HIGH-PERFORMANCE CARBON FIBER

TORAYCA

M40J COMMERCIAL DOCUMENTATION

1) Product

The fibre is produced by the treatment of an acrylic fibre precursor, with pyrolysis, surface treatment and sizing processes.
Each bobbin of TORAYCA carbon fibre is protected against dust and packed in container to prevent damage during transportation.

2) Requirements

The fibre shall comply with the requirements given in the table (see overleaf) for a period of 24 months after production if stored under normal conditions. The fibre shall be used after a minimum of 48 hours, conditioned between 20°C and 35°C in 40% to 80% relative humidity. The fibre shall be uniform in appearance and substantially free from yarn breakage and foreign bodies.

3) Quality control

Fibre properties: all fibre properties are established on a single production lot basis

1) Definition of lot (TY-020B)

A "lot" of fibre is carbonized from one creel load of precursor and carbonized on the same equipment under one set of processing conditions.

2) Sampling plan

The sampling plan for inspection is based on ISO-3951 "Sampling Procedures and Tables for Inspection by Variables for percent Defective".

3) Testing methods

Testing methods are based on the following TORAYCA standards:

Tensile properties	TY-030B-01 (current version)
Density	TY-030B-02 (current version)
Yield	TY-030B-03 (current version)
Sizing amount	TY-030B-05 (current version)
Twist	TY-030B-06 (current version)

4) Presentation of properties

Lot properties are obtained by taking the average values of each bobbin in the sampling plan. Tensile properties of each bobbin are the mean values of measurements taken on five specimens.

4) Certification

Each lot of fibre is certified by the manufacturer as fulfilling the requirements of this specification. A conformity certificate is sent to the customer with each delivery.

5) Fibre Properties

Property	Unit	Number of filaments	Nominal Value*
Tensile Strength Tensile Modulus Elongation	MPa (kgf/mm²) GPa (10^3kgf/mm²) %		4400 (450) 377 (38.5) 1.2
Density	g/cm³	6000 12000	1.75
Yield	g/1000 m	6000 12000	225 450
Sizing Type & Amount	50A, 50B	1%	
Twist	Twisted, Untwisted		

*The stated values are typical values. For design purposes, please contact us.

6) Functional Properties

Property	Unit	Number of filaments	Nominal Value
Specific Heat	Cal/g.°C		0.17
Electric Resistivity	x 10^{-3} Ω.cm		1.0
CTE	α10^{-6}/°C		-0.83
Thermal Conductivity	Cal/cm.s.°C		0.164
Cross Sectional Area	mm²	6000 12000	0.13 0.25
Filament Diameter	µm		5

7) Composite Properties*

Property	Unit		Nominal Value
Tensile Strength Tensile Modulus Tensile Strain	MPa (kgf/mm²) GPa (10^3kgf/mm²) %		2450 (250) 230 (23.5) 1.1
Compressive Strength Flexural Modulus	MPa (kgf/mm²) GPa (10^3kgf/mm²)		1270 (130) 195 (20.0)
ILSS	MPa (kgf/mm²)		90 (9)

* Toray 2500 – 120°C resin system. Measured temperature: RT. Normalized to 60% fiber volume.

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