

# Miralon® Yarn

Miralon yarn products are carbon nanotube (CNT) fibers that can be used in a variety of applications to lightweight and provide enhanced mechanical and electrical performance. The fiber is manufactured via chemical vapor deposition into raw tow that can be spun into the final fiber, plied together to make longer lengths, or stretched to enhance electrical and mechanical properties. It is composed of aligned bundles of CNTs hundreds of microns in diameter and millimeters long. Miralon yarn has successfully been used in aerospace, electrical, and structural applications.



## Potential Applications:

- Structural – overwrap, unidirectional prepreg, strength member in cable
- Antennas
- High frequency digital/signal and RF applications
- Short run data cable conductors
- Embedded electronics
- Heaters
- Cut & tear resistant yarn or fabrics
- Thermal / fire resistant yarn or fabrics

The Miralon yarn products are based upon a single-ply of 10 tex (10 grams/km) yarn with an diameter of ~130 microns. Miralon yarns are available for shipment in single ply or they can be plied/braided into multiple diameters (including AWG equivalents) for processing in extrusion lines for coating with polymers, resins, and dielectrics. They can also be layed up to form uni-directional prepreg.

## Typical Physical Properties

Dimensional	Metric			Standard		
	A-series <sup>1</sup>	C-series <sup>2</sup>		A-series <sup>1</sup>	C-series <sup>2</sup>	
Diameter	130	240	µm	0.01	0.0094	in
Linear Density	10	29	Tex (g/km)	10	29	Tex (g/km)
	90	260	denier (g/9000m)	90	260	denier (g/9000m)
Density	0.6 - 0.8	0.7 - 0.9	g/cm <sup>3</sup>	0.02 - 0.03	0.03	lbs/in <sup>3</sup>
<b>Mechanical</b>						
Tenacity	0.4	1.1	N/Tex	0.40	1.1	N/Tex
	4.5	12	g/den	4.5	12	g/den
Specific Strength	0.53	1.1	GPa/(g/cm <sup>3</sup> )	1900	4517	ksi/(lbs/in <sup>3</sup> )
Modulus of Elasticity	7	58	N/Tex	7	58	N/Tex
	79	655	g/den	79	655	g/den
Strain at Break	10 - 30	3 - 4	%	10 - 30	3 - 4	%
<b>Electrical</b>						
Specific Conductivity	2,800	19,000	S*cm <sup>2</sup> /g	2,800	19,000	S*cm <sup>2</sup> /g

<sup>1</sup> Based on single-ply A-series (base) yarn. <sup>2</sup> Based on 4-ply C-series (high strength) yarn.

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