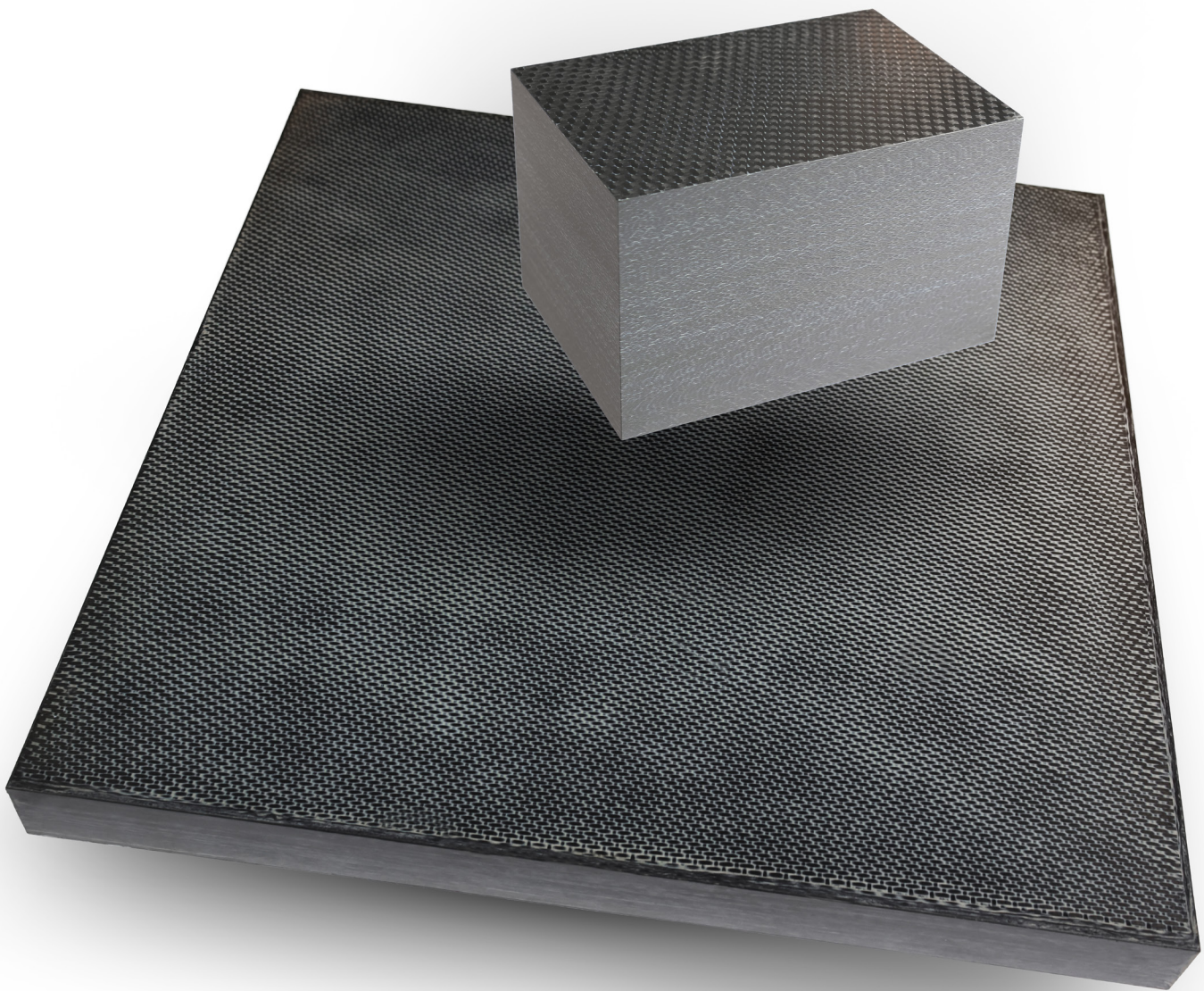
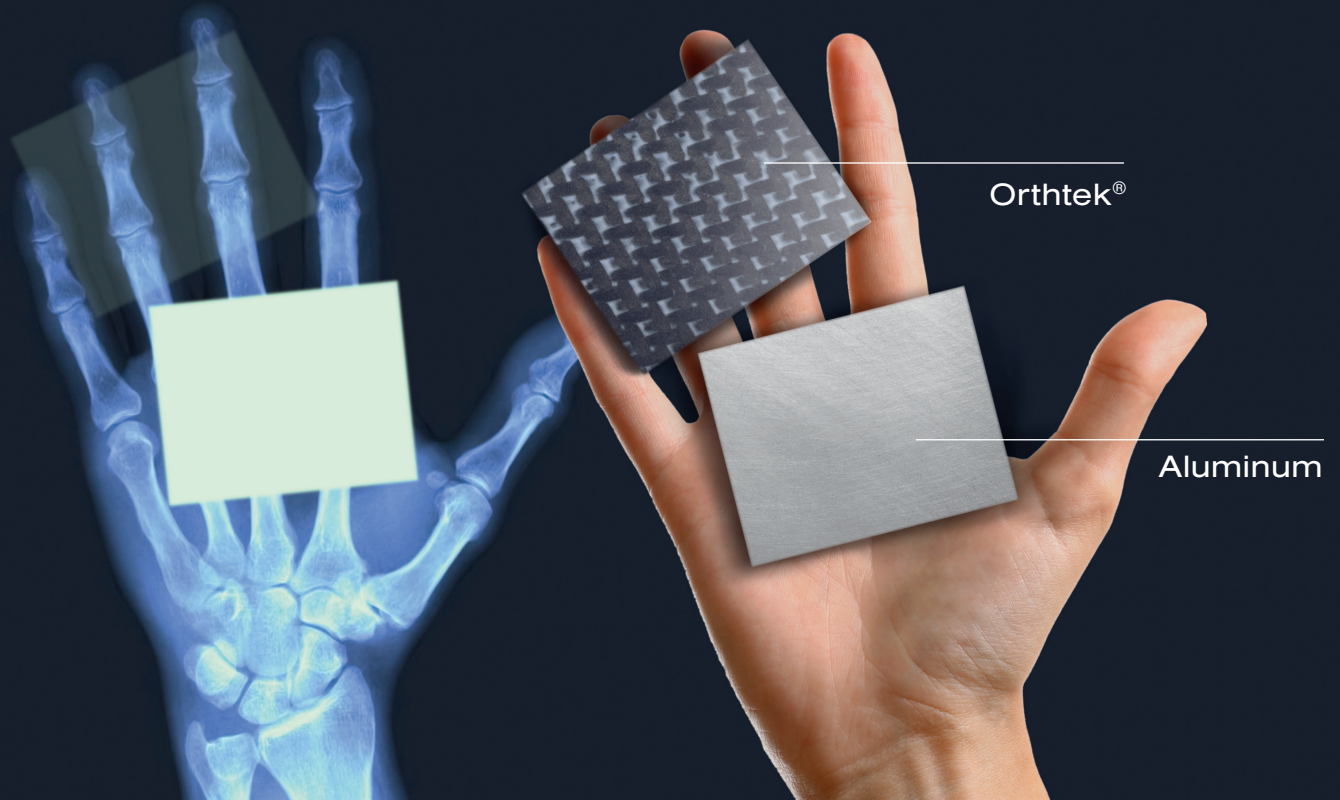


MEDICAL COMPOSITE PLATES

Lightweight Radiolucent Materials



Thermoplastic composite plates made from bi-directional woven carbon fiber, in combination with a PEEK matrix.



Orthtek®

RADIOLUCENT MATERIALS

Greene Tweed offers thermoplastic composite laminates for orthopedic and surgical device applications. These laminates are comprised of preimpregnated fabric material that is then stacked, heated and compression molded for final consolidation. These plates are comprised of a bi-directional woven carbon fiber, in combination with a PEEK matrix. These materials offer high-strength, precision tolerances and stability after repeated sterilization autoclave cycles, making them ideal for a range of surgical instruments, from nail guides to retractors.

With a superior strength to weight ratio when compared to metals, **Orthtek® composite plates** are radiolucent, whereas metallics are opaque.

FEATURES AND BENEFITS

- Radiolucent properties provide transparency to x-rays
- High-strength and stiffness properties ensures instruments perform reliably in surgical environments
- Lightweight components reduce physician fatigue during lengthy surgical procedures
- Resistance to repeated sterilization ensures dimensional stability is maintained after multiple autoclave cycles
- Exceptional corrosion resistance allows components to withstand the harsh chemicals used during the sterilization process
- Low water absorption helps maintain original physical properties of the component

ORTHTEK® WF

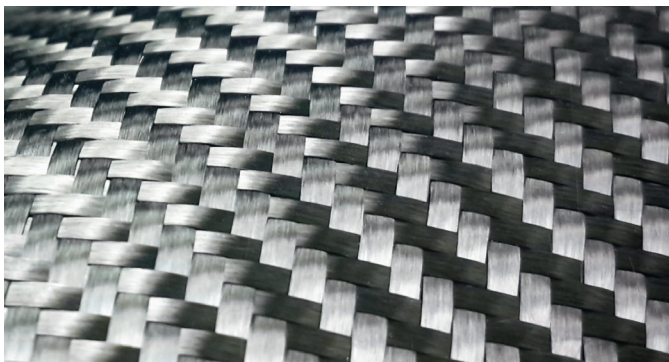
Improved equipment and lower level radiation requirements have increased the use of x-ray technology for surgical procedures and medical treatment. Traditionally, metals such as aluminum, stainless steel, and titanium have been used for structural components in the medical industry.

Many applications require the rigidity of metals and cannot use unreinforced thermoplastics. Orthtek® structures are radiolucent and provide the necessary mechanical performance for structures used in surgical equipment and devices.

These materials provide mechanical properties competitive with metals and are much lighter, resulting in superior strength to weight.

Orthtek® composite plates are engineered using selective carbon fiber reinforcements and thermoplastic polymers to achieve maximum strength and toughness for applications such as nail guides and x-ray cassettes.

Utilizing Orthtek® plates for surgical devices offers precision, durability, and unmatched performance coupled with radiolucent properties for real-time X-rays. Our bi-directional woven carbon fiber and PEEK matrix has a superior strength-to-weight ratio, reducing surgical fatigue and ensuring repeatable autoclave and sterilization capability without affecting form.

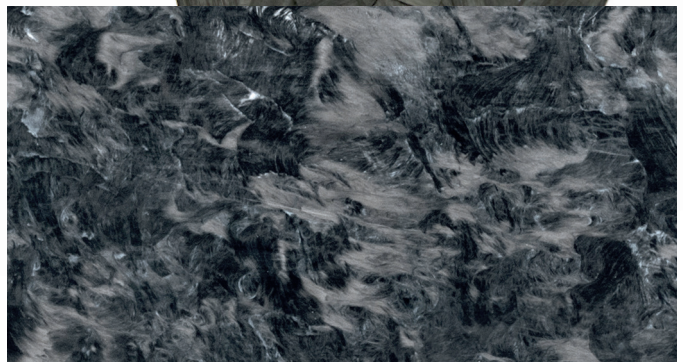


Bi-directional woven carbon fiber

XYCOMP® DLF

Xycomp® DLF™ is a lightweight thermoplastic composite developed to replace complex-shape metal medical tools including nail guides, fixators, retractors and others. With outstanding fatigue, vibration, and impact resistance, it provides up to 60 percent weight savings to help with tool ergonomics and user fatigue while providing exceptional performance.

Xycomp® DLF™ is produced from aerospace-grade, carbon-fiber-reinforced, unidirectional prepreg tape which is chopped into flakes, resulting in high fiber content (70% by weight), longer fibers (0.5 in./13 mm or greater), and a high degree of material control. Flakes are matched-die compression molded in a proprietary process called ProFusion, enabling the production of 3D shapes with variable wall thickness and molded-in features such as fasteners, inserts, and ribs. The benefits of this molding technique include the consolidation of complex assemblies into fewer parts, and the optimization of raw material required per component.



Xycomp® DLF™ chopped flakes

ARLON® 1260

Arlon® 1260 is a carbon-fiber-reinforced version of Arlon® 1000 and has the highest modulus, tensile strength, and shear of all the Arlon® grades. Designers often select Arlon® 1260 when they require a low coefficient of thermal expansion. Arlon® 1260 provides chemical resistance, economic strength to weight ratio, dimensional stability, and injection molding processing approach, allowing for high volume parts.

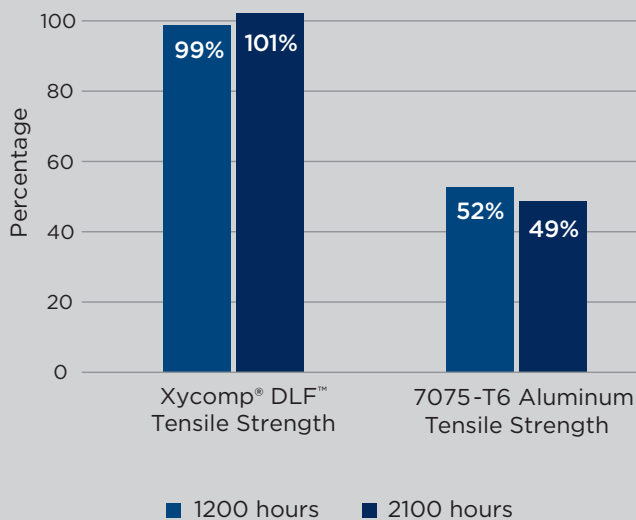


Universal Screw Guides

Thermal aging performance vs. aluminum

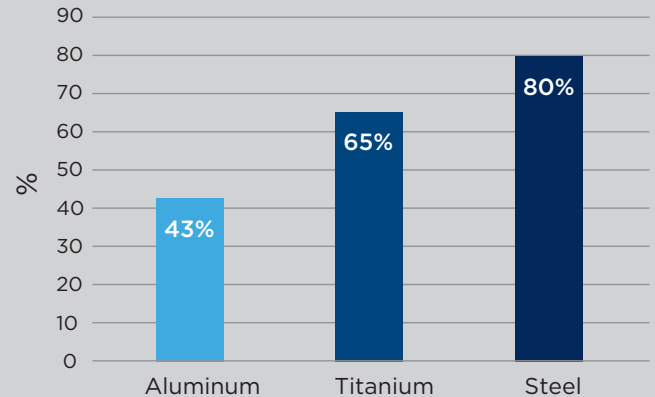
% Retention of properties after thermal aging at 350°F (177°C)

Xycomp® 5175 DLF® vs. aluminum



Density reduction vs. metal for weight savings

Xycomp® DLF® density reduction vs. metal



With outstanding fatigue, vibration, and impact resistance, Xycomp® DLF™ provides up to **60% weight savings** to help with tool ergonomics and user fatigue while providing exceptional performance.

MATERIAL COMPARISON

Typical Properties	Orthtek® WF	Xycomp® DLF™	Arlon® 1260
Fiber type	Carbon	Carbon	Carbon
Fiber Structure	Continuous woven	Discontinuous chopped	Random short
Fiber Orientation	X,Y [2d]	x,y,z [3d]	x,y,z [3d]
Fiber Content (By Volume)	50%	60%	30%
Tensile Strength (Psi/Mpa)	91,000/627	39,500/272	33,400/230
Flexural Modulus (Psi/Gpa)	7,000,000/48.3	5,600,000/38.6	2,800,000/19.3
Density (G/Cc)	1.54	1.61	1.41
Color	Black	Black	Black
Molding Method*	Compression	Compression	Injection molded
Radiolucency	Yes	Yes	Yes
Autoclavable	Yes	Yes	Yes
Typical Applications	Nail Guides, External Fixators, Plate Guides, Retractors, and others	Nail Guides, External Fixators, Plate Guides, Retractors, and others	Retractors, external fixators, and medical components

*Mechanical properties of fiber-reinforced injection molded, and extruded parts are measured in the direction of flow fibers generally tend to align in the direction of flow, resulting in properties significantly higher in this direct to the transverse direction. Fiber in compression-molded parts is more randomly oriented; therefore, mechanical properties are generally the same in all directions.

Greene Tweed's Orthtek® composite plates deliver strength, durability, and innovation for machining orthopedic components like nail guides and retractors. With advanced manufacturing techniques, Orthtek® composite plates provide precise control and optimal performance for orthopedic implant applications. With U.S. engineering, Swiss manufacturing, and ISO compliance, we empower machine shops to produce top-tier medical devices with precision and confidence.



Nail guides



Targeting device

MEDICAL COMPOSITE PRODUCTS

Fixation
componentsUniversal
screw guides

Contact Greene Tweed today to learn more
about our Medical Composite Plates.



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