



**HYOSUNG** ADVANCED MATERIALS

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### Carbon Fiber Sales Directory

| Territory   | Name               | Position        | Location        | Email                         |
|-------------|--------------------|-----------------|-----------------|-------------------------------|
| USA         | Ishma Pinckney     | Manager         | Charlotte, NC   | ishma.pinckney@us.hyosung.com |
|             | Minho Choi         | Manager         | South Korea     | mh.choi@hyosung.com           |
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|             | Patrick Lee        | Sales Manager   | South Korea     | donggon.lee@hyosung.com       |
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| Taiwan      | JT Ban             | Sales Manager   | South Korea     | jtban@hyosung.com             |
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|             | JT Ban             | Sales Manager   | South Korea     | jtban@hyosung.com             |
| ASEAN/India | Douglas Kam        | Sales Manager   | South Korea     | kamds777@hyosung.com          |
| India       | Ved Prakash Pandey | Sales Manager   | Haryana, India  | vedparkash@hyosung.com        |



AS9100D Certified

Mar. 2022.11

Carbon Fiber for a Better World

**TANSOME**®  
CARBON FIBER

by **HYOSUNG** ADVANCED MATERIALS



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**Note:** Carbon fiber and its related products are subject to control under export/import regulations of each country



## Hyosung Advanced Materials Corporation

Hyosung Advanced Materials began as a business unit dealing with industrial yarn as part of Dongyang Nylon and Dongyang Polyester, the founding fathers of Hyosung Group, and has continued to grow to become a leading global material vendor offering some of the world's finest products based on proprietary technologies and non-stop innovation.

Our products including high strength industrial yarn and fabric and materials for steel wire are widely used in a variety of industry sectors including automotive, civil engineering and architecture, agriculture and military logistics. We maintain our competitive edge by developing high caliber global products including tire cord, yarn for automobile seat belts and fabric for airbags, and developing and commercializing new materials that will help us grow sustainably.

Our goal is to transform ourselves from a vendor of products featuring world-class quality and performance to a solution provider that prioritizes user safety and comfort.

### Hyosung's Global NO.1 Businesses



We truly appreciate your encouragement and support for us and pledge to channel our resources to R&D efforts and innovation to repay our thanks with solutions that can help improve your quality of life. Please keep watching us grow into a more reputable company not only among our partners and customers but also throughout the global community by fulfilling our social responsibility based on moral integrity.

## Hyosung Carbon Fiber - History

| 2008~<br>Development Stage   | 2011~<br>Marketing Stage  | 2013~<br>Commercial Production Stage   | ~2028<br>Expansion Stage  |
|--|---|--|---|
| <b>2008</b><br>Started Carbon Fiber Development<br><br><b>2010</b><br>Successfully Developed H2550 Precursor & Carbon<br><br><b>2011</b><br>Approved Corporate Investment Plans for the Commercial Production Line | <b>2011</b><br>Started Global Product Marketing<br><br><b>2012</b><br>Successfully Developed H3055 Precursor & Carbon | <b>2013</b><br>Established Commercial Plant in Jeonju, Korea (CF Capa. : 2,000MT/yr)<br><br><i>"The 1st Korean company to produce High Performance Carbon Fiber &amp; PAN Precursor"</i><br><b>IATF 16949 : 2016</b><br>Quality Management System certified June 2019,<br><b>AS9100D</b><br>Aerospace Quality Management System certified June 2021. | <b>2020</b><br>Carbon Fiber Capa. : 4,000 MT/yr<br>Precursor Capa. : 8,000 MT/yr<br><br><b>~2022</b><br>Carbon Fiber Capa. : 6,500 MT/yr<br>Precursor Capa. : 13,000 MT/yr<br><br><b>~2023</b><br>Carbon Fiber Capa. : 9,000 MT/yr<br>Precursor Capa. : 18,000 MT/yr<br><br><b>~2028</b><br>Carbon Fiber Capa. : 24,000 MT/yr<br>Precursor Capa. : 48,000 MT/yr |

## Application



## Factory Site



## Hyosung Carbon Fiber - The Number 1 High Strength Carbon Fiber in the World

Strength of  
Hyosung  
Carbon Fiber

- ① Produces own precursor - Hyosung's own Technology
- ② Fully controlled continuous process from raw material to carbon fiber
- ③ Technology development capability
- ④ Customer technical support
- ⑤ High Strength carbon fiber
- ⑥ High Translation of fiber properties



### Typical Tow Properties

| Fiber Type                                   | Number of Filaments | Tensile Strength<br>SI Units<br>(MPa) | US Units<br>(Ksi) | Tensile Modulus<br>SI Unit<br>(GPa) | US Unit<br>(Msi) | Elongation<br>(%) | Density<br>(g/cm <sup>3</sup> ) | Filament Diameter<br>(µm) | Yield<br>(g/cm) | Sizing<br>Level (%) | Remark |
|--|---------------------|---------------------------------------|-------------------|-------------------------------------|------------------|-------------------|---------------------------------|---------------------------|-----------------|---------------------|--------|
| High Strength,<br>Standard Modulus           | H2550               | 6,000                                 | 5,516             | 800                                 | 250              | 36.3              | 2.2                             | 1.80                      | 7.0             | 400                 | 1.0    |
|  |                     | 12,000                                | 5,516             | 800                                 | 250              | 36.3              | 2.2                             | 1.80                      | 7.0             | 800                 | 1.0    |
|  |                     | 12,000                                | 5,516             | 800                                 | 250              | 36.3              | 2.2                             | 1.80                      | 7.0             | 800                 | Unsize |
|  |                     | 24,000                                | 5,516             | 800                                 | 250              | 36.3              | 2.2                             | 1.80                      | 7.0             | 1,650               | 1.0    |
| High Strength,<br>Intermediate Modulus       | H3055               | 12,000                                | 5,516             | 800                                 | 290              | 42.1              | 1.9                             | 1.80                      | 6.6             | 725                 | 1.0    |
|  | H3060               | 24,000                                | 6,000             | 870                                 | 290              | 42.1              | 2.1                             | 1.80                      | 5.5             | 1,040               | 1.0    |
| Ultra High Strength,<br>Intermediate Modulus | H3065               | 12,000                                | 6,400             | 928                                 | 290              | 42.1              | 2.2                             | 1.80                      | 5.0             | 510                 | 1.0    |

### Typical Composite Properties

| Fiber Type             |                         | H2550     |          |           |          | H3055     |          |           |          | H3040     |          | H3045     |          | Test Method |
|------------------------|-------------------------|-----------|----------|-----------|----------|-----------|----------|-----------|----------|-----------|----------|-----------|----------|-------------|
|                        |                         | 6K        |          | 12K       |          | 24K       |          | 12K       |          | 24K       |          |           |          |             |
|                        |                         | SI Units  | US Units | SI Units  | US Units | SI Units  | US Units | SI Units  | US Units | SI Units  | US Units | SI Units  | US Units |             |
| Tensile Properties     | 0° Tensile Strength     | 2,950 MPa | 428 Ksi  | 2,950 MPa | 428 Ksi  | 2,950 MPa | 428 Ksi  | 2,950 MPa | 428 Ksi  | 3,000 MPa | 435 Ksi  | 3,100 MPa | 449 Ksi  | ASTM D3039  |
|                        | 0° Tensile Modulus      | 140 GPa   | 20.3 Msi | 140 GPa   | 20.3 Msi | 140 GPa   | 20.3 Msi | 155 GPa   | 22.5 Msi | 150 GPa   | 21.7 Msi | 155 GPa   | 22.5 Msi | ASTM D3039  |
|                        | 0° Tensile Strain       | 2.00%     |          | 2.00%     |          | 2.00%     |          | 1.80%     |          | 1.80%     |          | 2.00%     |          | ASTM D3039  |
| Compressive Properties | 0° Compressive Strength | 1,450 MPa | 210 Ksi  | 1,450 MPa | 210 Ksi  | 1,450 MPa | 210 Ksi  | 1,500 MPa | 217 Ksi  | 1,500 MPa | 217 Ksi  | 1,540 MPa | 223 Ksi  | ASTM D3410  |
|                        | 0° Compressive Modulus  | 140 GPa   | 20.3 Msi | 140 GPa   | 20.3 Msi | 140 GPa   | 20.3 Msi | 155 GPa   | 22.5 Msi | 150 GPa   | 21.7 Msi | 155 GPa   | 22.5 Msi | ASTM D3410  |
| Flexural Properties    | 0° Flexural Strength    | 1,800 MPa | 261 Ksi  | 1,800 MPa | 261 Ksi  | 1,800 MPa | 261 Ksi  | 1,800 MPa | 261 Ksi  | 1,710 MPa | 248 Ksi  | 1,640 MPa | 237 Ksi  | ASTM D790   |
|                        | 0° Flexural Modulus     | 125 GPa   | 18.1 Msi | 125 GPa   | 18.1 Msi | 125 GPa   | 18.1 Msi | 150 GPa   | 21.8 Msi | 159 GPa   | 23.1 Msi | 145 GPa   | 21.0 Msi | ASTM D790   |
| ILSS                   | Strength                | 90 MPa    | 13.1 Ksi | 90 MPa    | 13.1 Ksi | 90 MPa    | 13.1 Ksi | 90 MPa    | 13.1 Ksi | 90 MPa    | 13.1 Ksi | 90 MPa    | 13.1 Ksi | ASTM D2344  |

The above properties do not constitute any warranty or guarantees.  
These values are for material selection purposes only.

### Standard Packaging

| Fiber Type                             | Number of Filaments | Spool Net Weight (kg) | Bobbin Size (mm) |    |    |     |     | Spool Per Case (ea) | Case Net Weight (kg) | Pallet Net Weight (kg) |
|--|---------------------|-----------------------|------------------|----|----|-----|-----|---------------------|----------------------|------------------------|
|  |                     |                       | A                | B  | C  | D   | E   |                     |                      |                        |
| High Strength,<br>Standard Modulus     | H2550               | 6000                  | 1.0              | 76 | 84 | 110 | 250 | 280                 | 12                   | 432                    |
|  |                     |                       | 2.0              | 76 | 84 | 123 | 250 | 280                 | 8                    | 576                    |
|  |                     |                       | 2.0              | 76 | 84 | 125 | 250 | 280                 | 8                    | 576                    |
|  |                     | 12000                 | 4.0              | 76 | 84 | 154 | 250 | 280                 | 6                    | 864                    |
|  |                     |                       | 6.0              | 76 | 84 | 180 | 250 | 280                 | 4                    | 864                    |
|  |                     |                       | 4.0              | 76 | 84 | 145 | 250 | 280                 | 6                    | 864                    |
| High Strength,<br>Intermediate Modulus | H3055               | 12000                 | 6.0              | 76 | 84 | 195 | 250 | 280                 | 4                    | 864                    |
|  |                     |                       | 8.0              | 76 | 84 | 220 | 250 | 280                 | 6                    | 768                    |
|  |                     |                       | 2.0              | 76 | 84 | 131 | 250 | 280                 | 8                    | 576                    |
|  |                     |                       | 4.0              | 76 | 84 | 155 | 250 | 280                 | 6                    | 864                    |

\* Inside Pull can be applicable / Gayford Packaging

