

# **New Technologies**

### **Polyimide-wrapped Conductors**



## DESIGNED FOR EXTREME CHALLENGES



### Polyimide-wrapped Conductors

#### Design / R&D Department

Davide Peroni, Marco D'Auria

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#### INTRODUCTION

**Polyimides** are synthetic polymers prepared by condensation reaction between a dianhydride and a diamine. Polyimide films and polyimide tapes have a typical yellow/orange colour and a translucent appearance. They are produced with a smooth surface without scratches and bubbles.

Polyimides combine high thermal and chemical resistance, besides remarkable dielectrical properties and radiation resistance. Due to these characteristics polyimide tape is designed to fulfill the highest requirements for cable and wire insulation in terms of reliability and durability.



Polyimide Tape Pad

#### ENGINEERING

For electrical insulating, there are composite materials that consist of a polyimide film coated on one or both sides with a fluoropolymer (fluorinated ethylene propylene, FEP). **FEP** is a melt processable resin: after the wrapping process the tape is heated and melted in order to stick together overlapped areas. In this way, a **seamless insulation layer** is realized. Most common configurations have a 25  $\mu$ m polyimide film with one or two 12.5  $\mu$ m FEP layers, for an overall thickness equal to 38 or 50  $\mu$ m.



Polyimide Film with one Fluoropolymer Layers

#### **ADVANTAGES**

Polyimide tape offers insulation with electrical and thermal properties in a **extensive operating range** (from -200 to +250 °C). Indeed, polyimide-insulated conductors are widely used in the construction of traction motors and transformers with high continuous operating temperature (>180 °C) and in aerospace facilities. It provides also **high cut-through and abrasion resistance**.

It has **excellent chemical resistance** to most organic solvents, acids and hydrocarbons. Moreover, it is an no-melted and self-extinguishing material with a high flammability rating.

Due its **excellent radiation resistance**, it can be used in adverse chemical environments in addition to radiation exposure, such as **nuclear reactors and linear accelerators**.

#### CONCLUSIONS

Meeting customers needs and thanks to partnership with suppliers, **De Angeli Prodotti** invests in new wrapping machines for broadening its tapeinsulated conductors portfolio with hi-tech potential products.

#### CONTACTS

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