# Inserkon® Magnet Wire

## General description

INSERKON® magnet wire is specially designed to be used in high speed winding machines, as well as in those processes where insertion and bobbin forming is difficult. This wire offers excellent winding characteristics and a very low coefficient of friction. The insulation is composed of a basecoat of Polyesterimide resin, and a top coat of Polyamideimide, therefore it has excellent dielectric, thermal, chemical and hermetic characteristics.

This product is manufactured in two insulation builds - Single and Heavy, and is offered in either Copper or Aluminum conductors.

The INSERKON® magnet wire with a copper conductor is recommended for use in electrical equipment with a thermal class of up to 200 °C. With an aluminum conductor, the thermal class is 220 °C.

| UL Designation | Thermal class (°C) | NEMA MW-1000 |
|---|---|---|
| PAI 200 | 200 Cu / 220 Al<br>200 Cu / 220 Al | MW 35<br>MW 73 |

## Specifications

Meets the requirements set forth in the following standards:

- NMX-J-482
- NEMA MW 1000, MW 35 and MW 73*
- IEC 317-13
- UL recognition under file E102627

## Characteristics

- Excellent performance in high speed winding machines and in processes where insertion and bobbin forming is difficult
- Very low coefficient of friction
- High scrape resistance
- Excellent adherence and flexibility
- Resistant to high temperatures
- High resistance to electrical overloads
- Resistant to R-12, R-22 and R-134 refrigerants used in refrigeration compressors*
- Very high degree of dielectric strength, even in humid conditions
- Highly resistant to heat shock
- Great resistance to thermoplastic flow
- Resistant to solvents

## Range of gauges

| Copper Conductors | | |
|---|---|---|
| Insulation build | AWG | mm |
| Single | 4 - 42 | 5.189 - 0.064 |
| Heavy | 4 - 42 | 5.189 - 0.064 |

| Aluminum Conductors | | |
|---|---|---|
| Insulation build | AWG | mm |
| Single | 14 - 24 | 1.628 – 0.511 |
| Heavy | 14 - 28 | 1.628 – 0.321 |

## Principal applications:

AUTOMOTIVE

- Alternators
- Field coils
- Starter motors
- All types of small motors (windshield wipers, power windows, etc.)

LOW POWER AND FRACTIONAL MOTORS

- Open
- Hermetic (refrigeration)*
- Starter coils

MOTORS IN GENERAL

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# TYPICAL TEST VALUES FOR AN INSERKON® HEAVY 18 AWG WIRE

Typical values only, not intended to be used as a specification

| TEST | SPECIFICATION (ANSI / NEMA MW 1000) MW 35-C | TEST METHOD | TYPICAL RESULTS |
|---|---|---|---|
| **Electrical** | | | |
| Dielectric Strength | ≥ of 5700 V | NEMA | 15900 V |
| Dielectric Strength at thermal rating | ≥ 4275 V | NEMA | 8000 V |
| Continuity | ≤ 5 discontinuities per 100 feet @ 1500V | NEMA | 0 (Zero) |
| **Mechanical** | | | |
| Elongation | Minimum of 32% | NEMA | 40% |
| Adherence and Flexibility | 20% sudden jerk, rolled 10 turns around a mandrel 3 times the diameter of the wire, visual inspection, no cracks or exposed conductor | NEMA | No cracks @ 25% elongation and 2X diameter |
| Springback (°) | ≤ 58 | NEMA | 54° |
| Unidirectional Abrasion | Average of 3 measurements @ 0°, 120° and 240°; ≥ 1150 grams | NEMA | 1750 grams |
| Repetitive Abrasion | Not specified (Cycles) | Weight of 700 grams | Avg. ≥ 280; minimum ≥ 190 |
| Coefficient of Friction | Not specified | Weight of 1000 g | Avg. ≤ 0.033; Max. reading of ≤ 0.050 |
| Twisted pair pull | Not specified (lb) | | ≤ 4 lb |
| Windability | Not specified (Cycles) | 1300 g, 0.200 mandrel, 1500 V | Avg. ≥ 25; Min. ≥ 16 |
| **Chemical** | | | |
| Retained Dielectric Strength | (Conditioning in R-22) ≥ 5700 V | NEMA | 5900 V |
| Resistance to Solvents | Immersion for 24 hours, after heating to 125 °C<br>Naphtha<br>Toluene<br>Ethylic Alcohol<br>5% Sulfuric Acid<br>Perchlorethyline<br>Xylene | Not soften sufficiently to expose the bare conductor | <br>Passes<br>Passes<br>Passes<br>Passes<br>Passes<br>Passes |
| Solubility | Not soften enough to expose conductor | NEMA | Passes |
| R-22 Refrigerant Extraction* | ≤ 0.25% | | 0.20% |
| **Thermal** | | | |
| Thermal Stability | 20000 hours @ 200 °C | ASTM | 210 ºC |
| Heat Shock | 20% sudden jerk, rolled 10 turns around a mandrel 3 times the diameter of the wire, before heating for ½ hour @ 220 ºC | NEMA | No cracks @ 20% elongation, 3X diameter and 1 hour at 250 °C |
| Thermoplastic Flow | ≥ 300 ºC | NEMA | Avg. of 390 |

** Under specific requirement*

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