



# HexTow® AS4

Carbon Fiber

## Product Data

HexTow® AS4 carbon fiber is a continuous, high strength, high strain, PAN based fiber available in 3,000 (3K), 6,000 (6K) and 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, and is suggested for use in weaving, prepregging, filament winding, braiding, and pultrusion.

AS4-GP 3k (1%), AS4-GP 12k (0.9%), and AS4 12k carbon fibers have 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                  |   |                        |
| 3K                                | 670 ksi                                 | 4,620 MPa              |
| 6K                                | 640 ksi                                 | 4,410 MPa              |
| 12K                               | 640 ksi                                 | 4,410 MPa              |
| Tensile Modulus (Chord 6000-1000) | 33.5 Msi                                | 231 GPa                |
| Ultimate Elongation at Failure    |   |                        |
| 3K                                | 1.8%                                    | 1.8%                   |
| 6K                                | 1.7%                                    | 1.7%                   |
| 12K                               | 1.7%                                    | 1.7%                   |
| Density                           | 0.0647 lb/in <sup>3</sup>               | 1.79 g/cm <sup>3</sup> |
| Weight/Length                     |   |                        |
| 3K                                | 11.8 x 10 <sup>-6</sup> lb/in           | 0.210 g/m              |
| 6K                                | 23.9 x 10 <sup>-6</sup> lb/in           | 0.427 g/m              |
| 12K                               | 48.0 x 10 <sup>-6</sup> lb/in           | 0.858 g/m              |
| Approximate Yield                 |   |                        |
| 3K                                | 7,086 ft/lb                             | 4.76 m/g               |
| 6K                                | 3,485 ft/lb                             | 2.34 m/g               |
| 12K                               | 1,734 ft/lb                             | 1.17 m/g               |
| Tow Cross-Sectional Area          |   |                        |
| 3K                                | 1.82 x 10 <sup>-4</sup> in <sup>2</sup> | 0.12 mm <sup>2</sup>   |
| 6K                                | 3.70 x 10 <sup>-4</sup> in <sup>2</sup> | 0.24 mm <sup>2</sup>   |
| 12K                               | 7.43 x 10 <sup>-4</sup> in <sup>2</sup> | 0.48 mm <sup>2</sup>   |
| Filament Diameter                 | 0.280 mil                               | 7.1 microns            |
| Carbon Content                    | 94.0%                                   | 94.0%                  |
| Twist                             | Never Twisted                           | Never Twisted          |

| Typical HexPly 8552 Composite Properties (at Room Temperature) | U.S. Units | SI Units  | Test Method    |
|--|------------|-----------|----------------|
| 0° Tensile Strength  | 320 ksi    | 2,205 MPa | ASTM D3039     |
| 0° Tensile Modulus   | 20.5 Msi   | 141 GPa   |                |
| 0° Tensile Strain  | 1.55%      | 1.55%     |                |
| 0° Flexural Strength   | 274 ksi    | 1,889 MPa | ASTM D790      |
| 0° Flexural Modulus  | 18.4 Msi   | 127 GPa   |                |
| 0° Short Beam Shear Strength                                   | 18.5 ksi   | 128 MPa   | ASTM D2344     |
| 0° Compressive Strength  | 222 ksi    | 1,530 MPa | ASTM Mod. D695 |
| 0° Compressive Modulus   | 18.6 Msi   | 128 GPa   |                |
| 0° Open Hole Tensile Strength                                  | 64 ksi     | 438 MPa   | ASTM D5766     |
| 90° Tensile Strength   | 11.7 ksi   | 81 MPa    | ASTM D3039     |
| Fiber Volume   | 60%        | 60%       |                |

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| Yarn/Tow Characteristics         | U.S. Units                  | SI Units                    |
|----------------------------------|-----------------------------|-----------------------------|
| Specific Heat                    | 0.28 Btu/lb-°F              | 0.27 cal/g-°C               |
| Electrical Resistivity           | $5.6 \times 10^{-5}$ ohm-ft | $1.7 \times 10^{-3}$ ohm-cm |
| Coefficient of Thermal Expansion | -0.35 ppm/°F                | -0.63 ppm/°C                |
| Thermal Conductivity             | 3.95 Btu/hr-ft-°F           | 6.83 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® AS4 is as follows:

| Filament Count | Nominal Weight |      | Nominal Length |       |
|----------------|----------------|------|----------------|-------|
|                | (lb)           | (kg) | (ft)           | (m)   |
| 3K             | 4.0            | 1.8  | 28,340         | 8,640 |
| 6K             | 4.0            | 1.8  | 13,940         | 4,250 |
| 12K            | 8.0            | 3.6  | 13,870         | 4,230 |

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

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:

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