

Thermoplastics

Reinforcing excellence

TEIJIN CARBON



Tenax™



Tenax™ thermoplastics

We think thermoplastic. Tenax™ thermoplastics are innovative materials, which when combined with rapid production processes allow for fast processing, low scrap rates, high mechanical performance, chemical resistance, and recyclability. We offer three types of products: thermoplastic unidirectional (TPUD), thermoplastic woven fabric (TPWF), and thermoplastic consolidated laminate (TPCL).

Your solution for high-performance thermoplastics reinforced with carbon fiber. Tenax™ thermoplastic products are based on high-performance Tenax™ carbon fibers. The tailored sizing for thermoplastic applications offers excellent fiber-matrix adhesion, which results in higher mechanical performance.

Benefits

Material advantages

- High-performance mechanical properties
- Low flammability, smoke, and toxicity
- Excellent resistance to chemicals and solvents
- Room temperature storage and shipping
- Compliant with health, safety, and environmental requirements
- Recyclable

Process advantages

- Out-of-autoclave consolidation (press forming, vacuum bagging)
- Short cycle time
- Thermoformable
- Automated processes (automated tape laying, winding for tubular parts and pressure vessels)
- Thermoplastic joining technologies



Products

Tenax™ thermoplastic unidirectional

Tenax™ TPUD is a thermoplastic unidirectional prepreg that combines two high-performance materials: carbon fiber for thermoplastic applications and a high-performance polymer (i.e., PEEK, low melt PAEK, PPS), or engineering polymer (i.e., PA, PC). TPUD is available in a wide range of widths and a variety of lengths – tailored to customers requirements. It is offered in different fiber grades such as HTS, IMS, and UTS.

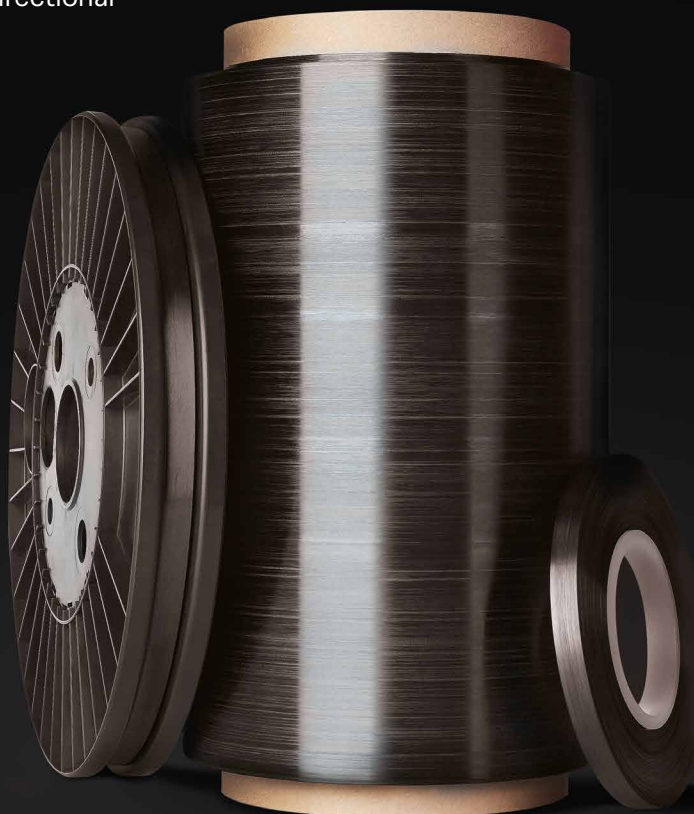
State-of-the-art production technology leads to

- significantly improved tape homogeneity
- fewer defects
- less internal stress
- high consolidation quality in all common high-rate manufacturing processes

Production process

The material can be laid by hand or automatically (automated tape laying, automated fiber placement) without the need for debulking like in thermoset prepreg, for example. It can then be consolidated in a press (static or semi-continuous) or in an oven under vacuum. Winding processing can also be applied to manufacture tubular parts in only one step.

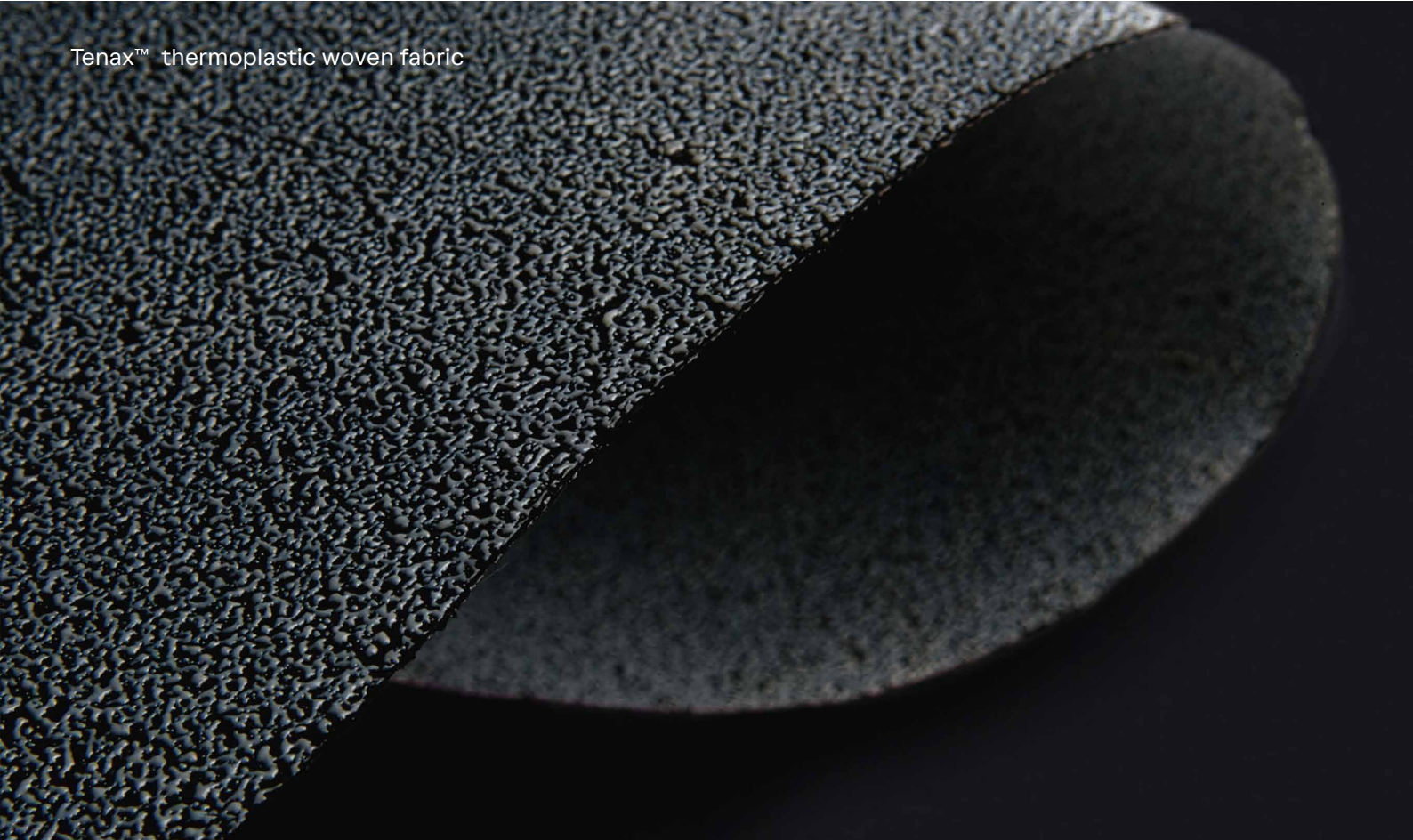
Tenax™ thermoplastic unidirectional



Tenax™ thermoplastic woven fabric

Tenax™ TPWF is a woven fabric coated with a thermoplastic polymer. The material is based on Tenax™ carbon fibers and high-performance and engineering polymer matrix systems (e.g., PEEK, PPS , PC) to provide superior mechanical, chemical, and thermal properties.

- TPWF is available in different fabric styles.
- TPWF is the core of our thermoplastic consolidated laminates (TPCL).
- TPWF can be used to create complex part designs with compression molding processes.



Tenax™ thermoplastic woven fabric

Tenax™ thermoplastic consolidated laminate

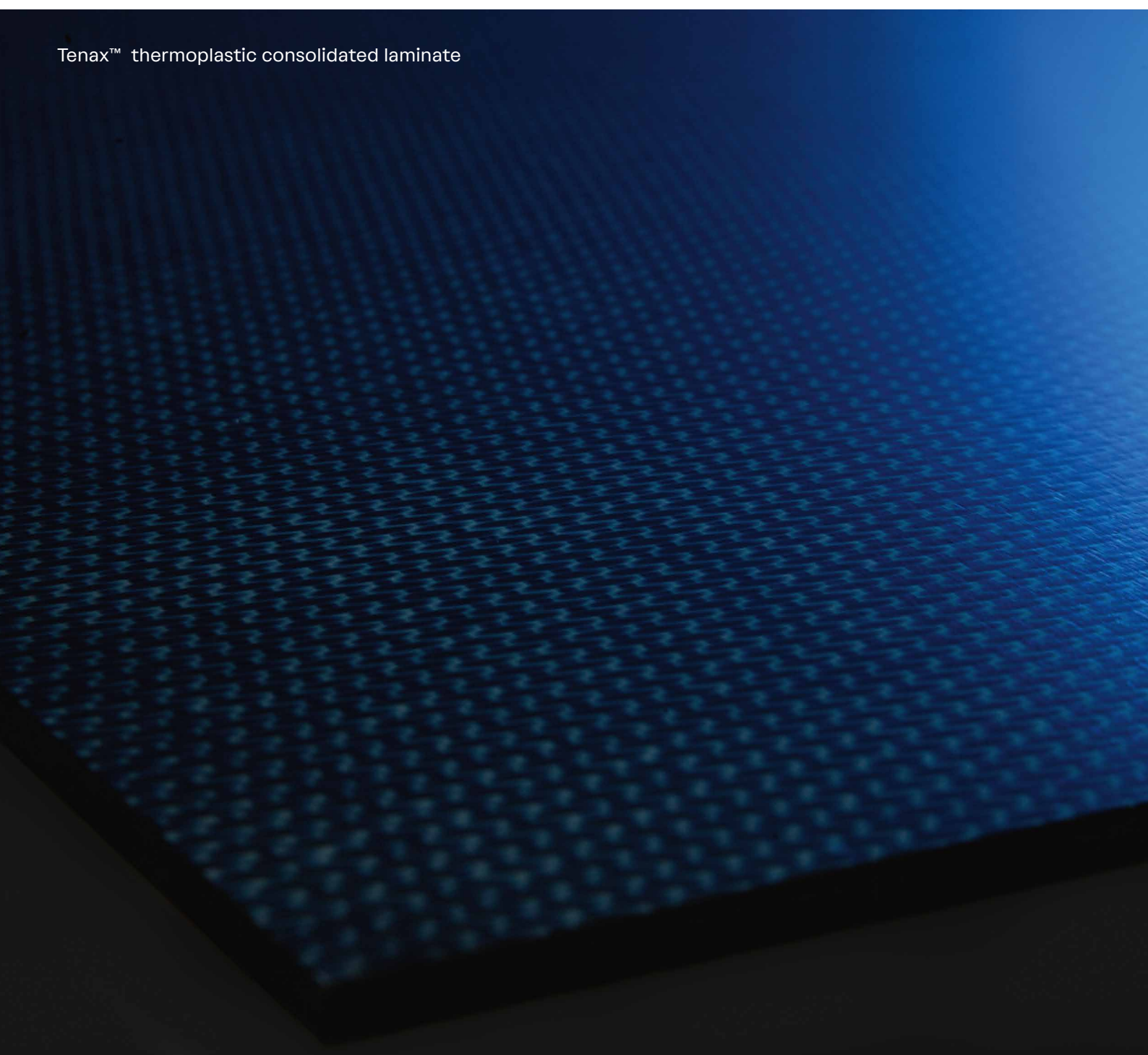
Tenax™ TPCL are completely impregnated and consolidated sheets made of several layers of carbon woven fabric coated with thermoplastic polymer (Tenax™ TPWF). They are based on Tenax™ carbon fibers and high-performance polymer matrix systems (e.g., PEEK, PPS) to provide superior mechanical, chemical, and thermal properties.

We offer TPCL PEEK in a size of 800 mm x 1,200 mm and TPCL PPS in a size of 1,200 mm x 1,800 mm with different stacking sequences and special surface layers, such as glass fabric for the prevention of corrosion or bronze mesh for lightning strike protection.

Production process

Tenax™ TPCL can be simply heated above its melting temperature and then stamped in a metallic mold within a press in a few minutes. Our material is suited for large-scale production of parts for high mechanical performance, such as structural components for aerospace. TPCL brackets and TPCL clips are used as structural connectors on the Airbus A350.

Tenax™ thermoplastic consolidated laminate



Medical applications

Tenax™ TPUD PEEK-HTS45 and Tenax™ TPCL PEEK-HTA40 are tested as non-cytotoxic according to DIN EN ISO 10993-5. There is no expected risk for patients when one of these materials is reprocessed in medical devices if the contact with human skin, mucosa, or damaged tissues does not exceed 24 hours.

Flame-retardant housing applications

Tenax™ TPUD and Tenax™ TPWF based on polycarbonate (PC) use a special flame-retardant PC resin and fulfill the V-0 (Vertical Burn) certification based on UL94, the standard for safety of flammability of plastic materials for parts in devices and appliances testing. The V-0 classification meets the requirements for enclosures with power supply (e.g., lithium-ion batteries) for applications such as notebook PCs and monitors.

AniForm material cards

To predict the formability of composite laminates, AniForm material cards are an easy-to-use and accurate simulation, enabling a first-time-right process implementation. The material properties are characterized at three different processing temperatures to predict realistic forming behavior.

AniForm material cards are available for:

- TPUD PPS HTS45 (Tenax™ TPUD HT 03 0145 610002)
- TPUD PAEK IMS65 (Tenax™ TPUD IM 02 0145 610020)
- TPWF PEEK HTA40 (Tenax™ TPWF PEEK-4-40-HTA40 E13 3K DT-5HS-285 6209)

Certification & qualification

NADCAP certification

Teijin Carbon Europe has passed the NADCAP (National Aerospace and Defense Contractors Accreditation Program) audit and has been awarded accreditation for non-metallic material manufacturing and testing. Nadcap is the leading international program for auditing and accrediting special processes in the aerospace and defense industries. Managed by the Performance Review Institute (PRI), the audit applies demanding requirements in terms of process control, quality assurance, and documentation. All European Tenax™ thermoplastic products are certified.

NCAMP qualification

Teijin Carbon has qualified its carbon fiber Tenax™ thermoplastic materials with polyetheretherketone (PEEK) with NCAMP (National Center for Advanced Materials Performance). The Federal Aviation Administration (FAA), European Aviation Safety Agency (EASA), and Agencia Nacional de Aviacao (ANAC – National Civil Aviation Agency of Brazil) accept composite specification and design values developed using the NCAMP process.

TEIJIN CARBON

Asia and Oceania

customer@teijin.co.jp

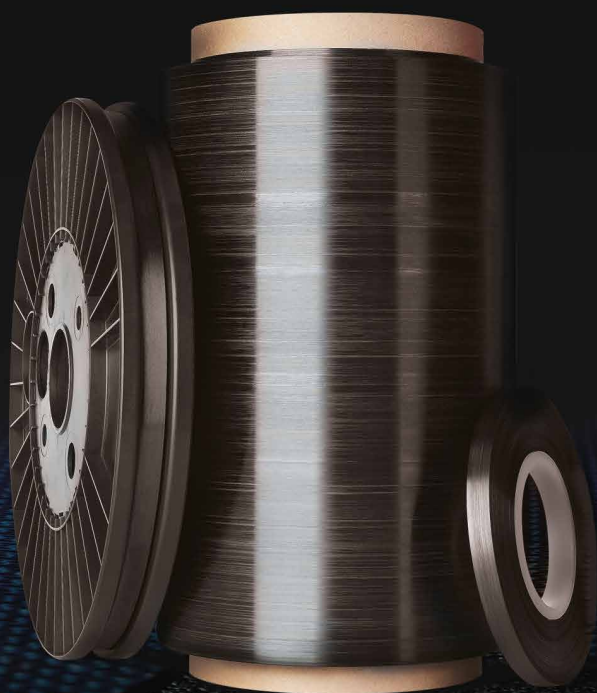
Europe, Middle East, and Africa

sales@teijincarbon.com

Americas

info@teijincarbon.us

02/2026



www.teijincarbon.com