ & RECT)	60317-1(RD) 60317-17(SQ & RECT)	JW 1177/ 14 (RD) JW1177/ 16 (SQ & RECT)
	Formvar Bondable	FB	MW 19	60317-5	JW 1177/ 6
130°C	Polyurethane Nylon Bondable - 130	PE	NONE	NONE	NONE
155°C	Polyurethane - 155*	P155	MW 79	60317-20	JW 1177/ 41
	Polyurethane Nylon - 155*	PN155	MW 80	60317-21	JW 1177/ 42
	Polyurethane Bondable - 155*	PB155	MW 131	60317-35	NONE
	Polyurethane Nylon Bondable - 155	PNB155	MW 136	NONE	NONE
	Dacron Glass - 155	DGLAS 155	MW 45 (RD) MW 46 (SQ & RECT)	NONE(RD) 60317-60(SQ & RECT)	JW 1177/ 20 (RD) JW1177/ 25 (SQ & RECT)
180°C	Polyurethane - 180*	P180	MW 82	60317-51	NONE
	Polyurethane Nylon - 180*	PN180	MW 83	60317-55	NONE
	Polyester-imide*	PT	MW 30	60317-8	JW 1177/ 12
	Polyester-Nylon*	PTN	MW 76	60317-22	JW 1177/ 38
	Solderable Polyester*	SPT	MW 77	60317-23	JW 1177/ 39
	Solderable Polyester Nylon*	SPTN	MW 78	NONE	JW 1177/ 40
	Polyurethane Bondable - 180	PB180	MW 132	NONE	NONE
	Polyurethane Nylon Bondable - 180	PNB180	MW 137	NONE	NONE
	Polyester-imide Bondable	PTB	NONE	60317-37	NONE
	Polyester-amide-imide Bondable*	APTB	MW 102	60317-38	NONE
	Solderable Polyester Bondable	SPTB	NONE	60317-36	NONE
	Dacron Glass High Temp	DGLAS HT	MW 51 (RD) MW 53 (SQ & RECT)	NONE(RD) 60317-61(SQ & RECT)	JW 1177/ 32 (RD) JW1177/ 34 (SQ & RECT)
200°C	Polyester - 200*	PT200	MW 74	60317-42	JW 1177/43
	Polyester A/I Topcoat*	APT	MW 35 (RD) MW 36 (SQ & RECT)	60317-13(RD) 60317-29(SQ & RECT)	JW 1177/ 14 (RD) JW1177/ 13 (SQ & RECT)
	Polyester A/I Polyamideimide*	APTIG	MW 73	60317-13	NONE
240°C	Polyimide - ML*	ML**	MW 16 (RD) MW 20 (SQ & RECT)	60317-46(RD) 60317-47(SQ & RECT)	JW 1177/ 15 (RD) JW1177/ 18 (SQ & RECT)

* UL Recognized Insulations

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INSULATION CHARACTERISTICS	GENERAL APPLICATIONS
Plain Enamel was one of the earliest film insulations developed for automotive ignition coils. Today it is primarily used in musical instruments for pickup coils. It is manufactured to single build dimensions and stocked in sizes 41 to 43 AWG.	Pickup coils for guitars and other instruments
Formvar was an early synthetic insulation composed of modified polyvinyl resins designed for continuous operation at 105C. It has excellent abrasion resistance and is compatible with most varnishes and impregnating compounds.	Oil filled transformers, motors, solenoids, superconducting coils or other cryogenic applications
Formvar with a superimposed thermoplastic film for use in heat or solvent activated self-bonding coils.	Relays, yoke coils, self-supporting coils
Class 130°C solderable polyurethane with superimposed thermoplastic polyvinyl butyral film for heat or solvent activated self-bonding coils with excellent bond strength at room temperature.	Voice coils, yoke coils, self-supporting coils
Solderable film composed of modified polyurethane resins designed mostly for fine wire applications with excellent resistance to moisture and most solvents.	Relays, high frequency coils and transformers, solenoids, small motors
Solderable dual film composed of modified polyurethane resins with a polyamide (nylon) overcoat that provides improvement in severe winding operations.	Appliance motors, relays, torroidal coils, fractional HP motors
Solderable polyurethane or polyurethane with nylon overcoat and a superimposed thermoplastic butyral film for coils requiring Class F service. Coils may be bonded by heat or with denatured alcohol. Generally made as Type 1 insulation build equal to heavy overall diameter.	Voice coils, helical coils, inductors, self-supporting coils
Dacron Glass is a combination of glass and polyester fibers applied as a served filament over bare or film coated magnet wire and may be supplied with an epoxy varnish or as fused unvarnished to prevent fraying of the fibers.	Dry transformers, Class B motors
Polyurethane film designed for applications requiring high thermal resistance and low soldering temperature.	Relays, ignition coils, solenoids, small transformers
Polyurethane with polyamide (nylon) overcoat for applications requiring high thermal properties and chemical resistance. Soldering temperatures 430°C (14-23 AWG) or 390°C (24 AWG and finer).	Relays, pulse transformers, small appliance motors
Film insulation composed of modified polyester resins with excellent chemical resistance.	Solenoids, servo motors, small appliance motors
Dual film composed of modified polyester resins with a nylon overcoat. Combines continuous 180°C operating temperature and low coefficient of friction for superior winding and insertion properties.	Motor stators, fractional HP motors
Film insulation composed of modified polyestermide resins designed to solder at 470°C, generally made at 24 AWG and finer sizes.	High temperature relays, transformers, automotive coils
Dual film composed of modified polyestermide resins with nylon overcoat for superior performance where winding stresses may be severe. Designed to solder at 470°C, this insulation is made mostly in heavier gauge sizes.	Transformers, automotive coils, appliance motors
One part (Polyurethane) or dual (Polyurethane Nylon) insulation system with superimposed thermoplastic film combining high thermal resistance, solderability, and self-bonding features.	Self-supporting coils, relays, voice coils
These are wires that combine characteristics of various class 180°C film insulations with self-bonding feature. Bonding method depends on choice of bond coat. May be made as Type 1 (heavy diameter) or Type 2 (triple diameter) construction.	Voice coils, inductors, yoke coils, small motors
Like Dacron Glass 155 except treated with high temperature organic varnish. May be served over bare or film coated magnet wire. Available only in shaped or heavy round wire sizes.	Large generators and alternators, dry type transformers
One part film system composed of THEIC modified polyester resins capable of continuous 200°C operating temperature designed specifically for finer size wires.	Coils, relays, small transformers, small appliance motors
A dual film insulation of polyester-amide-imide with polyamideimide (A/I) overcoat for superior windability, heat shock resistance, solvent resistance, and overload protection.	General purpose motors, fractional and integral motors (hermetic and open), dry type transformers
A triple film system composed of THEIC modified polyester, a corona resistant shield coat, and polyamideimide (A/I) overcoat designed to withstand severe voltage stresses. Made as heavy build construction in round sizes 12 through 24 AWG.	Inverter duty motors, high voltage motors
Film composed of aromatic polyimide resin that features high cut through, exceptional chemical resistance, minimal outgassing and capable of continuous operation at 240°C in extremely harsh environments.	High temperature continuous duty coils, hermetically sealed relays, fractional and integral HP motors