

Intermediate / High Modulus & High Strength PAN-based Carbon Fiber PYROFIL™ MR / HR / HS Series

Aerospace /
Sports&Leisure

About PAN-based Carbon Fibers

■What is PYROFIL™ ?

Pyrofil is a carbon fiber made from polyacrylonitrile (PAN) as the raw material. Based on Mitsubishi Chemical's expertise in [polymer design and function design](#), our unique product can meet all customer requirements.

■About PYROFIL™ MR / HR / HS Series

- MR Type : Product group including MR 70, which boasts [the world's highest tensile strength](#).
- HR Type : High modulus carbon fiber with [excellent processability*](#) (HR 40).
- HS Type : [Higher tensile modulus](#) than HR 40 (HS 40).

* Processability refers to the ease of spreading fibers and resin impregnation when manufacturing intermediate materials.



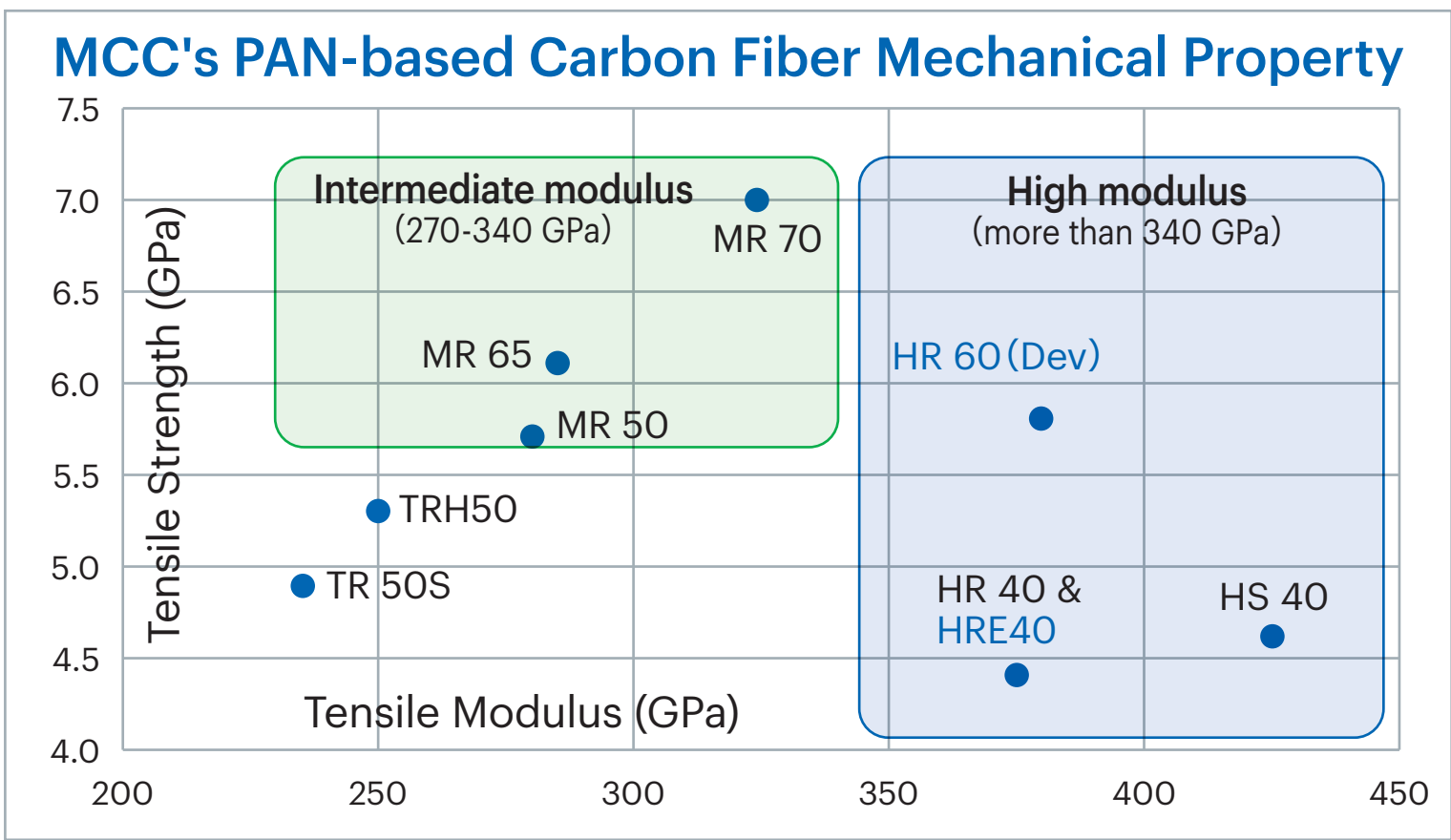
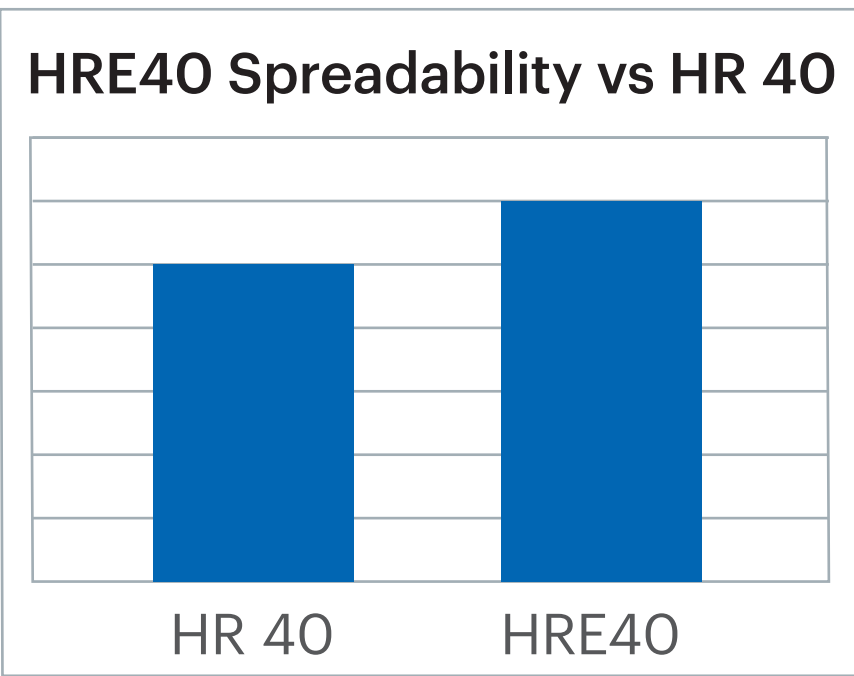
Technical Details and Features of Development Products

■High Modulus, High Strength Carbon Fiber HR 60

- [Improved strength by more than 25%](#) while maintaining the modulus of HR 40.
- Enables [significant weight reduction of composites](#).

■High Modulus Carbon Fiber HRE40

- Excellent Tow [Spreadability](#), Beyond proven HR 40, Ideal for [ultra-thin HM preregs](#)
- Improved Composite Performance
- Equivalent Tow Properties to HR 40



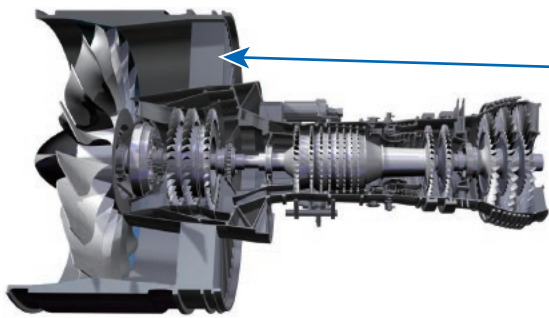
■Features and Application Examples

■Aerospace and Defense

Engine, main wing/auxiliary wing, brake pad, floor panel, satellite parts, missile parts, fuel tank, etc.

Our product is selected in aerospace customers.

PW1100G-JM for A320neo



Our high-strength PAN-based carbon fiber is used in the PW1100G-JM structural guide vane (SGV).

Engine diagram source: Japan Aircraft Engine Association

■High-End Sports & Leisure Products

Sports bikes, golf shafts, fishing rods, tennis/badminton rackets, baseball bats, hockey sticks, ski equipment, etc.

■Performance by Grade

PYROFIL™ Continuous Fiber(Tow)						
Fiber Type	Filament Count	Filament Diameter	Tensile Modulus	Tensile Strength	Yield	Density
		(μm)	(Gpa)	(Gpa)	(mg/m)	(g/cm³)
MR 50/MRE50 (Dev.)	12,000	6	284	5.56	573	1.80
MR 65	12,000	6	285	5.90	520	1.82
MR 70	12,000	5	324	7.00	415	1.82
HR 40/HRE40	12,000	6	375	4.41	600	1.82
HR 60 (Dev.)	12,000	6	375	5.70	500	1.82
HS 40	12,000	5	425	4.61	430	1.85

Values for development products may change.
All data are reference values and not guaranteed.