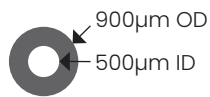


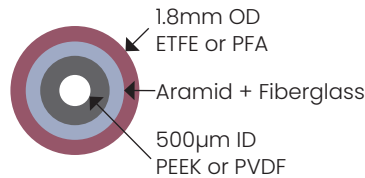
Low Outgassing Cable

For Space and Vacuum Environments

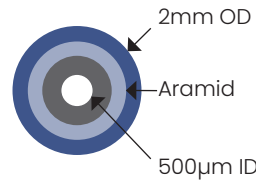
PEEK or PVDF



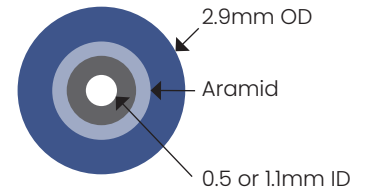
ETFE/PEEK or PFA/PVDF



PVDF/PVDF



PVDF/PVDF



Tubing Overview

	Advantage	Disadvantage
900µm OD PEEK	Large temperature range, very low shrinkage	Expensive, stiffness can be a challenge to route in boxes
900µm OD PVDF	Large temperature range, flexible, very low shrinkage	Low Melting Temperature and Pull Strength Shrinkage Varies from Lot to Lot
1.8mm OD ETFE / PEEK	Large Temperature Range , Flexible, Very Low Shrinkage	Expensive
1.8mm OD PFA / PVDF	Large Temperature Range , Flexible	Expensive
2mm OD PVDF / PVDF	Flexible, Inexpensive, and 12 Color Options	Shrinkage Varies from Lot to Lot
3mm OD PVDF / PVDF	Strong, Inexpensive, and 12 Color Options Stiffness limits fiber bending in high power operations	Shrinkage Varies from Lot to Lot

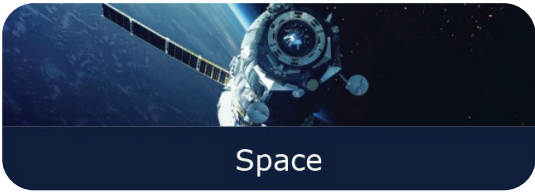
Tubing Properties

	900µm PEEK	900µm PVDF	1.8mm ETFE/ 900µm PEEK (Recommended for Space)	1.8mm PFA/ 900µm PVDF	2mm PVDF/ 900µm PVDF	2.9mm PVDF/ 900µm PVDF
Jackets (UL94 V-0)	Yes	Yes	Yes	Yes	Yes	Yes
Strength Members	None	None	Aramid and PTFE Coated Fiberglass	Aramid and PTFE Coated Fiberglass	Aramid	Aramid
Color (Customs Available)	Natural	Natural, Blue	Violet	Violet	Violet, Blue	Violet, Blue
Minimum Bend Radius* (With Tension)	18mm	18mm	36mm	36mm	40mm	60mm
Minimum Bend Radius* (No Tension)	9mm	9mm	18mm	18mm	20mm	30mm
Relative Stiffness (100mm tubing to 25mm radius)	0.2 Newton (0.04)	0 Newton (0 lbs)	0.22 Newton (0.05)	0.15 Newton (0.03 lbs)	0.25 Newton (0.05)	1 Newton (0.22 lbs)
Operating Temperature (Dependent on fiber used)	-55-200°C Optically to -40°	-40 - 85°C Optically to -5°	-55 - 150°C Optically to -40°	-55 - 125°C Optically to -5°	-40 - 85°C Optically to -5°	-40 - 85°C Optically to -5°
Shrinkage** (Typical) (10 - 20X from -40 to 85°C)	≈0.02%	≈1.5 - 5%	≈0.03%	≈0.13%	≈0.3 - 2%	≈0.3 - 2%
Maximum Load	4.5 Newton (1 lbs)	2.5 Newton (0.56 lbs)	45 Newton (10 lbs)	45 Newton (10 lbs)	45 Newton (10 lbs)	45 Newton (10 lbs)
Cable Weight	≈0.2kg/km (0.13 lbs / 1000ft)	0.52 kg/km (0.35 lbs / 1000ft)	3.5kg/km (2.35 lbs / 1000ft)	4kg/km (2.7 lbs / 1000ft)	3.8kg/km (2.55 lbs / 1000ft)	6.3kg / km (4.2 lbs / 1000ft)
Maximum Length	10 Meters	10 Meters	20 Meters	20 Meters	10 Meters	100 Meters

Values are given for design consideration and should be verified. Performance is not guaranteed and therefore should be verified by testing completed cable assemblies.

*Bend radius specifications are for bends up to 180°. Coiling of 1.8 to 2.9mm OD cable should be over 500mm diameter, or less ideal 1 to 3 coils around 150 to 200mm diameter.

**As a comparison traditional PVC cabling shrinks 3% to 6%.



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