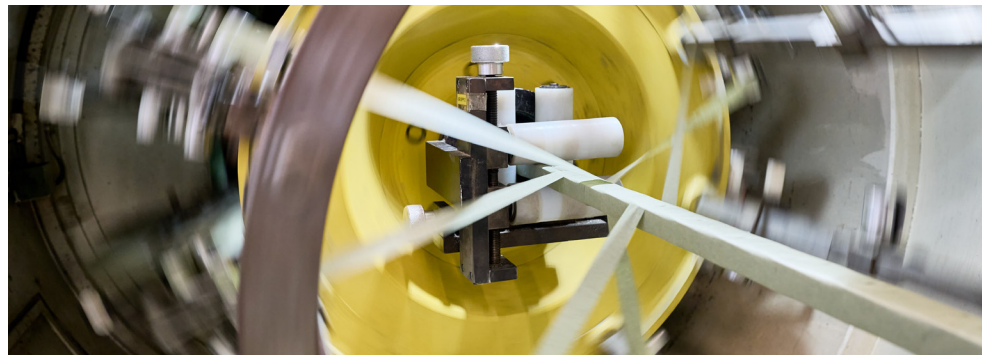




## Wrapped Magnet Wire Constructions

Wrapped Magnet Wire is the application of a single or double layer of insulating material over a bare or film-coated conductor. All conductors except paper wrapped are then heated, which fuses the insulation material to the conductor. Various tape materials are available to meet different applications and NEMA standards. Consult Table 1 for a list of materials, NEMA standards and wire shapes available.



### Typical applications include:

- > Motors and generators
- > Oil-filled transformers
- > Lifting magnets
- > Other applications requiring high thermal or mechanical protection

### Wrapped Magnet Wires provides the following benefits:

- > Abrasion resistance
- > Reliable physical separation between turns
- > Excellent electrical qualities

Wrapping magnet wire with glass or polyester glass provides increased abrasion resistance, as well as increased adhesion of secondary varnish. The fibers also create space between adjacent conductors providing improved dielectric insulation. Additional thermal capability can be obtained by adding varnish which saturates the fibers and provides a smooth outer surface.

Insulating tapes made with polyamide or polyimide provide excellent dielectric insulation between adjacent conductors, as well as high thermal resistance. Essex Solutions offers various lap constructions that meet MW60, 61, 64 and 65. These are typically wrapped over bare conductor, but can also be wrapped over film.

Film coated magnet wires have a lubricant applied over the insulation to allow it to slide more easily through automated winding equipment. However, wrapped wires do not have a lubricant, so appropriate winding speeds must be used to prevent damage during the winding process.



**TABLE 1**  
**Wrapped Magnet Wire Constructions**

NEMA STANDARD	DESCRIPTION	THERMAL CLASS	STANDARD MATERIAL	ROUND	RECTANGULAR OR SQUARE	WRAPPED OVER	
						BARE	FILM
MW 31-A	Paper	90,105	Various	X	-	X	X
MW 31-C							
MW 33-A	Paper	90,105	Various	-	X	X	-
MW 33-C							
MW 41-C	Glass fiber/varnish	155	Glass	X	-	X	X
MW 42-C	Glass fiber/varnish	155	Glass	-	X	X	X
MW 43-C	Glass fiber/silicone varnish	200	Glass	-	X	X	X
MW 44-C	Glass fiber/silicone varnish	200	Glass	X	-	X	X
MW 45-C	Polyester glass fiber	155	Dacron glass	X	-	X	X
MW 46-C	Polyester glass fiber	155	Dacron glass	-	X	X	X
MW 47-C	Polyester glass fiber/silicone varnish	200	Dacron glass	X	-	X	X
MW 48-C	Polyester glass fiber/silicone varnish	200	Dacron glass	-	X	X	X
MW 50-C	Glass fiber/high temperature varnish	180	Glass	X	-	X	X
MW 51-C	Polyester glass fiber/high temperature varnish	180	Dacron glass	X	-	X	X
MW 52-C	Glass fiber/high temperature varnish	180	Glass	-	X	X	X
MW 53-C	Polyester glass fiber/high temperature varnish	180	Dacron glass	X	-	X	X
MW 60-A	Aromatic polyamide paper covered	220	Nomex	-	X	X	-
MW 60-C							
MW 61-A	Aromatic polyamide paper covered	220	Nomex	X	-	X	-
MW 61-C							
MW 64-A	Aromatic polyamide tape covered	240	Kapton	-	X	X	-
MW 64-C							