

Norplex-Micarta Introduction

Norplex-Micarta is a leading manufacturer of high performance thermoset composite materials based on impregnation and lamination technology. Norplex-Micarta manufactures the highest quality specialty sheet products, pre-pregs, rods, molded shapes, and tubes to meet demanding applications for OEMs and fabricators around the world.

The global headquarters of Norplex-Micarta is located in Postville, Iowa, USA. To support the demand for thermoset composite materials in Asia, the Company also operates a facility in Changzhou, Jiangsu, P.R. China. Customers outside of mainland China are serviced by trade offices located in Shanghai and Shenzhen.

Norplex-Micarta is a subsidiary of Industrial Dielectrics Holdings, Inc. Industrial Dielectrics Holdings has two primary lines of business. The first is the Norplex-Micarta line of products. The second is IDI Composites International, which produces various thermoset molding compounds in the USA, Puerto Rico, Mexico, UK, France, and China.

Norplex-Micarta was formed in 2003, when Norplex purchased Micarta to form North America's largest manufacturer of industrial laminate materials. Both Norplex and Micarta have long histories. Micarta was the original brand name created by George Westinghouse for products based on Leo Baekeland's phenolic resin discovery. In 1913, Micarta was sold for the first time outside of the Westinghouse group of companies. In 1945, Norplex was formed in Wisconsin, USA. In 1975, demand for industrial laminates had grown substantially, and the laminates factory in Postville, Iowa was opened by Norplex. Throughout the 1980's and 1990's, both Norplex and Micarta made significant innovations in laminate materials. By the time the two companies merged in 2003, the product lines had expanded to include epoxy, phenolic, melamine, silicone and other thermoset resins in sheet, tube, rod, and molded shape forms.

Currently, the Postville, Iowa, USA facility employees 180 people and operates 5 days a week, 24 hours per day. This 42,650 square foot (13,000 square meter) facility has 6 processing lines to produce pre-preg and various pressing and tube manufacturing equipment.

The Changzhou, Jiangsu, China facility employees 60 people and operates 5 days a week, 16 to 20 hours per day. Focused on glass epoxy materials, this 32,800 square foot (10,000 square meter) facility has two processing lines to produce pre-preg, two press lines, and several different fabrication work centers.

With a history of more than 100 years, the Company's legacy of innovation, quality, and unparalleled service make Norplex-Micarta your partner for thermoset composites.

Norplex-Micarta – North America and Europe

Global Headquarters and Design Center

665 Lybrand Street
Postville, Iowa, USA 52162-0977
Phone: +1.563.864.7328
info@norplex-micarta.com
www.norplex-micarta.com

Norplex-Micarta – China and Asia Pacific

For mainland China inquiries:

Changzhou Micarta Composite Material Company

2 Xingtang Road, Hi-Tech Development Zone
Changzhou, 213127, P.R. China
Phone: +86 (519) 8507 8888
info@norplex-micarta.asia
www.norplex-micarta.asia

For inquiries outside of mainland China:

Micarta Composite Materials Trading Company, Ltd.

Phone: +86 186 8209 8677
Phone: +86 185 1673 7399
sales@norplex-micarta.asia

Key Markets Served

- Aerospace
- High Voltage Electrical Transmission and Distribution
- Construction and Threat Protection
- Heavy and Process Industries
- Medical and Scientific Devices
- Oil and Gas Exploration and Production
- Power Generation
- LNG and Pipelines
- Rail and Mass Transit
- Heavy Truck and Off Highway Vehicles
- Outdoor and Adventure

Equipment and Process Capability

Norplex-Micarta produces sheets, tubes, rods, and other specialty molded shapes for thousands of different applications in dozens of different industries.

The Postville, Iowa facility is equipped with a variety of impregnation and downstream equipment to serve the varied needs of the industrial market. Pre-preg can be produced on either horizontal or vertical machines as required to match the requirements of the fabrication process. Norplex-Micarta processes sheets and stock shapes internally.

Sheets are regularly produced at 6 inches (150 mm) thick, and several materials can be produced as a monolithic sheet as thick as 12 inches (300 mm). Tubes are produced on IDs ranging from 0.094 inches (2.3 mm) to 48 inches (1.2 meters) on specially built mandrels. These materials are generally further processed by firms that specialize in the machining, punching, or other stock removal fabrication process.

Utilizing custom designed equipment, in China, Norplex-Micarta can produce pre-preg up to 60 inches (1520 mm) wide. Maximum sheet width is approximately 57 inches (1440 mm) which may allow certain applications to achieve even greater part yield from a sheet. Sheets are regularly produced from 0.005 inches (0.127 mm) to 6 inches (150 mm) in thickness, and even greater thicknesses are possible upon request.

Norplex-Micarta's production occurs with environmental protection as a basic requirement. All manufacturing processes are controlled and include significant investments in thermal oxidizer (RTO) and energy conservation systems in order to meet the Company's commitment to environmental protection.



Quality Control

Norplex-Micarta utilizes state-of-the-art, custom designed, computer process controls to ensure materials and parts are produced under tightly controlled conditions supported by an ISO 9001 compliant quality management system.

Norplex-Micarta laboratories in both the USA and China are capable of testing many different properties of composite materials. For example, mechanical properties can be tested from -70°C to 350°C via a temperature chamber, glass transition temperature (T_g) can be tested via DSC and DMA, and electrical properties are tested on a 100KV dielectric breakdown machine custom built for this application. The laboratories support ongoing product and raw material testing, verification required by customers, and new product development.

Research and Development

Over 70% of the material produced by Norplex-Micarta is made to customer specifications.

From the global headquarters in the USA, the Company works directly with OEMs and other consumers of composite materials to develop new materials in order to solve unique challenges. Research and development projects have produced new generations of products such as tubes that can withstand the high temperature and stress environment in downhole oil and gas applications and unique worker protection devices in the electrical engineering field.

Working with new resin and reinforcements, as well as novel combinations of these materials, Norplex-Micarta develops several new materials annually to serve in some of the most demanding applications in the industry.

Designers choose to utilize Norplex-Micarta's materials because they can be customized to suit a specific application and can be:

- Lightweight, strong, and stiff
- Electrically insulating, ESD, or conductive
- Non-sparking, and low in flame, smoke, and toxicity generation
- Dimensionally stable
- Chemically resistant



Composite Technology

Norplex-Micarta utilizes thermoset impregnation and lamination technology.

Thermoset resin technologies are often a superior choice in many applications. A wide range of materials that can be tailored to maximize specific properties, thermoset resins include: Epoxy, Phenolic, Melamine, and Silicones. These resins do not melt, and have various advantages in electrical and thermal insulation, structural parts, and cost effectiveness.

Impregnation is a type of composite manufacturing where a resin system is combined with a reinforcement to create a pre-preg. Reinforcements can vary depending on the application and include: Glass, Cotton or Linen, Paper, Carbon fiber, and other advanced materials.

Pre-preg is then cured at high temperatures to create the cross-linking of the resin system that gives thermoset resin composite materials many of their valuable properties. The resulting materials are sheets, stock, or custom shapes.

These sheets, stock, or custom shapes can then be further processed using standard machining and fabrication methods to very precise dimensions. These parts are then incorporated into thousands of different devices and machines around the world serving hundreds of various functions depending on the application and industry.

Epoxy Composites

Epoxy can be combined with different reinforcements in order to meet the needs of a specific application. Furthermore, these resins can be modified to service extreme cold environments like outer space to applications exceeding 200°C.

Known for their excellent dielectric properties, epoxy materials are widely used in thousands of different industrial applications from power generation to medical devices, from electronics to aerospace, and from oil and gas to electrical devices. Not just insulators, epoxy materials can also be customized to provide electrostatic dissipative and semi-conductive properties and are often used exclusively for their robust mechanical properties. Moreover, specialty reinforcements can make the traditionally abrasive glass epoxy materials suitable in some wear applications.

Phenolic Composites

Phenolic materials are a good choice in many industrial applications. Produced to industry and customer standards in pre-preg, sheet, and shape form, these materials are made in dozens of different grades with various reinforcements and additives to maximize their properties for specific applications. All phenolic materials are inherently low in smoke generation and, when combined with cotton reinforcements, are non-sparking. Phenolic resin based materials are an excellent choice in mechanical wear applications such as pulleys, guides, and bearings, in various different industries from shipbuilding to foundries, from medical to food processing as well as electrical applications in explosion proof environments.

Melamine Composites

Melamine materials are excellent electrical materials. When combined with glass reinforcements, these materials provide a hard, self-extinguishing material with the best arc resistance of any products produced by Norplex-Micarta. Made to electrical industry and customer specifications in pre-preg, sheet, tube, and rod form, the most unique consideration of a melamine resin material is that when an electrical arc travels across the surface or through the body of the laminate, its trail is non-conductive. Applications include switchboard panels, arc barriers, circuit breaker parts, and structural/electrical parts functioning in environments of 140°C or less.

Silicone Composites

Silicone materials are typically reserved for the most demanding of all high temperature applications. Combined with glass reinforcements and produced in pre-preg, sheet and tube form, Norplex-Micarta silicone materials high-temperature performance and insulation properties make them equal or superior to many high-priced thermoplastics. These materials can handle temperatures as high as 600°C in short-term applications and 220°C in continuous use for several years. Major functions include high-temperature electrical insulation in ovens, welding, and plasma-cutting equipment.