



HexWeb® Fibertruss® HFT®

Fiberglass/Phenolic Honeycomb

Product Data

Description

HexWeb® HFT® is the designation used for fiberglass \pm 45 degree Fibertruss® bias weave reinforced/phenolic honeycomb. This bias weave construction greatly enhances the shear modulus properties of the honeycomb core. The shear modulus for HexWeb® Fibertruss® HFT® is about twice that of HRP® (honeycomb made of straight weave fiberglass) and three times that of HRH®-10 (honeycomb made from NOMEX®). This makes HexWeb® Fibertruss® HFT® honeycomb ideal for applications where minimum deflections are required. There is little change in flatwise compression properties because these values are dependent on the resin system and its ability to maintain the fiber matrix integrity.

HexWeb® Fibertruss® HFT® has improved damage resistance and handleability since the 45 degree angle of the fiber at the cell wall corners allows greater flexibility. This increased flexibility allows the HexWeb® Fibertruss® HFT® to be formed more easily than straight weave honeycombs, resulting in reduced shop losses and simplified fit up of parts during assembly.

HexWeb® Fibertruss® HFT® has improved node bond strength and flexibility that makes it possible to offer a 1/8-inch cell fiberglass reinforced honeycomb. This together with the higher shear properties makes HexWeb® Fibertruss® HFT® an excellent core for use with high modulus graphite or other composite facing materials. The potential problem of galvanic corrosion with untreated aluminum honeycomb is eliminated, and the small cell size provides uniform support and bonding area for such facings. HexWeb® HFT®/OX-Core™ is available for applications requiring enhanced formability over the standard hexagonal product.

Features

- High shear properties, due to the \pm 45 degree fiber orientation
- Small cell size, 1/8 inch minimum hexagonal, or 3/16 inch minimum overexpanded
- Improved flexibility, damage resistance, and handling characteristics over conventional 0/90 degree fiber construction
- High strength retention at temperatures up to 350°F
- Low moisture pickup
- Low smoke emissions

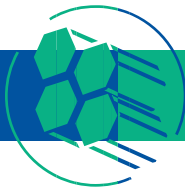
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® NOMEX is a registered trademark of E.I. DuPont de Nemours, Wilmington, Delaware.

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Applications

HexWeb® Fibertruss® HFT® is ideally suited for use in structural panels where superior nonmetallic core shear properties and/or minimum deflections are required. Typical applications are airfoil, control surfaces, fairings, engine nacelles, bulkheads, helicopter rotor blades, and equipment trays for motion-sensitive block boxes. HexWeb® Fibertruss® HFT® has also been designed into radomes because of its small cell size, dielectric transparency, and ease of handling.

HexWeb® Fibertruss® HFT® honeycomb is designated as follows:

Where:

Material – Cell Size – Density

Example: **HFT – 1/8 – 4.0**

HFT – designates bias weave fiberglass phenolic honeycomb

1/8 – is the cell size in inches

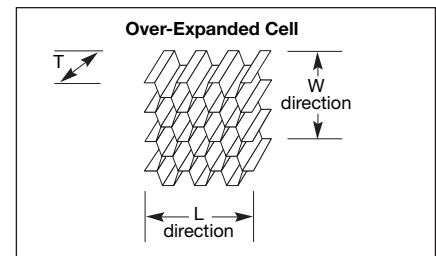
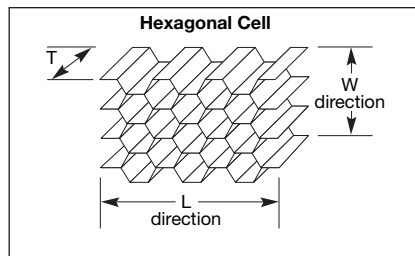
4.0 – is the nominal density in pounds per cubic foot

Dimensional Nomenclature

T = Thickness, or cell depth

L = Ribbon direction, or width

W = Long direction, or direction perpendicular to the ribbon



Availability

HexWeb® Fibertruss® HFT® will normally be supplied F.O.B. Casa Grande, Arizona. Lead times will vary with particular core types selected. A one block minimum buy may be required.

Standard Dimensions

HexWeb® Fibertruss® HFT® is currently made in standard panel sizes as shown below. For other thickness dimensions or requirements involving larger panels, pieces cut-to-size or formed parts, contact the nearest Hexcel Sales Office.

| | | |
|---------------|-------------------------------------|-------------------|
| HFT – 1/8 | 40 in. L ± 1 in. x 90 in. W ± 3 in. | 12–18 in. Block T |
| HFT – 3/16 | 40 in. L ± 1 in. x 90 in. W ± 3 in. | 12–18 in. Block T |
| HFT – 3/8 | 40 in. L ± 1 in. x 90 in. W ± 3 in. | 12–36 in. Block T |
| HFT/OX – 3/16 | 36 in. L ± 1 in. x 60 in. W ± 3 in. | 16 in. Block T |

Note: Due to the nature of the HexWeb® HFT®/OX product, cell configuration is not a perfect rectangle. See figure on the right, above, for a typical OX cell. HexWeb® HFT®/OX will be manufactured on a “best effort” basis only.

Thickness Tolerance

Tolerances on cut thickness are as follows:

0.125 in. to 2.000 in. tolerance will be ± 0.006 in.

2.001 in. to 4.000 in. tolerance will be ± 0.010 in.

4.001 in. and over tolerance will be ± 0.065 in.

Mechanical Properties

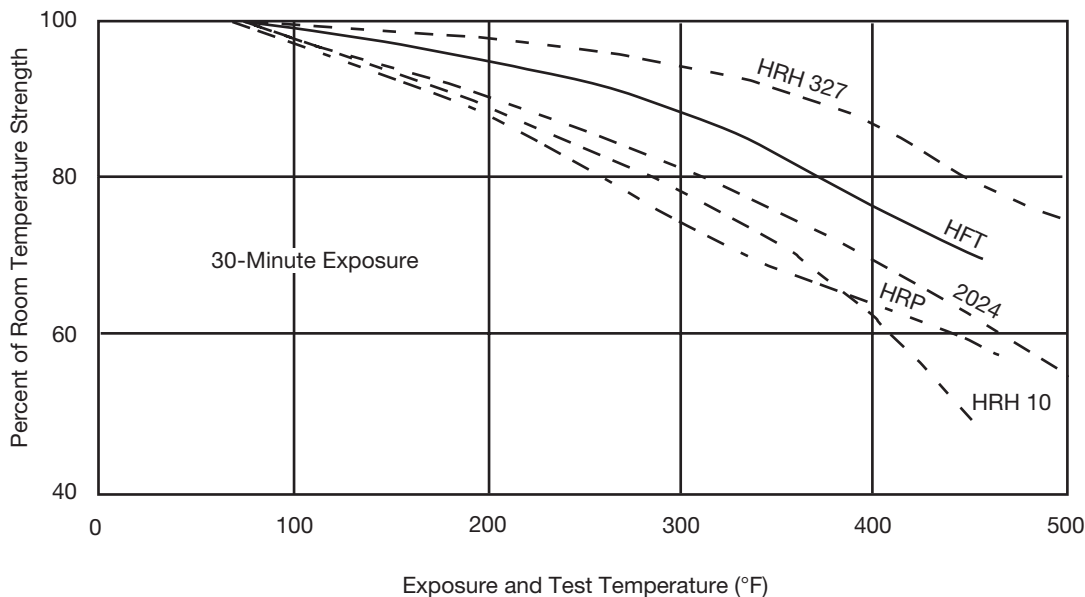
The following mechanical properties are based on testing of products per MIL-STD-401B at 0.500 inch thickness.

| Hexcel Honeycomb Designation Material – Cell – Density | Compressive | | | Plate Shear | | | | | |
|---|--------------|------|-------------|--------------|-----|-------------|--------------|-----|-------------|
| | Stabilized | | | L Direction | | | W Direction | | |
| | Strength psi | | Modulus psi | Strength psi | | Modulus psi | Strength psi | | Modulus psi |
| | typ | min | typ | typ | min | typ | typ | min | typ |
| HFT – 1/8 – 3.0 | 350 | 270 | 23.0 | 195 | 150 | 19.0 | 95 | 75 | 7.5 |
| HFT – 1/8 – 4.0 | 560 | 420 | 46.0 | 315 | 240 | 25.0 | 150 | 120 | 12.0 |
| HFT – 1/8 – 5.5 | 900 | 700 | 69.0 | 525 | 410 | 40.0 | 250 | 190 | 16.0 |
| HFT – 1/8 – 8.0 | 1750 | 1500 | 100.0 | 675 | 525 | 45.0 | 480 | 400 | 21.5 |
| HFT – 3/16 – 2.0 | 170 | 130 | 17.0 | 115 | 90 | 15.0 | 60 | 50 | 5.0 |
| HFT – 3/16 – 3.0 | 365 | 275 | 34.0 | 200 | 155 | 19.0 | 100 | 80 | 9.0 |
| HFT – 3/16 – 4.0 | 550 | 460 | 44.0 | 340 | 270 | 25.0 | 190 | 140 | 12.0 |
| HFT – 3/8 – 4.0 | 500 | 400 | – | 380 | 290 | 27.0 | 195 | 140 | 13.0 |
| HFT/OX – 3/16 – 6.0 | 1200 | 1020 | 63.0 | 320 | 240 | 18.0 | 260 | 190 | 19.0 |

Elevated Temperatures

A limited amount of testing at temperatures up to 450°F have shown the shear strength retention of HexWeb® Fibertruss® HFT® to be very good. Apparently the ± 45 degree fiber orientation again helps to maintain these good shear properties since the fiberglass is affected less than the resin system. Since the data is limited, it is suggested that the curve below is used as a guide only. Additional testing should be performed if certain properties are required.

Strength Retention at Elevated Temperatures





Moisture Pickup

Samples of HexWeb® Fibertruss® HFT®, HRP®, and HRH-10® were exposed to 95% relative humidity at 120°F for 120 hours to determine the moisture pickup. Three specimens each 5 in. L x 6 in. W x 0.50 in. T were first dried for one hour at 200°F, weighed, exposed to 95% R.H. and weighed again. The following percent moisture pickup was measured:

| | |
|---------------------|------|
| HFT – 1/8 – 4.0 | 1.3% |
| HFT – 3/16 – 4.0 | 1.6% |
| HRP – 3/16 – 4.0 | 1.7% |
| HRH-10 – 3/16 – 4.0 | 4.4% |

Important

Hexcel Corporation believes, in good faith, that the technical data and other information provided herein is materially accurate as of the date this document is prepared. Hexcel reserves the right to modify such information at any time. The performance values in this data sheet are considered representative but do not and should not constitute specification minima. The only obligations of Hexcel, including warranties, if any, will be set forth in a contract signed by Hexcel or in Hexcel's then current standard Terms and Conditions of Sale as set forth on the back of Hexcel's Order Acknowledgement.

For more information

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- Carbon, Glass, Aramid and Hybrid Prepregs
- Structural Film Adhesives
- Honeycomb Sandwich Panels
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For US quotes, orders and product information call toll-free 1-800-688-7734. For other worldwide sales office telephone numbers and a full address list please click here: <http://www.hexcel.com/contact/salesoffices>.