



**Global Thermoset  
Composite Solutions**

**High Performance  
Thermoset Composites  
For the Aerospace Industry**



**RT507**

High-temperature silicone resin system with excellent thermal insulation for exposure to arc, flame, or elevated heat



**NP193P**

Withstands high compressive force and high-temperature environments, in addition to providing excellent thermal insulation



**NP320E**

Electrically insulating, less abrasive than fiberglass, ideal for explosion-proof environments



**NP310AG**

Self-extinguishing with excellent wear properties, meets non-afterglow requirements

The military and commercial aerospace industry demands high-reliability products, excellent service, and complete confidentiality from its suppliers. Norplex-Micarta consistently meets those requirements, with a variety of high performance thermoset composite materials in sheet, tube, rod, and pre-preg forms, and has the ability to manufacture compression molded parts. Norplex-Micarta materials provide excellent thermal insulation and mechanical strength, and are certified to meet the most challenging aerospace specifications. From braking systems, to window frames, to structural elements, Norplex-Micarta is the preferred high performance composites manufacturer for OEMs and fabricators around the world.

Norplex-Micarta composites provide excellent mechanical strength, structural support, and durability. Manufactured components must withstand the initial impact force of installation, as well as the repeated stress of inspections and repairs. They must also exhibit excellent compressive, shear, tensile, and flexural strength to withstand the rigors of take-off, flight, and landing operations.

High-temperature environments, such as disk brake systems and landing gear, place particular stress on composites. Norplex-Micarta materials exhibit high strength at elevated operating temperatures, and also provide insulation from heat when used to separate two components. There are even Norplex-Micarta products with thermal expansion properties similar to those of aluminum and steel, common materials used in the construction of aircraft. This allows the composite to be used where a temperature shift causes surrounding elements to expand or contract.

Norplex-Micarta composites also offer excellent electrical insulation properties and low toxicity/burn characteristics. Some materials are self-extinguishing to minimize damage and risk in the case of fire or explosion.

## Honeycomb Floor and Wall Structures

Pre-preg material is used to manufacture the honeycomb floor structure between passenger and luggage compartments, as well as in the bulkheads of service areas. In addition to being lightweight, Norplex-Micarta composites also exhibit high compressive, shear, tensile, and flexural strength simultaneously to withstand the rigors of standard operation. Low burn and toxicity characteristics minimize danger to passengers and crew in the event of a fire or explosion.

## Window Frames

Norplex-Micarta high performance composites are used as window frame supports for the cockpit and passenger compartments. The glass window mounts into the composite frame, which is then bolted to the aluminum skeleton of the aircraft. The frame must withstand the impact force of installation, and provide excellent mechanical strength for the life of the aircraft. The coefficient of thermal expansion must be nearly identical to that of the aluminum skeleton and glass window to ensure that all elements expand and contract at the same rate, thereby maintaining the integrity of the window assembly. Frames are manufactured in thicknesses matching the glass window. Those made from Norplex-Micarta materials can withstand stresses of up to 15,000 to 20,000 psi, greatly exceeding the expected stresses during take-off, flight, landing, and taxiing operations.



**Honeycomb Floor and Wall Structures** support the tremendous weight of passenger compartments and service areas, plus the extreme tensile, shear, and flexural forces during operation.



**Window Frames** absorb the impact force of installation when the window is bolted to the skeleton of the aircraft.



**Braking Systems** withstand impact force and elevated temperatures during installation, inspection, use, and repair.

## Braking Systems

Disk brakes, which are used in both military and commercial aircraft, generate a great amount of heat during landing. A thermal insulation component is required to isolate the hot disk from the tire and strut frame that leads into the aircraft. This insulation component must also withstand extreme compressive force of up to 10,000 psi when the disk and wheel are bolted together during installation, as well as every time the braking system is inspected or repaired. The shaft of the braking system can also be insulated with a thermoset composite tube to isolate it from the tire. This tube must withstand the same high-temperature and compressive forces as disk brake components.

## Specialty Molded and Machined Shapes

Norplex-Micarta understands the demanding environment of the aerospace industry and works directly with engineers to design high-reliability molded and machined shapes to fit the most exacting applications.



Machined shapes courtesy of EPTAM Plastics.

**Specialty Molded and Machined Shapes** can be designed to fit the most demanding aerospace applications.