Magnet Wire/Winding Wire
Product Application and
Packaging Data

www.superioressex.com
Thank you for your interest in SUPERIOR ESSEX Magnet Wire/Winding Wire! As the global leader in magnet wire/winding wire, it is our intent to provide our customers with the highest quality products available on the market. All of our magnet wire facilities have stringent quality standards that constantly strive to meet or exceed our customer's expectations of our products. The quality systems of all magnet wire manufacturing facilities have been registered as compliant to both ISO 9002 and QS-9000. As the design center for magnet wire products, the Fort Wayne, Indiana headquarters holds both ISO 9001 and QS-9000 registrations. Numerous awards related to SUPERIOR ESSEX products and service levels have been received from customers in a wide variety of industries.

This Product Application and Packaging Data Guide should be useful for evaluation of all of the various magnet wire insulations available at SUPERIOR ESSEX, as well as in the selection of the proper packaging to fit the application during the winding process.

The magnet wire properties governing proper selection not only require consideration of the end use conditions, but system compatibility and ease of use in production. Solderability, abrasion resistance, bondability, flexibility, insulation builds, etc., are all typical production and design considerations. Higher temperature requirements and more complex systems as well as regulatory requirements dictate the need for knowledgeable selectivity of magnet wire.

Please contact your SUPERIOR ESSEX Magnet Wire sales representative for additional information or specific questions about the products in this guide.

NOTICE: All sales subject to Essex Group, Inc. Standard Terms and Conditions of Sale. See back cover.
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** DuPont Registered Trademark
Formvar
Polyvinyl Acetal-Phenolic

Class 105

NEMA MW 15-C/A (Round)
MW 18-C/A (Square & Rectangular)

Typical Applications
• Oil-filled transformers
• Motors
• Random wound coils
• Solenoids

General Properties
Formvar is a synthetic enamel composed of polyvinyl acetal and phenolic resins.
Formvar’s hot oil resistance sets it apart from all other magnet wire insulations. The flexibility, adhesion and abrasion scrape resistance of Formvar film is excellent. Its electrical properties are very good and it is resistant to common solvents. While Formvar has been replaced by GP/MR-200® and Nytherm® in many applications, Formvar continues to be the recommended film insulation most commonly used in oil-filled transformers.

<table>
<thead>
<tr>
<th>Sizes Available</th>
<th>Standard Type</th>
<th>Abbreviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Round (14-23 AWG)</td>
<td>Single Build</td>
<td>S. FORM</td>
</tr>
<tr>
<td>(4-23 AWG)</td>
<td>Heavy Build</td>
<td>H. FORM</td>
</tr>
<tr>
<td>Square and Rectangular</td>
<td>Heavy Build</td>
<td>H. FORM</td>
</tr>
</tbody>
</table>

Soderbond® N
Polyurethane/Polyamide/Polyvinyl Acetate

Class 105

NEMA MW 29-C

Typical Applications
• Helical and toroidal coils
• Solenoid coils
• Voice coils

General Properties
Soderbond® N uses a polyurethane basecoat and a polyamide topcoat followed by a bondcoat of polyvinyl acetate. This insulation system has a low temperature thermoplastic bondcoat which may be activated by heat or solvent (typically isopropyl alcohol). The electrical, chemical, physical and thermal properties of bondable wire are equivalent to those of the base insulation, except of course for the melting point or solvent resistance of the bondcoat. The bond strength is excellent at room temperatures. For applications requiring retention of bond strength at elevated temperatures, Polybondex® with type M or S bondcoat is recommended.

<table>
<thead>
<tr>
<th>Sizes Available</th>
<th>Standard Type</th>
<th>Abbreviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Round (16-31 AWG)</td>
<td>#1 Heavy Build Overall</td>
<td>SDBN-N #1</td>
</tr>
<tr>
<td>(18-28 AWG)</td>
<td>#2 Triple Build Overall</td>
<td>SDBN-N #2</td>
</tr>
</tbody>
</table>
Soderon®/130
Soderon®/155

Polyurethane/Polyamide

UL Recognized Class 130/155 Product

NEMA MW 28-C (CLASS 130)
MW 80-C (CLASS 155)

Typical Applications
Soderon® has excellent solderability and the 130/155°C thermal class. It has wide use in coils and small motors. It is not recommended where severe overloads are experienced.
• Appliance motors
• Relays
• Timer and clock coils
• Encapsulated coils

General Properties
Soderon® combines the magnet wire insulation characteristics of Soderex® with the advantages of a 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 provides improvement in the windability and tolerates more severe winding operations. Soderon is an excellent choice for automatic winding machines.

Soderex®/155

Polyurethane

UL Recognized Class 155 Product

NEMA MW 79-C

Typical Applications:
Soderex®/155 is widely used in coils and motor windings where severe overloads are not experienced and where solderability is important.
• Small motors
• Relays
• Electronic coils

Sizes Available

<table>
<thead>
<tr>
<th>Sizes Available</th>
<th>Standard Type</th>
<th>Abbreviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Round (35-46 AWG)</td>
<td>Single Build</td>
<td>S. Sdx/155</td>
</tr>
<tr>
<td>(35-46 AWG)</td>
<td>Heavy Build</td>
<td>H. Sdx/155</td>
</tr>
</tbody>
</table>

General Properties
Soderex®/155 is a polyurethane insulation which allows soldering without prior removal of the film from the wire. Soderex/155 has the equivalent physical and electrical properties of most other synthetic films. On heavier sizes the limitation of this film’s flexibility and adhesion is approached. Soderex/155 has excellent resistance to moisture and resists most common solvents including those used in synthetic baking varnishes.
Soderon®/180
Polyurethane/Polyamide
UL Recognized Class 180 Product

NEMA MW 83-C

Typical Applications
Soderon®/180 magnet wire is designed for applications requiring high thermal resistance and low soldering temperatures. Care must be exercised in the application of Soderon/180 magnet wire since this material does not exhibit overload resistance properties of most non-solderable Class 105, 130, 155 and 180 resin systems.

• Bobbin wound and paper section coils
• Molded and encapsulated coils
• Small motors, armatures and fields
• Automotive coils
• Toroidal coils
• Specialty power transformers

General Properties
Thermoplastic flow (cut-through) temperature of Soderon®/180 magnet wire is in the 250°C plus range; well above maximum process conditions found in molded coil work, trickle impregnation processes and standard pre-heat varnish cycles specified for normal Class 130, 155 and 180 systems.

Soderon/180 magnet wire solder strips readily without excessive build up of solder dross associated with other solderable type resin coatings. It solders consistently at temperatures as low as 390°C.

Flexibility and adhesion properties of the Soderon/180 magnet wire film are more than adequate for most wire winding applications.

Soderon/180 magnet wire insulation exhibits high dielectric strength retention under high humidity conditions. Also, the low dissipation factor of Soderon/180 magnet wire at high frequencies makes it a prime candidate for RF coil applications.

The solvent resistance properties of Soderon/180 are suitable for most Class 105, 130, 155, and 180 varnishes, encapsulants, and treating resins. It has improved salt water resistance compared to other solderable wires.

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Soderex®/180
Polyurethane
UL Recognized Class 180 Product

NEMA MW 82-C

Typical Applications
Soderex®/180 magnet wire is designed for applications requiring both high thermal resistance and low soldering temperatures. Care must be exercised in the application of Soderex/180 magnet wire since this material does not exhibit overload resistance properties of most non-solderable Class 105, 130, 155 and 180 resin systems.

• Relays
• Automotive Coils
• Specialty Power Transformers

General Properties
Thermoplastic flow (cut-through) temperature of Soderex®/180 magnet wire is in the 250°C plus range; well above maximum process conditions found in molded coil work, trickle impregnation processes and standard pre-heat varnish cycles specified for normal Class 130, 155 and 180 systems.

Soderex/180 magnet wire solder strips readily without excessive build up of solder dross associated with other solderable type resin coatings. It solders consistently at temperatures as low as 390°C.

Flexibility and adhesion properties of the Soderex/180 magnet wire film are more than adequate for most wire winding applications.

Soderex/180 magnet wire insulation exhibits high dielectric strength retention under high humidity conditions. Also, the low dissipation factor of Soderex/180 magnet wire at high frequencies makes it a prime candidate for RF coil applications.

The solvent resistance properties of Soderex/180 are suitable for most Class 105, 130, 155, and 180 varnishes, encapsulants, and treating resins. It has improved salt water resistance compared to other solderable wires.
Solidex®
Modified Polyester-imide

UL Recognized Class 180 Product
NEMA MW 77-C

Typical Applications
Solidex® is designed for those special coil applications where solderability is coupled with a need for high thermal resistance. Solidex is not recommended for in-slot motor windings or applications subject to high winding stresses.

Specific applications:
- Special transformer coils
- Shaded pole motor coils
- Automotive coils
- Electronic coils

Sizes Available
<table>
<thead>
<tr>
<th>Standard Type</th>
<th>Abbreviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single Build</td>
<td>S. Solidex</td>
</tr>
<tr>
<td>Heavy Build</td>
<td>H. Solidex</td>
</tr>
</tbody>
</table>

General Properties
Solidex® magnet wire is produced by insulating the conductor with a sole coat of a solder strippable, modified polyester resin. Physical properties are adequate for most coil applications. More severe winding requirements such as in-slot stator windings are not recommended without thorough evaluation. The Solidex film may be readily stripped from the conductor by immersing in an 850°-950°F solder pot; care must be exercised in preventing the film from overcuring due to poor immersion techniques.

Solidon®
Modified Polyester-imide/Polyamide

UL Recognized Class 180 Product
NEMA MW 78-C

Typical Applications
Solidon® is designed for those special coil applications where solderability is coupled with a need for high thermal resistance. The application potential for Solidon (compared to Solidex®) is enhanced by the addition of the polyamide overcoat to the high temperature modified polyester basecoat.

Specific applications:
- Shaded pole motor coils
- Special control coils
- Automotive coils

Sizes Available
<table>
<thead>
<tr>
<th>Standard Type</th>
<th>Abbreviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single Build</td>
<td>S. Solidon</td>
</tr>
<tr>
<td>Heavy Build</td>
<td>H. Solidon</td>
</tr>
</tbody>
</table>

General Properties
Solidon® magnet wire consists of a nylon topcoat over a solderable, high temperature modified polyester-imide.

The solder stripping characteristic of the composite has been optimized for processing in a solder pot at 850°-950°F. Physical properties are adequate for most coil applications. More severe winding requirements such as in-slot stator winding are not recommended without thorough evaluation. The electrical properties are influenced slightly by the hygroscopic nature of the nylon topcoat.
Nytherm®
Polyester/Polyamide
UL Recognized Class 180 Product

NEMA MW 76-C/A

Typical Applications
Nytherm® is resistant to scrapes and has excellent windability. This makes it a logical choice for high speed automatic winding equipment. Nytherm also offers excellent hot staking characteristics as well as termination by flame welding and insulation piercing terminals.
• Fractional and integral horsepower motors
• Coils and relays
• Control and dry-type transformers
• Encapsulated coils
• DC field coils

General Properties
Nytherm® is a film insulation with a modified polyester basecoat and a nylon topcoat. Typical of dual-coat construction, advantage is taken of the high thermal properties of the polyester and the mechanical properties of the nylon. Introduced to the motor industry by Essex® over three decades ago, it has become the standard of non-hermetic, fractional horsepower motors. This insulation offers the advantage of thermal endurance, high thermoplastic flow and excellent burnout performance. In the case of Nytherm, a 180°C thermal life and its outstanding burnout make it suitable for almost all motor applications except those operating in refrigerants or high moisture environments.

Sizes Available* Standard Type Abbreviation
Round (14-33 AWG) Single Build S. Nyth
(13-30 AWG) Heavy Build H Nyth

Polybondex®
Polyester/Polyamideimide/Bondcoat
UL Recognized Class 180 Product

NEMA MW 1000†

Typical Applications
• Clutch and brake coils
• Helical and toroidal coils
• Motor field coils
• Deflection yoke coils

Sizes Available* Standard Type Abbreviation
Round (13-32 AWG) #1 Heavy Build Overall PBX #1
(13-30 AWG) #2 Triple Build Overall PBX #2

*Polybondex G 13-27 AWG

Product Constructions Available

<table>
<thead>
<tr>
<th>Tradename</th>
<th>Thermal Class</th>
<th>Insulation: Bondcoat</th>
</tr>
</thead>
<tbody>
<tr>
<td>Polybondex T Bond M</td>
<td>180°C</td>
<td>Polyester: Epoxy (PBX-T Bond M)</td>
</tr>
<tr>
<td>Polybondex T Bond S</td>
<td>180°C</td>
<td>Polyester: Aromatic Polyamide (PBX-T Bond S)</td>
</tr>
<tr>
<td>Polybondex G Bond M</td>
<td>180°C</td>
<td>Polyester/amide-imide: Epoxy (PBX-G Bond M)</td>
</tr>
<tr>
<td>Polybondex G Bond S</td>
<td>180°C</td>
<td>Polyester/amide-imide: Aromatic Polyamide (PBX-G Bond S)</td>
</tr>
</tbody>
</table>

†Referenced for dimensional data only.

General Properties
Polybondex® describes a number of possible constructions of bondable wire having a GP/MR-200® or Thermalex 200® base insulation with a thermoplastic bondcoat. The bondcoat may be epoxy or aromatic polyamide. The bond strength and “melt” temperatures required will define the proper bondcoat to use. Both bondcoats have excellent bond strength at room temperatures. Bond S should be used where bond strength is more critical at elevated temperatures. The type M bondcoat may be activated by solvent (typically methylethyl ketone) or heat while the type S bondcoat is heat activated. Only the Polybondex bondcoat allows the use of resistance, induction or radiant heating to flow the bond. The electrical, chemical, physical and thermal properties are equivalent to GP/MR-200 or Thermalex 200. Typically, the addition of the bondcoat adds one overall build level to the wire dimension.
**GP/MR-200**

**Polyester/Polyamideimide**

UL Recognized Class 200 Product (Copper)

UL Recognized Class 220 Product (Aluminum)

**NEMA MW 35-C/A (Round)**

**MW 36-C/A (Square & Rectangular)**

**MW 73-C/A (Hermetic Round)**

### Typical Applications

- Fractional and integral horsepower motors (hermetic and open)
- Automotive and power tool motors
- General purpose motors
- Dry-type transformers
- Large coil applications – unvarnished, varnished or encapsulated
- Electronic Coils

### General Properties

GP/MR-200® is a multi-purpose film insulation which has a modified polyester basecoat and a polyamideimide topcoat. This combination provides a film insulation which has physical toughness, excellent dielectric properties, and superior chemical resistance to common solvents and refrigerants. Thermal properties of over 200°C qualify it for severe thermal overload applications. Compared to nylon overcoated polyester, the properties most improved are physical moisture, chemical and thermal resistance. GP/MR-200 is an extremely moisture resistant film insulation coating, suitable for many uses including open motor, high moisture application and hermetic applications. Other outstanding properties include thermal life, thermoplastic flow, burnout and heat shock. This product is the standard of excellence for motor repair, maximum result, and minimum reject applications. It is impressive because it couples the extra advantages of high moisture resistance with ease of insertion.

### Sizes Available

<table>
<thead>
<tr>
<th>Standard Type Abbreviation</th>
<th>Standard Type</th>
<th>Abbreviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heavy Build H. GP/MR-200</td>
<td>(4-36 AWG)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Square and Rectangular</td>
<td>H. GP/MR-200</td>
</tr>
</tbody>
</table>

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**Ultra Shield™ Plus**

**Polyester/Polyamideimide**

UL Recognized Class 200 Product

**NEMA MW 35-C**

### Typical Applications

Ultra Shield™ Plus magnet wire has been specifically designed for use in motors that may be subjected to higher voltage spikes present in inverter duty applications. The combination of the modified polyester basecoat and polyamideimide topcoat provides an insulation system with outstanding toughness and dielectric properties. Ultra Shield Plus magnet wire has improved voltage endurance and thermal properties compared to standard NEMA MW 35-C magnet wire, while retaining superior chemical resistance to common solvents and refrigerants. Ultra Shield Plus conforms to all of the requirements of NEMA MW 35-C.

Ultra Shield Plus magnet wire is recommended for various end uses as follows:

- **Rotating Machines**
  - Fractional and Integral HP Motors, Hermetic Motors, DC Motors, Power Tools, Automotive Alternators and Generators
- **Transformers**
  - All dry type, Class 105 through 200, Control Type
- **Electronics**
  - All types of coils, Class 105 through 200

### General Properties

Ultra Shield™ Plus magnet wire has excellent thermoplastic flow (cut-thru) properties, with typical test values in excess of 390°C. Ultra Shield Plus magnet wire has been extensively wound in various motor applications and has been highly commended for its superior windability performance.

Voltage endurance is the area where Ultra Shield Plus magnet wire really excels. Testing with sinusoidal and with inverter waveshapes shows that Ultra Shield Plus magnet wire lasts many times longer than standard NEMA MW 35-C insulation. While no standards for this type of testing have been universally accepted, our testing shows dramatic improvement in insulation life, especially under severe duty applications at higher temperatures.

Ultra Shield Plus magnet wire has been tested for resistance to R-22 refrigerant and the results show it to be compatible for hermetic systems. Insulation piercing, hot staking, and flame welding processes can all be used successfully with Ultra Shield Plus magnet wire. If the connection is to be soldered the insulation must be removed prior to soldering.
**Thermalex 200®**

Polyester

UL Recognized Class 200 Product

**NEMA MW 74-C/A**

**Typical Applications**

The principal application of Thermalex 200® polyester is in fine wire where a Class 200 construction is desired and solderability is not a requirement.

- Small appliance and power tool motors
- Continuous operation coils
- Encapsulated coils
- Sub-fractional instrument and servo-motors

**Sizes Available**

<table>
<thead>
<tr>
<th>Standard Type</th>
<th>Abbreviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single Build</td>
<td>S. Thermalex 200</td>
</tr>
<tr>
<td>Heavy Build</td>
<td>H. Thermalex 200</td>
</tr>
</tbody>
</table>

**General Properties**

Thermalex 200® is a Class 200 insulated fine and ultra-fine magnet wire. This wire is manufactured with a thermally stable, modified polyester film and has excellent physical, chemical and electrical properties for small coils operating at high temperature.

The physical properties of flexibility, abrasion resistance, and adhesion compare favorably with Formvar.

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**Allex®**

Aromatic Polyimide

UL Recognized Class 240 Product

**NEMA MW 16-C (Round)**

**MW 20-C (Square & Rectangular)**

**Typical Applications**

Whenever high temperatures and extreme overload or ambient conditions are required, Allex® magnet wire may be used.

- Fractional and integral horsepower motors
- High temperature continuous duty coils and relays
- Hermetic and sealed units
- Heavy duty hand tool motors
- Encapsulated coils

**Sizes Available**

<table>
<thead>
<tr>
<th>Standard Type</th>
<th>Abbreviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single Build</td>
<td>S. Allex</td>
</tr>
<tr>
<td>Heavy Build</td>
<td>H. Allex</td>
</tr>
</tbody>
</table>

**General Properties**

Allex® is a film-coated magnet wire made with aromatic polyimide resin. It is a Class 240 insulation with exceptional resistance to chemical solvents and burn-out. It will operate at temperatures in excess of 240°C for intermittent duty. The outstanding thermoplastic flow of over 400°C and its ability to withstand excessive overloads extends the use of magnet wire in extreme conditions. Allex is unaffected by prolonged exposure to varnish solvents and is compatible with most systems.
Glass Fibers

Glass and Dacron®

CLASS 155 Epoxy Varnish
CLASS 180 Polyester Varnish
CLASS 200 Silicone Varnish

Class 155 Epoxy Varnish
Class 180 Polyester Varnish
Class 200 Silicone Varnish

NEMA MW 41-C thru MW 48-C
MW 50-C thru MW 53-C

General Properties

Both glass and Dacron® glass can be served on either the bare magnet wire conductor or film construction. Dacron glass is available as fused unvarnished, while glass or Dacron glass is available varnished with epoxy (as standard), hi-temp. organic polyester, or silicone varnish. The glass is a continuous filament glass yarn and the Dacron glass is a combination of glass and polyester fibers. The advantage of the glass is its high resistance to overload burnout and the advantage of the Dacron glass is its abrasion resistance and increased flexibility.

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Nomex® Type 910

Aromatic Polyamide Paper

NEMA To be established

Typical Applications

Nomex® Type 910 paper, a newer product, is not UL-recognized and is designed specifically for the following applications:

- Liquid-immersed transformers with fluid temperatures up to 160°C

Sizes Available

<table>
<thead>
<tr>
<th>Standard Type</th>
<th>Abbreviation</th>
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</thead>
<tbody>
<tr>
<td>Single Build</td>
<td>SG</td>
</tr>
<tr>
<td>Double Build</td>
<td>DG</td>
</tr>
<tr>
<td>Single Build</td>
<td>SDG</td>
</tr>
<tr>
<td>Double Build</td>
<td>DDG</td>
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Sizes Available

<table>
<thead>
<tr>
<th>Standard Type</th>
<th>Abbreviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.0015 Nomex</td>
<td>NMX</td>
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Sizes Available

<table>
<thead>
<tr>
<th>Standard Type</th>
<th>Abbreviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Square and Rectangular 0.0015 Nomex with 50% Lap</td>
<td>NMX</td>
</tr>
</tbody>
</table>

General Properties

Nomex® Type 910 may be helically wrapped around magnet wire conductor of copper or aluminum in the same manner as conventional paper. A 1.5 mil thick tape applied with a 50% overlap is the most popular and recommended construction.

Nomex type 910 paper has been tested and provides excellent abrasion resistance compared to paper of the same weight basis.

The dielectric strength of the unimpregnated paper is superior to conventional paper products in both AC and impulse conditions.

** DuPont Registered Trademark
**Nomex® Type 410**

Aromatic Polyamide Paper

Class 220

NEMA MW 60-C/A (Square & Rectangular)  
MW 61-C/A (Round)

**Typical Applications**
- Dry-type or oil-filled transformers
- Lifting magnets
- Form wound coils

**General Properties**

Nomex® paper has the outstanding combination of physical toughness, chemical and moisture resistance as well as excellent high temperature dielectric breakdown strength. It is often used as a replacement for conventional paper where temperature requirements have increased. Nomex paper has a higher thermal rating than other papers and insulations of this type with the exception of Polyimide Tape or Kapton® polyimide fused tape. Nomex paper will retain at least 300 v/mil dielectric breakdown strength and 50% of its initial tensile strength after 10 years at 250°C.

**Sizes Available**

<table>
<thead>
<tr>
<th>Standard Type</th>
<th>Abbreviation</th>
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</thead>
<tbody>
<tr>
<td>Round (1/0-9 AWG)</td>
<td>0.002 NOMEX</td>
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<tr>
<td>Square and Rectangular</td>
<td>50% lap</td>
</tr>
</tbody>
</table>

**Polyimide Tape / Kapton®**

Polyimide Tape, Fused

Class 220

**Typical Applications**
- Submersible oil well pump motors
- Traction motors
- Alternator/motor off-highway construction units
- Rolling mill motors
- Lift truck motors

**Sizes Available**

<table>
<thead>
<tr>
<th>Standard Type</th>
<th>Abbreviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Round (2-10 AWG)</td>
<td>1 mil Polyimide Tape with 1/2 mil FEP adhesive</td>
</tr>
<tr>
<td>Square and Rectangular</td>
<td>50% lap</td>
</tr>
</tbody>
</table>

**General Properties**

Polyimide tape is covered with a thin coating of Fluorinated Ethylene Polymer (FEP) on either one or both sides of the film to provide adhesion. The principal advantages of this served tape insulation is its uniform, pinhole-free covering and thermal stability. It has exceptional thermoplastic flow (cut-thru) resistance under extreme temperature and pressure conditions. This tightly sealed polyimide tape insulation offers excellent moisture protection and because it is smooth and thin, it has a space advantage over glass, Dacron® glass, paper or fiber over film constructions. It is compatible with most standard varnishes and is highly resistant to solvent attack.

**DuPont Registered Trademark**
Packaging Data
## Packaging Reference Guide

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</tr>
</thead>
<tbody>
<tr>
<td>03</td>
<td>3&quot; x 3 1/2&quot; Spool</td>
<td>34 – 45</td>
<td>2</td>
<td>24</td>
<td>30</td>
</tr>
<tr>
<td>04</td>
<td>4 3/4&quot; x 3 1/2&quot; Spool</td>
<td>34 – 44</td>
<td>5</td>
<td>8</td>
<td>20</td>
</tr>
<tr>
<td>06</td>
<td>6&quot; x 3 1/2&quot; Spool Box</td>
<td>12 – 44</td>
<td>8</td>
<td>6</td>
<td>30</td>
</tr>
<tr>
<td>76</td>
<td>6&quot; x 3 1/2&quot; Spool Bulk Pack</td>
<td>31 – 44</td>
<td>8</td>
<td>6</td>
<td>42</td>
</tr>
<tr>
<td>05</td>
<td>6&quot; x 6&quot; Spool Box</td>
<td>12 – 43</td>
<td>12</td>
<td>4</td>
<td>20</td>
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<tr>
<td>75</td>
<td>6&quot; x 6&quot; Spool Bulk Pack</td>
<td>31 – 44</td>
<td>12</td>
<td>6</td>
<td>30</td>
</tr>
<tr>
<td>10</td>
<td>DIN 160/45 Spool</td>
<td>40 – 44</td>
<td>13</td>
<td>4</td>
<td>30</td>
</tr>
<tr>
<td>02</td>
<td>8&quot; x 6&quot; Reel</td>
<td>31 – 40</td>
<td>25</td>
<td>2</td>
<td>24</td>
</tr>
<tr>
<td>11</td>
<td>DIN 200/45 Spool</td>
<td>40 – 44</td>
<td>25</td>
<td>2</td>
<td>30</td>
</tr>
<tr>
<td>8</td>
<td>8 1/4&quot; x 9 3/4&quot; Taper Reel</td>
<td>25 – 36</td>
<td>45</td>
<td>1</td>
<td>16</td>
</tr>
<tr>
<td>13</td>
<td>Taper Flange TF® 80 In Pail</td>
<td>11 – 34</td>
<td>14 – 28</td>
<td>75</td>
<td>12</td>
</tr>
<tr>
<td>81</td>
<td>Taper Flange TF® 80 In Box</td>
<td>11 – 34</td>
<td>14 – 28</td>
<td>75</td>
<td>12</td>
</tr>
<tr>
<td>21</td>
<td>10&quot; x 11&quot; x 12&quot; Taper Reel</td>
<td>11 – 34</td>
<td>14 – 28</td>
<td>75</td>
<td>12</td>
</tr>
<tr>
<td>12</td>
<td>12&quot; x 7&quot; Reel</td>
<td>8 – 30</td>
<td>8 – 27</td>
<td>80</td>
<td>26</td>
</tr>
<tr>
<td>24</td>
<td>24&quot; Reel/8 Pack</td>
<td>1/0 – 14 Rd., Sq., Rect.</td>
<td>2/0 – 14 Rd., Sq., Rect.</td>
<td>250</td>
<td>75</td>
</tr>
<tr>
<td>24</td>
<td>24&quot; Reel/4 Pack</td>
<td>1/0 – 14 Rd., Sq., Rect.</td>
<td>2/0 – 14 Rd., Sq., Rect.</td>
<td>250</td>
<td>75</td>
</tr>
<tr>
<td>25</td>
<td>Reel-Pak 250</td>
<td>8 – 10</td>
<td>12 – 23</td>
<td>250</td>
<td>75</td>
</tr>
<tr>
<td>60</td>
<td>Taper Flange TF® 600</td>
<td>11 – 22</td>
<td>8 – 20</td>
<td>600</td>
<td>180</td>
</tr>
<tr>
<td>52</td>
<td>Taper Flange TF® 1000</td>
<td>14 – 20</td>
<td>12 – 20</td>
<td>1000</td>
<td>300</td>
</tr>
</tbody>
</table>
**3" SPOOLEssex® 3" Spool**

For heavy, intermediate and fine sizes of round copper magnet wire

Package Code: ............... 03
Spool Identification: ........ 3" Spool
Nominal Wire Weight: .... 2 lbs.
Spools per Carton: ............. 24
Cartons per Pallet: ............ 30
Pallet Dimension: ............. 26" x 42"

**4 7⁄8" SPOOLEssex® 4 7⁄8" Spool**

For heavy, intermediate and fine sizes of round copper magnet wire

Package Code: ............... 04
Spool Identification: ........ 4 7⁄8" Spool
Nominal Wire Weight: .... 5 lbs.
Spools per carton: ............. 8
Cartons per Pallet: ............ 20
Pallet Dimension: ............. 26" x 42"
Essex® 6" x 3 ½" Box
For heavy, intermediate and fine sizes of round copper magnet wire

Package Code: ............... 06
Spool Identification: ........ 6" Spool
Nominal Wire Weight: ...... 8 lbs.
Spools per Carton: ............ 6
Cartons per Pallet: ............ 30
Pallet Dimension: ............. 26" x 42"

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Essex® 6" x 3 ½" Bulk Pack
For heavy, intermediate and fine sizes of round copper magnet wire

Package Code: ............... 76
Spool Identification: ........ 6" Spool
Nominal Wire Weight: ...... 8 lbs.
Spools per Carton: ............ 6
Cartons per Pallet: ............ 42
Pallet Dimension: ............. 26" x 42"
**Essex® 6” x 6” Box**

*For heavy, intermediate and fine sizes of round copper magnet wire*

- Package Code: .............. 05
- Spool Identification: ........ 6” x 6” Spool
- Nominal Wire Weight: ........ 12 lbs.
- Spools per Carton: .......... 4
- Cartons per Pallet: .......... 20
- Spools Dimension: .......... 26” x 42”

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**Essex® 6” x 6” Bulk Pack**

*For intermediate and fine sizes of round copper magnet wire*

- Package Code: .............. 75
- Spool Identification: ........ 6” x 6” Spool
- Nominal Wire Weight: ........ 12 lbs.
- Spools per Carton: .......... 6
- Cartons per Pallet: .......... 30
- Pallet Dimension: .......... 42” x 42”
Essex® DIN 160/45 Spool
For fine sizes of round copper magnet wire
Package Code: ................. 10
Spool Identification: ........... DIN 160/45
Nominal Wire Weight: ....... 13 lbs.
Spools per Carton: ............. 4
Cartons per Pallet: .......... 30
Pallet Dimension: .......... 26" x 42"

Essex® DIN 200/45 Spool
For fine sizes of round copper magnet wire
Package Code: ................. 11
Spool Identification: ........... DIN 200/45
Nominal Wire Weight: ....... 25 lbs.
Spools per Carton: ............. 2
Cartons per Pallet: .......... 30
Pallet Dimension: .......... 26" x 42"
**Essex® 8" x 6" Reel**

For intermediate and fine sizes of round copper and aluminum magnet wire

Package Code: ................. 02
Reel Identification: .............. 8" x 6" Reel
Nominal Wire Weight: ....... 25 lbs. CU
Reels per Carton: ............... 2
Cartons per Pallet: .............. 24
Pallet Dimension: .............. 26” x 42”

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**Essex® 8 ½" x 9 ¼" Reel**

For intermediate and fine sizes of round copper magnet wire

Package Code: ................. 08
Reel Identification: .............. 8 ½" x 9 ¼" Taper Reel
Nominal Wire Weight: ....... 45 lbs. CU
Reels per Carton: ............... 1
Cartons per Pallet: .............. 16
Pallet Dimension: .............. 24” x 42”
Essex® TF® 80 Box

For heavy and intermediate sizes of round copper and aluminum magnet wire

Package Code: ............... 81
Reel Identification: ........... Taper Flange TF 80
Nominal Wire Weight: ........ 75 lbs. CU/25 lbs. AL
Reels per Carton: ............. 1
Cartons per Pallet: ............ 12
Pallet Dimension: ............. 26” x 42"

Essex® TF® 80 Pail

For heavy and intermediate sizes of round copper and aluminum magnet wire

Package Code: ............... 13
Reel Identification: ........... Taper Flange TF 80
Nominal Wire Weight: ........ 75 lbs. CU/25 lbs. AL
Reels per Carton: ............. 1
Cartons per Pallet: ............ 12
Pallet Dimension: ............. 26” x 42"
**Essex® 10" x 11" x 12" Reel**

*For heavy and intermediate sizes of round copper and aluminum magnet wire*

Package Code: 21  
Reel Identification: 10"x11"x12" Taper Reel  
Nominal Wire Weight: 75 lbs. CU/25 lbs. AL  
Reels per Carton: 1  
Cartons per Pallet: 12  
Pallet Dimension: 26" x 42"

**Essex® 12" x 7" Reel**

*For heavy and intermediate sizes of round copper and Aluminum magnet wire.*

Package Code: 12  
Reel Identification: 12" x 7" Reel  
Nominal Wire Weight: 75 lbs. CU/25 lbs. AL  
Reels per Pallet: 18  
Pallet Dimension: 26" x 42"
Essex® 24" Reel – 8 & 4 Pack
For heavy sizes of round and shaped copper and aluminum magnet wire
Package Code: .......... 24
Reel Identification: .......... 24" Reel
Nominal Wire Weight: ...... 250 lbs. CU/75 lbs. AL
Reels per Pallet: .......... 4 or 8
Pallet Dimension: .......... 4 Reels – 24"x40"x30"
........... 8 Reels – 48"x40"x30"

Essex® 25RP Reel
For heavy and intermediate sizes of round copper and Aluminum magnet wire.
Package Code: .......... 25
Reel Identification: .......... REEL-PAK 250
Nominal Wire Weight: ...... 250 lbs. CU/75 lbs. AL
Reels per Pallet: .......... 5
Pallet Dimension: .......... .42" x 42"
**Essex® TF® 600 Reel**

*For heavy sizes of round copper and aluminum magnet wire.*

Package Code: ................. 60
Reel Identification: ............ Taper Flange TF 600
Nominal Wire Weight: ............ 600 lbs. CU / 180 lbs. AL
Reels per Pallet: ................. 4
Pallet Dimension: ............... 42” x 42”

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**Essex® TF® 1000 Reel**

*For heavy sizes of round copper and aluminum magnet wire.*

Package Code: ................. 52
Reel Identification: ............ Taper Flange TF 1000
Nominal Wire Weight: ............ 1,000 lbs. CU / 300 lbs. AL
Reels per Pallet: ................. 4
Pallet Dimension: ............... 42” x 42”
1. ACCEPTANCE, WAIVER, MODIFICATION, INTERPRETATION AND CONSTRUCTION

Orders which are accepted, and contracts that are formed, are accepted or formed at Seller’s offices on the basis of and strictly limited to the Seller’s terms and conditions of sale, which Buyer is deemed to consent to as a condition thereto and to which shall control over any contrary or additional terms and conditions on any purchase order or other document of Buyer, which additional terms and conditions are hereby objected to and to which Buyer shall not be bound. Waiver of any term or condition of Buyer shall not constitute waiver of any other term or condition or legal remedy of Seller or act as a representation of or confirmation of any transaction contemplated hereby, including any order issued in response to a quote of Seller; shall constitute Buyer’s acceptance of Seller’s terms and conditions. No modification of any order or contract shall be binding unless in writing and signed by both parties thereto and interpreted in accordance with, and the construction thereof shall be governed by, the laws of the State of Indiana, United States of America. Capsions as used herein are for reference only and shall not be deemed or construed as in any way limiting or extending the meaning of any terms and conditions.

2. TITLE, DELIVERY, RISK OF LOSS AND SHIPPING

Title to and risk of loss of all goods sold hereunder shall pass to Buyer upon delivery. F.O.B. Seller’s factory (unless a different F.O.B. point is otherwise agreed to and accepted) to any agent of Buyer, including a common carrier or warehouse, as hereinafter provided. Whenever transportation rates and carrier’s liability for damage depend upon the value of the shipment as declared by shipper, Seller will declare such value so as to enable Buyer to have goods shipped at the lowest permissible transportation rates unless otherwise instructed in writing by Buyer. Buyer will furnish written direction instructions for all goods as promptly as possible. Seller shall bear the cost and the risk of buyer for arrange for shipment of the goods by a carrier of its own selection to Buyer’s destination. In the absence of destination instructions, Seller may at Buyer’s expense and with notice to Buyer, warehouse the goods in a reasonably suitable manner. Seller shall not be liable for loss or damage attributed to negligence in the selection of the carrier or the warehousing or in agreeing with either of them to contract terms on Buyer’s behalf.

All shipments will be at shipper’s option. Customer requested premium cost freight routing, including air freight will be shipped F.O.B. shipping point, freight collect to the customer. The promised shipping date is the Seller’s best estimate and will not operate to bind Seller to ship or to make deliveries on the date indicated or quoted or order acknowledgement.

3. PRICE AND PAYMENT

Unless otherwise specified all orders or contracts accepted will be invoiced at Seller’s prices in effect on the date of shipment, which Buyer agrees to pay. Unless otherwise specified, payment terms are net 30 days, and over due accounts shall accrue charges at a rate of 1.5% (.015) per month or the maximum legal rate, whichever is less. Credit and delivery shall be subject to Buyer’s approval and Seller reserves the right to alter the terms and/or a limit of credit. Each order or contract shall be treated as a distinct contract but if Buyer fail to fulfill the terms of payment, Seller may without prejudice to any other lawful remedy will defer further shipments, and/or cancel any order or contract. Buyer shall be liable to Seller for all costs and fees, including attorney fees, which Seller may reasonably incur in any actions by Seller taken to collect or any overdue account of Buyer.

Uncontested cost increases created by circumstances such as, but not limited to, changes in government energy policies, metal premiums or raw materials price increases are not covered by the price quoted. Any order accepted requiring special manufacturing processes, inspection, specified weight, packaging, test results, certification, etc., is subject to additional charges.

4. INSPECTION

If upon receipt of the goods by Buyer at destination the same shall appear not to conform to this or order or contract, Buyer shall within thirty (30) days after receipt thereof notice to Seller of such condition and afford Seller a reasonable opportunity to inspect the goods at Buyer’s expense and F.O.B. shipping point, however, the same shall be at the sole risk and expense of Buyer. Seller, at its election, will conduct, at its own expense, the entire defense of any claim, suit or action alleging that, without further com-