



# PYROFIL<sub>TM</sub> HR40

# High Modulus Carbon Fiber Product Data Sheet

#### **Description**

**PYROFIL**<sub>TM</sub> **HR40** is a high modulus carbon fiber with high tensile strength. It is a continuous carbon fiber and has 12k(12,000) and filaments with approximately 6 microns diameter. **PYROFIL**<sub>TM</sub> **HR40** is a PAN based carbon fiber, which is made of non-textile precursor designed for high performance applications and suitable for many applications requiring high modulus and tensile strength.

# **Typical Fiber Properties**

	SI Unit	US Unit
Strand Tensile Strength	4410 MPa	640 KSi
Strand Tensile Modulus	395 GPa	57 MSi
Filament density	1.82 g/cm <sup>3</sup>	0.066 lb/in <sup>3</sup>
Elongation	1.2 %	1.2 %
Filament Count	12k(12,000)	12k(12,000)
Mass Per Unit Length	600 mg/m(12K)	0.0336 lb/in
Filament Diameter	6.0	6.0
Thermal Conductivity	45 W/mK	
Coefficient Thermal Expansion (Vf 60%)	-0.4 x 10 <sup>-6</sup> m/m/K	
Specific Heat (Vf 60%)	0.75 J/gK	

# Sizing Agent

Epoxy compatible sizing is available.

### **Typical Spool Properties**

		SI Unit	US Unit
Spool Weight		1.5 kg (12k)	3.31 lbs
Fiber Length per Spool		2500 m	2734 yds
Core Size	Inner Diameter	76.5mm	3 in
	Outer Diameter	82.5 mm	3.2 in
	Core Length	280 mm	11 in
Standard Number of spools per package		12	12

Product data and parameters cited in this publications have been obtained in Mitsubishi Rayon Co., Ltd. laboratories using the material under carefully controlled conditions. The information, therefore, is believed to be indicative of representative properties obtainable. Mitsubishi Rayon Co., Ltd. can not accept responsibility for the misapplication of these products nor for their use under controlled conditions. Numerical values resulting from the application of this material are dependent on processing details. It is recommended that the users develop his/her own application techniques and generate data consistent with his/her specific applications and process.





### Typical Mechanical Properties

Mechanical Properties		SI Unit	US Unit
Unidirectional Tension	Strength	2920 MPa	430 ksi
Official rension	Modulus	228 GPa	33.6 Msi
Unidirectional Compression	Strength	1340 MPa	197 ksi
	Modulus	197 GPa	29.0 Msi
Unidurectional Flexure	Strength	1350 MPa	199 ksi
	Modulus	209 GPa	30.8 Msi
Interlaminar Shear Strength	Strength	76 MPa	11 ksi
Fiber Volume		60%	60%

The matrix resin used for this data package is #350, standard epoxy resin of Mitsubishi Rayon Co., Ltd that mainly applies to general purpose prepreg.

#### **Safety Precautions**

It is recommended that customers notice precautions for handling Carbon Fibers. Operators should read and understand Material Safety Data Sheet (MSDS) before handling carbon fibers. Material Safety Data Sheets (MSDS) are prepared for all MITSUBISHI RAYON products and are available if required.

# **For More Information**

MITSUBISHI RAYON CO., LTD. Carbon Fiber & Composite Materials Division 6-41 Konan 1-Chome, Minato-Ku, Tokyo 108-8506, Japan

Phone: +81-(0)3-5495-3048, 3050, 3046

Fax: +81-(0)3-5495-3206, 3207

**GRAFIL INC.** 

Head Office Europe Office
5900 88th Street 6 Orchard Court
Sacramento, CA 95828,USA Binley Business Park

Phone: +1-800-365-5533 Harry Weston Road Fax: +1-916-386-0347 Binley, Coventry CV3 2TQ England

Phone: +44 (0) 2476 447272

Fax: +44 (0) 2476 449565

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The data cited above are typical and not guaranteed. Mechanical properties are strongly affected by the processing and the resins capabilities customer chooses.