

MICRO-HPLC ACCESSORIES

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Valco Cheminert® HPLC Injection/ Switching Valves

The basic Cheminert® design involves a flat rotor which is engraved with slots that connect the ports. A stator is held at a constant, preset force against the rotor. When repairs are required, all that is necessary for rotor access is the removal of two or three screws. Remove the old rotor and replace it, put the screws back in and tighten them, and the valve is ready for use at the factory-set pressure specification. No adjustments are possible, much less required. Other advantages of the design include easy panel mounting, low actuating torque, and compact size. The flat plate design offers flow paths for basic flow switching and sample injection.

The valves have stators of Nitronic 60 (N60) stainless steel, PAEK, or titanium, all of which are compatible with common HPLC solvents. Valcon H rotors are used with metal stators, and Valcon E with PAEK. Metal valves are supplied with stainless steel nuts, with ferrules of the same material as the stator. Fittings for polymeric valves vary with the valve design. External sample loops are available in stainless steel, PEEK or titanium. See p. 59 for material descriptions.

Microbore HPLC internal loop injector 1/16" Valco fittings, 0.25 mm ports (.010")

Includes stainless steel nuts and ferrules of stator material. Valves with PAEK stators have PEEK nuts and ferrules. Microelectric actuator: 24 VDC, with 110/230 VAC to 24 VDC power supply.

	Part No.	
	0.2 µL	0.5 µL
N60 stainless stator		
Manual	VC4-1004-.2	VC4-1004-.5
With microelectric actuator	VC4-1004-.2EH	VC4-1004-.5EH
Replacement valve	VC4-1004-.2D	VC4-1004-.5D
Replacement rotor	VC4-10R-.2	VC4-10R-.5
Replacement stator	VC4-1C0	VC4-1C0
PAEK stator		
Manual	VC4-1344-.2	VC4-1344-.5
With microelectric actuator	VC4-1344-.2EH	VC4-1344-.5EH
Replacement valve	VC4-1344-.2D	VC4-1344-.5D
Replacement rotor	VC4-13R-.2	VC4-13R-.5
Replacement stator	VC4-1C4	VC4-1C4
Titanium stator		
Manual	VC4-1034-.2	VC4-1034-.5
With microelectric actuator	VC4-1034-.2EH	VC4-1034-.5EH
Replacement valve	VC4-1034-.2D	VC4-1034-.5D
Replacement rotor	VC4-10R-.2	VC4-10R-.5
Replacement stator	VC4-1C3	VC4-1C3

0.1µL and 0.05 µL sample volumes are also available. See p. 58 for actuator description. See p. 59 for material description.



Valco Model C4

Specifications:

N60 stainless or titanium stator
Valcon H rotor:

- 340 bar (5,000 psi)
- 75°C

PAEK stator
Valcon E rotor:

- 340 bar (5,000 psi)
- 50°C

VALVES FOR MICRO-HPLC

Microbore HPLC external loop injection/switching valve

1/16" Valco fittings, 0.25 mm ports (.010")

Includes stainless steel nuts and ferrules of stator material. Valves with PEEK stators have PEEK nuts and ferrules.

Microelectric actuator: 24 VDC, with 110/230 VAC to 24 VDC power supply.

*6-port valve includes a 5 µL loop of the stator material.

	Part No.	
	6-port*	10-port
N60 stainless stator		
Manual	VC2-1006	VC2H-1000
With microelectric actuator	VC2-1006EH	VC2H-1000EP
Replacement valve	VC2-1006D	VC2H-1000D
Replacement rotor	VC2-10R6	VC2-10R0H
Replacement stator	VC-1C06	VC-1C00H
PEEK stator		
Manual	VC2-1346	VC2H-1340
With microelectric actuator	C2-1346EH	VC2H-1340EP
Replacement valve	VC2-1346D	VC2H-1340D
Replacement rotor	VC2-13R6	VC2-13R0H
Replacement stator	VC-1C46	VC-1C40H
Titanium stator		
Manual	VC2-1036	VC2H-1030
With microelectric actuator	VC2-1036EH	VC2H-1030EP
Replacement valve	VC2-1036D	VC2H-1030D
Replacement rotor	VC2-10R6	VC2-10R0H
Replacement stator	VC-1C34	VC-1C30H



Valco Model C2

Specifications:

With N60 stainless or titanium stator and Valcon H rotor:

- 340 bar (5,000 psi)
- 75°C

With PEEK stator and Valcon E rotor:

- 340 bar (5,000 psi)
- 50°C

See p. 58 for actuator description.

See p. 59 for material description.

Sample Loops (for microbore HPLC external loop injection/switching valve)

Each metal loop includes two stainless steel nuts and ferrules.

Each PEEK loop includes two PEEK nuts and ferrules.

Injection Volume	Part No.		
	Stainless steel	PEEK (for PEEK stators)	Titanium
1 µL	VCSL1	VCZSL1PK	-
2 µL	VCSL2	VCZSL2PK	-
5 µL	VCSL5	VCZSL5PK	-
10 µL	VCSL10	VCZSL10PK	VCSL10TI
20 µL	VCSL20	VCZSL20PK	VCSL20TI
50 µL	VCSL50	VCZSL50PK	VCSL50TI
100 µL	VCSL100	VCZSL100PK	VCSL100TI
250 µL	VCSL250	VCZSL250PK	VCSL250TI
500 µL	VCSL500	VCZSL500PK	VCSL500TI
1 mL	VCSL1K	VCZSL1KPK	VCSL1KTI



Large-volume injection (sample loading) by column-switching

Large-volume injections are often performed in micro-HPLC, primarily for obtaining detection limits in the pg/mL range, but also for sample clean-up. The short length of the trace-enrichment columns (p. 48) allows higher flow rate compared with the separation columns to reduce turnover times between injections. It is therefore common to use a valve with somewhat larger

bore to increase robustness and reduce back-pressure.

When using loading flow rates at least 10x higher than the optimum flow rate on the separation column, we recommend the following combination of 6-ports valves for large-volume injection (sample loading) in microbore, capillary, and nano-HPLC.

0.25 mm bore valves for large-volume injection in microbore/capillary HPLC (min. loading flow rate 30 µL/min)

	Part No.	
	6-port injection valve	6-port or 10-port switching valve
N60 stainless stator	VC2-1006 (p. 54)	VC2-1006 / VC2H-1000 (p.54)
PAEK stator	VC2-1346 (p. 54)	VC2-1346 / VC2H-1340 (p. 54)
Titanium stator	VC2-1036 (p. 54)	VC2-1036 / VC2H-1030 (p. 54)

0.15 mm bore valves for large-volume injection in nano HPLC (min. loading flow rate 3 µL/min)

	Part No.	
	6-port injection valve	6-port or 10-port switching valve
N60 stainless stator	VC2-0006 (p. 56)	VC2-0006 / VC2H-0000 (p. 56)
PAEK stator	VC2-0346 (p. 56)	VC2-0346 / VC2H-0340 (p. 56)

Capillary HPLC internal loop injector

1/16" Valco fittings, 0.15 mm ports (.006")

Includes stainless steel nuts and ferrules of stator material. Valves with PEEK stators have PEEK nuts and ferrules.

Microelectric actuator: 24 VDC, with 110/230 VAC to 24 VDC power supply.

	Part No.		
	10 nL	20 nL	50 nL
N60 stainless stator			
Manual	VC4-0004-.01	VC4-0004-.02	VC4-0004-.05
With microelectric actuator	VC4-0004-.01EH	VC4-0004-.02EH	VC4-0004-.05EH
Replacement valve	VC4-0004-.01D	VC4-0004-.02D	VC4-0004-.05D
Replacement rotor	VC4-00R-.01	VC4-00R-.02	VC4-00R-.05
Replacement stator	VC4-0C0	VC4-0C0	VC4-0C0
PAEK stator			
Manual	VC4-0344-.01	VC4-0344-.02	VC4-0344-.05
With microelectric actuator	VC4-0344-.01EH	VC4-0344-.02EH	VC4-0344-.05EH
Replacement valve	VC4-0344-.01D	VC4-0344-.02D	VC4-0344-.05D
Replacement rotor	VC4-03R-.01	VC4-03R-.02	VC4-03R-.05
Replacement stator	VC4-0C4	VC4-0C4	VC4-0C4

0.1µL, 0.2µL and 0.5 µL sample volumes (e.g. for on-column focusing) are also available.
See p. 58 for actuator descriptions.
See p. 59 for material description.



Valco Model C4

Specifications:

With N60 stainless stator and Valcon H rotor:

- 340 bar (5,000 psi)
- 75°C

With PEEK stator and Valcon E rotor:

- 340 bar (5,000 psi)
- 50°C

VALVES FOR MICRO-HPLC

Capillary HPLC external loop injection/switching valve

1/16" Valco fittings, 0.15 mm ports (.006")

Includes stainless steel nuts and ferrules of stator material. Valves with PAEK stators have PEEK nuts and ferrules.

Microelectric actuator: 24 VDC, with 110/230 VAC to 24 VDC power supply.

*6-port valve includes a 2 µL loop of the stator material.

	Part No.	
	6-port*	10-port
N60 stainless stator		
Manual	VC2-0006	VC2H-0000
With microelectric actuator	VC2-0006EH	VC2H-0000EP
Replacement valve	VC2-0006D	VC2H-0000D
Replacement rotor	VC2-00R6	VC2-00R0H
Replacement stator	VC-0C06	VC-0C00H
PAEK stator		
Manual	VC2-0346	VC2H-0340
With microelectric actuator	VC2-0346EH	VC2H-0340EP
Replacement valve	VC2-0346D	VC2H-0340D
Replacement rotor	VC2-03R6	VC2-03R0H
Replacement stator	VC-0C46	VC-0C40H

See p. 58 for actuator descriptions.
See p. 59 for material description



Valvo Model C2

Specifications:

With N60 stainless stator and Valcon H rotor:

- 340 bar (5,000 psi)
- 75°C

With PAEK stator and Valcon E rotor:

- 340 bar (5,000 psi)
- 50°C

Sample Loops (for capillary HPLC external loop injection/switching valve)

Each metal loop includes two stainless steel nuts and ferrules.

Each PEEK loop includes two PEEK nuts and ferrules.

Injection Volume	Part No.		
	Stainless steel	PEEK (for PAEK stators)	Titanium
1 µL	VCSL1	VCZSL1PK	-
2 µL	VCSL2	VCZSL2PK	-
5 µL	VCSL5	VCZSL5PK	-
10 µL	VCSL10	VCZSL10PK	VCSL10TI
20 µL	VCSL20	VCZSL20PK	VCSL20TI
50 µL	VCSL50	VCZSL50PK	VCSL50TI
100 µL	VCSL100	VCZSL100PK	VCSL100TI
250 µL	VCSL250	VCZSL250PK	VCSL250TI
500 µL	VCSL500	VCZSL500PK	VCSL500TI
1 mL	VCSL1K	VCZSL1KPK	VCSL1KTI



VALVES FOR MICRO-HPLC

Nano HPLC internal loop injector 1/32" Cheminert fittings, 0.10 mm ports (.004")

Includes PEEK Cheminert fittings.
Microelectric actuator: 24 VDC, with 110/230 VAC to 24 VDC power supply.

	Part No.		
	4 nL	10 nL	20 nL
PAEK stator			
Manual	VCN4-4344-.004	VCN4-4344-.01	VCN4-4344-.02
With microelectric actuator	VCN4-4344-.004EH	VCN4-4344-.01EH	VCN4-4344-.02EH
Replacement valve	VCN4-4344-.004D	VCN4-4344-.01D	VCN4-4344-.02D



Model CN4

Specifications:

With PAEH stator and Valcon E rotor:

- 340 bar (5,000 psi)
- 50°C

Nano HPLC external loop injection/switching valve 1/32" Cheminert fittings, 0.10 mm ports (.004")

Includes PEEK Cheminert fittings.
Microelectric actuator: 24 VDC, with 110/230 VAC to 24 VDC power supply.
*The 6-port valve includes a 40 nL PEEK loop.

	Part No.	
	6-port*	10-port
PAEK stator		
Manual	VCN2-4346	VCN2-4340
With microelectric actuator	VCN2-4346EH	VCN2-4340EP
Replacement valve	VCN2-4346D	VCN2-4340D



Valco Model CN2

Specifications:

With PAEH stator and Valcon E rotor:

- 340 bar (5,000 psi)
- 50°C

Sample Loops (for nano HPLC external loop injector/switching valve)

Each PEEK loop includes two PEEK Cheminert nanovolume fittings.

Injection Volume	Part No.
250 nL	VCNSL250PK
1 µL	VCNSL1KPK
5 µL	VCNSL5KPK



Replacement nut for 6-port valve, part no: VC-NNFFPK
Replacement nut for 10-port valve, part no: VC-NNFLFPK

Two Position Microelectric Actuators and Accessories

- Automatic alignment
- Manual control with position indication
- Remote control by contact closures or TTL level logic signals
- RS-232 bidirectional communication (optional RS-485)
- Stall-sensing circuitry - no mechanical microswitches
- High speed switching - <100 ms in EH model
- Autosensing universal power supply, 110/230 VAC to 24 VDC
- CE-compliant



The microelectric valve actuator provides Valco dependability in a unit which is less than half the size of standard electric actuators. The actuator consists of a control module, a stepper motor/gearbox assembly, a manual remote control, interconnecting cables, and a 110/230 VAC to 24 VDC power supply. The composite version combines the stepper motor/gearbox assembly with the control module. The RS-232 interface cable, if required, must be ordered separately.

Microelectric Actuators

Standard voltage 24 VDC. Includes autosensing 24 VDC power supply.

Standoff version includes a 2" standoff. 3", 4", and 6" standoffs are also available.

All valves listed in this catalog can use EH-CE actuator, except for the 10-ports valves that require EP-CE actuator

ORDERING INFORMATION

	Part No.		
	With closemount assembly	With 2" standoff assembly	For use with existing standoff
High speed actuator	VEH-CE	VEH2-CE	VEHS-CE
Medium torque actuator	VEP-CE	VEP2-CE	VEPS-CE

RS-232 interface cable (fits all actuators), part no: VI-22697

!!! Plug-and-play cables that allow a direct connection and control between a specific instrument and the microelectric two position actuator are available. Please take contact for further information.

Rotor, Stator and Loop Material Descriptions

Valcon H

This composite, a carbon fiber reinforced, PTFE lubricated inert engineering polymer, has long been the standard for typical HPLC applications in which pressures are around 5000 psi and temperatures are not more than 75°C. It is not unusual for these valves to be ordered for use at 7000 psi, and less frequently for use at 10,000 psi. However, at that point the lifetime may be shortened by as much as 50%.

Valcon E

A polyaryletherketone/PTFE composite, the E material receives wide GC use in what had previously been a problematic gap between the optimum temperature ranges of P and T, and in HPLC applications where the temperature requirement is higher than what can be handled by the H material and where a lower pressure limit can be tolerated. (Standard specs are 400 psi at 225°C, but higher pressure ratings are possible at reduced temperatures.) However, this polymer cannot be used in prolonged contact with high concentrations of sulfuric and nitric acids, DMSO, THF, or liquid methylene chloride.

Stainless steel, type 316

This is the standard tubing material for chromatography, suitable for a wide variety of applications. It is cold drawn seamless, not welded, with close tolerances held on both ID and OD. We neither recommend nor offer Type 304 stainless steel for analytical applications. Austenitic stainless steels may be used for most chromatographic applications. Type 316 is most commonly used for HPLC because of its superior chloride ion resistance.

Nitronic 60 (N60)

Chemical resistance is similar to Type 316 stainless, but its resistance to galling and oxidation make it superior to Type 316 or 303 in the majority of applications. This is the standard material in Cheminert metal valves.

Titanium

Although it is more difficult to machine than common alloys containing aluminum and vanadium, Valco uses Grade 2 pure titanium in order to avoid possible

contamination of the sample stream with these metals. Good for organic and inorganic salts except aluminum and calcium chlorides, and all alkalis except boiling concentrated potassium hydroxide. Good with dilute, low temperature formic, lactic, sulfuric, hydrochloric, and phosphoric acids, but rapidly attacked by hydrofluoric acid. Good with dilute nitric acid at low temperatures; corrodes at high concentrations and temperatures. Can ignite with fuming nitric acid. Attacked by oxalic acid, concentrated phosphoric acid, hot trichloroacetic acid, and zinc chloride. Due to the nature of this metal, valves made of titanium typically have a shorter lifetime than HPLC grade stainless steel.

PAEK

Polyaryletherketone is the generic name for the family of polyketone compounds. (See PEEK) PAEK includes PEK, PEEK, PEKK, and PEKEKK, which differ in physical properties and, to a lesser degree, in inertness.

VICI utilizes a range of proprietary PAEK-based composites (PEEK and others) for valve and fitting components. These composites resist all common HPLC solvents and dilute acids and bases. However, concentrated or prolonged use of halogenated solvents may cause the polymer to swell. Avoid concentrated sulfuric or nitric acids (over 10%).

PEEK

Considered relatively inert and biocompatible, poly-etheretherketone tubing can withstand temperatures up to 100°C. Under the right circumstances, .005" - .020" ID tubing can be used up to 5000 psi for a limited time, and 0.030" to 3000 psi. Larger IDs are typically good to 500 psi. These limits will be substantially reduced at elevated temperatures and in contact with some solvents or acids.

Its mechanical properties allow PEEK to be used instead of stainless in many situations and in some environments where stainless would be too reactive. However, PEEK can be somewhat absorptive of solvents and analytes, notably methylene chloride, DMSO, THF, and high concentrations of sulfuric and nitric acid. This tubing is highly prone to "kinking", or sealing off, if held in a sharp bend over time.

MICRO-HPLC SYRINGES

HPLC Syringes

FROM SGE INTERNATIONAL

Compatible with Valco, Rheodyne, Beckman/Altex and SSI valves



FIXED NEEDLE

Volume	Needle Length	Gauge	OD	Tip Style	Part No.
5 µL	2"	22	0.028"	LC	S001301
10 µL	2"	22	0.028"	LC	S002301
10 µL	2"	22	0.028"	LC	S002335*
25 µL	2"	22	0.028"	LC	S003300
50 µL	2"	22	0.028"	LC	S004300
100 µL	2"	22	0.028"	LC	S005300
250 µL	2"	22	0.028"	LC	S006300
500 µL	2"	22	0.028"	LC	S007300

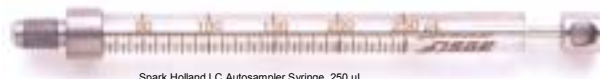
REMOVABLE NEEDLE

Volume	Needle Length	Gauge	OD	Tip Style	Part No.
5 µL	2"	22	0.028"	LC	S001310
10 µL	2"	22	0.028"	LC	S002310
10 µL	2"	22	0.028"	LC	S002313*
25 µL	2"	22	0.028"	LC	S003310
25 µL	2"	22	0.028"	LC	S003312*
50 µL	2"	22	0.028"	LC	S004310
50 µL	2"	22	0.028"	LC	S004312*
100 µL	2"	22	0.028"	LC	S005310
100 µL	2"	22	0.028"	LC	S005312*
250 µL	2"	22	0.028"	LC	S006310
250 µL	2"	22	0.028"	LC	S006312*
500 µL	2"	22	0.028"	LC	S007310
500 µL	2"	22	0.028"	LC	S007312*
1 mL	2"	22	0.028"	LC	S008105*
2.5 mL	2"	22	0.028"	LC	S008505*

* Gas tight (teflon piston)

HPLC Autosampler Syringes

FROM SGE INTERNATIONAL



Spark Holland LC Autosampler Syringe, 250 µL

Autosampler:	Volume	Part No.
Agilent HPLC 1090 and 1100	25 µL	S003670
	250 µL	S006670
Hitachi	500 µL	S007660
Kontron	250 µL	S006684
	500 µL	S007684
	1 mL	S008184
	2.5 mL	S008584
PerkinElmer	50 µL	S004995
	100 µL	S005990
	250 µL	S006995
	500 µL	S007995
	1 mL	S008185
Spark Holland	250 µL	S006683
	1 mL	S008183
Thermo Finnigan	250 µL	S006660
	500 µL	S007680
	1 mL	S008180
	2.5 mL	S008660
	5 mL	S008780
Waters WISP	25 µL	S003990
	250 µL	S006690

Micro-HPLC Manual Flow Meter

This low-cost manual flow meter is ideal for controlling the flow rate of your micro-HPLC system. Simply connect the flow meter to the outlet tubing from the column or detector and measure the time required to fill up the chosen volume on the syringe scale, e.g. 5 µL at 5 µL/min. The flow meter must be purged with gas and dried between each measurement.



Description	Syringe Volume	Flow Rate Range	Part No.
Flow meter for nano HPLC	1 µL	0.2 - 1 µL/min	SFM-01
Flow meter for capillary HPLC	5 µL	3 - 5 µL/min	SFM-05
Flow meter for microbore HPLC	50 µL	30 - 50 µL/min	SFM-50

Fitting: female 1/16" union.

TUBING

PEEK™ Tubing

FROM SCIVEX™, UPCHURCH SCIENTIFIC® DIVISION

- 1/16", 1/8" and 1.8 mm OD tubing available
- Biocompatible, inert and easily cut
- Great for high pressure applications



PEEK (polyetheretherketone) polymer tubing is biocompatible, chemically inert to most solvents, and can be used to replace stainless steel (SS) tubing in most liquid analytical systems. Unlike SS and titanium tubing, PEEK tubing is flexible and can be easily cut to desired lengths. PEEK tubing can be used with SS or polymer fittings.

The benefits of PEEK polymer tubing include a high pressure rating (up to 7,000 psi/480 bar in most cases) and a high temperature rating (max. continuous use temperature of 100°C). Additionally, PEEK tubing has a very smooth internal surface, which causes less internal

disturbance than similar sized metal tubing. Turbulence can cause remixing of separated bands and dilution of bands by the mobile phase.

PEEK tubing offers outstanding chemical solvent compatibility, with very few solvents interacting negatively with the polymer. However, DMSO, methylene chloride, and THF, can cause mild swelling of PEEK polymer. Conc. nitric and sulfuric acids will degrade PEEK, although studies show PEEK tubing can safely withstand 20-30% nitric acid, at room temperature, for brief system cleaning.

ORDERING INFORMATION – PEEK TUBING

PEEK TUBING, 1/32" OD

ID	Color	Max. Pressure	Part No.	
			1.5m	30cm/10pk
65 µm (0.0025")	Natural	345 bar (5,000 psi)*	U1579	U1579-12x
90 µm (0.0035")	Black	345 bar (5,000 psi)*	U1578	U1578-12x
125 µm (0.005")	Red	345 bar (5,000 psi)*	U1576	U1576-12x
0.25 mm (0.010")	Blue	345 bar (5,000 psi)*	U1581	U1581-12x
0.50 mm (0.020")	Orange	207 bar (3,000 psi)*	U1569	U1569-12x

PEEK TUBING 1/16" OD

ID	Color	Max. Pressure	Part No.
			1.5m
65 µm (0.0025")	Natural	483 bar (7,000 psi)*	U1560
100 µm (0.004")	Black	483 bar (7,000 psi)*	U1561
0.25 mm (0.010")	Blue	483 bar (7,000 psi)*	U1531B
0.50 mm (0.020")	Orange	483 bar (7,000 psi)*	U1532
1.00 mm (0.040")	Natural	345 bar (5,000 psi)*	U1538

PEEK TUBING 1/8" OD x 1.5 m

ID	Color	Max. pressure	Part No.
1.60 mm (0.062")	Natural	276 bar (4,000 psi)*	U1534
2.00 mm (0.080")	Natural	207 bar (3,000 psi)*	U1544

The products listed above are the most popular. Other dimensions are available:

360 µm OD: 50, 75, 100, and 150 µm. **510 µm OD:** 65, 125, and 255 µm ID. **1/32" OD:** 0.175, 0.2, 0.23, and 0.4 mm ID. **1/16" OD:** 0.125, 0.15, 0.175, 0.4, 0.75, and 1.4 mm ID. **1.8 mm OD:** 0.25, 0.5, 0.75, 1.05, and 1.40 mm ID.

Chemical/physical properties:

Chemicals which interact with PEEK polymer are not pH dependent; rather, interaction is more determined by other physical properties of the chemical(s) in question. Not recommended for use with nitric acid; sulfuric acid; halogenated acids, such as hydrofluoric, hydrobromic, and hydroiodic acids (hydrochloric acid is approved for most applications); and pure halogenated gases. Additionally, due to a swelling effect, be cautious in using the following solvents with PEEK tubing: methylene chloride, THF, and DMSO.

Temperature range:	up to 100°C
Thread strength:	excellent
pH range:	1-14
Sterilization tech.:	gamma irradiation ethylene oxide thermal
Autoclavable:	yes

NB!

Check page 65 for PEEK tubing cutter!

* Testing conducted with water at room temperature. Use of some chemicals and at higher temperatures may reduce the pressure limit. Using a heat gun or overheating can weaken your tubing.

Fused Silica Tubing

FROM POLYMICRO TECHNOLOGIES, LLC

- Wide ranges of sizes with IDs starting at < 5 µm and ODs starting at < 90 µm
- Unique internal and external geometries
- Excellent chemical durability and inertness

Polymicro is the world's leading supplier of fused silica tubing and has for decades supplied the industries of Gas Chromatography with tubing and coils; Capillary Electrophoresis with tubing and windowed capillary; Genomics with tubing, arrays, and assemblies for DNA sequencing and fragment analysis; Proteomics with tubing for nano/capillary HPLC columns, fluid

connections, and MS interfacing; Microfluidics (including Lab-on-a-chip) with tubing for fluid connections between nano/micro devices and macro environments. The combination of chemical inertness, flexibility, robustness, and gas-tight walls makes fused silica tubing the perfect choice for transportation of small volumes of gas, supercritical fluids, and liquids.

ORDERING INFORMATION – FUSED SILICA TUBING

TSP: Standard Polyimide Coating

ID (µm)	OD (µm)	CT* (µm)	Part No.
002 ± 01	150 ± 06	12	PTSP002150
005 ± 02	150 ± 06	12	PTSP005150
005 ± 02	363 ± 10	20	PTSP005375
010 ± 02	150 ± 06	12	PTSP010150
010 ± 02	363 ± 10	20	PTSP010375
015 ± 02	150 ± 06	12	PTSP015150
015 ± 02	363 ± 10	20	PTSP015375
020 ± 02	090 ± 06	12	PTSP020090
020 ± 02	150 ± 06	12	PTSP020150
020 ± 02	363 ± 10	20	PTSP020375
025 ± 02	150 ± 06	12	PTSP025150
025 ± 02	363 ± 10	20	PTSP025375
030 ± 03	150 ± 06	12	PTSP030150
030 ± 03	363 ± 10	20	PTSP030375
040 ± 03	105 ± 06	12	PTSP040105
040 ± 03	150 ± 06	12	PTSP040150
040 ± 03	363 ± 10	20	PTSP040375
050 ± 03	150 ± 06	12	PTSP050150
050 ± 03	186 ± 06	16	PTSP050192
050 ± 03	363 ± 10	20	PTSP050375
075 ± 03	150 ± 06	12	PTSP075150
075 ± 03	193 ± 07	12	PTSP075200
075 ± 03	363 ± 10	20	PTSP075375
100 ± 04	164 ± 06	12	PTSP100170
100 ± 04	193 ± 07	12	PTSP100200
100 ± 04	238 ± 07	16	PTSP100245
100 ± 04	363 ± 10	20	PTSP100375
150 ± 04	363 ± 10	20	PTSP150375
180 ± 06	340 ± 10	18	PTSP180350
200 ± 06	360 ± 10	18	PTSP200350
250 ± 06	360 ± 10	18	PTSP250350
320 ± 06	435 ± 10	18	PTSP320450
536 ± 06	665 ± 15	30	PTSP530660
530 ± 10	700 ± 20	24	PTSP530700
700 ± 10	850 ± 20	24	PTSP700850

TSG: High Temperature Polyimide Coating

ID (µm)	OD (µm)	CT* (µm)	Part No.
250 ± 06	350 ± 15	20	PTSG250350
320 ± 06	435 ± 15	18	PTSG320450
530 ± 06	673 ± 25	18	PTSG530660

TSU: UV Transparent Coating

ID (µm)	OD (µm)	CT* (µm)	Part No.
050 ± 03	363 ± 10	15	PTSU050375
075 ± 03	363 ± 10	15	PTSU075375
100 ± 04	363 ± 10	15	PTSU100375

TSP Characteristics:

- Standard polyimide coating
- Synthetic fused silica
- 100% proof tested at 100 kpsi**
- Operation up to 350°C

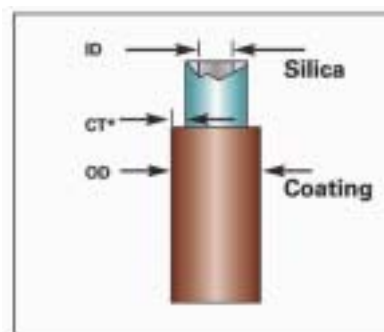
TSG Characteristics:

- High temp. polyimide coating
- Synthetic fused silica
- 100% proof tested at 100 kpsi**
- Operation up to 400°C

TSU Characteristics:

- UV transparent coating
- Synthetic fused silica
- Operation up to 160°C

* CT is Coating Thickness. Value is nominal.
** Tensile Strength



- Minimum purchasable length is 10 meter.
- One ceramic FS tubing cutter is included.

TUBING

PEEKsil™ Tubing

FROM SGE INTERNATIONAL



1/32" OD TUBING

ID (µm)	Length	Max. pressure	Color:	Qty.	Part No.
25	5 cm	580 bar (8,500 psi)	Orange	2-pk	S0624241
25	10 cm	580 bar (8,500 psi)	Orange	2-pk	S0624242
25	15 cm	580 bar (8,500 psi)	Orange	2-pk	S0624243
25	25 cm	580 bar (8,500 psi)	Orange	2-pk	S0624245
25	50 cm	580 bar (8,500 psi)	Orange	2-pk	S0624249
50	5 cm	580 bar (8,500 psi)	Natural	2-pk	S0624261
50	10 cm	580 bar (8,500 psi)	Natural	2-pk	S0624262
50	15 cm	580 bar (8,500 psi)	Natural	2-pk	S0624263
50	25 cm	580 bar (8,500 psi)	Natural	2-pk	S0624265
50	50 cm	580 bar (8,500 psi)	Natural	2-pk	S0624269
75	5 cm	580 bar (8,500 psi)	Black	2-pk	S0624271
75	10 cm	580 bar (8,500 psi)	Black	2-pk	S0624272
75	15 cm	580 bar (8,500 psi)	Black	2-pk	S0624273
75	25 cm	580 bar (8,500 psi)	Black	2-pk	S0624275
75	50 cm	580 bar (8,500 psi)	Black	2-pk	S0624279
100	5 cm	580 bar (8,500 psi)	Red	2-pk	S0624311
100	10 cm	580 bar (8,500 psi)	Red	2-pk	S0624312
100	15 cm	580 bar (8,500 psi)	Red	2-pk	S0624313
100	25 cm	580 bar (8,500 psi)	Red	2-pk	S0624315
100	50 cm	580 bar (8,500 psi)	Red	2-pk	S0624319
150	5 cm	580 bar (8,500 psi)	Purple	2-pk	S0624341
150	10 cm	580 bar (8,500 psi)	Purple	2-pk	S0624342
150	15 cm	580 bar (8,500 psi)	Purple	2-pk	S0624343
150	25 cm	580 bar (8,500 psi)	Purple	2-pk	S0624345
150	50 cm	580 bar (8,500 psi)	Purple	2-pk	S0624349

1/16" OD TUBING

ID (µm)	Length	Max. pressure	Color:	Qty.	Part No.
25	5 cm	580 bar (8,500 psi)	Orange	5-pk	S0624225
25	10 cm	580 bar (8,500 psi)	Orange	5-pk	S0624226
25	15 cm	580 bar (8,500 psi)	Orange	5-pk	S0624227
25	25 cm	580 bar (8,500 psi)	Orange	5-pk	S0624228
25	50 cm	580 bar (8,500 psi)	Orange	2-pk	S0624229
50	5 cm	1,000 bar (15,000 psi)	Natural	5-pk	S0624251
50	10 cm	1,000 bar (15,000 psi)	Natural	5-pk	S0624252
50	15 cm	1,000 bar (15,000 psi)	Natural	5-pk	S0624254
50	25 cm	1,000 bar (15,000 psi)	Natural	5-pk	S0624253
50	50 cm	1,000 bar (15,000 psi)	Natural	2-pk	S0624250
75	5 cm	1,000 bar (15,000 psi)	Black	5-pk	S0624290
75	10 cm	1,000 bar (15,000 psi)	Black	5-pk	S0624291
75	15 cm	1,000 bar (15,000 psi)	Black	5-pk	S0624292
75	25 cm	1,000 bar (15,000 psi)	Black	5-pk	S0624293
75	50 cm	1,000 bar (15,000 psi)	Black	2-pk	S0624294
100	5 cm	1,000 bar (15,000 psi)	Red	5-pk	S0624301
100	10 cm	1,000 bar (15,000 psi)	Red	5-pk	S0624302
100	15 cm	1,000 bar (15,000 psi)	Red	5-pk	S0624304
100	25 cm	1,000 bar (15,000 psi)	Red	5-pk	S0624303
100	50 cm	1,000 bar (15,000 psi)	Red	2-pk	S0624300
150	5 cm	580 bar (8,500 psi)	Purple	5-pk	S0624230
150	10 cm	580 bar (8,500 psi)	Purple	5-pk	S0624231
150	15 cm	580 bar (8,500 psi)	Purple	5-pk	S0624232
150	25 cm	580 bar (8,500 psi)	Purple	5-pk	S0624233
150	50 cm	580 bar (8,500 psi)	Purple	2-pk	S0624234
175	5 cm	580 bar (8,500 psi)	Yellow	5-pk	S0624351
175	10 cm	580 bar (8,500 psi)	Yellow	5-pk	S0624352
175	15 cm	580 bar (8,500 psi)	Yellow	5-pk	S0624354
175	25 cm	580 bar (8,500 psi)	Yellow	5-pk	S0624353
175	50 cm	580 bar (8,500 psi)	Yellow	2-pk	S0624350
200	5 cm	580 bar (8,500 psi)	Blue	5-pk	S0624202
200	10 cm	580 bar (8,500 psi)	Blue	5-pk	S0624203
200	15 cm	580 bar (8,500 psi)	Blue	5-pk	S0624205
200	25 cm	580 bar (8,500 psi)	Blue	5-pk	S0624204
200	50 cm	580 bar (8,500 psi)	Blue	2-pk	S0624201
300	5 cm	580 bar (8,500 psi)	Gray	5-pk	S0624214
300	10 cm	580 bar (8,500 psi)	Gray	5-pk	S0624215
300	15 cm	580 bar (8,500 psi)	Gray	5-pk	S0624216
300	25 cm	580 bar (8,500 psi)	Gray	5-pk	S0624217
300	50 cm	580 bar (8,500 psi)	Gray	2-pk	S0624218

- Smooth, inert inner surface
- Withstands high pressures
- No metal contamination

PEEKsil is PEEK™ polymer sheathed fused silica (FS) tubing, with an effective outer diameter of 1/32" or 1/16". The PEEK sheathing is mechanically strong and has ideal characteristics for sealing with metal or polymer fittings. PEEKsil can be used as a direct replacement for conventional stainless steel or PEEK tubing in many analytical systems, e.g. capillary and nano-HPLC.

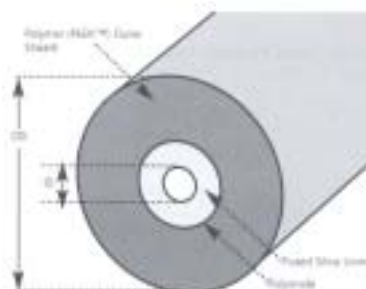
Like traditional FS tubing, PEEKsil has excellent chemical compatibility and has extremely low adsorption characteristics, especially when compared to stainless steel. The PEEK sheath/FS tubing combination makes this tubing capable of withstanding up to 1,000 bar (15,000 psi). PEEKsil is compatible with most organic solvents. PEEKsil is resistant to strong acids (except hydrofluoric acid), and has an effective pH range of 1-10.

OD Tolerances:

1/32" OD tubing: ± 0.03 mm
1/16" OD tubing: ± 0.03 mm

ID Tolerances:

25 µm ID tubing: ± 3 µm
50 µm ID tubing: ± 3 µm
75 µm ID tubing: ± 3 µm
100 µm ID tubing: ± 5 µm
150 µm ID tubing: ± 5 µm
175 µm ID tubing: ± 5 µm



Tubing Cutters

FOR POLYMER TUBING

A flat, 90°, burr-free cut is difficult to obtain with most commercial polymer tubing cutters. The UA-327 is designed specifically for cutting PEEK™, Teflon®, Tefzel® and other polymer tubing and it has built-in guide holes for both 1/16"-1/8" OD tubing. This simple molded guillotine cutter is durable, reliable and easy to operate. Cutting other tubing sizes using the next larger guide hole is possible, but a flat, 90° cut cannot be guaranteed. Five replacement blades are included with the cutter.



ORDERING INFORMATION

Description	Part No.
Polymer tubing cutter, 1/16" – 1/8" OD tubing	UA-327
Replacements blades (5-pk)	UA-328

FOR METAL TUBING I

This is the ideal tool for cutting 1/16" and 1/8" stainless steel tubing, leaving smooth, uniform cuts with a minimum of deburring and/or reaming. The easily replaced cutting wheel scores tubing in such way that the dead-volume is minimized. The cut allows tube-to-tube and tube-to-frit low dead-volume connections.



ORDERING INFORMATION

Description	Part No.
Metal tubing cutter, 1/16" – 1/8" OD tubing	J792
Replacement cutter wheel	J793

FOR METAL TUBING II

This pliers is ideal for cutting 1/16" and 1/32" stainless steel tubing, leaving smooth cuts. Cutting stainless steel tubing is difficult without distorting the outside diameter and closing the inside diameter. The jaws are annealed and will last for many years of normal operation. This cutter reaches "hard-to-get" places in your HPLC system.



ORDERING INFORMATION

Description	Part No.
Metal tubing cutter, 1/16" – 1/8" OD tubing	J796