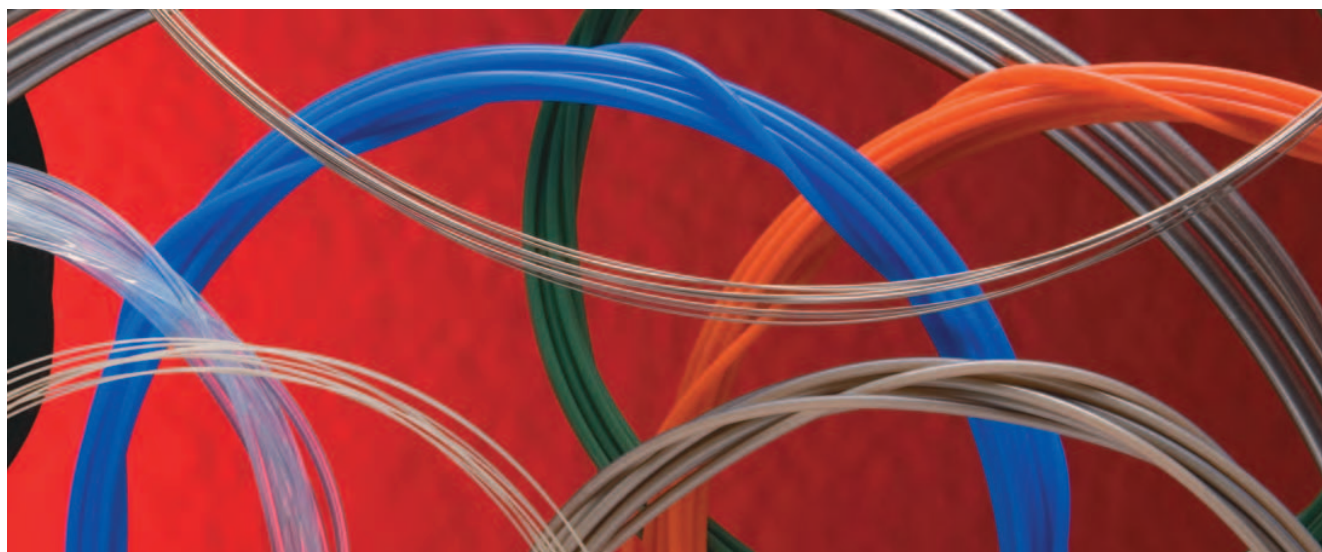


TUBING



METAL AND POLYMERIC

We offer chromatography grade tubing in a variety of polymers as well as stainless steel. Outside diameters are 360 µm, 1/32", 1/16", 1/8", and 1/4".

TUBING INDEX

PEEK TUBING

Natural PEEK.....page 9

Available in ODs from 360 micron to 1/4", in custom lengths (priced per meter) and packages of 1.5m, 3m, and 10m

Striped color-coded PEEK 10

A stripe is added to the outside of the tubing, so dye never contacts the fluid stream.

Dual-layer PEEK..... 11

With an inner layer of natural PEEK and an outer layer of color-coded PEEK, there is no possibility of stream contents coming in contact with coloring agents.

Solid color-coded PEEK..... 12

Color coding identifies the ID of your PEEK tubing. Each ID is coded with a different color.

OTHER POLYMERIC TUBING

PFA 13

ETFE..... 13

PTFE

Solid color-coded..... 14

Natural 15

FEP 16

Thermo-formed polymeric tubing .. 17

Impermeable tubing 17

FEP coated with PVDF combines the chemical resistance of FEP with the tight, impermeable structure of PVDF.

STAINLESS STEEL TUBING

Bulk SS tubing

Premium grade, seamless 19

Standard grade, welded seam 19

Pre-cut SS tubing

Standard 20

Flexible..... 21

! DISCLAIMER

The maximum holding pressure for any type of connections involving tubing and a ferrule varies considerably with the tubing material, the ferrule material, the clearance between tubing OD and ferrule ID, and the shape of the fitting detail.

➔ SEE ALSO

SolviFlex
coiled tubing 84

Tubing tools and accessories

Easy-Flange kit 99

Easy-Flange combi kit . 99

PEEK tubing elbows .. 100

Tubing cutters for:

Polymeric tubing

Clean-cut 100

Guillotine..... 100

Stainless tubing

Wheel type 101

Plier type 101

Tubing clip – the LC
tubing organizer.... 100



NATURAL PEEK TUBING

PEEK tubing has the strength required to withstand continuous use at HPLC pressure without swelling or bursting, and is not affected by halide salts, high strength buffers, or other aggressive mobile phases that corrode stainless steel. The polymer surface will not leach metal ions into the eluent or extract metal-sensitive components from the sample. Note however that dichloromethane, THF, and DMSO may cause swelling in PEEK, and concentrated acids like nitric and sulphuric acid will attack PEEK.



NATURAL PEEK TUBING
shown with ODs of
1/8", 1/16", 1/32", and 360 µm

i PEEK TUBING TOLERANCES

Due to tighter tolerances, VICI Jour PEEK tubing is the best choice for chromatography applications in which exact flow rates or tube volume are of importance. The tighter tolerance ensures a more consistent internal volume of transfer lines.

Tubing OD	OD and ID (±)
1/32"	0.025 mm
1/16"	0.025 mm
1/8"	0.075 mm
1/4"	0.100 mm

t TECH TIP

- A clean burr-free perpendicular cut can be achieved with our Clean-cut cutter for polymeric tubing . . 100
- To bend PEEK tubing at the optimal radius, use our tubing elbows . . 100

➔ MORE INFO

About PEEK® 113
Chemical resistance
PEEK 110-112
PEEK at higher
temperatures 110
Maximum working
pressure 108
Tubing ID chart:
volume per length . . 107
Tubing tolerances . . 109

➔ SEE ALSO

Clean-cut polymeric
tubing cutter 100
Easy-Flange kit 99
PEEK fittings
High pressure 24-35
Low pressure . . 48, 50-53
PEEK tubing elbows . . 100

SPECIFICATIONS

MAXIMUM RECOMMENDED WORKING TEMPERATURE
100°C (continuous) for 1/16" OD tubing with ID up to 0.75 mm

MAX WORKING PRESSURES AT ROOM TEMPERATURE
See page 108

OPTIONS

Contact your distributor for more information about:

- Longer bulk tubing lengths
- Customized ODs and IDs

PEEK tubing – natural

OD	ID (mm)	1.5 m	3 m	10 m
		Product No.	Product No.	Product No.
1/32"	0.13	JR-T-5993-M1.5	JR-T-5993-M3	JR-T-5993-M10
	0.15	JR-T-5706-M1.5 NEW	JR-T-5706-M3 NEW	JR-T-5706-M10 NEW
1/8"	0.75	—	JR-T-60041-M3	JR-T-60041-M10
	1.59	—	JR-T-6004-M3	JR-T-6004-M10
	2.00	—	JR-T-60042-M3	JR-T-60042-M10

OD	ID (mm)	per meter	Tubing tolerance: OD ± 0.037 mm; ID ± 0.0013 mm
		Product No.	
1/16"	0.064	JR-T-5998-0005 NEW	
	0.38	JR-T-62015	
1/4"	3.17	JR-T-6006	

↔ CONVERSIONS

75 µm	= .003"
0.013 mm	= .0005"
0.025 mm	= .001"
0.064 mm	= .0025"
0.075 mm	= .003"
0.100 mm	= .004"
0.13 mm	= .005"
0.15 mm	= .006"
0.38 mm	= .015"
0.75 mm	= .03"
1.59 mm	= 1/16"
2.00 mm	= .08"
3.17 mm	= 1/8"
1.5 m	= 4.92'
3.0 m	= 9.84'
10.0 m	= 32.8'

? WHICH PEEK TUBING FOR WHICH APPLICATION?

Application	Tubing
Standard HPLC*	1/16" OD x 0.25 mm ID
High pressure semi-prep LC*	1/8" OD
Agilent 1100 LC systems**	1/32"
Most capillary systems	360 µm

* Smaller ID for low flow rates/higher ID for high flow rates. Note that a low linear flow rate causes peak broadening.

**For some 1100 LC systems with high pressure flow paths

t TECH TIP: STRAIGHTENING PEEK TUBING

1. Start with stainless steel tubing:
ID slightly larger than OD of PEEK
Length = 2 cm shorter than PEEK
2. Slide PEEK tubing into stainless tubing, extending 1 cm out each end of the stainless
3. Place sleeved PEEK tubing into oven:
220°C for 30 minutes, or
180°C for 60 minutes
4. Allow sleeved tubing to cool in oven to ambient temperature
5. Once tubing is cooled, remove PEEK tubing from the SS sleeve
6. Check for straightness
7. Repeat if necessary



STRIPED COLOR-CODED PEEK TUBING

We recommend striped PEEK tubing for easy color-coded identification of tubing ID, with maximum chemical resistance and biocompatibility. The stripe is added to the outside, so dye never contacts the fluid stream.

All colorants used in the manufacture of this tubing are RoHS-compliant. (Restriction of Hazardous Substances)

1/32" OD

PRE-CUT LENGTHS

ID (mm)	Color	1 m Product No.	NEW 1.5 m Product No.	3 m Product No.
0.050	Orange	JR-T-5702-M1	JR-T-5702-M1.5	JR-T-5702-M3
0.064	Red	JR-T-5764-M1	JR-T-5764-M1.5	JR-T-5764-M3
0.075	Green	JR-T-5703-M1	JR-T-5703-M1.5	JR-T-5703-M3
0.10	Black	JR-T-5704-M1	JR-T-5704-M1.5	JR-T-5704-M3
0.13	Red	JR-T-5705-M1	JR-T-5705-M1.5	JR-T-5705-M3
0.18	Yellow	JR-T-5707-M1	JR-T-5707-M1.5	JR-T-5707-M3
0.20	Orange	JR-T-5708-M1	JR-T-5708-M1.5	JR-T-5708-M3
0.25	Blue	JR-T-5710-M1	JR-T-5710-M1.5	JR-T-5710-M3
0.50	Orange	JR-T-5720-M1	JR-T-5720-M1.5	JR-T-5720-M3



SPECIFICATIONS

MAXIMUM RECOMMENDED WORKING TEMPERATURE

100°C (continuous) for 1/16" OD tubing with ID up to 0.75 mm

MAX WORKING PRESSURES AT ROOM TEMPERATURE

See page 108

TUBING TOLERANCES

Tubing OD	OD and ID (±)
1/32"	0.025 mm
1/16"	0.025 mm

OPTIONS

Contact your distributor or VICI about:

- Longer bulk tubing lengths
- Customized ODs and IDs

1/16" OD

PRE-CUT LENGTHS

ID (mm)	Color	NEW 1.5 m Product No.	3 m Product No.	5 m Product No.	10 m Product No.	NEW 15 m Product No.	25 m Product No.
0.050	Orange	JR-T-5802-M1.5	JR-T-5802-M3	JR-T-5802-M5	JR-T-5802-M10	JR-T-5802-M15	JR-T-5802-M25
0.075	Green	JR-T-5803-M1.5	JR-T-5803-M3	JR-T-5803-M5	JR-T-5803-M10	JR-T-5803-M15	JR-T-5803-M25
0.10	Black	JR-T-5804-M1.5	JR-T-5804-M3	JR-T-5804-M5	JR-T-5804-M10	JR-T-5804-M15	JR-T-5804-M25
0.13	Red	JR-T-5999-M1.5	JR-T-5999-M3	JR-T-5999-M5	JR-T-5999-M10	JR-T-5999-M15	JR-T-5999-M25
0.18	Yellow	JR-T-6000-M1.5	JR-T-6000-M3	JR-T-6000-M5	JR-T-6000-M10	JR-T-6000-M15	JR-T-6000-M25
0.25	Blue	JR-T-6001-M1.5	JR-T-6001-M3	JR-T-6001-M5	JR-T-6001-M10	JR-T-6001-M15	JR-T-6001-M25
0.50	Orange	JR-T-6002-M1.5	JR-T-6002-M3	JR-T-6002-M5	JR-T-6002-M10	JR-T-6002-M15	JR-T-6002-M25
0.75	Green	JR-T-6003-M1.5	JR-T-6003-M3	JR-T-6003-M5	JR-T-6003-M10	JR-T-6003-M15	JR-T-6003-M25
1.00	Grey	JR-T-60031-M1.5	JR-T-60031-M3	JR-T-60031-M5	JR-T-60031-M10	JR-T-60031-M15	JR-T-60031-M25
1.40	Black	JR-T-60032-M1.5	JR-T-60032-M3	JR-T-60032-M5	JR-T-60032-M10	JR-T-60032-M15	JR-T-60032-M25



CONVERSIONS

50 µm = .002"	0.20 mm = .008"
75 µm = .003"	0.25 mm = .01"
100 µm = .004"	0.50 mm = .02"
125 µm = .005"	0.75 mm = .03"
150 µm = .006"	1.00 mm = .04"
0.013 mm = .0005"	1.40 mm = .055"
0.025 mm = .001"	
0.050 mm = .002"	1.5 m = 4.92'
0.064 mm = .0025"	3.0 m = 9.84'
0.075 mm = .003"	5.0 m = 16.40'
0.10 mm = .004"	10.0 m = 32.80'
0.13 mm = .005"	15.0 m = 49.21'
0.18 mm = .007"	25.0 m = 82.02'



TECH TIP

VICI Jour sample loops for analytical applications are made of PEEK striped color-coded tubing.

PEEK loops 95



SEE ALSO

Clean-cut polymeric tubing cutter 100
Easy-Flange kit 99
PEEK fittings

High pressure 24-35
Low pressure . 48, 50-53
PEEK tubing elbows .. 100

**SPECIFICATIONS**

**MAXIMUM RECOMMENDED
WORKING TEMPERATURE**
100°C (continuous)

TUBING TOLERANCES

Tubing OD	OD and ID (±)
1/16"	0.025 mm

OPTIONS

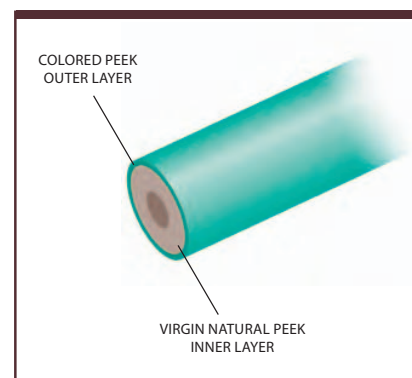
Contact your distributor
or VICI about:

- Longer bulk tubing lengths
- Customized ODs and IDs

DUAL LAYER COLOR-CODED PEEK TUBING

- Inner layer of natural PEEK,
outer layer of color-coded PEEK
- No possibility of stream coming in contact with coloring agents
- Pressure performance equivalent to single layer tubing
- 1/16" OD, IDs from 0.10 to 0.75 mm

Our dual layer PEEK tubing eliminates any concern that a critical sample stream could be contaminated by pigments used to color code the tubing. It looks like any other color-coded tubing at first glance, but a closer look reveals that the pigmented layer* surrounds a separate but integrally-bonded inner layer of natural PEEK. Only natural PEEK is in contact with the fluid stream.



*All colorants used in the manufacture of this tubing are RoHS-compliant. (Restriction of Hazardous Substances)

1/16" OD**PRE-CUT LENGTHS**

ID (mm)	Color	bar	psi	NEW 1.5 m	3 m	10 m	NEW 15 m	25 m
				Product No.	Product No.	Product No.	Product No.	Product No.
0.10	Black	460	6700	JR-TD-5804-M1.5	JR-TD-5804-M3	JR-TD-5804-M10	JR-TD-5804-M15	JR-TD-5804-M25
0.13	Red	420	6100	JR-TD-6007-M1.5	JR-TD-6007-M3	JR-TD-6007-M10	JR-TD-6007-M15	JR-TD-6007-M25
0.18	Yellow	400	5800	JR-TD-6008-M1.5	JR-TD-6008-M3	JR-TD-6008-M10	JR-TD-6008-M15	JR-TD-6008-M25
0.25	Blue	386	5600	JR-TD-6009-M1.5	JR-TD-6009-M3	JR-TD-6009-M10	JR-TD-6009-M15	JR-TD-6009-M25
0.50	Orange	350	4500	JR-TD-6010-M1.5	JR-TD-6010-M3	JR-TD-6010-M10	JR-TD-6010-M15	JR-TD-6010-M25
0.75	Green	240	3500	JR-TD-6011-M1.5	JR-TD-6011-M3	JR-TD-6011-M10	JR-TD-6011-M15	JR-TD-6011-M25

MORE INFO

About PEEK®113
 Chemical resistance
 PEEK110=112
 PEEK at higher
 temperatures110
 Maximum working
 pressure108
 Tubing ID chart:
 volume per length ..107
 Tubing tolerances109

SEE ALSO

Solid color-coded
 PEEK tubing 12
 Clean-cut polymeric
 tubing cutter100

PEEK tubing • Color-coded



TUBING

SOLID COLOR-CODED PEEK TUBING

Color-coding identifies the ID of your PEEK tubing – each ID is coded with a different color. Solid colored tubing is made of pre-dyed raw material.

All colorants used in the manufacture of this tubing are RoHS-compliant. (Restriction of Hazardous Substances)

1/32" OD

PRE-CUT LENGTHS

For natural PEEK tubing, see page 9.

ID (mm)	Color	1 m	3 m
		Product No.	Product No.
0.050	Orange	JR-T-5602-M1	JR-T-5602-M3
0.064	Red	JR-T-5664-M1	JR-T-5664-M3
0.075	Green	JR-T-5603-M1	JR-T-5603-M3
0.10	Black	JR-T-5604-M1	JR-T-5604-M3
0.13	Red	JR-T-5605-M1	JR-T-5605-M3
0.15	Purple	JR-T-5606-M1	JR-T-5606-M3
0.18	Yellow	JR-T-5607-M1	JR-T-5607-M3
0.20	Orange	JR-T-5608-M1	JR-T-5608-M3
0.25	Blue	JR-T-5610-M1	JR-T-5610-M3
0.50	Orange	JR-T-5620-M1	JR-T-5620-M3

SPECIFICATIONS

MAXIMUM RECOMMENDED WORKING TEMPERATURE

100°C (continuous) for 1/16" OD tubing with ID up to 0.75 mm

MAX WORKING PRESSURES AT ROOM TEMPERATURE

See page 108

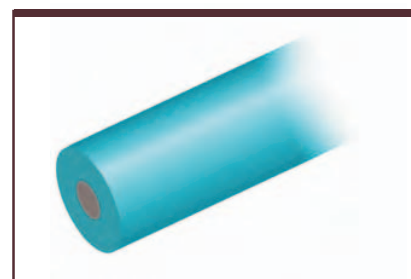
TUBING TOLERANCES

Tubing OD	OD and ID (±)
1/32"	0.025 mm
1/16"	0.025 mm

OPTIONS

Contact your distributor or VICI about:

- Longer bulk tubing lengths
- Customized ODs and IDs



1/16" OD

PRE-CUT LENGTHS

For natural PEEK tubing, see page 9.

ID (mm)	Color	NEW 1.5 m	3 m	10 m	NEW 15 m	25 m
		Prod No	Prod No	Prod No	Product No.	Product No.
0.10	Black	JR-T-6020-M1.5	JR-T-6020-M3	JR-T-6020-M10	JR-T-6020-M15	JR-T-6020-M25
0.13	Red	JR-T-6007-M1.5	JR-T-6007-M3	JR-T-6007-M10	JR-T-6007-M15	JR-T-6007-M25
0.15	Purple	JR-T-6030-M1.5	JR-T-6030-M3	JR-T-6030-M10	JR-T-6030-M15	JR-T-6030-M25
0.18	Yellow	JR-T-6008-M1.5	JR-T-6008-M3	JR-T-6008-M10	JR-T-6008-M15	JR-T-6008-M25
0.25	Blue	JR-T-6009-M1.5	JR-T-6009-M3	JR-T-6009-M10	JR-T-6009-M15	JR-T-6009-M25
0.38	Grey	JR-T-6040-M1.5	JR-T-6040-M3	JR-T-6040-M10	JR-T-6040-M15	JR-T-6040-M25
0.50	Orange	JR-T-6010-M1.5	JR-T-6010-M3	JR-T-6010-M10	JR-T-6010-M15	JR-T-6010-M25
0.75	Green	JR-T-6011-M1.5	JR-T-6011-M3	JR-T-6011-M10	JR-T-6011-M15	JR-T-6011-M25

TECH TIP

See our dual layer PEEK tubing for solid colored PEEK tubing with no possibility of stream coming into contact with coloring agents. 11

MORE INFO

About PEEK® 113
Chemical resistance
PEEK 110-112
PEEK at higher
temperatures 110
Maximum working
pressure 108
Tubing ID chart:
volume per length .. 107
Tubing tolerances 109

SEE ALSO

Clean-cut polymeric
tubing cutter 100
Easy-Flange kit 99
PEEK fittings
High pressure 24-35
Low pressure . 48, 50-53
PEEK tubing elbows .. 100



SPECIFICATIONS – ETFE AND PFA

MAX WORKING PRESSURES

See page 108

TUBING TOLERANCES

Tubing OD	OD and ID (±)
1/16" *	0.05 mm
1/8"	0.10 mm
1/4"	0.10 mm OD 0.20 mm ID
* ETFE with 0.20 mm ID: OD ± 0.07 Wall ± 0.08	

OPTIONS

Contact your distributor or VICI about:

- Longer tubing lengths at competitive bulk prices
- Customized ODs and IDs

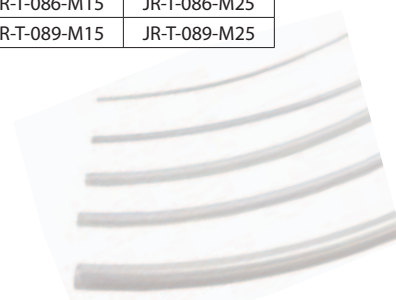
ETFE TUBING

ETFE (ethyltrifluoroethylene) tubing is particularly suitable for HPLC, since it has a higher burst pressure as compared to PTFE. 1/16" OD x 0.25 mm ID tubing will withstand up to 186 bar (2700 psi) with water as mobile phase. However, it is important to note that when used with organic solvents, ETFE tubing may swell, reducing that maximum pressure to 70 bar (1000 psi).

This is the ideal polymer for applications with chloride salts, which typically corrode stainless steel.

OD	ID (mm)	NEW 1.5 m	3 m	10 m	NEW 15 m	25 m
		Product No.	Product No.	Product No.	Product No.	Product No.
1/32"	0.25	JR-T-084-M1.5	JR-T-084-M3	JR-T-084-M10	JR-T-084-M15	JR-T-084-M25
1/16"	0.20	JR-T-079-M1.5	JR-T-079-M3	JR-T-079-M10	JR-T-079-M15	JR-T-079-M25
	0.25	JR-T-080-M1.5	JR-T-080-M3	JR-T-080-M10	JR-T-080-M15	JR-T-080-M25
	0.50	JR-T-082-M1.5	JR-T-082-M3	JR-T-082-M10	JR-T-082-M15	JR-T-082-M25
	0.75	JR-T-083-M1.5	JR-T-083-M3	JR-T-083-M10	JR-T-083-M15	JR-T-083-M25
1/8"	1.00	JR-T-085-M1.5	JR-T-085-M3	JR-T-085-M10	JR-T-085-M15	JR-T-085-M25
	1.59	JR-T-086-M1.5	JR-T-086-M3	JR-T-086-M10	JR-T-086-M15	JR-T-086-M25
	2.40	JR-T-089-M1.5	JR-T-089-M3	JR-T-089-M10	JR-T-089-M15	JR-T-089-M25

OD	ID (mm)	1 m	3 m
		Product No.	Product No.
3.0 mm	1.0	JR-T-087-M1	JR-T-087-M3
6.0 mm	4.0	JR-T-088-M1	JR-T-088-M3
6.4 mm	4.8	JR-T-090-M1 NEW	JR-T-090-M3 NEW



PFA TUBING

PFA (perfluoroalkoxy) tubing from VICI Jour has excellent chemical stability and mechanical strength. 1/16" OD high purity tubing has a maximum pressure rating of up to 100 bar (1450 psi), while 1/8" OD tubing can be used at up to 72 bar (1050 psi).

Always use PFA instead of PTFE if gas permeability is an issue.

OD	ID (mm)	NEW 1.5 m	3 m	10 m	NEW 15 m	25 m
		Product No.	Product No.	Product No.	Product No.	Product No.
1/16"	0.50	JR-T-4001-M1.5	JR-T-4001-M3	JR-T-4001-M10	JR-T-4001-M15	JR-T-4001-M25
	0.75	JR-T-4002-M1.5	JR-T-4002-M3	JR-T-4002-M10	JR-T-4002-M15	JR-T-4002-M25
	1.00	JR-T-4007-M1.5	JR-T-4007-M3	JR-T-4007-M10	JR-T-4007-M15	JR-T-4007-M25
1/8"	1.59	JR-T-4003-M1.5	JR-T-4003-M3	JR-T-4003-M10	JR-T-4003-M15	JR-T-4003-M25

OD	ID (mm)	per meter Product No.
1/8"	1.70	JR-T-4005
3/16"	3.20	JR-T-4009
1/4"	3.97	JR-T-4006 NEW
	4.35	JR-T-4004
	4.80	JR-T-4008 NEW



TECH TIP

- When selecting tubing for low pressure applications, give careful consideration to gas permeability characteristics.
- Use PFA instead of PTFE if gas permeability is an issue.

MORE INFO

About ETFE.....113
Chemical resistance ..110
Maximum working pressure108
Tubing ID chart:
volume per length...107
Tubing tolerances109

SEE ALSO

Clean-cut polymeric tubing cutter100
Easy-Flange kit99
Low pressure fittings46-55
Solviflex coiled PFA tubing84

CONVERSIONS

50 µm = .002"	0.13 mm = .005"	3.97 mm = .156"
75 µm = .003"	0.15 mm = .006"	4.0 mm = .16"
100 µm = .004"	0.18 mm = .007"	4.35 mm = .17"
125 µm = .005"	0.20 mm = .008"	4.8 mm = .19"
150 µm = .006"	0.25 mm = .01"	1.0 m = 3.28'
0.013 mm = .0005"	0.38 mm = .015"	1.5 m = 4.92'
0.025 mm = .001"	0.50 mm = .02"	3.0 m = 9.84'
0.050 mm = .002"	0.75 mm = .03"	5.0 m = 16.40'
0.064 mm = .0025"	1.00 mm = .04"	10.0 m = 32.80'
0.075 mm = .003"	1.59 mm = 1/16"	15.0 m = 49.21'
0.07 mm = .0027"	1.70 mm = .067"	25.0 m = 82.02'
0.08 mm = .0031"	2.40 mm = .094"	
0.10 mm = .004"	3.20 mm = .126"	

PTFE tubing • Color-coded



TUBING

PTFE TUBING

PTFE (polytetrafluoroethylene) tubing is chemically inert and suitable for lower pressure applications. Typically 1/16" OD tubing holds up to 62 bar (900 psi) and 1/8" up to 35 bar (500 psi). Maximum continuous operating temperature is 100°C.

PTFE tubing – solid color-coded

Solid colors identify the tubing ID.

Black PTFE, available in two IDs, is recommended for light sensitive applications such as enzymatic reactions, luminescent reactions, connecting to a flow cell, and radioactive HPLC.

OD	ID (mm)	Color	3 m Product No.	10 m Product No.	25 m Product No.
1/16"	0.25	Blue	JR-T-4011C-M3	JR-T-4011C-M10	JR-T-4011C-M25
	0.25	Black	JR-T-6808-M3	JR-T-6808-M10	JR-T-6808-M25
	0.50	Black	JR-T-6811-M3	JR-T-6811-M10	JR-T-6811-M25
	0.50	Orange	JR-T-4183C-M3	JR-T-4183C-M10	JR-T-4183C-M25
	0.75	Green	JR-T-4036C-M3	JR-T-4036C-M10	JR-T-4036C-M25



SPECIFICATIONS

MAXIMUM RECOMMENDED WORKING TEMPERATURE

100°C (continuous)

MAX WORKING PRESSURES AT ROOM TEMPERATURE

See page 108

TUBING TOLERANCES

Tubing OD	OD and ID (±)
1/16"	0.05 mm
1/8"	0.10 mm
1/4"	0.10 mm
1/2"	0.20 mm

OPTIONS

Contact your distributor or VICI about:

- Longer tubing lengths at competitive bulk prices
- Customized ODs and IDs

TECH TIP

Use PFA instead of PTFE if gas permeability is an issue.

TECH TIP

Use black PTFE for light sensitive applications such as enzymatic reactions, luminescent reactions, connecting to a flow cell, and radioactive HPLC.

MORE INFO

About PTFE.....104
Chemical resistance ..110
Maximum working pressure108
Tubing ID chart:
volume per length..107
Tubing tolerances109

SEE ALSO

Clean-cut polymeric tubing cutter100
Easy-Flange kit 99
Flanged fittings....47, 49
Flangeless fittings ..47-48

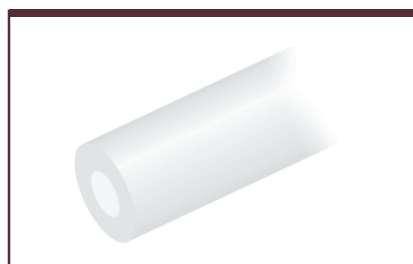


PTFE tubing – natural color

OD	ID (mm)	NEW 1.5 m	3 m	5 m	10 m	NEW 15 m	25 m
		Product No.	Product No.	Product No.	Product No.	Product No.	Product No.
1/16"	0.18	JR-T-6805-M1.5	JR-T-6805-M3	JR-T-6805-M5	JR-T-6805-M10	JR-T-6805-M15	JR-T-6805-M25
	0.25	JR-T-4011-M1.5	JR-T-4011-M3	JR-T-4011-M5	JR-T-4011-M10	JR-T-4011-M15	JR-T-4011-M25
	0.50	JR-T-4183-M1.5	JR-T-4183-M3	JR-T-4183-M5	JR-T-4183-M10	JR-T-4183-M15	JR-T-4183-M25
	0.75	JR-T-4036-M1.5	JR-T-4036-M3	JR-T-4036-M5	JR-T-4036-M10	JR-T-4036-M15	JR-T-4036-M25
	1.00	JR-T-6807-M1.5	JR-T-6807-M3	JR-T-6807-M5	JR-T-6807-M10	JR-T-6807-M15	JR-T-6807-M25
1/8"	1.59	JR-T-6800-M1.5	JR-T-6800-M3	JR-T-6800-M5	JR-T-6800-M10	JR-T-6800-M15	JR-T-6800-M25
	2.40	JR-T-4037-M1.5	JR-T-4037-M3	JR-T-4037-M5	JR-T-4037-M10	JR-T-4037-M15	JR-T-4037-M25

OD	ID (mm)	NEW 1.5 m	3 m	10 m	NEW 15 m	25 m
		Product No.	Product No.	Product No.	Product No.	Product No.
2 mm	1.70	JR-T-6801-M1.5	JR-T-6801-M3	JR-T-6801-M10	JR-T-6801-M15	JR-T-6801-M25
4 mm	3.00	JR-T-4039-M1.5	JR-T-4039-M3	JR-T-4039-M10	—	—

Tubing OD		ID	per meter
in.	mm		Product No.
3/16"	4.76	3.76 mm	JR-T-4041
0.236"	6.00	4.00	JR-T-4042 NEW
1/4"	6.35	4.76 mm	JR-T-6810 NEW
0.315"	8.00	6.00 mm	JR-T-4050 NEW
1/2"	12.7	9.53 mm	JR-T-4043 NEW



CONVERSIONS

50 µm = .002"	0.13 mm = .005"	3.97 mm = .156"
75 µm = .003"	0.15 mm = .006"	4.0 mm = .16"
100 µm = .004"	0.18 mm = .007"	4.35 mm = .17"
125 µm = .005"	0.20 mm = .008"	4.8 mm = .19"
150 µm = .006"	0.25 mm = .01"	1.0 m = 3.28'
0.013 mm = .0005"	0.38 mm = .015"	1.5 m = 4.92'
0.025 mm = .001"	0.50 mm = .02"	3.0 m = 9.84'
0.050 mm = .002"	0.75 mm = .03"	5.0 m = 16.40'
0.064 mm = .0025"	1.00 mm = .04"	10.0 m = 32.80'
0.075 mm = .003"	1.59 mm = 1/16"	15.0 m = 49.21'
0.07 mm = .0027"	1.70 mm = .067"	25.0 m = 82.02'
0.08 mm = .0031"	2.40 mm = .094"	
0.10 mm = .004"	3.20 mm = .126"	

FEP tubing • Natural



TUBING

FEP TUBING

FEP (FluorinatedEthylenePropylene) tubing is chemically inert to most HPLC solvents, and is recommended for low pressure applications. Typically 1/16" OD tubing holds up to 117 bar (1700 psi), and 1/8" OD holds up to 70 bar (1000 psi).

We recommend FEP for ion chromatography applications.

		1 m	3 m	10 m
OD	ID (mm)	Product No.	Product No.	Product No.
1/32"	0.13	JR-T-6605-M1	JR-T-6605-M3	JR-T-6605-M10
	0.15	JR-T-6606-M1	JR-T-6606-M3	JR-T-6606-M10
	0.18	JR-T-6607-M1	JR-T-6607-M3	JR-T-6607-M10
	0.20	JR-T-6797-M1	JR-T-6797-M3	JR-T-6797-M10
	0.25	JR-T-6610-M1	JR-T-6610-M3	JR-T-6610-M10
	0.38	JR-T-6615-M1	JR-T-6615-M3	JR-T-6615-M10
	0.40	JR-T-6798-M1	JR-T-6798-M3	JR-T-6798-M10
	0.50	JR-T-6620-M1	JR-T-6620-M3	JR-T-6620-M10

		NEW 1.5 m	3 m	10 m	NEW 15 m	25 m
OD	ID (mm)	Product No.	Product No.	Product No.	Product No.	Product No.
1/16"	0.25	JR-T-6812-M1.5	JR-T-6812-M3	JR-T-6812-M10	JR-T-6812-M15	JR-T-6812-M25
	0.30	JR-T-6702-M1.5	JR-T-6702-M3	JR-T-6702-M10	JR-T-6702-M15	JR-T-6702-M25
	0.50	JR-T-6802-M1.5	JR-T-6802-M3	JR-T-6802-M10	JR-T-6802-M15	JR-T-6802-M25
	0.75	JR-T-6803-M1.5	JR-T-6803-M3	JR-T-6803-M10	JR-T-6803-M15	JR-T-6803-M25
	1.00	JR-T-6806-M1.5	JR-T-6806-M3	JR-T-6806-M10	JR-T-6806-M15	JR-T-6806-M25
1/8"	1.59	JR-T-6804-M1.5	JR-T-6804-M3	JR-T-6804-M10	JR-T-6804-M15	JR-T-6804-M25
	2.10	JR-T-6813-M1.5	JR-T-6813-M3	JR-T-6813-M10	JR-T-6813-M15	JR-T-6813-M25
3/16"	3.18	JR-T-6835-M1.5	JR-T-6835-M3	JR-T-6835-M10	JR-T-6835-M15	JR-T-6835-M25
1 mm	0.50	JR-T-6105-M1.5	JR-T-6105-M3	JR-T-6105-M10	JR-T-6105-M15	JR-T-6105-M25
2 mm	1.00	JR-T-6210-M1.5	JR-T-6210-M3	JR-T-6210-M10	JR-T-6210-M15	JR-T-6210-M25
3 mm	1.00	JR-T-6310-M1.5	JR-T-6310-M3	JR-T-6310-M10	JR-T-6310-M15	JR-T-6310-M25
	2.00	JR-T-6320-M1.5	JR-T-6320-M3	JR-T-6320-M10	JR-T-6320-M15	JR-T-6320-M25

		per meter
OD	ID (mm)	Product No.
4 mm	3.00	JR-T-6860 NEW
1/4"	3.96	JR-T-6840 NEW
	4.35	JR-T-6809
	3/16"	JR-T-6841 NEW
5/16"	1/4"	JR-T-6650 NEW

SPECIFICATIONS

MAXIMUM RECOMMENDED WORKING TEMPERATURE
80°C (continuous)

MAX WORKING PRESSURES AT ROOM TEMPERATURE

See page 108

TUBING TOLERANCES

Tubing OD	OD and ID (±)
1/32"	0.025 mm
1/16"	0.08 mm
1/8"	0.10 mm
1/4"	0.10 mm OD
	0.20 mm ID

OPTIONS

Contact your distributor or VICI about:

- Longer tubing lengths at competitive bulk prices
- Customized ODs and IDs



TECH TIP

When selecting tubing for low pressure applications, give careful consideration to gas permeability characteristics.

MORE INFO

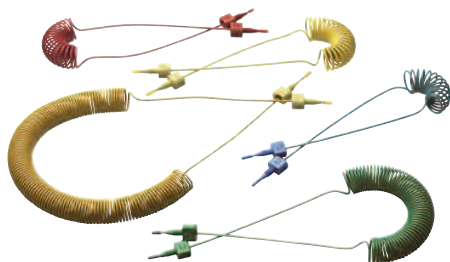
About FEP.....113
Chemical resistance ..110
Maximum working pressure108
Tubing ID chart:
volume per length..107
Tubing tolerances109

SEE ALSO

Clean-cut polymeric tubing cutter100
Easy-Flange kit 99
Low pressure fittings46-55

CONVERSIONS

0.05 mm = .002"	0.50 mm = .02"	3.76 mm = .15"	1.0 m = 3.28'
0.10 mm = .004"	0.75 mm = .03"	3.96 mm = .156"	1.5 m = 4.92'
0.13 mm = .005"	1.00 mm = .04"	4.00 mm = .157"	3.0 m = 9.84'
0.15 mm = .006"	1.59 mm = 1/16"	4.35 mm = .17"	5.0 m = 16.40'
0.18 mm = .007"	1.70 mm = .067"	4.76 mm = 3/16"	10.0 m = 32.80'
0.20 mm = .008"	2.00 mm = .08"	4.80 mm = .189"	15.0 m = 49.21'
0.25 mm = .01"	2.10 mm = .083"	6.00 mm = .24"	25.0 m = 82.02'
0.30 mm = .012"	2.40 mm = .094"	6.35 mm = 1/4"	
0.38 mm = .015"	3.00 mm = .12"	7.94 mm = 5/16"	
0.40 mm = .016"	3.18 mm = 1/8"	9.35 mm = 3/8"	



THERMO-FORMED POLYMERIC TUBING

- Available in a variety of polymers
- Provides axial flexibility
- Telephone cables or customer-specified shapes

VICI Jour offers thermo-formed tubing in various geometric shapes and polymers. The form will maintain its shape so long as the temperature does not exceed 100°C.

Straight tubing, spirals, or even more complex forms – just define your form and material on a drawing for us.

FOR PRICING

Contact VICI or your local distributor for more information or a quotation.

SPECIFICATIONS

PRESSURE

Low pressure only

TUBING

1/8" OD 1.65 mm ID

TOLERANCES

±0.05 mm (.002")

OD and ID

MATERIALS

Tubing: FEP coated with PVDF

Insert: PCTFE

Ferrule: ETFE

Fitting: PPS

OPTIONS

Contact us for more info about longer tubing lengths at competitive bulk prices.

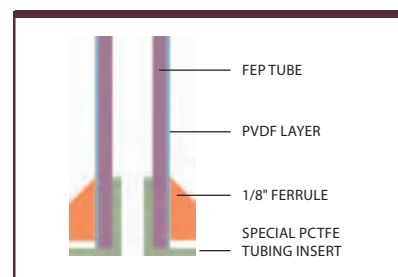
IMPERMEABLE POLYMERIC TUBING

- FEP coated with PVDF
- Excellent chemical resistance
- For technical applications
- Prevents "re-gassing" after degassing in LC applications

PTFE and FEP have very good chemical resistance, but are too permeable to be suitable for mobile phase transfer lines. PVDF, on the other hand, lacks chemical resistance but is a very tight polymer with no observable micropores. Our impermeable tubing is produced by co-extruding PVDF over FEP to combine the best features of both polymers, ensuring that degassed solvent will stay degassed until it reaches the HPLC pump.

The PVDF layer can easily be stripped away with our Clean-Cut tubing cutter or a razor blade, leaving a length of exposed FEP to extend into the solvent reservoir.

When making connections, a special PCTFE tubing insert fits into the ID of the tubing and seals against the bottom of the port, preventing the solvent from contacting the PVDF layer at the end of the tube.



TECH TIP

Use FEP or PFA tubing inside the solvent reservoir, since PVDF has limited chemical resistance.

TECH TIP

Always use the specially-designed tubing insert to prevent solvent contact with the PVDF layer.

MORE INFO

About FEP.....113

About PVDF.....114

Chemical resistance ..110

Tubing ID chart:

volume per length ..107

Tubing tolerances109

SEE ALSO

Clean-cut polymeric

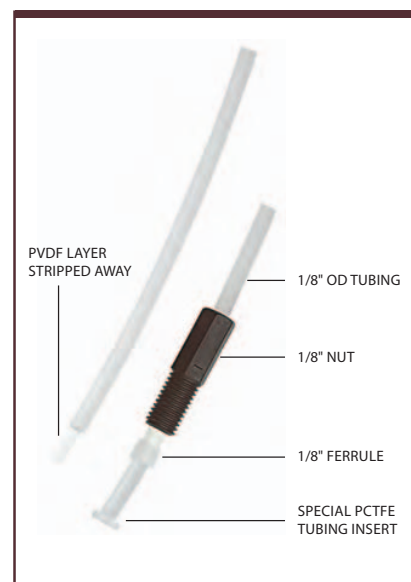
tubing cutter100

Color-sleeve

fingertight adapters . 23

	3 m	10 m
	Product No.	Product No.
Impermeable tubing, 1/8" OD x 1.65 mm ID	JR-T-6130-M3	JR-T-6130-M10

	Qty/pkg	Product No.
Additional spare parts		
PCTFE tubing inserts	10	JR-6141-10
1/8" PPS nuts	10	JR-55071-10
1/8" ETFE ferrules	10	JR-051-10
Fitting kit	Contains:	JR-6140
	PCTFE tubing inserts	2
	1/8" PPS nuts	2
	1/8" ETFE ferrules	2





FUSED SILICA CAPILLARY TUBING **NEW**

Untreated fused silica (FS) capillaries

FS capillaries are manufactured by coating fused silica with a layer of polyimide, and consist of synthetically manufactured quartz glass in amorphous (non-crystalline) form.

Due to the polyimide coating, the tubing is flexible and robust. The tubing is stable at temperatures up to 350°C, and is ideal for applications in Micro- and Nano-LC.

FS capillaries are chemically inert. They can be used with organic solvents and in the pH range from 0 – 10.

Sold by the meter.

OD	ID	per meter Product No.
360 µm	25 µm	JR-T-7360-025
	50 µm	JR-T-7360-050
	75 µm	JR-T-7360-075
	100 µm	JR-T-7360-100
	150 µm	JR-T-7360-150
	180 µm	JR-T-7360-180



SPECIFICATIONS

MAXIMUM RECOMMENDED
WORKING TEMPERATURE
350°C

PRESSURE RATING
Up to 6000 bar
(87,000 psi)

TOLERANCES
OD ± 5 µm (.002")
ID ± 5 µm (.002")

Note: Parameters for
temperature and pressure
ratings **are strongly
dependent on bending,
chemicals used, pres-
sure, and temperature.**

t TECH TIP

Use our 360 µm
Nanovolume® fittings to
connect this tubing free
of dead volume.

PEEK fittings 44
Stainless fittings 45

↔ CONVERSIONS

50 µm = .002"
75 µm = .003"
100 µm = .004"
0.13 mm = .005"
0.18 mm = .007"
0.25 mm = .01"
0.38 mm = .015"
0.50 mm = .02"
0.75 mm = .03"
1.00 mm = .04"
1.52 mm = XXXX
1.59 mm = 1/16"
1.70 mm = .067"
2.10 mm = .083"
2.16 mm = .XXX"
4.65 mm = .XXX"



STAINLESS STEEL TUBING

This is the standard tubing material for chromatography, suitable for a wide variety of applications. Close tolerances are held on both ID and OD.

Note that bulk tubing is roughly cut with tubing pliers, so the ends must be properly cut before use. For electrolytically-cut premium SS tubing, please order our pre-cut tubing (pages 20-21). Pre-cut tubing is steam cleaned and offers burr-free ends – ready to use for high end LC applications.

Stainless tubing – premium grade

UHPLC, HPLC, GC

SPECIFICATIONS

PRESSURE RATING

Values shown are minimum; rating varies with ID; (see page 107)

OD	bar	psi
360 µm	679	9857
1/32"	400	5800
1/16"	365	5300
1/8"	315	4600

TOLERANCES

Tubing ID	OD and ID (±)
50 µm	0.010 mm
75 µm	0.010 mm
100 µm	0.010 mm
all other ID's	0.025 mm

OPTIONS

Contact us for more info about longer tubing lengths at competitive bulk prices.

- Cold drawn, seamless Type 316 stainless steel
- Variety of sizes for UHPLC, HPLC, and GC applications
- Smooth internal surface
- Soft annealed OD for easy ferrule connections

Our premium grade seamless stainless steel tubing is the base for all high pressure and ultra-high pressure lines in your equipment.

		NEW 1.5 m	3 m	10 m
<i>OD</i>	<i>ID (mm)</i>	<i>Product No.</i>	<i>Product No.</i>	<i>Product No.</i>
1/32"	0.13	JR-TSS.505-M1.5	JR-TSS.505-M3	JR-TSS.505-M10
	0.18	JR-TSS.507-M1.5	JR-TSS.507-M3	JR-TSS.507-M10
	0.25	JR-TSS.510-M1.5	JR-TSS.510-M3	JR-TSS.510-M10
	0.50	JR-TSS.520-M1.5	JR-TSS.520-M3	JR-TSS.520-M10
1/16"	0.13	JR-TSS105-M1.5	JR-TSS105-M3	JR-TSS105-M10
	0.25	JR-TSS110-M1.5	JR-TSS110-M3	JR-TSS110-M10
	0.38	JR-TSS115-M1.5	JR-TSS115-M3	JR-TSS115-M10
	0.50	JR-TSS120-M1.5	JR-TSS120-M3	JR-TSS120-M10
	0.75	JR-TSS130-M1.5	JR-TSS130-M3	JR-TSS130-M10
	1.00	JR-TSS140-M1.5	JR-TSS140-M3	JR-TSS140-M10
1/8"	0.75	JR-TSS230-M1.5	JR-TSS230-M3	JR-TSS230-M10
	1.00	JR-TSS240-M1.5	JR-TSS240-M3	JR-TSS240-M10
	1.52	JR-TSS260-M1.5	JR-TSS260-M3	JR-TSS260-M10
	1.70	JR-TSS267-M1.5	JR-TSS267-M3	JR-TSS267-M10
	2.16	JR-TSS285-M1.5	JR-TSS285-M3	JR-TSS285-M10

OD	ID (µm)	per meter
		Product No.
360 µm	75	JR-T-623-03
		NEW
	150	JR-T-623-06
		NEW

TECH TIP

For zero dead volume connections, we strongly recommend pre-cut stainless steel tubing . . . 20

NOTE

ID dimensions in mm are converted from nominal inch dimensions.

MORE INFO

About Type 316 stainless steel 114
Maximum working pressure 107
Tubing ID chart: volume per length . . 107

SEE ALSO

Pre-cut SS tubing . . . 20-21
Stainless steel tubing cutter 101
Stainless fittings 36-41

SPECIFICATIONS

PRESSURE RATING

Values shown are minimum; rating varies with ID; (see page 93)

OD	bar	psi
1/16"	315	4600
1/8"	315	4600

TOLERANCES

OD	± 0.05mm	(.002")
ID	± 0.05mm	(.002")

OPTIONS

Contact us for more info about longer tubing lengths at competitive bulk prices.

Stainless tubing – standard grade

HPLC, GC

- Type 316 stainless steel, welded under inert gas
- Variety of sizes for HPLC and GC applications
- Smooth internal surface
- Soft annealed OD for easy ferrule connections

OD	ID (mm)	<i>NEW</i> 1.5 m	3 m	10 m
		Product No.	Product No.	Product No.
1/16"	0.10	JR-T-625-03-M1.5	JR-T-625-03-M3	JR-T-625-03-M10
		<i>NEW</i>	<i>NEW</i>	<i>NEW</i>
	0.13	JR-T-625-04-M1.5	JR-T-625-04-M3	JR-T-625-04-M10
	0.18	JR-T-625-05-M1.5	JR-T-625-05-M3	JR-T-625-05-M10
	0.25	JR-T-625-10-M1.5	JR-T-625-10-M3	JR-T-625-10-M10
	0.50	JR-T-625-20-M1.5	JR-T-625-20-M3	JR-T-625-20-M10
	0.75	JR-T-625-30-M1.5	JR-T-625-30-M3	JR-T-625-30-M10
	1.00	JR-T-625-40-M1.5	JR-T-625-40-M3	JR-T-625-40-M10
1/8"	2.1	JR-T-626-00-M1.5	JR-T-626-00-M3	JR-T-626-00-M10

per meter		
OD	ID (mm)	Product No.
1/4"	4.65	JR-T-628-00

Stainless tubing • Pre-cut



TUBING

Stainless steel tubing – pre-cut

- For zero dead volume connections
- Steam-cleaned and ready to use
- Soft annealed OD for easy ferrule connections
- Color bands for quick identification of tubing ID



VICI Jour offers pre-cut 1/32" and 1/16" stainless steel tubing in lengths most commonly required in UHPLC and HPLC systems. The tubes are cut to square, burr-free ends for zero dead volume connections. Colored bands allow quick ID identification. VICI pre-cut tubing is specially cleaned with steam from micro-filtered deionized water, which removes both organic and inorganic contaminants. Longer tubes that cannot be steam-cleaned are cleaned with liquid hexane. Softener-free polyethylene caps are used to prevent any contamination during shipment and storage.

PRE-CUT TUBING FOR STANDARD HPLC

OD	ID (mm)	Color	50 mm	100 mm	NEW 130 mm
			Product No.	Product No.	Product No.
1/16"	0.13	Red	JR-T-97005	JR-T-97010	JR-T-97012
	0.18	Yellow	JR-T-97025	JR-T-97030	JR-T-97032
	0.25	Blue	JR-T-97045	JR-T-97055	JR-T-97057
	0.50	Orange	JR-T-97075	JR-T-97080	JR-T-97082
	0.75	Green	JR-T-97095	JR-T-97100	JR-T-97102

OD	ID (mm)	Color	NEW 180 mm	200 mm	300 mm
			Product No.	Product No.	Product No.
1/16"	0.13	Red	JR-T-97013	JR-T-97015	JR-T-97020
	0.18	Yellow	JR-T-97033	JR-T-97035	JR-T-97040
	0.25	Blue	JR-T-97058	JR-T-97060	JR-T-97065
	0.50	Orange	JR-T-97083	JR-T-97085	JR-T-97090
	0.75	Green	JR-T-97103	JR-T-97105	JR-T-97110

PRE-CUT TUBING FOR MICRO LC **NEW**

Use with 1/32" Nanovolume fittings, page 43.

OD	ID (mm)	Color	50 mm	100 mm	130 mm
			Product No.	Product No.	Product No.
1/32" NEW	0.050	Blue	JR-T-91050	JR-T-91100	JR-T-91130
	0.075	Black	JR-T-92050	JR-T-92100	JR-T-92130

OD	ID (mm)	Color	180 mm	200 mm	300 mm
			Product No.	Product No.	Product No.
1/32" NEW	0.050	Blue	JR-T-91180	JR-T-91200	JR-T-91300
	0.075	Black	JR-T-92180	JR-T-92200	JR-T-92300

SPECIFICATIONS

PRESSURE RATING

Varies with ID; minimum is 365 bar (5300 psi) (see page 107)

TOLERANCES

Tubing OD	OD and ID (±)
1/32"	0.01 mm
1/16"	± 0.05 mm OD ± 0.025 mm ID

NOTE

Do not bend Micro LC tubing more than 90° to avoid closure.

TECH TIP

Contact your local distributor or VICI for custom lengths.

CONVERSIONS

50 µm = .002"
75 µm = .003"
100 µm = .004"
125 µm = .005"
150 µm = .006"
0.13 mm = .005"
0.18 mm = .007"
0.25 mm = .01"
0.50 mm = .02"
0.75 mm = .03"

**SPECIFICATIONS****PRESSURE RATING**

Varies with ID; minimum
is 365 bar (5300 psi)
(see page 107)

TOLERANCES

OD $\pm 0.05\text{mm}$ (.002")
ID $\pm 0.025\text{mm}$ (.001")

Stainless steel tubing – pre-cut flexible

- Seamless 1/32" tubing with 1/16" laser-welded ends
- For zero dead volume connections
- Steam-cleaned and ready to use
- Soft annealed OD for easy ferrule connections
- Color bands for quick identification

Our flexible pre-cut stainless steel tubing is made of 1/32" premium grade 316 stainless steel tubing with ends laser-welded into 1/16" tubing of the same premium grade.

The tubes are cut to square, burr-free ends for zero dead volume connections. Colored bands allow quick ID identification.

VICI pre-cut tubing is specially cleaned with steam from micro-filtered deionized water, which removes both organic and inorganic contaminants. Longer tubes that cannot be steam-cleaned are cleaned with liquid hexane. Softener-free polyethylene caps are used to prevent any contamination during shipment and storage.

PRE-CUT FLEXIBLE TUBING FOR STANDARD HPLC

OD	ID (mm)	Color	105 mm	<i>NEW</i> 130 mm	150 mm	<i>NEW</i> 180 mm	200 mm
			Product No.	Product No.	Product No.	Product No.	Product No.
1/16"	0.13	Red	JR-T-96005	JR-T-96008	JR-T-96010	JR-T-96013	JR-T-96015
	0.18	Yellow	JR-T-96105	JR-T-96108	JR-T-96110	JR-T-96113	JR-T-96115
	0.25	Blue	JR-T-96205	JR-T-96208	JR-T-96210	JR-T-96213	JR-T-96215
	0.50	Orange	JR-T-96305	JR-T-96308	JR-T-96310	JR-T-96313	JR-T-96315
OD	ID (mm)	Color	280 mm	400 mm	600 mm	700 mm	900 mm
			Product No.	Product No.	Product No.	Product No.	Product No.
1/16"	0.13	Red	JR-T-96020	JR-T-96025	JR-T-96030	JR-T-96035	—
	0.18	Yellow	JR-T-96120	JR-T-96125	JR-T-96130	JR-T-96135	JR-T-96145
	0.25	Blue	JR-T-96220	JR-T-96225	JR-T-96230	JR-T-96235	—
	0.50	Orange	JR-T-96320	JR-T-96325	JR-T-96330	JR-T-96335	—

