

Tubing

METAL AND POLYMERIC

We offer chromatography grade tubing in ODs of 360 μm , 1/32", 1/16", and 1/8". Tubing can be ordered in economical pre-cut standard lengths, or can be custom cut to meet your specific instrumentation requirements. All VICI metal tubing is chromatographic grade seamless drawn tubing of the highest available quality. Stainless tubing is 316 series.

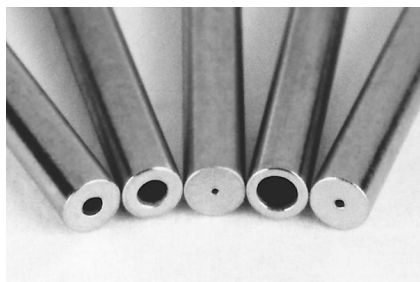
Cutting and Cleaning

The improper cutting and cleaning of metal tubing is the largest single cause of chromatographic problems and premature valve failure. The use of our precision cut and finished tubing with VICI fittings and valves maintains the flow uniformity and cleanliness that high performance systems require.

VICI's electrolytic cutting process yields polished tubing with flat ends, minimizing the potential for dead volumes or leaks caused by the uneven ends and burrs left by the tools common in the general laboratory environment – wire cutters, files, jewelers' saws, and most

tubing cutters. These non-precision cutters are likely to generate particulates and deform inner and outer diameters, which can introduce dead volume and flow anomalies.

Each piece of VICI pre-cut metal tubing is specially cleaned with micro-filtered steam from deionized water to remove both organic and inorganic contaminants, representing a major improvement over the common practice of using organic solvents to "clean" tubing. Our test reports have been confirmed by most of the major instrument suppliers: the VICI process provides analytically clean tubing.



Electrolytically cut and polished



File cut



Plier cut

TECH TIP

Forty years of Valco experience show that the particles left in poorly cut tubing are the number one cause of valve damage.

TECH TIP

For optimal zero dead volume connections, make sure your tubing meets the best industry standards—OD tolerance should be nominal dimension $\pm .002$ ".

| Fractional dimension | Nominal dimension |
|----------------------|-------------------|
| 1/32" | .031 |
| 1/16" | .062 |
| 1/8" | .125 |
| 1/4" | .250 |
| 3/8" | .375 |
| 1/2" | .500 |



1/16" OD
x .040" ID

1/32" OD
x .004" ID

360 μ m OD
x .001" ID

Three sizes of electroformed nickel tubing

Electroformed nickel tubing

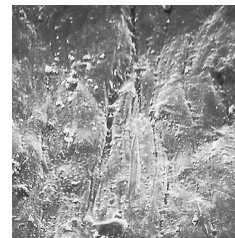
Our microbore EFNi tubing is made by electroplating nickel over a diamond-drawn mandrel in a continuous process. When the mandrel is removed, an internal surface with a mirror-like 1-2 microinch finish remains. The ductile nature of nickel allows the tubing to be easily manipulated. Unlike glass- or silica-lined stainless, EFNi can accept tight bends and cutting without heating, and does not release damaging glass fragments or silica particles.

A comparison of the interiors of commonly used tubing (below) shows the quality of the electroformed nickel tubing surface. (All photos are x500 magnification.) The rough interior surface of the mill-drawn Nickel 200 tubing has potential for carryover or cross contamination, and both the Nickel 200 and the stainless steel contain pits, voids, striations, and particles – problems which intensify as the ID decreases.

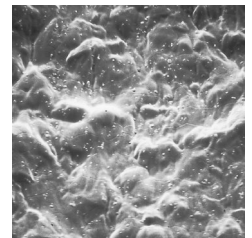
Custom IDs/ODs are available upon request.



Electroformed nickel
(EFNi)



Nickel 200 alloy



Type 316 stainless steel

PRICING PER FOOT

For pricing purposes, the length is rounded up to the next foot. For example, a 5" piece is charged as one foot; an 18" piece as two feet. The price per foot is based on the length of each piece, not the total quantity ordered. Cutting and cleaning charges are included in the price per foot for EFNi tubing.

CONVERSIONS

0.05 mm = .002"
0.10 mm = .004"
0.12 mm = .005"
0.25 mm = .010"
0.50 mm = .020"
0.75 mm = .030"
1.0 mm = .040"
1.5 mm = .060"
2.0 mm = .080"
4.6 mm = .180"
6.0 mm = .236"
6.4 mm = .253"
7.0 mm = .275"
10.0 mm = .400"
27.0 mm = 1.08"

1/32" = 0.8 mm
1/16" = 1.6 mm
1/8" = 3.2 mm
1/4" = 6.4 mm
3/8" = 9.5 mm
1/2" = 12.7 mm

360 μ m OD EFNi tubing

Custom lengths

Prices are per foot. See pricing note in box at left.

| Tubing ID | Prod No | Max length |
|-----------|-----------|------------|
| .001" | TEFNI.101 | 1 foot |
| .002" | TEFNI.102 | 2 feet |
| .004" | TEFNI.104 | 20 feet |
| .005" | TEFNI.105 | 30 feet |
| .007" | TEFNI.110 | 50 feet |

1/32" OD EFNi tubing

Custom lengths

Prices are per foot. See pricing note in box at left.

| Tubing ID | Prod No | Max length |
|-----------|-----------|------------|
| .002" | TEFNI.502 | 2 feet |
| .004" | TEFNI.504 | 20 feet |
| .005" | TEFNI.505 | 30 feet |
| .007" | TEFNI.507 | 50 feet |
| .010" | TEFNI.510 | 50 feet |
| .012" | TEFNI.512 | 50 feet |
| .015" | TEFNI.515 | 50 feet |
| .020" | TEFNI.520 | 50 feet |

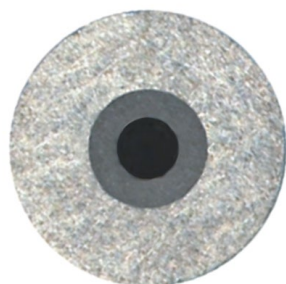
1/16" OD EFNi tubing

Custom lengths

Prices are per foot. See pricing note in box at left.

| Tubing ID | Prod No | Max length |
|-----------|----------|------------|
| .020" | TEFNI120 | 25 feet |
| .030" | TEFNI130 | 35 feet |
| .040" | TEFNI140 | 50 feet |

VICI electrochemically plates PEEK and fused silica tubing with pure nickel. This strengthens the tubing and allows direct connections using metal ferrules while maintaining the chemical benefits of the wetted surfaces inside.



Nickel-clad fused silica

- Inert, flexible transfer lines
- Improved heat transfer
- Thick wall version allows direct connection using metal ferrules
- Rated for up to 40,000 psi (dependant on size and plating thickness)

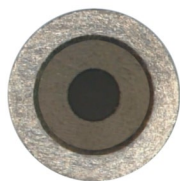
We take polyimide-coated fused silica (FS) and remove the polyimide layer. Then we electrochemically plate the FS with pure nickel. The resulting nickel-plated FS tube provides superior heat transfer to the FS lining, permitting use as a flexible transfer line with the best qualities of silica-lined stainless but with improved heat transfer and a shorter bend radius.

For high pressure applications, we recommend using our 1/32" 316 stainless ferrules.

1/32" OD tubing is available in IDs from 10 to 250 μm , permitting use of metal ferrules for improved leak-tight connections.

800 μm (1/32") OD nickel-clad fused silica *Custom lengths*

| <i>Tubing ID</i> | <i>Prod No</i> |
|-------------------|----------------|
| 10 μm | TNFS800360010 |
| 15 μm | TNFS800360015 |
| 20 μm | TNFS800360020 |
| 25 μm | TNFS800360025 |
| 50 μm | TNFS800360050 |
| 100 μm | TNFS800360100 |
| 180 μm | TNFS800360180 |
| 250 μm | TNFS800360250 |



Nickel-clad polyimide-coated fused silica

- Thin wall version for resistive heating offers improved heat transfer as compared to wire-wrapped designs
- Thin wall version results in column packages with even less mass, critical when temperature measurement is based on the change in resistance

Any polyimide-coated FS can be electroplated with pure nickel. This results in a ruggedized traditional FS column (or transfer line with deactivated FS), which can be resistively heated, if desired. Temperature is measured using the resistance of the nickel, removing any need for external sensors. A thin-wall, low mass version optimized for resistive heat applications is available in eight different diameters. We offer several options for tubing connections.

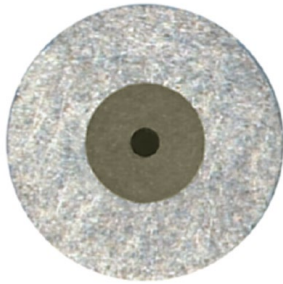
Please contact the factory to discuss your application.

TECH TIP

For best results, order clad tubings in the precise length required. Clean cuts are difficult to achieve with the tools normally available.

PRICING PER FOOT

For pricing purposes, the length is rounded up to the next foot. For example, a 5" piece is charged as one foot; an 18" piece as two feet. The price per foot is based on the length of each piece, not the total quantity ordered. Cutting and cleaning charges are included in the price per foot for TNF tubing.



Nickel-clad PEEK

- Permits use of PEEK tubing at 30,000 psi
- Direct connection with metal ferrules

Since we can manufacture virtually any size of PEEK tubing from 360 μm OD/ .002" ID on up, the possibilities are endless. In any size, the mechanical properties of nickel combined with the chemical properties of PEEK produce enhanced performance with robust metal ferrule connections.

NEW Nickel-clad PEEK

Custom lengths

| Tubing OD: | 800 μm (1/32") | 1600 μm (1/16") |
|--------------------|---|--|
| <i>Tubing ID</i> | <i>Prod No</i> | <i>Prod No</i> |
| 50 μm | TNPK800360050 | TNPK16001140050 |
| 75 μm | TNPK800360075 | TNPK16001140075 |
| 100 μm | TNPK800360100 | TNPK16001140100 |
| 125 μm | TNPK800360125 | TNPK16001140125 |
| 180 μm | TNPK800360180 | TNPK16001140180 |
| 205 μm | TNPK800360205 | — |
| 250 μm | TNPK800404250 | TNPK16001140250 |
| 305 μm | TNPK800510305 | TNPK16001140305 |
| 380 μm | TNPK800535380 | — |
| 510 μm | TNPK800660510 | TNPK16001140510 |
| 760 μm | — | TNPK16001140760 |
| 1015 μm | — | TNPK160011401015 |

CONVERSIONS

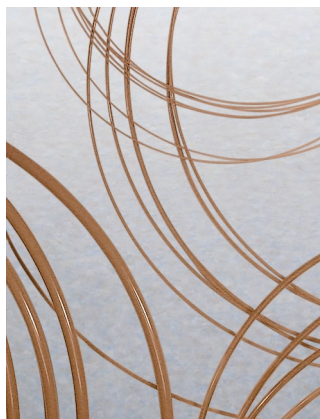
| | |
|--------------------|---------|
| 50 μm | = .002" |
| 75 μm | = .003" |
| 100 μm | = .004" |
| 125 μm | = .005" |
| 150 μm | = .006" |
| 180 μm | = .007" |
| 205 μm | = .008" |
| 250 μm | = .010" |
| 305 μm | = .012" |
| 380 μm | = .015" |
| 510 μm | = .020" |
| 760 μm | = .030" |
| 1015 μm | = .040" |
| 800 μm | = 1/32" |
| 1600 μm | = 1/16" |

TUBING

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 nitric and sulphuric acid will attack PEEK.

OD and ID tolerances for our PEEK tubing are $\pm .0005"$ for 360 micron and 1/32" tubing; $\pm .0005"$ for 1/16" tubing with ID up to .010" and $\pm .001"$ for IDs above .010"; and $\pm .003"$ for 1/8".



360 µm PEEK tubing

Custom lengths

Custom-length 360 µm PEEK tubing is square-cut and ready to use. Specify the length required, in meters

| | .002" ID <i>Prod No</i> | .004" ID <i>Prod No</i> | .005" ID <i>Prod No</i> | .006" ID <i>Prod No</i> |
|------------------|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|
| Priced per meter | TPK.102 | TPK.104 | TPK.105 | TPK.106 |

1/32" OD PEEK tubing

| <i>Length</i> | .0025" ID <i>Prod No</i> | .005" ID <i>Prod No</i> | .010" ID <i>Prod No</i> | .015" ID <i>Prod No</i> |
|---------------|------------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|
| 5 meters | TPK.502-5M | TPK.505-5M | TPK.510-5M | TPK.515-5M |
| 10 meters | TPK.502-10M | TPK.505-10M | TPK.510-10M | TPK.515-10M |
| 25 meters | TPK.502-25M | TPK.505-25M | TPK.510-25M | TPK.515-25M |

1/16" OD PEEK tubing

| <i>Length</i> | .006" ID <i>Prod No</i> | .010" ID <i>Prod No</i> | .020" ID <i>Prod No</i> | .030" ID <i>Prod No</i> |
|---------------|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|
| 5 meters | TPK106-5M | TPK110-5M | TPK120-5M | TPK130-5M |
| 10 meters | TPK106-10M | TPK110-10M | TPK120-10M | TPK130-10M |
| 25 meters | TPK106-25M | TPK110-25M | TPK120-25M | TPK130-25M |

1/8" OD PEEK tubing

| <i>Length</i> | .060" ID <i>Prod No</i> |
|---------------|-----------------------------------|
| 5 meters | TPK260-5M |
| 10 meters | TPK260-10M |
| 25 meters | TPK260-25M |

PEEK TUBING ELBOWS

Tubing elbows (90° and 180°) are ideal for routing 1/16" PEEK tubing through an LC system. These elbows are proportioned to bend PEEK tubing at the optimum radius for maximum chemical resistance and burst pressure. Installation is simple – just snap the tubing into the elbow.

| | |
|----------------------|----------------|
| <i>Package of 5:</i> | <i>Prod No</i> |
| 90° elbow | JR-357090-5 |
| 180° elbow | JR-357180-5 |



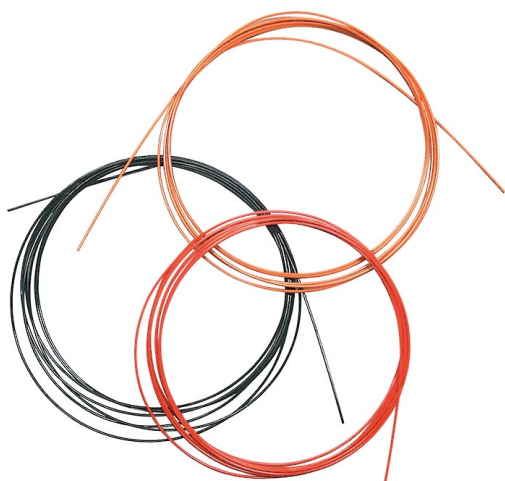
MORE INFORMATION

Polymeric tubing

| | |
|------------|---------|
| PTFE | page 92 |
| FEP | 92 |
| ETFE | 92 |

CUSTOM PEEK TUBING

We offer PEEK tubing custom-manufactured to meet your specific OD, ID, and color requirements. The OD range is .014" (360 micron) to 1/8", with a minimum ID of .002" for tubing up to 1/16" OD. (Maximum ID varies according to the OD.) Color coding can be solid or striped.



Color-coded PEEK tubing

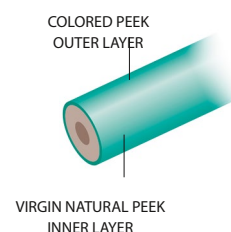
Color-coded tubing helps you identify the ID of your PEEK tubing – each ID is coded with a different color. Use this tubing where maximum chemical resistance and biocompatibility are required.

1/16" OD dual layer color-coded PEEK tubing

Custom lengths

Our dual layer PEEK tubing eliminates any concern that a critical sample stream could be contaminated by the 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.

| Tubing ID | Color | bar | psi | Prod No |
|-----------|--------|-----|------|------------|
| .004" | Black | 460 | 6700 | JR-TD-5804 |
| .005" | Red | 420 | 6100 | JR-TD-6007 |
| .007" | Yellow | 400 | 5800 | JR-TD-6008 |
| .010" | Blue | 386 | 5600 | JR-TD-6009 |
| .020" | Orange | 350 | 4500 | JR-TD-6010 |
| .030" | Green | 240 | 3500 | JR-TD-6011 |



1/16" OD striped color-coded PEEK tubing

Custom lengths

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

Specify the length required, in inches or feet. For pricing custom tubing, the length is rounded up to the next foot. For example, a 5" piece is charged as one foot; an 18" piece as two feet.

| Tubing ID | Color | bar | psi | Prod No |
|-----------|--------|-----|------|------------|
| .004" | Black | 460 | 6700 | JR-T-5804 |
| .005" | Red | 420 | 6100 | JR-T-5999 |
| .007" | Yellow | 400 | 5800 | JR-T-6000 |
| .010" | Blue | 386 | 5600 | JR-T-6001 |
| .020" | Orange | 350 | 4500 | JR-T-6002 |
| .030" | Green | 240 | 3500 | JR-T-6003 |
| .040" | Grey | 165 | 2400 | JR-T-60031 |

CONVERSIONS

| | | |
|---------|---|---------|
| 10 ft | = | 3.05 m |
| 25 ft | = | 7.62 m |
| 100 ft | = | 30.48 m |
| 50 µm | = | .002" |
| 100 µm | = | .004" |
| 125 µm | = | .005" |
| 150 µm | = | .006" |
| 0.25 mm | = | .010" |
| 0.50 mm | = | .020" |
| 0.75 mm | = | .030" |
| 1.0 mm | = | .040" |
| 1.5 mm | = | .060" |
| 2.0 mm | = | .080" |
| 4.6 mm | = | .180" |
| 6.0 mm | = | .236" |
| 6.4 mm | = | .253" |
| 7.0 mm | = | .275" |
| 10.0 mm | = | .400" |
| 27.0 mm | = | 1.08" |
| 1/32" | = | 0.8 mm |
| 1/16" | = | 1.6 mm |
| 1/8" | = | 3.2 mm |
| 1/4" | = | 6.4 mm |
| 3/8" | = | 9.5 mm |
| 1/2" | = | 12.7 mm |

1/16" OD striped color-coded PEEK tubing

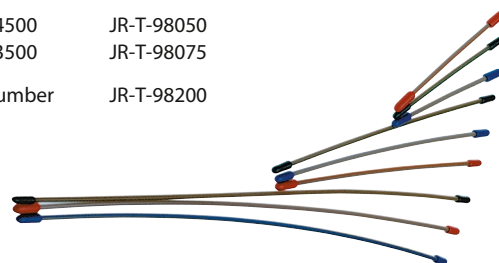
Pre-cut kits

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

Includes 15 pieces of tubing; 5 each of 5 cm, 10 cm, and 20 cm pre-cut lengths.

| Tubing ID | Color | bar | psi | Prod No |
|-----------|--------|-----|------|------------|
| .005" | Red | 420 | 6100 | JR-T-98013 |
| .007" | Yellow | 400 | 5800 | JR-T-98017 |
| .010" | Blue | 386 | 5600 | JR-T-98025 |
| .020" | Orange | 350 | 4500 | JR-T-98050 |
| .030" | Green | 240 | 3500 | JR-T-98075 |

Super kit, one of each above product number
(75 pieces total) JR-T-98200



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

TUBING

PTFE, FEP, and ETFE tubing

Polymeric tubing is square cut and ready to use. Each package of polymeric tubing contains one piece of the specified length.

See also PEEK tubing, pages 90-91.



1/16" OD polymeric tubing

| | | .006" ID <i>Prod No</i> | .010" ID <i>Prod No</i> | .015" ID <i>Prod No</i> | .020" ID <i>Prod No</i> | .030" ID <i>Prod No</i> |
|-------------|-----------|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|
| PTFE | 5 meters | TTF106-5M | TTF110-5M | TTF115-5M | TTF120-5M | TTF130-5M |
| | 10 meters | TTF106-10M | TTF110-10M | TTF115-10M | TTF120-10M | TTF130-10M |
| | 25 meters | TTF106-25M | TTF110-25M | TTF115-25M | TTF120-25M | TTF130-25M |
| | | | | | | |
| FEP | 5 meters | — | TFEP110-5M | — | TFEP120-5M | TFEP130-5M |
| | 10 meters | — | TFEP110-10M | — | TFEP120-10M | TFEP130-10M |
| | 25 meters | — | TFEP110-25M | — | TFEP120-25M | TFEP130-25M |
| | | | | | | |
| ETFE | 5 meters | — | TTZ110-5M | — | TTZ120-5M | TTZ130-5M |
| | 10 meters | — | TTZ110-10M | — | TTZ120-10M | TTZ130-10M |
| | 25 meters | — | TTZ110-25M | — | TTZ120-25M | TTZ130-25M |
| | | | | | | |

1/8" OD polymeric tubing

| | | .030" ID <i>Prod No</i> | .060" ID <i>Prod No</i> | .085" ID <i>Prod No</i> |
|-------------|-----------|-----------------------------------|-----------------------------------|-----------------------------------|
| PTFE | 5 meters | TTF230-5M | TTF260-5M | TTF285-5M |
| | 10 meters | TTF230-10M | TTF260-10M | TTF285-10M |
| | 25 meters | TTF230-25M | TTF260-25M | TTF285-25M |
| | | | | |
| FEP | 5 meters | — | TFEP260-5M | — |
| | 10 meters | — | TFEP260-10M | — |
| | 25 meters | — | TFEP260-25M | — |
| | | | | |
| ETFE | 5 meters | — | TTZ260-5M | — |
| | 10 meters | — | TTZ260-10M | — |
| | 25 meters | — | TTZ260-25M | — |
| | | | | |

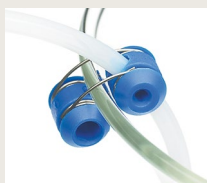
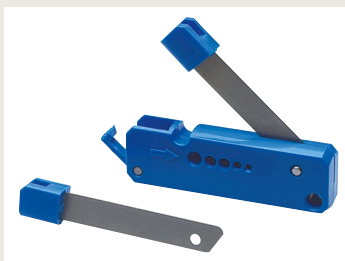
— Not available

CLEAN-CUT POLYMER TUBING CUTTER

For leak-free tubing connections in an LC system, right angles and clean cuts are essential. The Clean-Cut makes burr-free perpendicular cuts on polymeric tubing without distorting the outside diameter or closing the inside diameter. The handy pocket-sized tool features a unique safety locking mechanism to secure the blade when not in use.

Prod No

Clean-Cut tubing cutter JR-797
Replacement blade JR-798



TUBING CLIP – THE LC TUBING ORGANIZER

The tubing clip holds 1/16" and 1/8" polymer tubing precisely where you want them in your beakers, flasks, bottles, etc. up to 4 mm wall thickness. The stainless steel spring ensures a long lifetime.

Package of 5: *Prod No*
Tubing clip JR-9001-5

MORE INFORMATION

PEEK tubing

Natural page 90

Color-coded 91

Striped 91

CUSTOM LENGTHS

Custom lengths of PTFE tubing up to a maximum of 250' available on request. Additional charges may apply.

TUBING POLYMERS

PTFE Inert; very soft, easily cold flows. Produced as Teflon®

FEP Chemically resistant like PTFE, but lower creep and higher friction. More transparent than PTFE.

ETFE Resistant to most chemical attack; some chlorinated solvents will cause tubing to swell. Produced as Tefzel®

CONVERSIONS

10 ft = 3.05 m
25 ft = 7.62 m
100 ft = 30.48 m

Metal tubing, bulk quantities

Bulk metal tubing is not electrolytically cut or cleaned. The annealing process provides tubing which is sufficiently clean for most chromatography applications. *(See note at left for custom-cleaned tubing.)*

To order, specify the length required in one meter increments.

CLEANED CUSTOM LENGTH TUBING

You can order custom length tubing which has been electrolytically cut, deburred, and steam cleaned. Please contact VICI or your local distributor for product numbers and pricing.

The maximum lengths available depends on the ID of the tubing:

| Tubing ID | Max length |
|-----------|------------|
| .005" | 90 cm |
| .007" | 150 cm |
| .010" | 300 cm |
| .020" | 600 cm |
| .026" | 1200 cm |
| .030" | 1500 cm |
| >.030" | 1500 cm |

Tubing up to 6 feet in length will be supplied straight. Longer tubes will be supplied coiled.

CONVERSIONS

| | |
|---------|-----------|
| 50 µm | = .002" |
| 100 µm | = .004" |
| 125 µm | = .005" |
| 150 µm | = .006" |
| 0.25 mm | = .010" |
| 0.50 mm | = .020" |
| 0.75 mm | = .030" |
| 1.0 mm | = .040" |
| 1.5 mm | = .060" |
| 2.0 mm | = .080" |
| 4.6 mm | = .180" |
| 6.0 mm | = .236" |
| 6.4 mm | = .253" |
| 7.0 mm | = .275" |
| 10.0 mm | = .400" |
| 27.0 mm | = 1.08" |
| 1/32" | = 0.8 mm |
| 1/16" | = 1.6 mm |
| 1/8" | = 3.2 mm |
| 1/4" | = 6.4 mm |
| 3/8" | = 9.5 mm |
| 1/2" | = 12.7 mm |

316 stainless

Bulk quantities

| Tubing ID | 1/32" OD Prod No | 1/16" OD Prod No | 1/8" OD Prod No |
|-----------|---------------------|---------------------|--------------------|
| .005" | TSS.505 | TSS105 | — |
| .007" | TSS.507 | — | — |
| .010" | TSS.510 | TSS110 | — |
| .015" | — | TSS115 | — |
| .020" | TSS.520 | TSS120 | — |
| .026" | — | TSS126 | — |
| .030" | — | TSS130 | TSS230 |
| .040" | — | TSS140 | TSS240 |
| .060" | — | — | TSS260 |
| .070" | — | — | TSS267 |
| .085" | — | — | TSS285 |

Nickel 200

Bulk quantities

| Tubing ID | 1/32" OD Prod No | 1/16" OD Prod No | 1/8" OD Prod No |
|-----------|---------------------|---------------------|--------------------|
| .005" | — | TNI105 | — |
| .010" | TNI.510 | — | — |
| .020" | TNI.520 | TNI120 | — |
| .030" | — | TNI130 | — |
| .040" | — | TNI140 | — |
| .085" | — | — | TNI285 |

Hastelloy C

Bulk quantities

| Tubing ID | 1/32" OD Prod No | 1/16" OD Prod No | 1/8" OD Prod No |
|-----------|---------------------|---------------------|--------------------|
| .010" | — | THC110 | — |
| .020" | — | THC120 | — |
| .030" | — | THC130 | — |
| .040" | — | THC140 | — |
| .070" | — | — | THC270 |
| .085" | — | — | THC285 |

Inconel 600

Bulk quantities

| Tubing ID | 1/32" OD Prod No | 1/16" OD Prod No | 1/8" OD Prod No |
|-----------|---------------------|---------------------|--------------------|
| .061" | — | — | TINCO261 |
| .082" | — | — | TINCO282 |

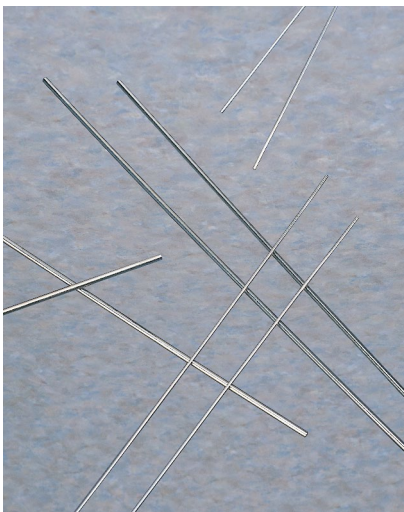
— Not normally available

TUBING

Pre-cut stainless tubing

These packages of pre-cut Type 316 stainless tubing provide an economical solution to the problems that are caused by "seat-of-the-pants" cutting in the lab or field. They are priced to give a saving over the charge for custom-cut tubing.

All tubing is electrolytically cut and specially steam-cleaned with micro-filtered steam from deionized water, which removes both organic and inorganic contaminants.



1/32" OD stainless tubing

Pre-cut lengths

| Length | .005" ID Prod No | .010" ID Prod No | .020" ID Prod No |
|-------------------------------|---------------------|---------------------|---------------------|
| <i>2 pieces per package</i> | | | |
| 5 cm | T5N5D | T5N10D | T5N20D |
| 10 cm | T10N5D | T10N10D | T10N20D |
| 20 cm | T20N5D | T20N10D | T20N20D |
| 30 cm | T30N5D | T30N10D | T30N20D |
| 50 cm | T50N5D | T50N10D | T50N20D |
| 100 cm | — | T100N10D | T100N20D |
| <i>10 pieces per package</i> | | | |
| 5 cm | T5N5-10 | T5N10-10 | T5N20-10 |
| 10 cm | T10N5-10 | T10N10-10 | T10N20-10 |
| 20 cm | T20N5-10 | T20N10-10 | T20N20-10 |
| 30 cm | T30N5-10 | T30N10-10 | T30N20-10 |
| 50 cm | T50N5-10 | T50N10-10 | T50N20-10 |
| 100 cm | — | T100N10-10 | T100N20-10 |
| <i>50 pieces per package</i> | | | |
| 5 cm | T5N5-50 | T5N10-50 | T5N20-50 |
| 10 cm | T10N5-50 | T10N10-50 | T10N20-50 |
| 20 cm | T20N5-50 | T20N10-50 | T20N20-50 |
| 30 cm | T30N5-50 | T30N10-50 | T30N20-50 |
| 50 cm | T50N5-50 | T50N10-50 | T50N20-50 |
| 100 cm | — | T100N10-50 | T100N20-50 |
| <i>100 pieces per package</i> | | | |
| 5 cm | T5N5-100 | T5N10-100 | T5N20-100 |
| 10 cm | T10N5-100 | T10N10-100 | T10N20-100 |
| 20 cm | T20N5-100 | T20N10-100 | T20N20-100 |
| 30 cm | T30N5-100 | T30N10-100 | T30N20-100 |
| 50 cm | T50N5-100 | T50N10-100 | T50N20-100 |
| 100 cm | — | T100N10-100 | T100N20-100 |

TECH TIP

Forty years of Valco experience show that the particles left in poorly cut tubing are the number one cause of valve damage.

CONVERSIONS

| | | |
|---------|---|---------|
| 5 cm | = | 1.97" |
| 10 cm | = | 3.94" |
| 20 cm | = | 7.87" |
| 30 cm | = | 11.82" |
| 50 cm | = | 19.68" |
| 100 cm | = | 39.37" |
| 0.12 mm | = | .005" |
| 0.25 mm | = | .010" |
| 0.50 mm | = | .020" |
| 0.75 mm | = | .030" |
| 1.0 mm | = | .040" |
| 1.5 mm | = | .060" |
| 2.0 mm | = | .080" |
| 4.6 mm | = | .180" |
| 6.0 mm | = | .236" |
| 6.4 mm | = | .253" |
| 7.0 mm | = | .275" |
| 10.0 mm | = | .400" |
| 27.0 mm | = | 1.08" |
| 1/32" | = | 0.8 mm |
| 1/16" | = | 1.6 mm |
| 1/8" | = | 3.2 mm |
| 1/4" | = | 6.4 mm |
| 3/8" | = | 9.5 mm |
| 1/2" | = | 12.7 mm |

1/16" OD stainless tubing*Pre-cut lengths*

| <i>Length</i> | .005" ID <i>Prod No</i> | .010" ID <i>Prod No</i> | .020" ID <i>Prod No</i> | .030" ID <i>Prod No</i> | .040" ID <i>Prod No</i> |
|-------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|
| <i>2 pieces per package</i> | | | | | |
| 5 cm | T5C5D | T5C10D | T5C20D | T5C30D | T5C40D |
| 10 cm | T10C5D | T10C10D | T10C20D | T10C30D | T10C40D |
| 20 cm | T20C5D | T20C10D | T20C20D | T20C30D | T20C40D |
| 30 cm | T30C5D | T30C10D | T30C20D | T30C30D | T30C40D |
| 50 cm | T50C5D | T50C10D | T50C20D | T50C30D | T50C40D |
| 100 cm | — | T100C10D | T100C20D | T100C30D | T100C40D |
| <i>10 pieces per package</i> | | | | | |
| 5 cm | T5C5-10 | T5C10-10 | T5C20-10 | T5C30-10 | T5C40-10 |
| 10 cm | T10C5-10 | T10C10-10 | T10C20-10 | T10C30-10 | T10C40-10 |
| 20 cm | T20C5-10 | T20C10-10 | T20C20-10 | T20C30-10 | T20C40-10 |
| 30 cm | T30C5-10 | T30C10-10 | T30C20-10 | T30C30-10 | T30C40-10 |
| 50 cm | T50C5-10 | T50C10-10 | T50C20-10 | T50C30-10 | T50C40-10 |
| 100 cm | — | T100C10-10 | T100C20-10 | T100C30-10 | T100C40-10 |
| <i>50 pieces per package</i> | | | | | |
| 5 cm | T5C5-50 | T5C10-50 | T5C20-50 | T5C30-50 | T5C40-50 |
| 10 cm | T10C5-50 | T10C10-50 | T10C20-50 | T10C30-50 | T10C40-50 |
| 20 cm | T20C5-50 | T20C10-50 | T20C20-50 | T20C30-50 | T20C40-50 |
| 30 cm | T30C5-50 | T30C10-50 | T30C20-50 | T30C30-50 | T30C40-50 |
| 50 cm | T50C5-50 | T50C10-50 | T50C20-50 | T50C30-50 | T50C40-50 |
| 100 cm | — | T100C10-50 | T100C20-50 | T100C30-50 | T100C40-50 |
| <i>100 pieces per package</i> | | | | | |
| 5 cm | T5C5-100 | T5C10-100 | T5C20-100 | T5C30-100 | T5C40-100 |
| 10 cm | T10C5-100 | T10C10-100 | T10C20-100 | T10C30-100 | T10C40-100 |
| 20 cm | T20C5-100 | T20C10-100 | T20C20-100 | T20C30-100 | T20C40-100 |
| 30 cm | T30C5-100 | T30C10-100 | T30C20-100 | T30C30-100 | T30C40-100 |
| 50 cm | T50C5-100 | T50C10-100 | T50C20-100 | T50C30-100 | T50C40-100 |
| 100 cm | — | T100C10-100 | T100C20-100 | T100C30-100 | T100C40-100 |

CLEANED CUSTOM LENGTH TUBING

You can order custom length tubing which has been electrolytically cut, deburred, and steam cleaned. Please contact VICI or your local distributor for product numbers and pricing.

The maximum lengths available depends on the ID of the tubing:

| Tubing ID | Max length |
|------------------|-------------------|
| .005" | 90 cm |
| .007" | 150 cm |
| .010" | 300 cm |
| .020" | 600 cm |
| .026" | 1200 cm |
| .030" | 1500 cm |
| >.030" | 1500 cm |

Tubing up to 6 feet in length will be supplied straight. Longer tubes will be supplied coiled.

VOLUME CHART

| Tubing ID | Volume | | Tubing ID | Volume | |
|------------------|------------------|------------------|------------------|------------------|------------------|
| | $\mu\text{l/cm}$ | $\mu\text{l/in}$ | | $\mu\text{l/cm}$ | $\mu\text{l/in}$ |
| .005" | 0.13 | 0.32 | .030" | 4.56 | 11.58 |
| .010" | 0.51 | 1.29 | .040" | 8.11 | 20.59 |
| .015" | 1.14 | 2.90 | .060" | 18.24 | 46.33 |
| .020" | 2.03 | 5.15 | .070" | 24.83 | 63.06 |
| .025" | 3.17 | 8.04 | .085" | 36.61 | 92.99 |

Typical ID tolerances for our tubing are $\pm .001"$. This is much tighter than normal commercial grades of tubing; however, it is enough to result in noticeable error if exact volumes are not measured.