



TEMCo Copper Magnet Wire - Data Sheet

Soderon® - 155°C temp class Polyurethane/Polyamide

Gauge:	10 to 45 AWG
Conductor:	Solid Round Copper
Pounds per 1000 feet:	ranges from 12.64 to 0.01304
Feet per pound:	ranges from 79.11 to 76715
Insulation Temp. Rating:	155°C
Enamel Type:	Polyurethane Base Coat / Polyamide Overcoat (no overcoat on 45 AWG)
Enamel Build:	Heavy Build (Except 45 AWG, which is single build)
Average Wire Diameter:	ranges from 0.0675 to 0.0025
Manufacturer:	Essex USA
Product Line:	Soderon 155
Color:	Red
Solder Process:	Solder without removing insulation.
Approvals:	NEMA Designation MW 80-C (MW 80-C on 45 AWG) IEC Designation 60317-21 (60317-20 on 45 AWG)

Applications: UL Recognized, File: E32638
Appliance motors, relays, timer and clock coils, encapsulated coils.

Product Description Soderon® combines the magnet wire insulation characteristics of polyurethane with the advantages of a polyamide (nylon) topcoat. With the nylon, Soderon® is still readily solderable, yet the solvent resistance and thermal stability of the insulation is excellent. In addition, the nylon improves windability and tolerates more severe winding operations. Soderon® is an excellent choice for automatic winding machines.

Corporate Headquarters:	TEMCo - Tower Electric Motor Company	41484 Christy Street	Fremont, CA 94538
Inside USA: (877) 474-8209	International: (510) 490-2187	Fax: (510) 490-1507	www.temcoindustrialpower.com

Specifications may vary slightly from the information provided. For certified drawings and specifications, please contact a TEMCo representative.

ENGINEERING HIGHLIGHTS

1. THERMAL CLASSIFICATION

SODERON® FS/155 magnet wire is a UL Listed Class 155 material when measured in accordance with the ASTM D 2307 test method.

2. THERMOPLASTIC FLOW

Thermoplastic flow (cut-thru) temperature of SODERON® FS/155 magnet wire is 228°C; well above maximum process conditions found in molded coil work, trickle impregnation processes and standard preheat varnish cycles specified for normal Class 155 systems.

3. SOLDERABILITY

SODERON® FS/155 magnet wire solders faster than any other solderable product without the excessive buildup of enamel residue associated with other solderable type resin coatings.

4. WINDABILITY

Flexibility and adhesion properties of the SODERON® FS/155 magnet wire film, because of its tough nylon topcoat, exceeds most winding applications and requirements.

5. ELECTRICAL

SODERON® FS/155 magnet wire insulation exhibits high dielectric strength.

6. CHEMICAL

The solvent resistant properties of SODERON® FS/155 are suitable for most classes 105, 130 and 155 varnishes, encapsulants, and treating resins.

APPLICATION

SODERON® FS/155 fast solder magnet wire is designed to be utilized where the particular coil or component design may utilize the unique solder stripping property.

SODERON® FS/155 magnet wire with its improved fast solder polyurethane film, over coated with nylon, surpasses standard Class 130 and 155 in its speed of solderability and can be used in a wide array of wire applications. The film lends itself to the precise process control required in manufacturing many electrical/electronic devices.

As with all solderable magnet wire, care must be exercised in the application of SODERON® FS/155 magnet wire since this material does not exhibit overload resistance properties like most non-solderable Classes 105, 130 and 155 resin.

SODERON® FS/155 (Sizes 7 to 31 AWG) may be considered for the following applications:

- Bobbin wound and paper section coils
- Molded and encapsulated coils
- Small motors, armature and fields
- Automotive coils
- Toroidal coils



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THERMAL PROPERTIES

	Typical Performance	Required Performance
HEAT SHOCK RESISTANCE	20%, 2xD @ 175°C, no cracks	20%, 3xD, no cracks
SOLDERABILITY	2.5 seconds @ 390°C	less than 3 seconds @ 390°C
THERMAL STABILITY	167°C	155°C minimum
THERMOPLASTIC FLOW	237°C	200°C

PHYSICAL PROPERTIES

ABRASION RESISTANCE

Repeated Scrape	N/A	N/A
Unidirectional	N/A	N/A

ADHESION AND FLEXIBILITY

CONDUCTOR ELONGATION	No topcoat or basecoat cracks.	20%, 3XD, no cracks
SPRINGBACK	26%	20% minimum

ELECTRICAL PROPERTIES

CONTINUITY	less than 0 faults/100ft. @ 350V DC	less than 15 faults/100ft. @ 350V DC
DIELECTRIC BREAKDOWN VOLTAGE		
Room Temperature	3780 volts, avg.	1220 volts, minimum
Rated Temperature	2696 volts, avg.	915 volts, minimum

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Recommended Winding Tension

Whole AWG Size	NEMA NOM. BARE O.D. Inches	Maximum Tension Grams
30	0.01000	358
31	0.00890	282
32	0.00800	228
33	0.00710	180
34	0.00630	142
35	0.00560	112
36	0.00500	89
37	0.00450	72
38	0.00400	57
39	0.00350	44
40	0.00310	34
41	0.00280	28
42	0.00250	22
43	0.00220	17
44	0.00200	14
45*	0.00176	11
46*	0.00157	8.8
47*	0.00140	7
48*	0.00124	5.5
49*	0.00111	4.4
50*	0.00099	3.5
51*	0.00088	2.8
52*	0.00078	2.2
53*	0.00070	1.7
54*	0.00620	1.4

Note: This table is provided as a general guide only. The appropriate winding tensions may vary depending on a number of factors, including product application. The type of winder, payoff device, and type of coil may vary the tensions to be used. In general, use the minimum tension that provides a good winding. Some minor variations in the softness of the wire from one lot to another may also dictate minor adjustments in winding tension.

Using the yield strength of fully annealed wire as a point of reference, tensions beyond these may cause excessive stretching and high coil resistance.

Maximum recommended tensions are based upon 10,000 p.s.i. for copper.

* Theoretical dimensions for sizes 45 AWG and finer.