



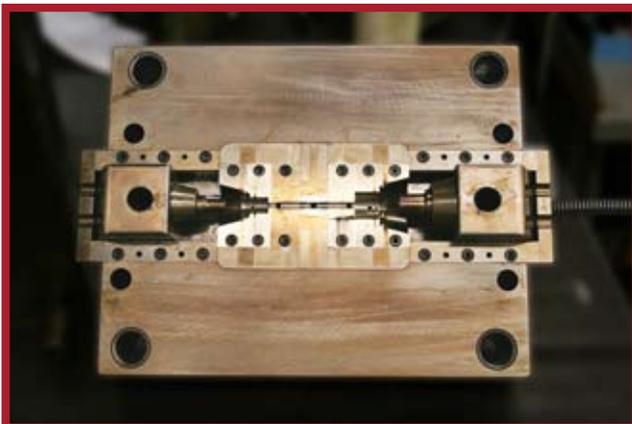
Glenair Composite Connector and Accessory Production Capabilities

Glenair is the recognized leader in composite thermoplastic research and development for the interconnect accessory industry. In fact, no one else has tooled even a small fraction of the composite thermoplastic accessories available today from Glenair. The product line includes circular and rectangular connectors and accessories, cable junction boxes, conduit, conduit fittings, protective covers, shielding, shielding support rings, and more. It is an ongoing goal at Glenair, largely achieved at this point, to be able to offer equivalent function composite thermoplastic interconnect components for the complete range of interconnect products we produce in metal.

Glenair composite components are produced in injection molded and, in certain cases, machined versions ideally suited for use in harsh environments where resistance to high temperatures, outgassing, corrosive fluids, fire, and shock and vibration is required. Glenair composites are ASTM E595 space rated, and are qualified to the shock, vibration, thread strength and bend moment requirements of MIL-DTL-38999 and SAE AS85049. The materials also meet stringent EMI/RFI/HIRF and indirect lightning strike performance specifications.

Glenair has the largest and most experienced staff of composite engineers and manufacturing experts in the interconnect accessory industry. Their combined expertise insures Glenair composite products mate correctly with both

metal and composite connectors and meet the customer's most stringent performance requirements. All Glenair designs provide a dimensionally stable and cadmium-free alternative to plated aluminum and brass.



Glenair composite material options include Ultem® (PEI), Amodel® (PPA), Ryton® (PPS), Torlon® (PAI), PEEK, Siltem and LCP. Base materials can be augmented with conductive and non-conductive additives and reinforcing fibers to meet specific functional specifications. As mentioned, each composite material has its own specific structural properties. The following is a brief introduction to the most common materials used by Glenair:

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Ultem® (PEI) is an amorphous thermoplastic available in extruded bars for machining and pellets for injection molding. It combines high performance with good processing characteristics and offers high heat resistance, high strength



Glenair stocks an abundant supply of the composite materials used in the fabrication of our parts.

Ryton® (PPS) is a high temperature, injection molded material. It has good mechanical properties and excellent chemical resistance at elevated temperatures. Different grades are available including glass filled and glass/mineral filled versions. Ryton R4-XT is a 40 percent glass filled version engineered for improved knit-weld line characteristics. As a semi-crystalline material, Ryton exhibits excellent resistance to prolonged exposure to high temperatures, up to 500° F (260° C). Ryton also provides outstanding resistance to a broad spectrum of aggressive chemicals and has very stable dielectric and insulating properties. Ryton meets ASTM E595 outgassing requirements and UL94 flammability tests.

Glenair's G-FLEX polymer (polyetherimide-siloxane) is a high-temperature material used primarily to produce annular convoluted tubing. The material is offered in a broad range of operating temperatures, has exceptional flexibility and good crush resistance. In certain applications, G-FLEX is a suitable alternative to costlier halogen-free composite polymers such as PEEK (polyetheretherketone). PEEK is a semi-crystalline thermoplastic that operates at extremely high temperatures—500°F (260° C) long-term and 600°F (315° C) short term. An extrudable material, PEEK offers one of the lightest strength to weight ratios available in a composite.

modulus and broad chemical resistance. Ultem 2300 is a 30% glass filled thermoplastic which displays excellent property retention and resistance to environmental stress. It can be further reinforced with conductive fibers, or plated, for EMI resistance. Ultem performs in operating environments up to 378° F (192° C) long term and 410° F (210° C) short term. Ultem meets ASTM E595 outgassing, 14 CFR Part 25 flammability, and zero halogen outgassing requirements.