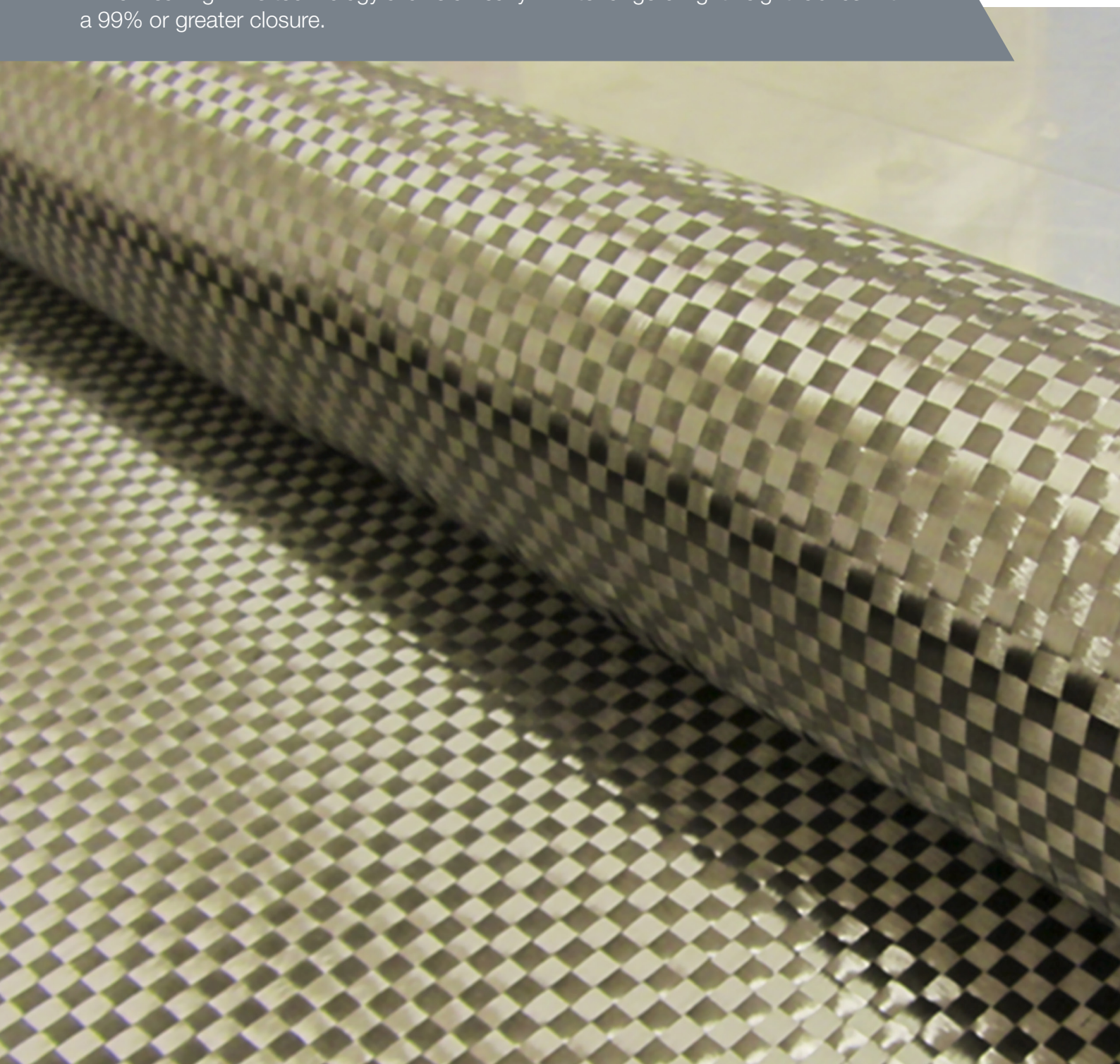
HEXCEL®

PrimeTex®
Reinforcements

PrimeTex® reinforcements use a patented process to spread carbon fiber in the fabric while weaving. This technology allows a nearly infinite range of lightweight fabrics with a 99% or greater closure.



PrimeTex®
Reinforcements

- Advanced technology spreads fibers in both the warp and weft direction
- Improves closure factor compared to conventional weaving process
- Use of higher K tow for a given Fabric Areal Weight (FAW)
- Weight savings up to 20%
- Uniform weave and gap-free structure
- Excellent water tightness when used in honeycomb sandwich structures
- Laminate mechanical properties maintained after spreading process with reduced variability thanks to homogenous resin/fiber distribution

PrimeTex® reinforcements are a range of carbon fabrics which have been processed for a smooth, closed weave and uniform cosmetic appearance. The fiber tows are spread in both the warp and weft direction for unique aesthetic appeal. They are more uniform as the filaments in each tow are spread out, creating a thinner and more closely woven fabric that provides better mechanicals and less porosity in a laminate. It can also be used to lower the mass in a composite where lighter weight is the key characteristic.

As lightweighting becomes critical for composite structures, the standard weights of available fabrics, particularly with the lower cost 6K and 12K fibers, limits the flexibility of the designer. Hexcel's R&T team has developed a new process to correct for this historical limitation. Now in production, Hexcel's PrimeTex fabrics use an advanced process to spread the carbon fiber in the fabric while weaving. This technology allows a nearly infinite range of lightweight fabrics, down to 75 gsm (with 3K fiber) with the same or better closure than standard 3K 193 gsm fabrics (all Hexcel PrimeTex fabrics are targeted to have a 99% or greater closure).

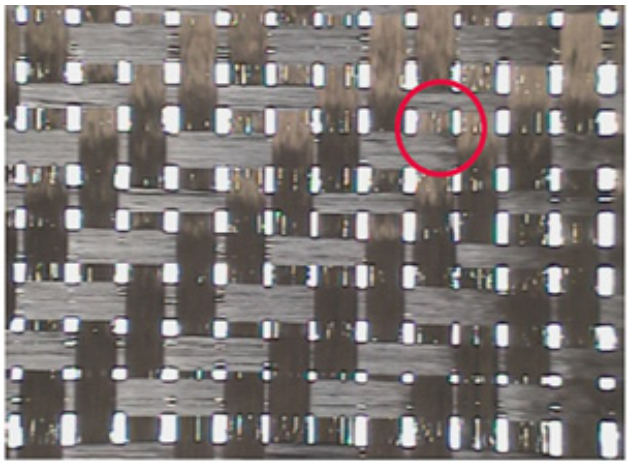
Although there are other spread-tow carbon fiber fabrics on the market, they require additional manufacturing steps which drive high costs. PrimeTex fabrics are woven and spread in one step, meaning the designer can realize the cost advantage of a lower cost input fiber, while reducing weight at the same time. An example is HexTow® IM2A GP 12K intermediate modulus fiber. IM2A fiber has a Young's modulus of 40MSI, nearly 20% stiffer than AS4C fiber. Before PrimeTex, IM fibers had to be woven from more expensive aerospace grade IM7 GP 6K. The low-cost commercial grade IM2A12K fiber gives the designer the higher modulus he is looking for at commercial carbon costs.

Key benefits of PrimeTex® reinforcements:

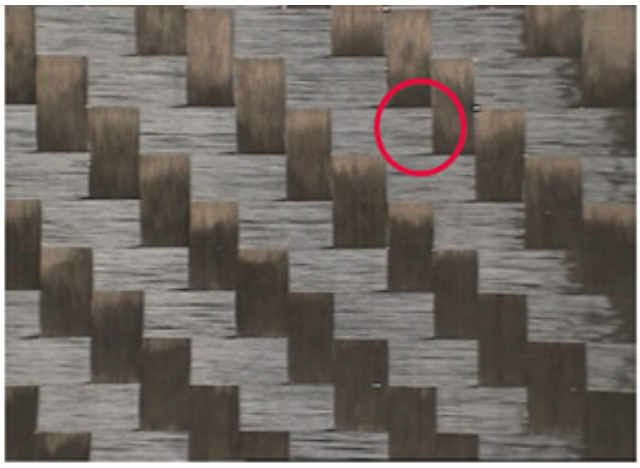
- ***Lightweight*** – PrimeTex fabrics can be lighter weight than standard fabrics using the same input fiber.
- ***Reduced Cost*** – Lower cost input fibers can be used such as replacing 3K with 12K fiber. Also PrimeTex fabrics are woven in one step reducing manufacturing costs.
- ***Higher Properties*** – PrimeTex fabrics have lower crimp resulting in higher mechanical properties with lower resin usage.
- ***Handling*** – PrimeTex fabrics drape very well and have a softer feel than standard fabrics. There is no additional binder bonded to the fiber to interfere with the fiber-resin interface.
- ***Uniform Closure*** – Can also be used on standard weight fabrics resulting in a nearly opaque fabric suitable for use as a cosmetic ply over a less visually appealing substrate.

Typical Applications

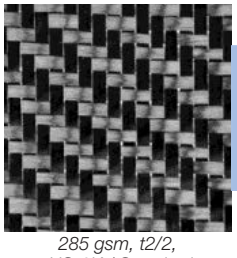
- Aircraft and helicopter sandwich structures and thin monolithic parts
- UAV/light aircraft market targeted by cost to weight
- Automotive structures
- Sports equipment (skis, hockey sticks, bikes, helmets)



HexForce® 193 gsm, Twill 2/2, HS12K
Open factor: 5%



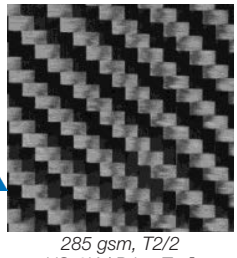
PrimeTex® 193 gsm, Twill 2/2, HS12K
Open factor: 0.3%



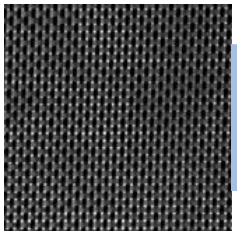
285 gsm, t2/2,
HS-6K / Standard

Enhanced Performance

Delivering improved mechanical performance
and better surface finish



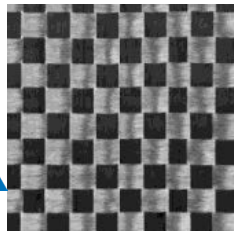
285 gsm, T2/2
HS-6K / PrimeTex®



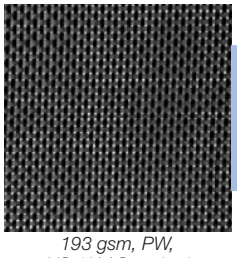
98 gsm, PW,
HS-1K / Standard

Greater Value for Customers

For the same weight, PrimeTex® + Higher K Tow can replace
standard woven carbon fabrics while maintaining performance levels



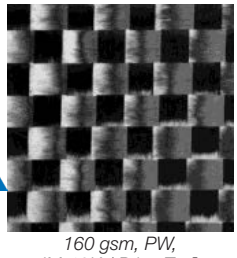
98 gsm, PW,
HS-3K / PrimeTex®



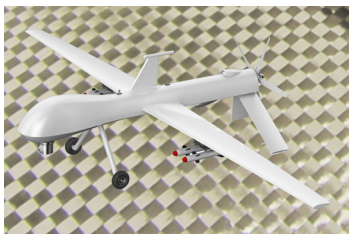
193 gsm, PW,
HS-3K / Standard

Lightweighting

PrimeTex® combined with high performance fiber can replace standard
woven carbon for 10%+ anticipated weight benefit



160 gsm, PW,
IM-12K / PrimeTex®



Hexcel Product Family

HexTow® Carbon Fiber

HexFlow® Resins

HexMC®-i Molding Composite

HexForce® Reinforcements

Polyspeed® Laminates

HexWeb® Honeycomb Core

HiTape® Advanced Reinforcements

Modipur® Polyurethane

HexWeb® Engineered Core

HexPly® Prepregs

HexBond® Adhesives

HexTool® Tooling Material

HiMax® Multiaxial Reinforcements

HexAM® Additive Manufacturing

For more information

Hexcel is a leading worldwide supplier of lightweight composite materials to aerospace and industrial markets. Our comprehensive range includes:

- HexTow® carbon fibers
- HexForce® reinforcements
- HiMax® multiaxial reinforcements
- HexPly® prepregs
- HexAM® additive manufacturing
- HexMC®-i molding compounds
- HexFlow® RTM resins
- HexBond® adhesives
- HexTool® tooling materials
- HexWeb® honeycomb
- Acousti-Cap® sound attenuating honeycomb
- Engineered core
- Engineered products
- Polyspeed® laminates

For U.S. quotes, orders and product information call toll-free 1-866-601-5430. For other worldwide sales office telephone numbers and a full address list, please go to:

http://www.hexcel.com/contact

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