Magnet Wire Insulation Guide

MWS Wire Industries

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
** Registered trademark of IST Industrial Summit Technology

THERMAL CLASS	INSULATION CHARACTERISTICS	GENERAL APPLICATIONS
105°C	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 44 gauge	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
130°C	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
155°C	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
180°C	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 polyesterimide 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 polyesterimide 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
200°C	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
240°C	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