



# HexTow<sup>®</sup> IM7

Carbon Fiber

Product Data

HexTow<sup>®</sup> IM7 carbon fiber is a continuous, high performance, intermediate modulus, PAN based fiber available in 12,000 (12K) filament count tows. This fiber has been surface treated and can be sized to improve its interlaminar shear properties, handling characteristics, and structural properties. It is suggested for use in weaving, prepregging, filament winding, braiding, and pultrusion.

The unique properties of HexTow<sup>®</sup> IM7 fiber, such as higher tensile strength and modulus, as well as good shear strength, allow structural designers to achieve both higher safety margins for both stiffness and strength critical applications.

IM7-G 12k (0.25%) carbon fiber has been qualified to NMS 818 Carbon Fiber Specification (NCAMP). This allows customers to call out an industry standard, aerospace grade carbon fiber without the need to write and maintain their own specification.

| Typical Fiber Properties             | U.S. Units                              | SI Units               |
|--------------------------------------|---|------------------------|
| Tensile Strength<br>6K               | 800 ksi                                 | 5,515 MPa              |
| 12K                                  | 820 ksi                                 | 5,655 MPa              |
| Tensile Modulus (Chord 6000-1000)    | 40.0 Msi                                | 276 GPa                |
| Ultimate Elongation at Failure<br>6k | 1.9%                                    | 1.9%                   |
| 12K                                  | 1.9%                                    | 1.9%                   |
| Density                              | 0.0643 lb/in <sup>3</sup>               | 1.78 g/cm <sup>3</sup> |
| Weight/Length<br>6K                  | 12.5 x 10 <sup>-6</sup> lb/in           | 0.223 g/m              |
| 12K                                  | 25.0 x 10 <sup>-6</sup> lb/in           | 0.446 g/m              |
| Approximate Yield<br>6K              | 6,674 ft/lb                             | 4.48 m/g               |
| 12K                                  | 3,337 ft/lb                             | 2.24 m/g               |
| Tow Cross-Sectional Area<br>6K       | 1.94 x 10 <sup>-4</sup> in <sup>2</sup> | 0.13 mm <sup>2</sup>   |
| 12K                                  | 3.89 x 10 <sup>-4</sup> in <sup>2</sup> | 0.25 mm <sup>2</sup>   |
| Filament Diameter                    | 0.203 mil                               | 5.2 microns            |
| Carbon Content                       | 95.0%                                   | 95.0%                  |
| Twist                                | Never Twisted                           | Never Twisted          |

| Typical HexPly 8552 Composite Properties | U.S. Units | SI Units  | Test Method    |
|--|------------|-----------|----------------|
| 0° Tensile Strength                      | 395 ksi    | 2,723 MPa | ASTM D3039     |
| 0° Tensile Modulus                       | 23.8 Msi   | 164 GPa   |                |
| 0° Tensile Strain                        | 1.6%       | 1.6%      |                |
| 0° Flexural Strength                     | 270 ksi    | 1,862 MPa | ASTM D790      |
| 0° Flexural Modulus                      | 22.0 Msi   | 152 GPa   |                |
| 0° Short Beam Shear Strength             | 18.5 ksi   | 128 MPa   | ASTM D2344     |
| 0° Compressive Strength                  | 245 ksi    | 1,689 MPa | ASTM Mod. D695 |
| 0° Compressive Modulus                   | 21.2 Msi   | 146 GPa   |                |
| 0° Open Hole Tensile Strength            | 62 ksi     | 427 MPa   | ASTM D5766     |
| 0° Open Hole Compressive Strength        | 48.8 ksi   | 336 MPa   | ASTM D6484     |
| 90° Tensile Strength                     | 16.1 ksi   | 111 MPa   | ASTM D3039     |
| Fiber Volume                             | 60%        | 60%       |                |



| <b>Yarn/Tow Characteristics</b>  | <b>U.S. Units</b>           | <b>SI Units</b>             |
|----------------------------------|-----------------------------|-----------------------------|
| Specific Heat                    | 0.21 Btu/lb-°F              | 0.21 cal/g-°C               |
| Electrical Resistivity           | $4.9 \times 10^{-5}$ ohm-ft | $1.5 \times 10^{-3}$ ohm-cm |
| Coefficient of Thermal Expansion | -0.36 ppm/°F                | -0.64 ppm/°C                |
| Thermal Conductivity             | 3.12 Btu/hr-ft-°F           | 5.40 W/m-°K                 |

### **Carbon Fiber Certification**

This carbon fiber is manufactured to Hexcel aerospace grade specification HS-CP-5000. A copy of this specification is available upon request. A Certification of Analysis will be provided with each shipment.

### **Available Sizing**

Sizing compatible with various resin systems, based on application are available to improve handling characteristics and structural properties. Please see additional information on available Sizes on our website or contact our technical team for additional information.

### **Packaging**

Standard packaging of HexTow® IM7 is as follows:

| <b>Filament Count</b> | <b>Nominal Weight</b> |             | <b>Nominal Length</b> |            |
|-----------------------|-----------------------|-------------|-----------------------|------------|
|                       | <b>(lb)</b>           | <b>(kg)</b> | <b>(ft)</b>           | <b>(m)</b> |
| 6K                    | 4.0                   | 1.8         | 26,400                | 8,050      |
| 12K                   | 4.0                   | 1.8         | 13,350                | 4,070      |

Other package sizes may be available on request. The fiber is wound on a 3-inch ID by 11-inch long cardboard tube and overwrapped with plastic film.

### **Safety Information**

Obtain, read, and understand the Material Safety Data Sheet (MSDS) before use of this product.



### Important

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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

Hexcel is a leading worldwide supplier of composite materials to aerospace and other demanding industries. Our comprehensive product range includes:

- Carbon Fiber
- RTM Materials
- Honeycomb Cores
- Carbon, Glass, Aramid and Hybrid Prepregs
- Structural Film Adhesives
- Honeycomb Sandwich Panels
- Special Process Honeycombs
- Reinforced Fabrics

For US quotes, orders and product information call toll-free 1-866-556-2662 and 1-800-987-0658.

For other worldwide sales office telephone numbers and a full address list, please click here:

<http://www.hexcel.com/contact/salesoffice>