

# **Jour**®

**Chromatography Fluid/Gas Transfer** 





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# **CERTIFICATIONS** CERTIFICATE

# Certificate

#### **VICI AG INTERNATIONAL**

VICI Jour has been a part of VICI AG International in Switzerland since 2004. The complete Jour line of accessories and consumables for fluid transfer in GC and LC is available from VICI AG International, VICI Valco Canada, VICI Precision Sampling, and through our international distributor network.

VICI AG International, in Schenkon, Switzerland, is an independent site for the manufacturing of Valco and Cheminert valves and the handling of all VICI product lines in Europe, Africa, the Middle East, and the Far East.

VICI AG International has obtained the ISO certificate to the standard of 9001:2008, and is the first ISO-certified manufacturer of high pressure and low pressure valves for scientific equipment.



#### **VICI JOUR PRODUCT LINE**

Jour products include a complete line of tubing and capillaries in a wide variety of diameters and materials, high and low pressure fingertight fittings and connection accessories, column hardware, high and low pressure filters, cutters and other tools, backpressure regulators, and much more.

We offer accessories and consumables for fluid transfer in GC and LC, including:

- Fittings high pressure polymeric and stainless, Nanovolume® PEEK and stainless, and low pressure
- Tubing and sample loops
- Safety products and mobile phase handling systems
- Filters and frits
- PEEK columns and guard columns



## NEW FROM VICIJOUR

#### **TUBING**

VICI offers new FS tubing, new SS Precut tubing kits for Micro LC, new tubing packaging sizes, and new tubing dimensions.

#### **NEW** Untreated fused silica (FS) capillaries

**PAGE** 18

Our NEW FS capillaries are manufactured from fused silica coated with a layer of polyimide to make them more flexible and robust. These chemically inert capillaries, stable at temperatures up to 350°C, are suitable for Micro and Nano LC applications involving organic solvents and other fluids in pH ranges from 0 to 10.

Sold by the meter.

		per meter
OD	ID	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



#### **NEW Polymeric tubing – new sizes**

PAGES 9-13, 15-16

For our full lines of PEEK, ETFE, PFA, FEP, and PTFE tubing, see pages noted above.

			1.5 m	3 m	10 m	15 m	25 m
	OD	ID (mm)	Product No.	Product No.	Product No.	Product No.	Product No.
PEEK	1/32"	0.15	JR-T-5706-M1.5	JR-T-5706-M3	JR-T-5706-M10	_	_
ETFE	1/8"	2.40	JR-T-089-M1.5	JR-T-089-M3	JR-T-089-M10	JR-T-089-M15	JR-T-089-M25
	6.4 mm	4.8	_	JR-T-090-M3	_	_	_

		per meter
OD	ID (mm)	Product No.
1/16"	0.064	JR-T-5998-0005
1/4"	3.97	JR-T-4006
	4.80	JR-T-4008
4 mm	3.00	JR-T-6860
1/4"	3.96	JR-T-6840
	3/16"	JR-T-6841
5/16"	1/4"	JR-T-6650
1/8"	1.00 mm	JR-T-6820
6.00 mm	4.00 mm	JR-T-4042
6.35 mm	4.76 mm	JR-T-6810
8.00 mm	6.00 mm	JR-T-4050
12.7 mm	9.53 mm	JR-T-4043
	1/16" 1/4"  4 mm 1/4"  5/16"  1/8"  6.00 mm  6.35 mm	1/16" 0.064  1/4" 3.97  4.80  4 mm 3.00  1/4" 3.96  3/16"  5/16" 1/4"  1/8" 1.00 mm  6.00 mm 4.00 mm  6.35 mm 4.76 mm  8.00 mm 6.00 mm





#### STAINLESS STEEL TUBING

VICI is now able to offer smaller diameters in 360 micron, 1/32", and 1/16" OD stainless tubing.

#### NEW Stainless tubing – standard grade UHPLC PAGE 19

		1.5 m	3 m	10 m
OD	ID (mm)	O (mm) 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

#### NEW Stainless tubing – premium grade UHPLC PAGE 19

For Micro and Nano LC

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



#### **NEW Pre-cut tubing for Micro LC**

**PAGE 20** 

1/32" OD tubing with IDs of 50 and 75 micron is only offered in precut lengths. Each precut piece is electrolytically cut and steam cleaned, ready for use in any (U)HPLC System.

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

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

#### **NEW Pre-cut tubing for standard HPLC**

**PAGE 21** 

VICI added SS pre-cut lengths of 130 mm and 180 mm for 1/16" OD tubing and for pre-cut flexible stainless steel tubing. Lengths of 130 mm and 180 mm are commonly used for (U)HPLC systems.

			130 mm	180 mm
OD	ID (mm)	Color	Product No.	Product No.
1/16"	0.13	Red	JR-T-97012	JR-T-97013
	0.18	Yellow	JR-T-97032	JR-T-97033
	0.25	Blue	JR-T-97057	JR-T-97058
	0.50	Orange	JR-T-97082	JR-T-97083
	0.75	Green	JR-T-97102	JR-T-97103

#### **FITTINGS**

#### **NEW PEEK one-piece fingertight fittings**

10-32

**PAGE 26** 

- Reinforced glass fiber (GF) PEEK.
- One-piece no ferrule required
- Fingertight up to 350 bar (5000 psi)
- Biocompatible

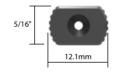
Sold in packages of 5.

		Material			Product No.
(Package/5)	Standard	Reinforced GF PEEK	9.15 mm	20.8 mm	JR-5513-5
	Narrow hexhead/ fingertight	Reinforced GF PEEK	1/4"	28.1 mm	JR-5518-5

#### **NEW** High pressure PEEK-HT™ one-piece fittings

**PAGE 27** 

VICI fittings made from PEEK™ HT are rated up to 500 bar as fingertights and up to 1000 bar when tightened with a tool. The superior material also provides the benefit of longer life time; that is, the fittings can be tightened/ loosened more often.





Sold in packages of 5.

	Product No.
(Package/5)	JR-55031-5

#### **NEW** Medium pressure PVDF one-piece fingertight fittings

VICI fingertight fittings made from PVDF are rated up to 180 bar. They are applicable up to medium pressures; using polymeric tubing they prevent constriction of tubing as with PEEK fingertight fittings. Sold in packages of 5.

(Package/5)	PVDF	Translucent white	JR-55020-PVDF-5

#### **NEW** Low pressure polypropylene adapters

**PAGE 54** 

VICI offers two additional low pressure PP adapters with 1/4-28 bottom sealing thread, to male Luer lock and to barbed 1/16".

	Inlet		Outlet			Product No.
(Sold individually)	Male	1/4-28 UNF BST	Barbed	1/16"		JR-075012
(Package/10)	Male	Luer	Male	1/4-28 UNF BST	93,	JR-070226-10

#### **FILTERS**

#### **HIGH PRESSURE**

High pressure precolumn and inline filters now include 0.2 micron filter elements. These filters prevent any damage to chromatographic columns, enabling safe, robust chromatographic separations.

#### **NEW Stainless steel precolumn filter UHPLC**

**PAGE 64** 

Bore size	Pore size	Internal volume	Product No.	
0.13/0.15 mm	0.2 μm	0.66 μL	JR-69230-02	46.5 mm

#### **NEW Stainless steel in-line filter**

#### **UHPLC**

**LOW PRESSURE** 

**PAGE 65** 

**PAGE 61** 

		memai			
Bore size	Pore size	volume	Product No.		
0.25 mm	0.2 μm	0.3 μL	JR-68230-02	9.0 mm	0.25 mm (FLOW)
					24.0 mm

#### **LOW PRESSURE**

For low pressure, a newly designed all-stainless mobile phase filter comes with a stainless stepped connector for direct coupling to mobile phase tubing. The filter is available in three different porosities – 2, 10, and 20 micron.

#### **NEW Stainless steel mobile phase** filter/helium sparger

Fitting type	Tubing ID/ pipe size	Pore size	Product No.	
Stepped	1/16",	2 μm	JR-8000-0495-2	9.5 mm
	3/32",	10 μm	JR-8000-0495-10	5.2 mm —
	and 3.76 mm	20 μm	JR-8000-0495-20	45.0 mm

NEW PRODUCTS

#### **SAFETY**

#### Safety exhaust filters

#### with **NEW** breakthrough detectors

#### PAGES 68-69

#### **NEW Replacement exhaust filter kits PAGE 68**

Includes three exhaust filters, three breakthrough detectors (if ordered), and a carrying case.



VICI offers exhaust filters with new breakthrough detectors. The newly-designed total organic vapor (TOV) breakthrough detector allows additional detection of aliphatic hydro-carbons (i.e. hexane) and aromatic hydrocarbons (i.e. benzene).



Description	Product No.	
Exhaust filter kit		JR-S-35
Kit includes:	Qty	Product No.
Exhaust filters	3	JR-S-20005
with breakthrough detectors		
Carrying case	1	JR-S-35L

Description	Product No.	
Exhaust filter kit without dete	JR-S-36	
Kit includes:	Qty	Product No.
Exhaust filters	3	JR-S-20002
without breakthrough detectors		
Carrying case	1	JR-S-35L

**VICI CAP KITS PAGE 74** 

HPLC systems use up to four different mobile phases. We offer two safety cap kits for use with gradient (up to quaternary) HPLC systems.

#### **NEW VICI cap kit**

#### **GL45** THREADS



Description	Product No.					
VICI cap kit	VICI cap kit					
Kit includes:	Qty	Product No.				
VICI caps, GL45, three ports	4	JR-S-11002				
Air inlet valves with 4 mm filters	4	JR-S-20003				
PP plugs	4	JR-201999				
Carrying case	1	JR-S-31				

#### **NEW VICI cap kit**

#### **GL45** THREADS



Description		Product No.
VICI cap kit		JR-S-32
Kit includes:	Qty	Product No.
VICI caps, GL45, two ports	3	JR-S-11001
VICI cap, GL45, three ports	1	JR-S-11002
Air inlet valves with 4 mm filters	4	JR-S-20003
PP plug	1	JR-201999
Carrying case	1	JR-S-31L

**MULTI CAPS PAGES 80-82** 

VICI's **NEW** multi caps can be used either for mobile phase or for waste bottles/canisters. Thread sizes include GL38, GL45, DIN50, S51, B53, DIN60, S61, GLS80, and B83.

All multi caps come with a set of angled PA barbed adapters for connecting tubing with 4mm, 6mm and 8mm ID, as well as a PA plug for the M10x1 bore and PP plugs for the 1/4-28 bores.



**GL38 threads** JR-S-13011



**GL45** threads JR-S-11052



DIN60 threads JR-S-16052



**GLS80** threads JR-S-18053

#### PEEK SAMPLE LOOPS

**PAGE 95** 

PEEK sample loops with volumes of 1, 2, 3 and 4 microliters are available for all types of valves – Cheminert, Valco, and Rheodyne.



#### **NEW For Cheminert valves**

#### **NEW For Valco valves**

Fit all Cheminert C1, C1CF, C2, C2V, and C3 type valves.

Sample size	Pressure *		Product No.
	bar psi		
1 μΙ	480	7000	JR-SLC-85-1
2 μΙ	460	6700	JR-SLC-85-2
3 μΙ	460	6700	JR-SLC-85-3
4 µl	460	6700	JR-SLC-85-4

Fit all 1/16" Valco W and UW type valves.

Sample size	Pressure *		Product No.
	bar	psi	
1 µl	480	7000	JR-SLV-75-1
2 μΙ	460	6700	JR-SLV-75-2
3 µl	460	6700	JR-SLV-75-3
4 µl	460	6700	JR-SLV-75-4



#### **NEW For Rheodyne valves**

Fit all Rheodyne metal and metal-free valves.

Sample size	Pressure *		Product No.
	bar psi		
1 μΙ	480	7000	JR-SLR-2190
2 μΙ	460	6700	JR-SLR-2191
3 μΙ	460	6700	JR-SLR-2192
4 μΙ	460	6700	JR-SLR-2193



#### **ACCESSORIES**

#### **NEW HPLC Backpressure regulators**

**PAGE 102** 

Our newest backpressure regulator is made from stainless steel, rated up to 300 bar (4200 psi). It can be used for preparative and SFC applications.



	Range		Housing	Product No.
Stainless steel	90-300 bar	1300-4200 psi	SS	JR-BPR3



#### **NEW** Utility box

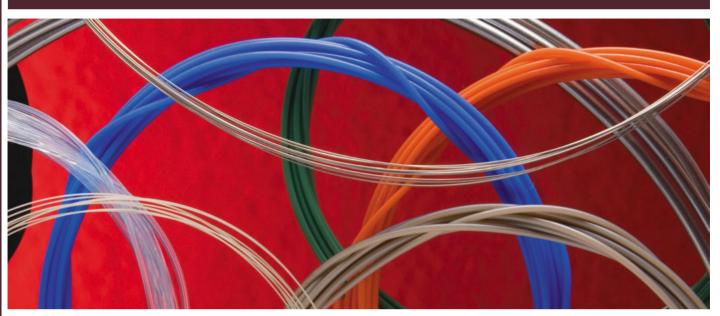
**PAGE 105** 

This empty toolbox can be equipped by each individual. Utility boxes help store all the chromatographic accessories in the lab; moreover, they can be easily moved to wherever the chromatographic system is located.

	Product No.
Utility box	JR-35U

# **TUBING**

### TUBING



**METAL AND POLYMERIC** 

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

#### **TUBING INDEX**

PEEK TUBING  Natural PEEK	OTHER POLYMERIC TUBING         PFA       1.         ETFE       1.         PTFE       Solid color-coded       14         Natural       1.5         FEP       10
Striped color-coded PEEK	Thermo-formed polymeric tubing 1. Impermeable tubing
color-coded PEEK, there is no possibility of stream contents coming in contact with coloring agents.	STAINLESS STEEL TUBING Bulk SS tubing Premium grade, seamless
Solid color-coded PEEK	Standard

#### 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	٠.				84

### Tubing tools and accessories Easy-Flange kit . . . .

asy-Flange combi kit . 99
EEK tubing elbows100
ubing cutters for:
Polymeric tubing
Clean-cut100
Guillotine100
Stainless tubing
Wheel type101
Plier type101
ubing clip – the LC
tubing organizer100



#### **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 metalsensitive 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  $360 \mu m$ 

#### 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	

#### 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

#### PEEK tubing - natural

		1.5 m	3 m	10 m
OD	ID (mm)	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 <i>NEW</i>	JR-T-5706-M3 <b>NEW</b>	JR-T-5706-M10 <i>NEW</i>
1/16"	0.064	JR-T-5998-M1.5	JR-T-5998-M3	JR-T-5998-M10
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

		per meter	
OD	ID (mm)	Product No.	
1/16"	0.064	JR-T-5998-0005 <b>NEW</b>	Tubing tolerance: OD $\pm$ 0.0013 mm
	0.38	JR-T-62015	
1/4"	3 17	IR-T-6006	

our tubing elbows . 100

#### MORE INFO

About PEEK®113
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PEEK at higher
temperatures 110
Maximum working
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Tubing ID chart:
volume per length107
Tubing tolerances 109

#### SEE ALSO

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tubing cutter100
Easy-Flange kit 99
PEEK fittings
High pressure24-35
Low pressure . 48, 50-53
PEEK tubing elbows100

#### CONVERSIONS

**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

• Customized ODs and IDs

for more information

Longer bulk tubing

about:

lengths

 $75 \, \mu m = .003$ " 0.013 mm = .0005"  $0.025 \, \text{mm} = .001$ "  $0.064 \, \text{mm} = .0025'$  $0.075 \, \text{mm} = .003$ " 0.100 mm = .004"  $0.13 \, \text{mm} = .005$ "  $0.15 \, \text{mm} = .006$ "  $0.38 \, \text{mm} = .015$ "  $0.75 \, \text{mm} = .03$ "

 $1.59 \, \text{mm} = 1/16$ " 2.00 mm = .08"  $3.17 \, \text{mm} = 1/8$ " 1.5 m = 4.92' $3.0 \, \text{m} = 9.84'$ 

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

#### 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



TUBING

#### 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**

			NEW	
		1 m	1.5 m	3 m
ID (mm)	Color	Product No.	Product No.	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** 

		NEW	_	_		NEW	
		1.5 m	3 m	5 m	10 m	15 m	25 m
ID (mm)	Color	Product No.	Product No.	Product No.	Product No.	Product No.	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

CONVER	SIONS			
50 μm =	.002"	0.20 mm	=	.008"
75 μm =	.003"	0.25 mm	=	.01"
$100  \mu m =$	.004"	0.50 mm	=	.02"
$125  \mu m =$	.005"	0.75 mm	=	.03"
$150  \mu m =$	.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	=	32.8o'
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**

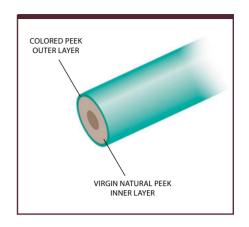
Contact your distributor or VICI about:

- 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

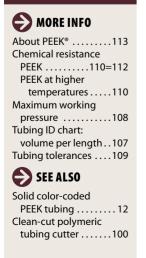
Our dual layer PEEK tubing eliminates any concern that a critical sample stream could be contaminated by pigments used to color code the tubing. It looks like any other color-coded tubing at first glance, but a closer look reveals that the pigmented layer\* surrounds a separate but integrally-bonded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

NEW				NEW				
				1.5 m	3 m	10 m	15 m	25 m
ID (mm)	Color	bar	psi	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





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.

		1 m	3 m
ID (mm)	Color	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

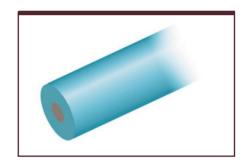
**TUBING TOLERANCES** 

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.

		NEW			NEW	
		1.5 m	3 m	10 m	15 m	25 m
ID (mm)	Color	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



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

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#### 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.

		NEW			NEW	
		1.5 m	3 m	10 m	15 m	25 m
OD	ID (mm)	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
	1.00	JR-T-085-M1.5	JR-T-085-M3	JR-T-085-M10	JR-T-085-M15	JR-T-085-M25
1/8"	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

		1 m	3 m
OD	ID (mm)	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 <b>NEW</b>	JR-T-090-M3 <b>NEW</b>



#### **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.

		NEW		NEW		
		1.5 m	3 m	10 m	15 m	25 m
OD	ID (mm)	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

			per meter
OD	,	ID (mm)	Product No.
1/8	"	1.70	JR-T-4005
3/16	5"	3.20	JR-T-4009
1/4	"	3.97	JR-T-4006 <b>NEW</b>
		4.35	JR-T-4004
		4.80	JR-T-4008 <i>NEW</i>



CONVERSIONS		
$50  \mu m = .002"$	0.13  mm = .005"	3.97  mm = .156"
$75  \mu m = .003$ "	0.15  mm = .006"	4.0  mm = .16"
$100  \mu m = .004$ "	0.18  mm = .007"	4.35  mm = .17"
$125  \mu m = .005$ "	0.20  mm = .008"	4.8  mm = .19"
$150  \mu m = .006$ "	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"	

#### 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.

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TUBING

#### **PTFE TUBING**

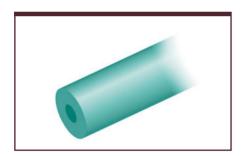
PTFE (polytetrafluoroethylene) tubing is chemically inert and suitable for lower pressure applications. Typically 1/16" OD tubing holds up to 62 bar (900 psi) and 1/8" up to 35 bar (500 psi). Maximum continuous operating temperature is 100°C.

#### 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.

			3 m	10 m	25 m
OD	ID (mm)	Color	Product No.	Product No.	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
- Customized ODs and IDs



#### TECH TIP

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



#### TECH TIP

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



#### MORE INFO

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#### SEE ALSO

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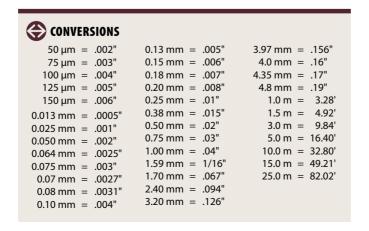
#### PTFE tubing - natural color

		NEW				NEW	
		1.5 m	3 m	5 m	10 m	15 m	25 m
OD	ID (mm)	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

NEW			NEW				
	1.5 m 3 m			10 m	15 m	25 m	
	OD	ID (mm)	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 <b>NEW</b>	
1/4"	6.35	4.76 mm	JR-T-6810 <b>NEW</b>	
0.315"	8.00	6.00 mm	JR-T-4050 <b>NEW</b>	
1/2"	12.7	9.53 mm	JR-T-4043 <b>NEW</b>	







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			NEW	
		1.5 m	3 m	10 m	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
ſ	5/16"	1/4"	JR-T-6650	NEW

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"	

#### **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.

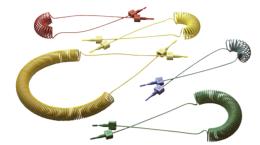
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Low pressure	
fittings	.46-55





#### 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 vour 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

FEP coated Tubing:

with PVDF

Insert **PCTFE** Ferrule

ETFE PPS **Fitting** 

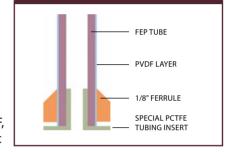
#### **OPTIONS**

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.

	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



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



Always use the speciallydesigned tubing insert to prevent solvent contact with the PVDF layer.

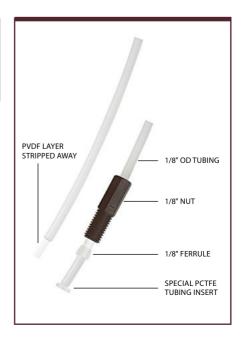
#### MORE INFO

About FEP113
About PVDF114
Chemical resistance110
Tubing ID chart:
volume per length 107
Tubing tolerances109

#### SEE ALSO

_	
Clean-cut polymeric	
tubing cutter	100
Color-sleeve	
fingertight adapters	23

		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	





TUBING

#### 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 (noncrystalline) 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.

		per meter
OD	ID	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  $\pm 5 \,\mu m$  (.002") ID  $\pm 5 \,\mu m$  (.002")

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



#### TECH TIP

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

PEEK fittings.....44 Stainless fittings . . . . 45



#### CONVERSIONS

 $50 \, \mu m = .002$ "  $75 \, \mu m = .003$ "

 $100 \, \mu m = .004$ "

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 $1.59 \, \text{mm} = 1/16$ "

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

ner meter

#### **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

NEW

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
OD	ID (mm)	Product No.	Product No.	Product No.
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

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

#### TECH TIP

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



ID dimensions in mm are converted from nominal inch dimensions.

#### MORE INFO

#### 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") ± 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

		NEW		
		1.5 m	3 m	10 m
OD	ID (mm)	Product No.	Product No.	Product No.
1/16"	0.10	JR-T-625-03-M1.5 <i>NEW</i>	JR-T-625-03-M3 <b>NEW</b>	JR-T-625-03-M10 <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

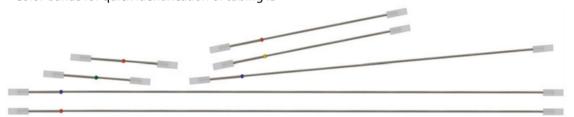
		per meter
OD	ID (mm)	Product No.
1/4"	4.65	JR-T-628-00



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

					NEW
			50 mm	100 mm	130 mm
OD	ID (mm)	Color	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

			NEW		
			180 mm	200 mm	300 mm
OD	ID (mm)	Color	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.

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

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



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



#### TECH TIP

Contact your local distributor or VICI for custom lengths.



#### **CONVERSIONS**

 $50 \, \mu m = .002$ "

 $75 \, \mu m = .003$ "

 $100 \, \mu m = .004$ "

 $125 \, \mu m = .005$ "  $150 \, \mu m = .006$ "

0.13 mm = .005"

0.18 mm = .007"

0.25 mm = .01"

0.50 mm = .02"

0.75 mm = .03"



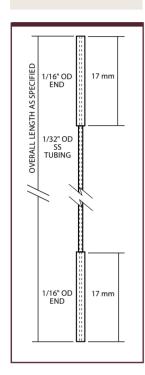
#### **SPECIFICATIONS**

#### PRESSURE RATING

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

#### **TOLERANCES**

OD ±0.05mm (.002") ID ±0.025mm (.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

				NEW		NEW	
			105 mm	130 mm	150 mm	180 mm	200 mm
OD	ID (mm)	Color	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

			280 mm	400 mm	600 mm	700 mm	900 mm
OD	ID (mm)	Color	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	_



# HITINGS

## FITTINGS



HIGH AND LOW PRESSURE



### HIGH PRESSURE POLYMERIC FITTINGS ..... page 24-35

High pressure polymeric fittings are useful in applications involving proteins, peptides, and other samples of biological origin where metal systems may interact with samples. Fittings made from PEEK-HT can also be used in UHPLC.



### ULTRA-HIGH PRESSURE STAINLESS FITTINGS ...... page 36-41

Our stainless steel fittings are typically compression fittings, in which a ferrule is compressed onto the tube as a nut is tightened. They offer the best reliability in high pressure situations.



#### NANOVOLUME® HPLC FITTINGS .. page 42-45

With bore sizes of 100 and 150 microns, (.004" -.006"), the minimal transfer volume contributed by Nanovolume® components makes them especially beneficial in applications with flow rates in the  $\mu l/$  min range, when the transfer volume can be critical.



#### **LOW PRESSURE FITTINGS** ...... page 46-55

Low pressure fittings are ideally suited for flow injection analysis, low pressure liquid chromatography, and stream sampling devices. They may be safely used at pressures up to 500 psi and temperatures to 50°C.



#### **Tools for fittings**

Ferrule removal kit103
Tweezer103
ValvTool102
Wrench103



NUT NOT

INCLUDED



#### **SPECIFICATIONS**

For 1/4" hex-head nuts MATERIAL Polypropylene



#### **COLOR-IT FINGERTIGHT ADAPTERS**

- For high and low pressure
- Fit all hex-head PEEK and SS fittings for 1/16" tubing
- Available in six colors for easy solvent line identification

Color-It snap-on fingertight adapters are used with our 1/4" PEEK and stainless hex-head nuts, converting them into color-coded fingertight fittings in an instant. Available in six colors.

Color	Qty/pkg	Product No.
Blue	5	JR-55010-5
Yellow	5	JR-55011-5
Green	5	JR-55012-5
Black	5	JR-55013-5
White	5	JR-55014-5
Red	5	JR-55015-5
Assorted	12	JR-55016-12
	(2 each)	



#### **SPECIFICATIONS**

For 1/4" hex-head nuts MATERIAL Polypropylene



#### **COLOR-SLEEVE FINGERTIGHT ADAPTERS**

- For high and low pressure
- Designed for our PPS fittings for 1/16" tubing
- Available in twelve colors for easy solvent line identification

This adapter is useful for color coding different solvent lines, and turns VICI Jour PPS nuts into fingertight fittings in an instant.

Color		Qty/pkg	Product No.
	Natural	5	JR-55080-5
		10	JR-55080-10
	White	5	JR-55081-5
		10	JR-55081-10
	Dark grey	5	JR-55082-5
		10	JR-55082-10
	Black	5	JR-55083-5
		10	JR-55083-10
	Lavender	5	JR-55084-5
		10	JR-55084-10
	Red	5	JR-55085-5
		10	JR-55085-10
	Yellow	5	JR-55086-5
		10	JR-55086-10

Color		Qty/pkg	Product No.
	Orange	5	JR-55087-5
		10	JR-55087-10
	Brown	5	JR-55088-5
		10	JR-55088-10
	Green	5	JR-55089-5
		10	JR-55089-10
	Blue	5	JR-55090-5
		10	JR-55090-10
	Purple	5	JR-55091-5
		10	JR-55091-10
Assorted	All 12 colors	2 each	JR-5508X-24
	Blue, red, green, yellow, black, white	2 each	JR-5508X-12

Hex head nuts
PEEK .........25, 27, 29
Stainless .......37
PPS

High pressure . . . . 25, 31 Low pressure . . . . . 47

# HIGH PRESSURE FITTINGS



HPLC AND UHPLC, POLYMERIC

Standard high pressure PEEK fittings are rated up to 350 bar (5000 psi) with fingertight nuts, well beyond the burst strength of most PEEK tubing. PEEK-HT™ fittings are rated at about 500 bar when finger-tightened; if they are tightened with a tool, 1,000 bar can be achieved. PEEK-HT also provides the benefit of longer life time; that is, the fittings can be tightened/loosened more often.

All our polymeric fittings for HPLC and UHPLC are manufactured from high quality inert polymers to exacting tolerances.

#### HIGH PRESSURE POLYMERIC FITTINGS INDEX

ONE-PIE	CE FITTINGS
	5,000 psipage
	5,000 psi
PPS hex-	-head
PEEK fin	gertight
Color-	coded
Natura	al
	-twist one piece fittings
NUTS AN	ID FERRULES
PEEK fer	rules, over 5,000 psi
Single fe	errule connections
_	ferrule connections
	onnections

	lugs3 aps
Unions Bulkhe	INIONS         5
Standa	EES AND CROSSES  and tees and crosses
	DAPTERS ort and Luer adapters 3:

PLUGS AND CAPS

# 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



**UHPLC** 

10-32



#### **SPECIFICATIONS**

TUBING OD / THREADS

1/32" 6-40 1/16" 10-32

MATERIAL

PEEK-HT

PRESSURE RATING

Fingertight, on stainless steel tubing:

625 bar 1/32" (9,000 psi) 1/16" 700 bar

(10,000 psi)

#### Made of special PEEK-HT<sup>™</sup> for better pressure resistance

- Biocompatible
- Handy tightening tool included

• One-piece - no ferrule required

**PEEK one-piece hex-head fittings** 

These fittings are machined from special PEEK material to reach a higher pressure rating than standard PEEK fittings.

Includes a tightening tool (page 103) for easy installation.

	Tubing OD	Thread	Hex size	Length	Product No.
(Package/10)	1/32"	6-40	3/16"	12.0 mm	JR-5525N-10
	1/16"	10-32	1/4"	17.0 mm	JR-5520N-10

#### **SPECIFICATIONS**

**TUBING OD / THREADS** 

1/16" 10-32

MATERIAL **PEEK** 

**TOLERANCE** 

±0.05 mm (.002")

PRESSURE RATING

<350 bar (5000 psi) (Varies with tubing ID and material)

#### PEEK one-piece hex-head fittings

- Fingertight up to 350 bar (5000 psi)
- Excellent chemical and mechanical properties
- One-piece no ferrule required
- Biocompatible
- For any 10-32 high pressure fitting

PEEK one-piece hex-head fittings are easy to use with the ValvTool or with the Color-It color-coded fingertight adapters. The 10-32 thread will fit virtually all standard high pressure female connections, and will withstand pressures of up to 350 bar (5000 psi). Available in short and long versions.

		Product No.
(Package/5)	Short	JR-55100-5
	Long	JR-55110-5





Short





#### PPS one-piece hex-head fittings

10-32

#### **SPECIFICATIONS**

TUBING OD / THREADS

1/16" 10-32

#### MATERIAL

**Black PPS** (Polyphenylene sulfide)

**TOLERANCE** ±0.05 mm (.002")

#### PRESSURE RATING

<350 bar (5000 psi) (Varies with tubing ID and material)

- Economically-priced alternative to **PEEK**
- · Excellent chemical and mechanical properties
- One-piece no ferrule required
- Slim design finger-tight with Color-Sleeve adapter

The VICI Jour PPS one-piece hex-head (fingertight with adapter) fitting offers excellent chemical and pressure resistance.

Product No. (Package/5) JR-58000-5



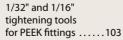


#### MORE INFO

About PEEK .....113 About PPS.....113 Chemical resistance ..110



1/16" OD tubing for high pressure applications . . . . . 9-12 PEEK starter kit .....104





Sleeve adapters for hexhead fittings . . page 23

Color-





#### PEEK and PVDF one-piece fingertight fittings - color-coded

10-32

10-32

- PEEK: fingertight up to 350 bar (5000 psi) PVDF: fingertight to 180 bar (2600 psi)
- Excellent chemical and mechanical properties Biocompatible
- One-piece no ferrule required

Our PEEK fingertight fittings are available in six colors, for easy identification of tubing lines. They are rated to 350 bar (5000 psi) and can be used in virtually any type of 10-32 thread HPLC fitting detail on the market. PVDF fittings are chemically inert, and suitable for medium pressure applications. They will not constrict soft polymeric tubing as PEEK fingertight fittings sometimes do. Packages of 5.

	Material	Color	Product No.
(Pkg/5)	PEEK	Natural	JR-55020-5
	1	Black	JR-55021-5
		Red	JR-55022-5
Dis.	1	Yellow	JR-55023-5
-	10 pr	Blue	JR-55024-5
	6	Green	JR-55025-5

_	_	_		•
		Material	Color	Product No.
(Pkg	/5)	PVDF	Translucent white	JR-55020-PVDF-5 <b>NEW</b>
			0	
	5/16'		mm 22.	0 mm

#### **SPECIFICATIONS**

TUBING OD / THREADS 1/16" 10-32

MATERIAL PEEK

TOLERANCE

±0.05 mm (.002")

#### PRESSURE RATING

Material bar PEEK <350 5000 PVDF <180 2600 (Varies with tubing ID and material)

#### **PEEK one-piece fingertight fittings**

- Two new fittings are made of reinforced glass fiber (GF) PEEK.
- Fingertight up to 350 bar (5000 psi)
- One-piece no ferrule required
- Biocompatible

Sold in packages of 5.

9 9	it ap to ooc ou.	(σσσσ μσ.,	30id in p	Product No.	
(Package/5)	Standard	Natural PEEK	12.0 mm	22.0 mm	JR-5502-5
	Short	Natural PEEK	12.0 mm	17.1 mm	JR-5504-5
	Long	Natural PEEK	12.0 mm	25.1 mm	JR-5507-5
	Narrow hex-head/ fingertight	Natural PEEK	1/4"	28.1 mm	JR-5508-5
	Standard	Reinforced GF PEEK	9.15 mm	20.8 mm	JR-5513-5 <b>NEW</b>
	Narrow hexhead/ fingertight	Reinforced GF PEEK	1/4"	28.1 mm	JR-5518-5 <b>NEW</b>

#### **SPECIFICATIONS**

**TUBING OD / THREADS** 

1/16" 10-32 MATERIAL

**PEEK** 

TOLERANCE

±0.05 mm (.002")

#### PRESSURE RATING

<350 bar (5000 psi) (Varies with tubing ID and material)



#### **11** TECH TIP

Coloration pigments are carefully chosen so as to contain no heavy metals or hazardous chemicals.



#### 🚹 TECH TIP

Color-It fingertight adapters may be used with 1/4" hex-head fittings, such as JR-5518, converting them into color-coded fingertight fittings..... page 23



#### MORE INFO

About PEEK ......113 About PVDF.....113 Chemical resistance ..110

10-32



10-32

#### **SPECIFICATIONS**

TUBING OD / THREADS

1/16" 10-32

MATERIAL

PEEK-HT **TOLERANCE** 

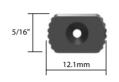
±0.05 mm (.002")

PRESSURE RATING

**Tightening** bar Fingertiaht <500 7250 With tool <1000 14500 (Varies with tubing ID and material)

#### PEEK-HT<sup>™</sup> one-piece fittings **NEW**

When used as fingertight fittings, our PEEK-HT fittings hold pressures up to 500 bars (7250 psi). Pressures up to 1000 bars (14,500 psi) can be accomplished with a tightening tool.





For tightening tool, use either a ValvTool (JR-800, page 102) or an open end wrench (JR-804, page 103.)

Sold in packages of 5.

	Product No.
(Package/5)	JR-55031-5



26.9 mm

16.3 mm

27.2 mm

#### **SPECIFICATIONS**

TUBING OD / THREADS

1/16" 10-32

MATERIAL

**PEEK** Ferrule: PEEK

PRESSURE RATING

<350 bar (5000 psi) (Varies with tubing ID and material)

#### **OPTIONS**

#### **OPTIONAL FERRULE MATERIALS**

FEP, PFA, glass-filled PEEK, PCTFE, glass-filled PTFE, and PTFE.

Contact us for availability.

Some 1/32" versions are available. Call for details.

#### PEEK no-twist "one-piece" fittings

- Snap-in ferrule rotates freely
- · Choice of ferrule materials
- Choice of fitting lengths

No-twist fittings offer the convenience of a one-piece fitting while solving a problem inherent to such designs. In other one-piece designs, the ferrule rotates against the fitting detail, creating particulates. The no twist design has a separate ferrule that snaps into the nut, so it's attached but still free to avoid rotation during tightening.

Since the ferrule is not machined onto the nut, it can be made from a different material. We offer several PEEK nuts, with ferrules of PEEK or one of the optional materials listed at left.

Sold in packages of 5.

(Package/5)

Tubina OD

1/16"

Fingertight



PEEK

ferrule

Product No.

JR-ZNF1FPK-5

JR-ZNF1PK-5

JR-MZNF1PK-5

JR-LZNF1PK-5

JR-ZNF1PK-F-5





1/16" OD tubing for high pressure applications . .page 9-12 PEEK starter kit .....104 ValvTool for tightening hex-head fittings ...102 Color-It fingertight adapters......23





**PEEK ferrules** UHPLC

- Biocompatible 1/16" ferrule for ultra-high pressures
- Alternative to titanium ferrules in applications with titanium valves
- Excellent in combination with stainless nuts (see page 37)

Product No. (Package/5) JR-5010N-5

#### **SPECIFICATIONS**

TUBING OD / THREADS

1/16" 10-32

MATERIAL

PEEK

PRESSURE RATING

On SS tubing with SS nut: 650 bar (9400 psi)

#### **PEEK nuts with single ferrules**

- Reuseable nut, replaceable ferrule
- For 1/32", 1/16", and 1/8" tubing
- Suitable for pressures to 280 bar (4000 psi)

Fingertight nuts have a knurled surface designed to allow sufficient sealing force to be applied to the ferrule without wrenches. Hex style nuts allow wrench tightening; however, since they are polymeric, they can break, and are recommended for use only when space is limited and your fingers will not fit.



#### **SPECIFICATIONS**

MATERIAL **PEEK** 

PRESSURE RATING

<280 bar (4000 psi) (Varies with tubing ID and material)

Tubina OD Thread Product No. (Pkg/5) 1/32" JR-ZF.5PK-5 Single ferrules 1/16" JR-5003-5 1/8" JR-ZF2PK-5 Fingertight 1/32" 6-40 JR-ZN.5FPK-5 amma 6.4 mm 10.7 mm (6.35 mm 1/16" 10-32 JR-5570-5 **Fingertight** 10 mm 17.5 mm Hex-head 1/8" 5/16-24 JR-ZN2PK-5 9.5 mm 16 mm

#### MORE INFO About PEEK ......113 Chemical resistance ..110 SEE ALSO 1/16" OD tubing for high pressure applications . . . . . 9-12 PEEK starter kit . . . . . 104 PEEK tubing . . . . . . 9-12 Stainless steel nuts .... 37 ValvTool for tightening hex-head fittings ...102 Color-It fingertight adapters.....23





#### **SPECIFICATIONS**

TUBING OD / THREADS

1/16" 10-32

MATERIAL **PEEK** 

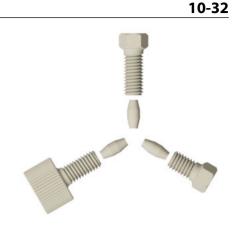
#### PRESSURE RATING

<420 bar (6000 psi) (Varies with tubing ID and material)

#### **PEEK nuts with double ferrules**

- High pressure rating up to 420 bar (6000 psi)
- Ideal for 1/16" PEEK tubing
- Fit any 10-32 fitting

These nuts are for use with VICI Jour double ferrules, which grip the tubing twice for added stability. The fingertight version may be hand-tightened for operation at up to 420 bar (6000 psi). The hex-head version can be used for connections that are difficult to reach, or are closely spaced. The fittings work in virtually any female 1/16" fitting.



		Tubing OD				Product No.
(Package/5)	Double ferrule	1/16"				JR-5004-5
	Nuts	1/16"	Hex-head	Short	1/4"	JR-5511-5
				Long	1/4" 15.	JR-5510-5
			Fingertight		12.0 mm	R-5580-5



#### Nut, ferrule, and bushing

1/4-28

- High pressure rating up to 490 bar (7000 psi) with 1/16" tubing
- For 1/4-28 connections
- Available for 1/32" and 1/16" tubing

This combination of PPS nut, PEEK ferrule, and stainless steel bushing allows a high pressure connection in a 1/4-28 flat-bottomed fitting detail.

Sold in packages of 10.

Order nuts and bushing/ferrules separately.



#### **SPECIFICATIONS**

#### TUBING OD / THREADS

1/32" 1/4-28 1/16" 1/4-28

#### MATERIALS

PPS Nut Ferrule PEEK Bushing SS

#### PRESSURE RATING

OD	bar	psi							
1/32"	175	2500							
1/16"	490	7000							
(Varies with tubing ID and									
materia	1)								

		Tubing OD			Product No.
(Package/10)	PPS hex-head nut	1/32" or 1/16"			JR-55050-10
	Bushing and ferrule	1/32"			JR-FPKBSS.5-10
		1/16"			JR-FPKBSS1-10



1/4-28 PPS hex-head nuts are available with three different sealing designs for flangeless and flanged fittings . . . . . . . . . . . 47





To make up high pressure connection with nut, ferrule, and bushing, first slide the nut on the tubing, then the bushing, and then the PEEK ferrule as shown in the product photo.



#### **SPECIFICATIONS**

MATERIAL PEEK

#### PRESSURE RATING

<350 bar (5000 psi) (Varies with tubing material)

#### **PEEK plugs and caps**

- For plugging ports and capping solvent lines
- Available in all common thread sizes

Sold individually.

	Threads		Product No.
Plugs	6-40	6.4 mm 15.5 mm	JR-ZP.5FPK
	10-32	12.0 mm 19.7 mm	JR-408
		9.5 mm 22.2 mm	JR-ZP1FPK
		6.4 mm 22.7 mm	JR-MZP1PK
		6.4 mm 29.0 mm	JR-LZP1PK
	1/4-28	7.7 mm 17.5 mm	JR-409
	M6	7.7 mm 17.5 mm	JR-410
Caps	6-40	6.4 mm 8.4 mm	JR-ZC.5FPK
	10-32	9.5 mm 10.4 mm	JR-ZC1PK
	1/4-28	9.5 mm 10.2 mm	JR-CCPK-1



**PEEK unions** 10-32

- Easy connection of transfer/solvent lines
- Low dead volume
- Completely inert and biocompatible

VICI Jour PEEK unions are usable with most common organic and inorganic HPLC solvents without risking corrosion, metal contamination, or protein degradation that might occur with stainless steel. Small diameter bores are used to ensure low dead volume connections. These unions have the standardized Valco fitting details with smooth transition of the taper into the threaded part. Connections to these PEEK unions can be made with any 10-32 fitting that uses polymeric ferrules. PEEK unions are available in body-only versions as well as complete with our PEEK one-piece fingertight fittings ready to connect to any 1/16" OD tubing.

	Bore (mm)		Qty/pkg	Product No.			
Union with fittings	0.25		1	JR-1061			
	0.50		1	JR-1066			
	0.75		1	JR-1067			
		21.8 mm					
Body only	0.25		1	JR-061			
	0.50		1	JR-066			
	0.75	21.8 mm	1	JR-067			
Replacement fittings							
PEEK 1/16" one-piece fi fittings, 10-32, black	ngertight		5	JR-55021-5			

#### **SPECIFICATIONS**

TURING OD 1/16"

MATERIAL

**PEEK** 

PRESSURE RATING

<350 bar (5000 psi) (Varies with tubing ID and

#### **PEEK bulkhead unions**

- Designed for panel mounting
- Easy connection of transfer/solvent
- Low dead volume
- Completely inert and biocompatible

Bulkhead unions are designed to be mounted through an instrument panel or on a bracket. Typically the mounting nut goes inside the instrument, so that the long threaded portion will be out of sight.

Bulkhead unions require a minimum 10 mm panel hole, 9 mm maximum thickness.

Includes fittings.

#### Bore (mm) Qty/pkg Product No. **Bulkhead** union 0.25 JR-ZBU1CFPK with fittings 0.50 JR-ZBU1MFPK 1 0.75 JR-ZBU1FPK 22.1 mm Replacement fittings PEEK 1/16" one-piece fingertight IR-55021-5 fittings, 10-32, black JAM-Nut replacement mounting JR-CBN nut for bulkhead fittings

#### **SPECIFICATIONS**

TUBING OD / THREADS

1/16" 10-32 MATERIAL

**PFFK** 

10-32

PRESSURE RATING

<350 bar (5000 psi) (Varies with tubing ID and material)



Low pressure PEEK 1/4-28 unions.....50 PEEK one-piece fingertight fittings 25-27



#### **SPECIFICATIONS**

#### TUBING OD / THREADS

1/32" 6-40 1/16" 10-32 1/8" 5/16-24

#### MATERIAL

PEEK

#### PRESSURE RATING

<350 bar (5000 psi) (Varies with tubing ID and material)

#### **PEEK reducing unions**

- Connects 1/16" to 1/32" tubing, or 1/8" to 1/16" tubing
- Easy connection of transfer/solvent lines
- Completely inert and biocompatible

VICI Jour PEEK reducing unions are usable with most common organic and inorganic HPLC solvents without risking corrosion, metal contamination, or protein degradation that might occur with stainless steel. These reducing unions have the standardized Valco fitting details with smooth transition of the taper into the threaded part.

#### Includes fittings.

Tubi	ng OD	Bore (mm)		Qty/pkg	Product No.
1/16" to	1/16" to 1/32" 0.25			1	JR-ZRU1.5FPK
1/8" to 1/16"		0.75	27.6 mm	1	JR-ZRU21FPK
PEEK re	placemen	t fittings	'		
For 1/16	5" to 1/32"	reducing un	ions		
1/16"	One-piec black	e fitting,		5	JR-55021-5
1/32"	Fingertight nut		10.7 mm	1	JR-ZN.5FPK
1/32"	Ferrule			1	JR-ZF.5PK
For 1/8'	to 1/16" r	educing unio	ons		
1/8"	Hex-head	d PEEK nut	16 mm	5	JR-ZN2PK-5
1/8"	PEEK ferr	ule		5	JR-ZF2PK-5
1/16"	One-piec black	e fitting,		5	JR-55021-5





#### **PEEK tees and crosses**

10-32

- Easy connection of transfer/solvent lines
- Low dead volume
- Completely inert and biocompatible

The 100% PEEK flowpath makes VICI Jour PEEK tees and crosses usable with most common organic and inorganic HPLC solvents without the risk of corrosion, metal contamination, or protein degradation that might occur with stainless steel.

Small diameter through-holes are used to ensure low dead volume connections. These unions have the standardized Valco fitting details with smooth transition of the taper into the threaded part. Connections to these PEEK tees and crosses can be made with any 10-32 fitting that uses polymeric ferrules.

PEEK tees and crosses are available in body-only versions as well as complete with our PEEK one-piece fingertight fittings ready to connect to any 1/16" OD tubing.

	Bore (mm)	Qty/pkg	<b>With fittings</b> <i>Product No.</i>	<b>Body only</b> <i>Product No.</i>			
Tee	0.25	1	JR-1030	JR-2030			
MEI	0.50	1	JR-1032	JR-2032	•		
Em ME	0.75	1	JR-1033	JR-2033			
Cross	0.25	1	JR-1040	JR-2040			
WEI	0.50	1	JR-1042	JR-2042	•		
E M HATE	0.75	1	JR-1043	JR-2043			
Replacement fittings							
PEEK 1/16" one-piece fingertight fittings, 10-32, black		5	JR-55021-5	•			

#### **SPECIFICATIONS**

TUBING OD / THREADS

1/16" 10-32

MATERIAL PEEK

**BODY SIZE** 

25.0 mm OD

12.0 mm thick

PRESSURE RATING

<350 bar (5000 psi) (Varies with tubing ID and material)

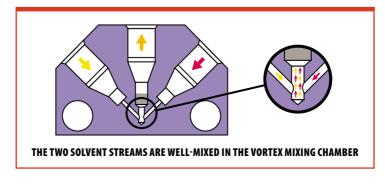


#### Biocompatible mixing tee

- High pressure gradient mixing
- Post column reactions
- Completely biocompatible
- Built-in protein-friendly titanium filter, 10 µm

A unique, more thorough mixing results from the turbulence generated by the introduction angle of the solvents as well as by the flow through our titanium filter element. The biocompatible tee can be used for high pressure gradient mixing as well as for post column reactions.





#### **SPECIFICATIONS**

**TUBING OD / THREADS** 

1/16" 10-32

MATERIAL **PFFK** 

10-32

PRESSURE RATING

<350 bar (5000 psi) (Varies with tubing ID and material)



#### **SPECIFICATIONS**

MATERIAI

PEEK

BORE

0.40 mm

#### PRESSURE RATING

<70 bar (1000 psi) 1/4-28 < 70 bar (1000 psi) Luer <35 bar (500 psi) (Varies with tubing ID and material)

# **PEEK adapters**

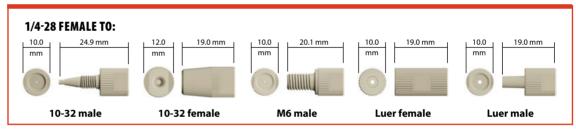
- Connect various combinations of thread types, male and female
- Includes male and female Luer adapters
- Low dead volume
- For any 10-32 high pressure fitting

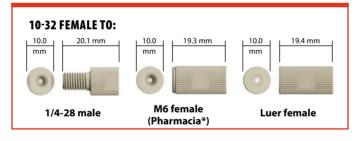
We offer male and female Luer adapters as well as adapters to connect standard LC fittings to standard LC ports. The 100% PEEK flowpath makes VICI Jour PEEK adapters usable with most common organic and inorganic HPLC solvents without risking corrosion, metal contamination, or protein degradation that might occur with stainless steel.

Sold individually.

Description		Product No.
1/4-28 female to	10-32 male	JR-0612
	10-32 female	JR-062
	M6 male	JR-0622
	Luer female	JR-0625
	Luer male	JR-0626
10-32 female to	1/4-28 male	JR-0617
	M6 female (Pharmacia*)	JR-5595
	Luer female	JR-0623

Description		Product No.
10-32 male to	1.3 mm barbed	JR-0691 <b>NEW</b>
Waters female to	10-32 male	JR-0611
M6 female to	10-32 male	JR-5505
Female Luer to	1/4-28	JR-CFLAPK
	10-32	JR-ZUFLPK
Male Luer to	1/4-28	JR-CMLAPK















<sup>\*</sup> Pharmacia is a division of GE Healthcare.

# ULTRA-HIGH PRESSURE FITTINGS



**STAINLESS STEEL** 

Our stainless steel fittings are typically compression fittings, in which a ferrule is compressed onto the tube as a nut is tightened. They offer the best reliability in high and ultra-high pressure situations.

# **ULTRA-HIGH PRESSURE STAINLESS FITTINGS INDEX**

NUTS	PLUGS AND CAPS
Valco nutspage 37	Plugs
Valco nuts are available for	Caps
1/32", 1/16", and 1/8" tubing, in several lengths.	TEES AND CROSSES
Phoodyna <sup>®</sup> compatible puts 27	Tees 39
Rheodyne* compatible nuts 37 These nuts are sized for 1/16" tubing, and come in three	UNIONS AND REDUCING UNIONS
lengths.	Unions
FERRULES	Imperial 40
Valco	Imperial to metric



# **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.

# **♦** N

#### MORE INFO

ChromBox kit105
HPLC parts kit with
PEEK and stainless
fittings and tubing
Fingertight adapters
Color-lt23
Color-Sleeve23
Nanovolume® high
pressure fittings42-45
Stainless starter kits 104
Tools for fittings 102-103

#### **ULTRA-HIGH PRESSURE FITTINGS • STAINLESS STEEL**



#### **SPECIFICATIONS**

TUBING OD / THREADS

1/32" 6-40 1/16" 10-32 1/8" 5/16-24

#### MATERIAL

Type 303 SS

#### PRESSURE RATING

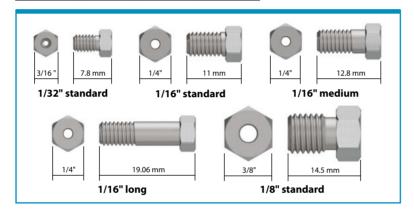
With premium SS tubing and ZF1S6 ferrule: 1375 bar (20,000 psi)

#### Valco® stainless nuts UHPLC

- Excellent fit to Valco fitting details
- Different lengths available
- For 1/32", 1/16", and 1/8" OD tubing

These nuts are for use with all standard Valco internal fittings and most valves. They may be used with fittings from other manufacturers as well. The medium and long types are ideal for metal Valco and Cheminert valves with more than 8 ports, or where the fitting head may be otherwise inaccessible.

	Tubing OD	Length	Product No.
(Package/5)	1/32"	Standard	JR-ZN.5-5
	1/16"	Standard	JR-ZN1-5
		Medium	JR-MZN1-5
		Long	JR-LZN1-5
	1/8"	Standard	JR-ZN2-5



# Rheodyne® compatible stainless nuts

**UHPLC** 

SPECIFICATIONS
TUBING OD/THREADS

1/16" 10-32

#### MATERIAL

Type 316 SS

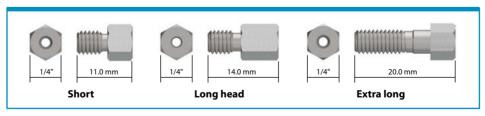
#### PRESSURE RATING

<500 bar (7,250 psi) (Varies with tubing ID and material)

- Excellent fit to Rheodyne fitting details
- Different lengths available
- For 1/16" OD tubing

These nuts are for use with metal Rheodyne valves. Three different length nuts are available, in order to accommodate any possible connecting situation. The standard nut is suitable for easily accessible connections (couplers, detectors, columns, etc.) For very tight and difficult to reach areas, we recommend the long and extra long nut.

	Tubing OD	Length	Product No.
(Package/5)	1/16"	Short	JR-56-5
		Long head	JR-57-5
		Extra long	JR-58-5





Using nuts with different lengths will create more space, for better wrench access.



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Color-It fingertight adapters. . . . . . . 23



ULTRA-HIGH PRESSURE FITTINGS • STAINLESS STEEL

# Valco® stainless ferrules

#### **UHPLC**

- Excellent fit to Valco fitting details
- For 1/32", 1/16", and 1/8" OD tubing

These ferrules are for use with all standard Valco internal fittings and most valves, and with those of most other manufacturers as well. Valco metal ferrules cut a ring near the end of the tube, preventing tube release at high pressures without significantly deforming and restricting the tube interior. (However, if the hardness of the tubing is equal to or greater than that of the ferrule, deformation of the tube rather than a cut ring is likely.)

	Product No.		
(Package/5)	1/32"		JR-ZF.5S6-5
	1/16"		JR-ZF1S6-5
	1/8"		JR-ZF2S6-5

# **SPECIFICATIONS**

#### TURING OD

For 1/32", 1/16", and 1/8" OD tubing

#### MATERIAL

Type 316 SS

# PRESSURE RATING

1375 bar (20,000 psi) (Varies with tubing ID and material)

# Rheodyne® compatible stainless ferrules

- Excellent fit to Rheodyne fitting details
- For 1/16" OD tubing
- For use with metal Rheodyne valves.

	Tubing OD		Product No.
(Package/5)	1/16"	Standard ferrule	JR-59-5
		2-step Rheodyne- type ferrule	JR-60-5

#### **SPECIFICATIONS**

#### **TUBING OD**

For 1/16" OD tubing

#### MATERIAL

Type 316 SS

#### PRESSURE RATING

<500 bar (7,250 psi) (Varies with tubing ID and material)

# Stainless steel plugs

**UHPLC** 

Use a plug to close off an usused port in a valve, manifold, or HPLC column. The standard stainless plug consists of a zero volume nut with a ferrule made up on a piece of solid rod.

	Tubing OD	Product No.
(Sold	1/32"	JR-ZP.5
individually)	1/16"	JR-ZP1
	1/8"	JR-ZP2

#### **SPECIFICATIONS**

#### **TUBING OD / THREADS**

1/32" 6-40 1/16" 10-32 1/8" 5/16-24

#### MATERIAL

1/32" Type 303 SS 1/16" Type 316 SS Type 303 SS





UHPLC PEEK ferrules...28 Open end wrench .... 103 Stainless steel starter kit.....104 ValvTool for tightening

hex-head fittings ...102

# **ULTRA-HIGH PRESSURE FITTINGS • STAINLESS STEE**



#### **SPECIFICATIONS**

**TUBING OD / THREADS** 

1/32" 6-40 1/16' 10-32 1/8" 5/16-24

MATERIAL

Type 303 SS

# Stainless steel caps

Use a cap to close off a tube with a ferrule and internal nut already made up. A cap is essentially a piece of hex stock with a zero volume fitting detail machined into it, but with no through-hole.

	Tubing OD	Product No.
(Sold	1/32"	JR-ZC.5
individually)	1/16"	JR-ZC1
	1/8"	JR-ZC2



#### **SPECIFICATIONS**

**TUBING OD** 

For 1/16" OD tubing

#### **BODY DIMENSIONS**

23.4 mm OD x 12.7 mm thick

#### MATERIAL

Body Type 316 SS Type 303 SS Nuts Ferrules Type 316 SS

#### PRESSURE RATING

1375 bar (20,000 psi) (Varies with tubing ID and material)

#### **TEES AND CROSSES**

- Easy connection of solvent lines
- Low dead volume
- For 1/16" OD tubing

VICI stainless steel tees and crosses are for joining solvent lines. They are precision machined with a focus on the concentricity of the bore as well as on the finish of the surfaces to create leak-free connections.

These tees and crosses have internal threads, which we recommend for most applications. Internal threads make stronger connections and internal fitting details provide the lowest dead volume for high performance instrumentation.

Stainless tees **UHPLC** 

VICI stainless steel tees join three 1/16" solvent line

Three nuts and ferrules are included with each tee.

Bore (mm)	Qty/pkg	Product No.
0.25	1	JR-ZT1C
0.50	1	JR-ZT1M
0.75	1	JR-ZT1
Replacement nut		JR-ZN1-5
ferrule	5	JR-ZF1S6-5
	0.25 0.50 0.75	0.25 1 0.50 1 0.75 1 nut 5



# **Stainless crosses**

VICI stainless steel crosses join four 1/16" solvent li

Four nuts and ferrules are included with each tee.

	Bore (mm)	Qty/pkg	Product No.
1/16" cross	0.25	1	JR-ZX1C
	0.50	1	JR-ZX1M
	0.75	1	JR-ZX1
Replacement nut		5	JR-ZN1-5
Replacement ferrule		5	JR-ZF1S6-5



**UHPLC** 



#### **ULTRA-HIGH PRESSURE FITTINGS • STAINLESS STEEL**

#### UNIONS AND REDUCING UNIONS

- Easy connection of solvent lines
- Low dead volume

VICI stainless steel unions and reducing unions are precision machined with a focus on the concentricity of the bore as well as on the finish of the surfaces to give an absolute leak-free connection.

These unions have internal threads, which we recommend for most applications. Internal threads make stronger connections and internal fitting details provide the lowest dead volume for high performance instrumentation.

#### Stainless unions

**UHPLC** 

- Choice of four bore sizes
- For 1/16" OD tubing

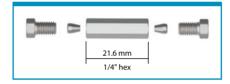
Replacement ferrule

VICI stainless steel unions join two pieces of 1/16" OD metal tubing.

JR-ZF1S6-5

Two nuts and ferrules ship with each union.

#### Bore (mm) Qty/pkg Product No. 1/16" union 0.15 JR-ZU1XCS6 0.25 JR-ZU1CS6 0.50 JR-ZU1MS6 1 0.75 JR-ZU1S6 JR-ZN1-5 Replacement nut



#### **SPECIFICATIONS**

**TUBING OD** 

For 1/16" OD tubing

MATERIAL

Body Type 316 SS Nuts Type 303 SS Ferrules Type 316 SS

PRESSURE RATING

1375 bar (20,000 psi) (Varies with tubing ID and material)

# Stainless reducing unions

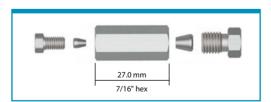
**IMPERIAL** 

**UHPLC** 

These reducing unions join 1/16" OD to 1/8" OD tubing.

Two nuts and ferrules ship with each union.

	Size	Qty/pkg	Product No.
Reducing union	1/8" to 1/16"	1	JR-ZRU21
Replacement nut	1/8"	5	JR-ZN2-5
	1/16"	5	JR-ZN1-5
Replacement ferrule	1/8"	5	JR-ZF2S6-5
	1/16"	5	JR-ZF1S6-5



#### **SPECIFICATIONS**

**TUBING OD** 

For joining 1/8" to 1/16" **OD** tubing

MATERIAL

Type 316 SS Body Type 303 SS Nuts Ferrules Type 316 SS

**PRESSURE RATING** 

1375 bar (20,000 psi) (Varies with tubing ID and material)



# SEE ALSO

Nanovolume® high pressure fittings . . 42-45 Stainless starter kit ...104 HPLC parts kit with stainless fittings and tubing

ChromBox kit.....105 HPLC parts kit with PEEK and stainless fittings and tubing

#### **ULTRA-HIGH PRESSURE FITTINGS • STAINLESS STEEL**



#### **SPECIFICATIONS**

#### **TUBE REDUCING OD**

1/32" to 1.0 mm 1/16" to 2.0 mm 1/8" to 3.0 mm

#### MATERIAL

Type 303 SS Body Nuts Type 303 SS Ferrules Type 316 SS

#### PRESSURE RATING

1375 bar (20,000 psi) (Varies with tubing ID and material)

# Stainless reducing unions

#### **IMPERIAL TO METRIC**

#### **UHPLC**

- Ultra-high pressure
- For 1 mm, 2 mm, and 3 mm OD tubing



With these reducing unions, metric tubing can be connected to imperial fittings, valves, and chromatographic systems. The unions are manufactured from Type 303 stainless steel.

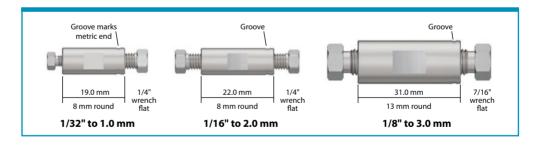
For easy identification, the metric end is marked by a groove.

Two nuts and ferrules ship with each reducing union.

	Tubing OD	Bore (mm)	Threads	Qty/pkg	Product No.
Reducing union	1/32" to 1.0 mm	0.25	6-40 to 10-32	1	JR-096
	1/16" to 2.0 mm	0.75	10-32	1	JR-082
	1/8" to 3.0 mm	0.75	5/16-24	1	JR-086

	Tubing OD	Threads	Qty/pkg	Product No.
Replacement nut	1/32"	6-40	5	JR-ZN.5-5
	1/16"	10-32	5	JR-ZN1-5
	1/8"	5/16-24	5	JR-ZN2-5
	for 1.0 mm	10-32	5	JR-ZN1-5
	for 2.0 mm	10-32	5	JR-80-5
	for 3.0 mm	5/16-24	5	JR-ZN2-5

	Tubing OD	Qty/pkg	Product No.
Replacement	1/32"	5	JR-ZF.5S6-5
ferrule	1/16"	5	JR-ZF1S6-5
	1/8"	5	JR-ZF2S6-5
	1.0 mm	5	JR-097-5
	2.0 mm	5	JR-083-5
	3.0 mm	5	JR-087-5

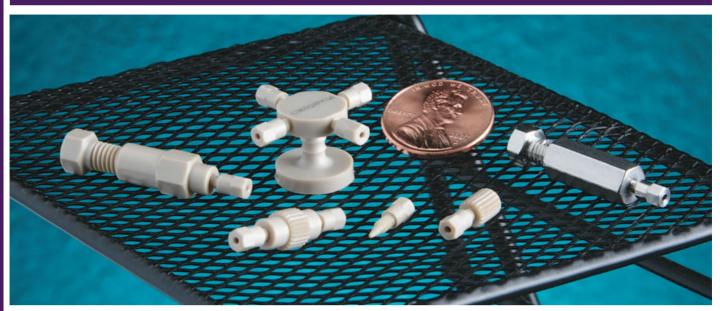




Wrench Reducing P/N union

1/4" 1/32" to 1.0 mm JR-096 1/4" 1/16" to 2.0 mm JR-082 7/16" 1/8" to 3.0 mm JR-086

# NANOVOLUME® FITTINGS



HIGH PRESSURE FITTINGS • FOR 360 MICRON AND 1/32" TUBING

VICI Nanovolume® fittings generally have bore sizes of 100-150 μm (.004" - .006"), ranging down to 50 µm (.002"). The minimal transfer volume contributed by Nanovolume® components makes them especially beneficial in applications with flow rates in the µl/min range, when the transfer volume can be critical.

# HIGH PRESSURE NANOVOLUME® FITTINGS INDEX

#### 1/32" NANOVOLUME® FITTINGS

Nuts, ferrules, unions, and reducing unions ...... 43

1/32" fittings, with 100 or 150 µm bore, are ideal for high resolution capillary chromatography. Rated at 5,000 psi with fingertight nuts, they will remain leak-tight well beyond the burst strength of most PEEK tubing. These fittings are machined from high quality inert polymers to the same exacting tolerances as our popular Valco zero dead volume fittings, and the taper angle and detail design conform to the industry standard established by the Valco line.

#### **360 MICRON NANOVOLUME® FITTINGS**

For PEEK or FS tubing, <10K psi..... 44 For fused silica tubing, 10K psi..... 45

For metal tubing, <20K psi ........ 45 These high pressure fittings permit

direct connection of 360 µm OD fused silica, PEEK, stainless, or electroformed nickel tubing without the use of liners. The ferrule snaps into the nut so that the fitting is "one-piece", but the ferrule remains free to rotate as the nut is tightened so that the tube doesn't twist. Because of the compact size and fine 2-56 threads, a leak-free connection that seals at pressures in excess of 20,000 psi can be easily formed with the available manual tool.

# MORE INFO

360 µm OD capillaries Fused silica . . . . . . . 18 Stainless......19 1/32" OD capillaries Stainless.....19-20

# **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.





#### **NANOVOLUME FITTINGS FOR 1/32" TUBING**

- 100 and 150 µm bores available
- Nuts, ferrules, and unions
- For PEEK tubing

VICI Nanovolume® fittings are designed for capillary LC, used in HTS techniques, proteomics, genomics, and other newer developments in industrial research requiring small sample size for reduction of analysis time.

VICI Nanovolume connectors include our one-piece fingertight fittings for 1/32" OD tubing, featuring our patented\* collapsible ferrule. PEEK ferrules for use with our external nuts also feature the collapsible, grooved design. To avoid potential confusion, all fittings utilizing the Cheminert collapsible ferrule are made of black PEEK; fittings with a standard Valco ZDV fitting detail are natural PEEK.

\*U.S. patent no. 6,575,501.

# Nanovolume® fittings

FOR 1/32" TUBING

The internal nut includes a collapsible ferrule as an integral part of the fitting; the external nut must be used with the separate ferrule listed below.

#### Tubing OD Product No. One-piece nut/ferrule 1/32" JR-C-NNFFPK JR-C-EN.5FPKB External nut 1/32" 1/16" JR-C-EN1FPKB 1/32" JR-ZGF.5PK Ferrule, collapsible 1/16" JR-ZGF1PK

Bore size:		100 micron	150 micron
	Tubing OD	Product No.	Product No.
Union (external to internal)	1/32"	JR-C-NEU.5XFPK	JR-C-NEU.5FPK
Reducing union	1/16" to 1/32"	_	JR-C-NERU1FPK

1/4" Nu1	18.4 mm	7.6 mm 1/32"	9.5 mm	1/32" union	1/16" to 1/32"
•					

#### **SPECIFICATIONS**

**TUBING OD / THREADS** For 1/32" OD PEEK

Nut/ferrule 6-40

External nut 1/32"

8-36 1/16" 10-32

MATERIAL PEEK

#### PRESSURE RATING

<350 bar (5,000 psi) (Varies with tubing ID and material)

**TOLERANCES** 

±0.05mm (.002")

# Liners for 1/32" connectors

FOR USE WITH FUSED SILICA TUBING



360 μm Nanovolume® fittings ......42-45



 $50 \, \mu m = .002"$  $100 \, \mu m = .004$ "  $150 \, \mu m = .006$ "

 $0.25 \, \text{mm} = .010$ "

 $0.50 \, \text{mm} = .020$ " 0.75 mm = .030" Use these natural PEEK liners to adapt 1/32" connectors to the most common sizes of fused silica tubing.

The 27 mm liners are for internal nuts with collapsible ferrules (JR-C-NNFFPK or JR-C-NNFLFPK0. 10 mm liners are for use with external nuts (JR-C-EN.5FPKB).

Sold in packages of 5.

	For tubing OD (Package/5)	<b>125 - 175 μm</b> <i>Prod No</i>	<b>175 - 225 μm</b> <i>Prod No</i>	<b>225 - 275 μm</b> <i>Prod No</i>	<b>275 - 325 μm</b> <i>Prod No</i>	<b>325 - 375 μm</b> <i>Prod No</i>
27 mm liners		JR-C-NL.15L-5	JR-C-NL.20L-5	JR-C-NL.25L-5	JR-C-NL.30L-5	JR-C-NL.35L-5
10 mm liners		JR-C-NL.15S-5	JR-C-NL.20S-5	JR-C-NL.25S-5	JR-C-NL.30S-5	JR-C-NL.35S-5



#### **HIGH PRESSURE FITTINGS • NANOVOLUME**

#### NANOVOLUME FITTINGS FOR 360 MICRON TUBING

- For direct connection of 360 µm tubing
- Work with metal, fused silica, or PEEK
- Up to 20,000 psi with metal tubing
- Snap-in rotating ferrule for "one-piece" fitting with no tubing twist
- Eliminate use of troublesome liners

Our high pressure fittings permit direct connection of 360 micron OD fused silica, PEEK, stainless, or electroformed nickel tubing without the use of liners. The ferrule snaps into the nut so that the fitting is "one-piece", but the ferrule remains free to rotate as the nut is tightened so that the tube doesn't twist. Because of the compact size and fine 2-56 threads, a leak-free connection that seals at pressures in excess of 20,000 psi can be easily formed with the available manual tool.

VICI Nanovolume 360 µm fittings are dedicated for use with either fused silica, metal, or PEEK tubing; components cannot be mixed or used with a different tubing material.

Tees and crosses offer a choice of three bore sizes, and feature a "quick-mount" base with adhesive backing to make sure that the fitting is stable and fragile tubing doesn't get broken. There is also a quick-mount PEEK union.



# For PEEK or fused silica tubing up to 10,000 psi

FOR 360 µm TUBING

These fittings are constructed from premium grade natural PEEK material. They are intended for use with PEEK or fused silica tubing at pressures up to 10,000 psi, or the maximum pressure for which the tubing is rated, whichever is lower. Quick-mount versions have integral base with double stick tape to secure fittings to a surface.

		Product No.
Nut/ferrule	1,,,,,,	JR-C360NFPK
Сар	m	JR-C360CPK
Plug	-Imm	JR-C360PPK
Tightening tool		JR-C360ET

Bore size:	50 micron	100 micron	150 micron
	Product No.	Product No.	Product No.
Union	JR-C360UPK2	JR-C360UPK4	JR-C360UPK6
Reducing union, 1/16" to 360 μm	_	_	JR-C360RU1PK6
Union, quick mount	JR-C360QUPK2	JR-C360QUPK4	JR-C360QUPK6
Tee, quick mount	JR-C360QTPK2	JR-C360QTPK4	JR-C360QTPK6
Cross, quick mount	JR-C360QXPK2	JR-C360QXPK4	JR-C360QXPK6



#### **SPECIFICATIONS**

#### TUBING OD / THREADS

For PEEK or FS tubing 360 µm 2-56

# MATERIAL

PEEK

#### PRESSURE RATING

<689.5 bar (10,000 psi) (Varies with tubing ID and material)



360 µm OD capillaries Fused silica . . . . . . . . 18 Stainless ..... 19

# 🚺 TECH TIP

360 micron fittings are dedicated for use with either fused silica, metal, or PEEK tubing. Components cannot be mixed or used with a different tubing material.

# **TECH TIP**

Grooves on the fitting body indicate the bore



Grooves indicate bore size 1 groove: 50 μm 2 grooves: 100 μm no grooves: 150 µm



# For fused silica tubing — 10,000 psi and above

# FOR 360 µm TUBING

#### **SPECIFICATIONS**

**TUBING OD / THREADS** For FS tubing 360 µm 2-56

#### **MATERIALS**

Body **HPLC** grade SS Nut HPLC grade SS Gold-plated Ferrule nickel

#### PRESSURE RATING

 $\geq$  689.5 bar (10,000 psi) (Varies with tubing ID and material)

These fittings are constructed from HPLC grade stainless steel, with stainless steel nut and a special ferrule which is precision machined from electroformed nickel. For optimal sealing characteristics, the ferrule is gold plated.

#### Product No

	rroductivo.
Nut/ferrule	JR-C360NFFS
Cap	JR-C360CFS

Bore size:	50 micron	100 micron	150 micron
	Product No.	Product No.	Product No.
Union	JR-C360UFS2	JR-C360UFS4	JR-C360UFS6
Reducing union,1/32" to 360 μm	JR-C360RU.5FS2	JR-C360RU.5FS4	JR-C360RU.5FS6
Reducing union,1/16" to 360 μm	_	_	JR-C360RU1FS6



# For metal tubing up to 20,000 psi

#### FOR 360 µm TUBING

Our highest pressure Nanovolume fittings are constructed of HPLC grade stainless steel, including stainless steel nut and ferrule. These fittings are optimized for use with stainless or electroformed nickel tubing.

# Product No.

Nut/ferrule	JR-C360NFS6
Cap	JR-C360C

Bore size:	50 micron	100 micron	150 micron
	Product No.	Product No.	Product No.
Union	JR-C360US62	JR-C360US64	JR-C360US66
Reducing union, 1/32" to 360 μm	JR-C360RU.5S62	JR-C360RU.5S64	JR-C360RU.5S66
Reducing union, 1/16" to 360 μm	_	_	JR-C360RU1S66



**SPECIFICATIONS TUBING OD / THREADS** 

For metal tubing

360 µm 2-56 MATERIAL

HPLC grade SS PRESSURE RATING <1375 bar (20,000 psi) (Varies with tubing ID and

material)

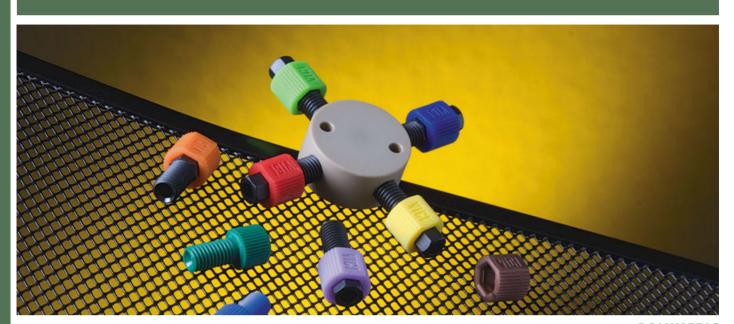
360 µm OD capillaries Fused silica . . . . . . . . 18 Stainless......19 1/32" Nanovolume® fittings ..... 43

# **CONVERSIONS**

 $50 \, \mu m = .002"$  $100 \, \mu m = .004$ "  $150 \, \mu m = .006"$ 0.25 mm = .010" 0.50 mm = .020"

0.75 mm = .030"





POLYMERIC

Our low pressure fittings are ideally suited for flow injection analysis, low pressure liquid chromatography, and stream sampling devices. They may be safely used at pressures up to 500 psi and temperatures to 50°C.

# LOW PRESSURE POLYMERIC FITTINGS INDEX

NUTS, FERRULES, AND WASHERS
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PERISTALTIC TUBING ADAPTER SET	53
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# Connect soft tubing to PTFE and PTFE-like tubing with this biocompatible adapter set, which works with peristaltic tubing up to

ADAPTERS, POLYPROPYLENE ..... 54 Includes male and female Luer to barbed, 10-32, and 1/4-28 male and

# PLUGS, POLYPROPYLENE

4.50 mm OD.

10-32 and	1/4-28.			 				 	55	

#### MICRO VALVES FOR LC AND GC.....55

female, and other combinations.

Simplify your liquid or gas handling application. The unique design of the fitting detail allows a leak-free seal with no potential for rotor damage from overtightening.

#### FITTING DESIGNS

VICI Jour offers two types of low pressure fittings for 1/4-28 flat-bottomed fitting details:

- Flangeless connections utilize several ferrule designs. The ferrule grips the tubing as the fitting is tightened, without significantly reducing the tubing ID.
- Flanged tube end fittings are retained on polymeric tubing by a flange formed around a polypropylene washer. The washer never comes in contact with the mobile phase.



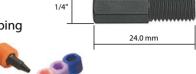
The maximum holding pressure for any type of connections involving tubing and a ferrule varies considerably with the tubing material the ferrule material, the clearance between tubing OD and ferrule ID, and the shape of the fitting detail.



#### **NUTS AND FERRULES**

- Economic alternative to PEEK
- Excellent chemical resistance

• For 1/16" or 1/8" OD tubing



Our PPS 1/4-28 fitting series offers excellent chemical and pressure resistance. Three different sealing options are available. PPS nuts are fingertight when used with Color-Sleeve adapters.

# PPS hex-head nuts and collapsible ferrules (flangeless)

1/4-28

#### **SPECIFICATIONS**

TUBING OD / THREADS 1/16" 1/4-28 1/8" 1/4-28

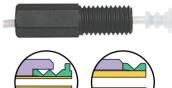
Pressure rating:

OD Rar Psi 1/16' 105 1500 1/8" 500 35 (Varies with tubing ID and material)

\*Patent No. 6,575,501

Patented\* collapsible ferrules are not included. Order separately. \* Patent No. 6,575,501

		Material	Tubing OD		Product No.
(Package/10)	Nut for use with	PPS	1/16"		JR-55050-10
	collapsible ferrule		1/8"		JR-55051-10
	Collapsible ferrules	PCTFE	1/16"	900)	JR-CFL-CB1KF
			1/8"	00	JR-CFL-CB2KF
		PFFK	1/16"	no.d	IR-CFL-CR1PK



1/16" 1/8"

# PPS hex-head nuts and inverted ferrules (flangeless)

1/4-28

#### **SPECIFICATIONS**

**TUBING OD / THREADS** 1/4-28 1/32"

1/4-28 1/16 1/4-28 1/8"

#### PRESSURE RATING

OD	Bar	Psi					
1/16"	105	1500					
1/8"	35	500					
(Varies with tubing ID and							
material)							

Ferrules are not included. Order separately.

		Material	Tubing OD	Product No.
(Package/10)	Nut for use with	PPS	1/32"	JR-55073-10
	inverted ferrule		1/16"	JR-55070-10
			1/8"	JR-55071-10
			1.0 mm	JR-55073-10
			2.0 mm	JR-55072-10
	Inverted ferrules	ETFE	1/32"	JR-032-10
			1/16"	JR-041-10
			1/8"	JR-051-10
	(A)	/1	1.0 mm	JR-031-10
			2.0 mm	JR-042-10
	3.0 mm 2.0 mm	1.0 mm	3.0 mm	JR-049-10





# PPS hex-head nuts and washers (flanged connections)

1/4-28

#### **SPECIFICATIONS**

TUBING OD / THREADS 1/16" 1/4-28

1/8" 1/4-28

PRESSURE RATING OD Bar Psi 1/16' 105 1500

1/8" 35 500 (Varies with tubing ID and material)

Washers are not included. Order separately.

		Material	Tubing OD	Product No.
(Package/10)	Nut for flange/	PP	1/16"	JR-55060-10
	washer connection		1/8"	JR-55061-10
	Washer	PP	1/16"	JR-201926-10
			1/8"	JR-201928-10
	Easy-Flange kit (see p	JR-201540		





# SEE ALSO

High pressure 1/4-28 nuts and ferrules ......30 Color-Sleeve adapters ......... 23



About polymers . 113-114 Chemical resistance of PPS . . . . . . . 110-112

# CHEMICAL **RESISTANCE OF PPS**

A = suitable B = marginalC = not recommended

Chemical class	Resistance	Chemical class	Resistance
Acids, organic	Α	Bases	В
Acids, inorganic	B/C*	Esters	Α
Aldehydes	Α	Halogenated org	. A/B
Alcohols	Α	Hydrocarbons	Α
Concentrated h	nalogen acids	Ketones	Α



# **PEEK fingertight nuts (flangeless)**

- Compatible with all 1/4-28 flat-bottom ports
- Excellent chemical resistance
- For 1/16" or 1/8" OD tubing
- True fingertight no tools required





1/4-28

PEEK flangeless nuts in combination with our inverted ferrule do not require a flanging tool. A handtightening procedure makes leak-free seals.

With this fitting system, the inert ETFE ferrule is the only part besides the tubing which comes into contact with the fluid stream – the nut is never in contact.

Ferrules are not included. Order separately.

		Material	Tubing OD	Product No.
(Package/10)	Nut for use with	PEEK	1/16"	JR-20124-10
	inverted ferrule		1/8"	JR-20116-10
	Inverted ferrules	ETFE	1/16"	JR-041-10
			1/8"	JR-051-10





1/8"

#### **SPECIFICATIONS**

TUBING OD / THREADS

1/16" 1/4-28 1/8" 1/4-28

**MATERIALS** 

PFFK Nut Ferrules ETFE

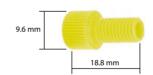
PRESSURE RATING

Bar 1/16" 1500 105 1/8" 35 500 (Varies with tubing ID and material)



# **Color-coded fingertight nuts (flangeless)**

- Polyacetal economical alternative to PEEK
- Compatible with all 1/4-28 flat-bottom ports
- For 1/16" or 1/8" OD tubing
- True fingertight no tools required





1/4-28

Polyacetal flangeless nuts in combination with the inverted ferrule do not require a flanging tool. A hand-tightening procedure makes leak-free seals. With this fitting system, the inert ETFE ferrule is the only part besides the tubing which comes into contact with the fluid stream – the nut is never in contact. Six colors are available.

				1/16"	1/8"
		Colo	or	Product No.	Product No.
(Package/10)	Nuts		Green	JR-040GR-10	JR-050GR-10
			Blue	JR-040BL-10	JR-050BL-10
			Yellow	JR-040YL-10	JR-050YL-10
			Red	JR-040RE-10	JR-050RE-10
			White	JR-040WH-10	JR-050WH-10
			Black	JR-040BK-10	JR-050BK-10
	1" long nuts	ts	White	JR-040WL-10	JR-050WL-10
	Inverted ETF	E ferrules		JR-041-10	JR-051-10
			,		



#### **SPECIFICATIONS**

TUBING OD / THREADS 1/4-28 1/16"

1/8" MATERIAL

Polyacetal Nut Ferrules ETFE

1/4-28

PRESSURE RATING

OD Bar Psi 1/16" 70 1000 500 1/8" 35 (Varies with tubing ID and



The inert ETFE ferrule used with these nuts is the only part besides the tubing which is in contact with the fluid stream.





#### **SPECIFICATIONS**

TUBING OD / THREADS

1/16" 1/4-28 1/8" 1/4-28

#### MATERIAL

Fiberglass-reinforced polypropylene

# PRESSURE RATING

<30 bar (435 psi) (Varies with tubing ID and material)

# **Color-coded fingertight nuts (flanged connections)**

- For flanged connections
- Compatible with all 1/4-28 flat-bottom ports
- For 1/16" or 1/8" OD tubing
- Fiberglass-reinforced PP with PP washers







For those systems requiring or preferring flanged connections, use these fiberglass-reinforced fittings with our Easy-Flange flanging tool and polypropylene washers to make a clean connection. The flange on the tubing ensures that the washer never comes in contact with the mobile phase.

Six colors are available.

				1/16"	1/8"
			Color	Product No.	Product No.
(Package/10)	Nuts		Green	JR-202123-10	JR-202143-10
			Blue JR-202122-10	JR-202122-10	JR-202142-10
			Yellow	JR-202124-10	JR-202144-10
			Red	JR-202125-10	JR-202145-10
			White	JR-201094WH-10	JR-201580WH-10
			Black	JR-201094BK-10	JR-201580BK-10
	1" long nuts		White	JR-202120-10	JR-202119-10
			Black	JR-202118-10	JR-202121-10
	Polypropylene	washer	10	JR-201926-10	JR-201928-10

# Union body for flanged connections

• For flanged 1/4-28 flat-bottom connections

Union body, polyamide

- Through bore low pressure union
- For 1/16" or 1/8" OD tubing

(Package/5)

• Completely inert and biocompatible

Flanged fittings are not included.

Order PPS hex-head flanged nuts or color-coded fingertight flanged nuts separately.





**SPECIFICATIONS** 

TUBING OD / THREADS

1/4-28

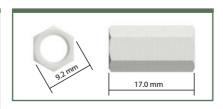
1/4-28

1/16"

MATERIAL Polyamide

1/8"











**PEEK unions** 1/4-28

- For easy connection of low pressure solvent lines
- Low dead volume
- For 1/16" or 1/8" OD tubing
- Flat-bottomed 1/4-28 fitting details
- Completely inert and biocompatible

These unions facilitate the guick and reliable connection of two pieces of 1/16" or 1/8" OD tubing. Use with color-coded adapters for easy solvent line identification.

These are available either as the body only, or complete with fittings.

A union with fittings includes:

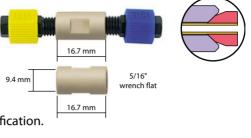
- PEEK low pressure union
- ETFE inverted ferrules
- 2 PPS flangeless hex-head nuts
- Color-Sleeve adapters

		Tubing OD	Bore (mm)	Product No.
(Sold	Union, with fittings	1/16"	0.50	JR-1064
individually)			0.75	JR-1068
		1/8"	1.30	JR-1065
	Body only	1/16"	0.50	JR-064
			0.75	JR-068
		1/8"	1.30	JR-065

dually)			0.75	JR-1068
		1/8"	1.30	JR-1065
	Body only	1/16"	0.50	JR-064
			0.75	JR-068
		1/8"	1.30	JR-065
		Tubina OD	Dradust Na	

Tubing OD Product No.

Replacement fittings						
(Package/10)	PPS flangeless nuts	1/16"	JR-55070-10			
		1/8"	JR-55071-10			
	Inverted ETFE	1/16"	JR-041-10			
	ferrules	1/8"	JR-051-10			



#### **SPECIFICATIONS**

#### TUBING OD / THREADS

1/16" 1/4-28

1/8" 1/4-28

#### MATERIALS

PEEK Body Nut PPS Ferrules ETFE

#### **PRESSURE RATING**

OΠ Pci Bar 1/16" 1500 105 1/8" 35 500 (Varies with tubing ID and material)

# **PEEK bulkhead unions**

- Panel mounting (10 mm hole required, max 9 mm thick)
- Low dead volume
- For 1/16" or 1/8" OD tubing
- Completely inert and biocompatible
- For easy connection of low pressure solvent lines



Bulkhead unions are designed to be mounted through an instrument panel or on a bracket.

They are sold complete with fittings, and include:

- 2 PPS flangeless hex-head nuts
- 2 ETFE inverted ferrules
- 2 Color-Sleeve adapters

		Bore (mm)	Tubing OD	Product No.
(Sold	Bulkhead union,	0.75	1/16"	JR-CBUMPK
individually)	with fittings	1.50	1/8"	JR-CBULPK

#### Tubing OD Product No.

Replacement fittings						
(Package/10)	PPS flangeless nuts	1/16"	JR-55070-10			
		1/8"	JR-55071-10			
	Inverted ETFE		JR-041-10			
	ferrules	1/8"	JR-051-10			

# SEE ALSO

_	
Color-coded fingertight flanged nuts	49
Color-Sleeve adapters, in 12 colors	23
High pressure PEEK unions	22
PPS hex-head flanged nuts	47

# **SPECIFICATIONS**

#### **TUBING OD / THREADS**

1/32" 1/4-28 1/16" 1/4-28 1/4-28 1/8"

#### MATERIALS

1/4-28

PFFK Body PPS Nut Ferrules ETFE

#### PRESSURE RATING

OD Bar 1/16" 105 1500 500 1/8" 35 (Varies with tubina ID and material)



Use our impermeable tubing to avoid gas diffusion in the solvent lines ......17



# **SPECIFICATIONS**

TUBING OD / THREADS

1/32" 1/4-28 1/16" 1/4-28 1/8" 1/4-28

#### MATERIALS

PEEK Body Nuts PPS Ferrules ETFE

#### PRESSURE RATING

≤48 bar (700 psi) (Varies with tubing ID and material)

#### **PEEK reducing unions**

IMPERIAL TO METRIC 1/4-28

- Connects 1/16", 1/8", 1 mm, 2 mm, and 3 mm OD polymeric tubing
- Completely inert and biocompatible

With these reducing unions, metric tubing can be connected to imperial fittings on valves and LC systems.

A reducing union with fittings includes:

- PEEK low pressure reducing union
- 1 PPS flangeless hex-head nut, imperial size noted
- 1 PPS flangeless hex-head nut, metric size noted
- ETFE inverted ferrules
- Color-Sleeve adapters

		Tubing OD	Bore (mm)	Product No.
(Sold	Reducing union,	1/32" to 1 mm	0.50	JR-0640
individually)	with fittings	1/16" to 2 mm	0.75	JR-0680
		1/8" to 3 mm	1.30	JR-0650

			Material	Tubing OD		Product No.
Replacement	fittings					
(Package/10)	Nut for us	e with	PPS	1/32"		JR-55073-10
	inverted f	errule		1/16"		JR-55070-10
				1/8" 1.0 mm / 1/32"		JR-55071-10
						JR-55073-10
				2.0 mm		JR-55072-10
	Inverted f	errules	ETFE	1/32"		JR-032-10
				1/16"		JR-041-10
				1/8"		JR-051-10
		/3	1.0 mm		JR-031-10	
				2.0 mm		JR-042-10
	3.0 mm	2.0 mm	1.0 mm	3.0 mm		JR-049-10



IMPERIAL 1/2-20 to 1/4-28

22.9 mm

# TECH TIP

While our PEEK unions are typically used with inverted ferrules, collapsible ferrules or flanged connections can also be used.





# ferrule

# **SPECIFICATIONS**

#### TUBING OD / THREADS

1/8" 1/4-28 1/4" 1/2-20

#### **MATERIALS**

**Body** PEEK Nuts 1/8" PP

1/4" PPS **Ferrules** 

1/8" PEEK 1/4" **PCTFF** 

#### PRESSURE RATING

<35 bar (500 psi) (Varies with tubing ID and material)

# **PEEK reducing unions**

- Connects 1/4" and 1/8" OD tubing
- Completely inert and biocompatible
- Low dead volume

PEEK reducing unions are sold complete

with fittings, and include:

- One 1/8" flangeless nut, white polypropylene
- One 1/8" ferrule, PEEK
- One 1/4" flangeless nut, PPS
- One 1/4" ferrule, CTFE

		Bore (mm)	Tubing OD	Product No.
(Sold	Reducing union	1.5	1/4" to 1/8"	JR-CU4LPK
individually)	with fittings			

		Material	Tubing OD	Product No.			
Replacement fittings							
(Sold individually)	Flangeless nut, white propylene	White propylene	1/8"	JR-CFL-2W-S			
		PPS	1/4"	JR-CFL-4PPS			
	Ferrule	PEEK	1/8"	JR-CFL-CB2PK-S			
		PCTFE	1/4"	JR-CFL-CB4KF-S			



# PEEK tees, crosses, and manifolds

1/4-28

- For 1/16" or 1/8" OD tubing
- Flat-bottomed 1/4-28 fitting details
- Completely inert and biocompatible

These VICI Jour connectors for low pressure applications are machined from PEEK. The bodies have 1/4-28 female ports which accept any flanged or flangeless fittings for 1/8" or 1/16" OD tubing.

Choose smaller through-holes for applications where low flowrate or low dead volume is required. Fittings with 1.50 mm through-holes are preferred for high flowrate applications.

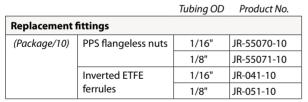
These are available as the body only, or complete with fittings.

The appropriate number of the following are included when fittings are ordered:

- PPS flangeless hex-head nuts
- ETFE inverted ferrules
- Color-Sleeve adapters

#### Sold individually.

			Tubing OD	Bore (mm)	<b>With fittings</b> <i>Product No.</i>	<b>Body only</b> <i>Product No.</i>
(Sold	Tees		1/16"	0.50	JR-6029	JR-6034
individually)				0.80	JR-6030	JR-6032
			1/8"	1.50	JR-6031	JR-6033
	Crosses		1/16"	0.50	JR-6039	JR-6044
				0.80	JR-6040	JR-6042
			1/8"	1.50	JR-6041	JR-6043
	Manifolds	5 ports	1/16"	0.75	JR-C5M1PK	_
			1/8"	1.50	JR-C5M2PK	_
		9 ports	1/16"	0.75	JR-C9M1PK	_
			1/8"	1.50	JR-C9M2PK	<del>-</del>







# **BODY SIZES**

		Diameter	Thickness
Tees		25.0 mm	12.0 mm
Crosses		25.0 mm	12.0 mm
Manifolds	5 ports	22.2 mm	17.1 mm
	9 ports	22.2 mm	28.6 mm

#### **SPECIFICATIONS**

TUBING OD / THREADS

1/16" 1/4-28 1/8" 1/4-28

MATERIALS

Body PFFK Nut PPS Ferrules ETFE

**BODY SIZES** 

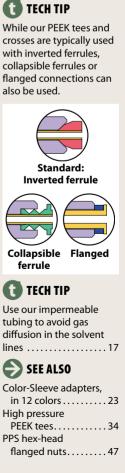
See chart below

PRESSURE RATING

OD Rar 1/16" 105 1500 1/8" 35 500 (Varies with tubing ID and

material)







1/4-28

1/4-28

#### **SPECIFICATIONS**

TUBING OD / THREADS

1/16" 1/4-28 1/8" 1/4-28

#### **MATERIALS**

Body PEEK Nut PPS Ferrules ETFE

#### PRESSURE RATING

**0D** Bar
 Psi

 1/16"
 105
 1500

 1/8"
 35
 500

 (Varies with tubing ID and material)

#### **MIXING VOLUME**

 Bore
 Volume

 0.75 mm
 25 μl

 1.50 mm
 100 μl

**SPECIFICATIONS** 

**TUBING OD / THREADS** 

1/4-28

1/4-28

**PEEK** 

1/16"

MATERIALS Body

Bushings PPS Nut PPS

Ferrules ETFE

12 mm diameter.

SEE ALSO

1/8"

**BORE** 

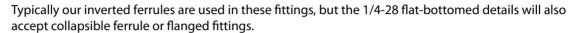
1.50 mm

**BODY SIZE** 28 mm long,

PEEK mixing tees

- For 1/16" or 1/8" OD tubing
- Mountable
- Completely inert and biocompatible

A unique mixing results from the the turbulence created by the introduction angle of the solvents. The mixing is much more thorough than with a conventional tee.



These are available as the body only, or complete with fittings. A mixing tee with fittings includes:

- 3 PPS flangeless hex-head nuts
- 3 ETFE inverted ferrules
- 3 Color-Sleeve adapters

#### Sold individually.

		Tubing OD	Bore (mm)	Product No
(Sold	Mixing tee, with	1/16"	0.75	JR-CM1XPK
individually)	fittings	1/8"	1.50	JR-CM2XPK
	Body only	1/16"	0.75	JR-B-CM1XPK
		1/8"	1.50	JR-B-CM2XPK

Tubing OD Pro	duct No
---------------	---------

Replacement fittings						
(Package/10)	PPS flangeless nuts	1/16"	JR-55070-10			
		1/8"	JR-55071-10			
	Inverted ETFE	1/16"	JR-041-10			
	ferrules	1/8"	JR-051-10			



# Peristaltic tubing adapter set

- For connecting soft tubing to PTFE and PTFE-like tubing
- Works with peristaltic tubing up to 4.50 mm OD
- For 1/16" and 1/8" PTFE and PTFE-like tubing
- Biocompatible
- Low dead volume

This "one-fits-all" set consists of everything needed to connect 1/16" or 1/8" OD PTFE and PTFE-like tubing to soft tubing (such as silicone), up to 4.5 mm in OD, minimum 0.5 mm ID.

The adapter includes:

• 3 different bushings (for the different soft tubing ODs)

Product No

- 2 PPS nuts (one each for 1/16" and 1/8" OD tubing)
- 2 ETFE inverted ferrules (one each for 1/16" and 1/8" OD)
- 2 Color-Sleeve adapters

Sold individually.





# ......

	rioduct No.
PEEK adapter for peristaltic to PTFE	JR-PTAS
ubing connection	





# Polypropylene adapters

	Inlet		Outlet		Product No.
(Package/10)	Male	Luer	Barbed	1/16"	JR-070211-10
				3/32"	JR-070212-10
				1/8"	JR-070213-10
			Male	10-32	JR-070224-10
				1/4-28	JR-070225-10
				1/4-28 UNF BST	JR-070226-10
		1/4-28	Barbed	1/16"	JR-071123-10
				1/8"	JR-071323-10
		10-32	Barbed	1/16"	JR-071124-10
				1/8"	JR-071324-10
	Female	Luer	Barbed	1/16"	JR-070111-10
				3/32"	JR-070112-10
				1/8"	JR-070113-10
			Female	Luer	JR-070101-10
			Male	10-32	JR-070124-10
				1/4-28	JR-070123-10
	Straight t		Barbed to	1/16"	JR-073210-10
	tube iittii	'9	barbed	3/32"	JR-073220-10
				1/8"	JR-073230-10
(Sold individually)	Male	1/4-28 UNF BST	Barbed	1/16"	JR-075012
	Flat bottom	1/4-28	Barbed	1/8" ID	JR-075013

**SPECIFICATIONS** MATERIAL Polypropylene



High pressure
PEEK adapters ......35 High pressure plugs ... 31



#### **SPECIFICATIONS**

THREADS 10-32 or 1/4-28 MATERIAL Polypropylene

# Polypropylene plugs

#### 1/4-28 or 10-32

		Product No.
(Package/10)	10-32 male	JR-072450-10
	1/4-28 male	JR-072350-10
	1/4-28 male, flat bottom	JR-201999-10

#### Micro valves for GC and LC

1/4-28

# **SPECIFICATIONS**

# TUBING OD / THREADS

1/16" 1/4-28 1/8" 1/4-28

#### DIMENSIONS

Bore 1.50 mm Height 44.70 mm Diameter 27.94 (without fittings)

#### **MATERIALS**

Wetted parts

PEEK, PTFE Body POM PPS Nuts Ferrules PCTFE

# PRESSURE RATING

200 psi gas Tested with helium using 1/16" OD x 0.84 mm ID PTFE tubing with PEEK collapsible ferrules

200 psi liquid Tested with isopropanol using 1/8" OD x 0.75 mm ID PTFE tubing with CTFE collapsible ferrules

#### Compact 1" design

- Convenient panel mount, hole diameter 8 mm (0.3125"), 6 mm maximum thickness
- Biocompatible and inert
- Variety of configurations

Simplify your liquid or gas handling application with a VICI Jour sampling micro valve. The unique design of the fitting detail allows a leak-free seal with no potential for rotor damage from overtightening. Internal parts are PEEK and PTFE.

Includes flangeless PPS fittings and CTFE collapsible ferrules for 1/8" OD tubing.

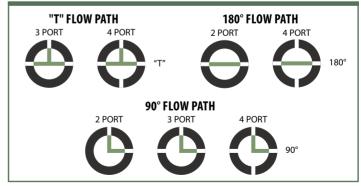
Sold individually.



"T" flow path	3 ports	JR-660100
	4 ports	JR-660110
180° flow path	2 ports	JR-660200
	4 ports	JR-660210
90° flow path	2 ports	JR-660300
	3 ports	JR-660310
	4 ports	JR-660320

		Material	Tubing	OD	Product No.
Replacement	fittings				
(Package/10)	Nut for use with	PPS	1/16"		JR-55050-10
	collapsible ferrule		1/8"		JR-55051-10
	Collapsible ferrules	PEEK	1/16"	200	JR-CFL-CB1PK
		CTFE	1/8"	00	JR-CFL-CB2KF

#### **FLOW PATH CONFIGURATIONS**





High pressure PEEK tees......34 PPS hex-head flanged nuts.....47 Color-Sleeve adapters, in 12 colors . . . . . . . . 23



# TECH TIP

Use our impermeable tubing to avoid gas diffusion in the solvent lines ......17



While micro valves are typically used with collapsible ferrules, inverted ferrules or flanged connections can also be used. See page 47.



STANDARD: Collapsible ferrule



**INVERTED FERRULE** 



# **FILTERS**



**METAL AND POLYMERIC** 

Filters trap foreign particulates from sample and mobile phase streams before they can damage valuable columns and instruments.

# **FILTERS INDEX**

# **LOW PRESSURE FILTERS**

In-line filter cartridgespage	56
Mobile phase filters	
Last Drop	57
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Last Drop biocompatible	
glass filter	58
No-Met biocompatible	59
Filter/spargers	
Last Drop	60
Stainless steel	61

#### **HIGH PRESSURE FILTERS**

PEEK
In-line filter kit 62
Sure-Guard62
Precolumn filter kit 63
Replacement frits 63
Stainless
UHPLC precolumn filter 64
Inline filter65
Replacement frits 64-65

**SPECIFICATIONS** 

**PCTFE** 

316 SS

5.20 mm

0.8 mm

**MATERIALS** Cartridge PTFE/

Filter

OD

Bore

screen:

DIMENSIONS

1/4-28 detail

Filter surface

**TOLERANCES** 

diameter 2 mm

±0.05 mm (.002")

Thickness 2.03 mm

# **NOTES**

\* Flowrate measured with methanol/water (1:1), ultrasonic degassed, helium sparging to prevent regassing.



#### **TECH TIP**

We recommend using these in-line filter cartridges in combination with our low pressure fittings:

PEEK unions50	
Tees and crosses52	
Manifolds52	
Micro valves 55	



# **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.

# In-line filter cartridges

- Fit all 1/4-28 fitting details • Easy to replace
- Compact design • Three porosity options

These convenient-to-use filters can be simply dropped into any 1/4-28 fitting detail, such as in a union. The filters are constructed of PTFE and PCTFE, with a Type 316 stainless low-pressure-drop screen. The inner design of the cartridge ensures the equal distribution of the solvent to the screen.

		Maximum	
	Pore size	flow rate *	Product No.
(Package/5)	2 μm	30 ml/min	JR-CFE-S2-5
	10 μm	30 ml/min	JR-CFE-S10-5
	75 μm	30 ml/min	JR-CFE-S75-5



**LOW PRESSURE** 





# Last Drop mobile phase filters

**LOW PRESSURE** 

# **SPECIFICATIONS**

#### MATERIALS

Body **PTFE** Frits PTFE/ 316 SS/PE

#### CONNECTIONS

Stepped tubing version is for 1.5, 2.2, and 3.5 mm ID tubing

Fitting version (for 1/8" OD tubing) includes PEEK 1/4-28 nut with ETFE ferrule

- No loss of mobile phase
- Biocompatible PTFE frits or stainless steel frits
- Three porosity options
- Two connector types: stepped tubing and 1/4-28 fitting



The Last Drop mobile phase filter allows more analyses per batch of mobile phase and helps reduce hazardous waste. The flat filter element sits parallel to the bottom of the reservoir, allowing the Last Drop to filter all but the last 2% of the mobile phase from the reservoir without drawing air into the system. Compare this with conventional cylindrical filters that can begin to draw air into the system when nearly 10% of the solvent remains in the reservoir.

The Last Drop mobile phase filter consists of a 316 stainless steel, PTFE 2.5 µm, or a hydrophobic PE filter element pressed into an inert PTFE housing. The top of the housing has a 1/4-28 nut and ferrule or a stepped PEEK fitting connector which slips into 1.5, 2.2, or 3.5 mm ID pump inlet lines.

Connector typ	e:	Maximum	Stepped tubing connector	Fitting connector
Filter material	Pore size	flow rate *	Product No.	Product No.
PTFE	2.5 μm	1.2 ml/min	JR-9000-0520	JR-9000-0520F
	5 μm	2.6 ml/min	JR-9000-0521	JR-9000-0521F
	10 μm	3.5 ml/min	JR-9000-0522	JR-9000-0522F
Polyethylene	10 μm	11 ml/min	JR-9000-0522H	JR-9000-0522HF
Stainless	2 μm	28 ml/min	JR-9000-0530	JR-9000-0530F
	5 μm	30 ml/min	JR-9000-0531	JR-9000-0531F
	10 μm	30 ml/min	JR-9000-0532	JR-9000-0532F





#### **NOTES**

\* Flowrate measured with methanol/water (1:1), ultrasonic degassed, helium sparging to prevent regassing.



#### **TECH TIPS**

- Economy Last Drop mobile phase filters are easy to replace - easy to clean. Use ultrasound or replace with a new filter.
- Connect the Economy Last Drop filter with 1/8" OD tubing:

ETFE tubing......13 FEP tubing......16 PFA tubing......13 PTFE tubing ....14-15

• We recommend metal-free PTFE or glass filters for sensitive biochromatography applications where metal surfaces may corrode or interact with samples.



#### SEE ALSO

Last Drop mobile phase filter/spargers......60

# **Economy Last Drop mobile phase filters**

**LOW PRESSURE** 

#### **SPECIFICATIONS**

MATERIALS Body PTFE Frits PTFE/316 SS TUBING OD For 1/8" OD tubing

- Very competitively priced
- Biocompatible PTFE frits or stainless steel frits
- Three porosity options
- Two diameters

Economy mobile phase filters come in two body diameters, for various dimensions of bottle necks.

The filter body is made of PTFE, which is resistant to virtually all common mobile phases.

Frit material	Body OD	Pore size	Maximum flow rate *	Product No.
PTFE	19 mm	2.5 μm	1.2 ml/min	JR-4676-2.5TF
		5 μm	2.6 ml/min	JR-4676-5TF
		10 μm	3.5 ml/min	JR-4676-10TF
	22 mm	2.5 μm	1.2 ml/min	JR-4677-2.5TF
		5 μm	2.6 ml/min	JR-4677-5TF
		10 μm	3.5 ml/min	JR-4677-10TF
Stainless	19 mm	2 μm	30 ml/min	JR-4676-2
steel		10 μm	30 ml/min	JR-4676-10
	22 mm	2 μm	30 ml/min	JR-4677-2
		10 μm	30 ml/min	JR-4677-10







**FILTERS** 

# Last Drop biocompatible glass mobile phase filters LOW PRESSURE

- The solution for biocompatibility and high flowrates
- Easy-push tubing connection

Because it has a glass frit, the flowrate can be much higher with this filter than with PTFE mobile phase filters. The glass foot allows withdrawal of nearly all of the mobile phase – less than 2% is left in the bottle.



#### **SPECIFICATIONS**

MATERIALS Body Glass Frit Glass

**TUBING OD** 

For use with 1/8" tubing

Includes 1/8" tubing connector.

		Maximum	
Frit material	Pore size	flow rate *	Product No.
Glass	1.0 - 1.6 μm	30 ml/min	JR-9000-0520B
	10-16 μm	50 ml/min	JR-9000-0526G
	40-100 μm	200 ml/min	JR-9000-0528G

For tubing	Size	Qty/pkg	Product No.	
Replacemen	t connectors			
1/8" OD	6.8 mm	1	JR-9000-0525GC	





# **NOTES**

• \* Flowrate measured with methanol/ water (1:1), ultrasonic degassed, helium sparging to prevent regassing.



#### TECH TIPS

- Because they are hydrophobic, No-Met filters may initially require some priming with methanol or acetonitrile.
- Connect the No-Met filter with 1/8" OD tubing:

ETFE tubing	13
FEP tubing	.16
PFA tubing	
PTFE tubing14	-15



# No-Met biocompatible mobile phase filters

**LOW PRESSURE** 

#### **SPECIFICATIONS**

#### MATERIALS

Body PTFE/

Polyethylene PEEK Adapter

**PEEK Fitting** Ferrule **ETFE** 

**TUBING OD** 

For 1/8" OD tubing

- · Very competitively priced
- Inert and biocompatible
- Replacement filters
- Also recommended for IC

Stainless steel in the flowpath is not acceptable in a growing number of applications involving the separation of biomolecules. High salt buffers can corrode stainless steel, and the metal ions released from metallic filters may contaminate or otherwise react with the biomolecules of interest.



The No-Met polyethylene filter is designed for these applications, with inert polymeric fittings for 1/8" tubing and a 20 µm filter effectively eliminating metal contamination from the fluid path. Use them for IC and biochromatography applications.

No-Met filters can be used at flow rates up to 500 ml/min, measured with methanol/water (1:1), ultrasonically degassed. Flow rates can vary with solvent and tubing ID.

The economy version can easily be slipped over 1/8" OD tubing, with no fitting required.



			Maximum		
Connection	Filter material	Pore size	flow rate *	Product No.	
1/4-28 nut and ferrule	PTFE	5 μm	2.2 ml/min	JR-32171	
	Polyethylene	<20 μm	500 ml/min	JR-32178	
Economy slip-on connection	Polyethylene	20 μm	300 ml/min	JR-32174	
					_

		Maximum			
Filter material	Pore size	flow rate *	Product No.		
Replacement element					
PTFE	20 μm	2.2 ml/min	JR-32172		
Polyethylene	<20 μm	500 ml/min	JR-32179		



**Last Drop filter/sparger** 

**LOW PRESSURE** 

The Last Drop filter/sparger combines filtration and sparging in a single unit. The PTFE housing contains a mobile phase filter with a stainless steel, PTFE, or hydrophobic PE filter element.

Spargers have a porosity of 10 microns.

The filter/sparger includes:

- PEEK stepped connector which slips into 1.5, 2.2, or 3.5 mm ID solvent lines
- 1/4-28 nut and ferrule for the sparging line



400

		Maximum	
Filter material	Pore size	flow rate *	Product No.
PTFE	2.5 μm	1.2 ml/min	JR-9000-0602
	5 μm	2.6 ml/min	JR-9000-0603
	10 μm	3.5 ml/min	JR-9000-0604
Polyethylene	10 μm	11 ml/min	JR-9000-0604H
Stainless	2 μm	28 ml/min	JR-9000-0640
	5 μm	30 ml/min	JR-9000-0641
	10 um	30 ml/min	JR-9000-0642



#### **SPECIFICATIONS**

#### MATERIALS

PTFE Body Frits PTFE/

316 SS/PE

Stepped tubing connector PEEK Nut PEEK Ferrule ETFE

#### CONNECTIONS

Stepped tubing connector for 1.5, 2.2, and 3.5 mm ID tubing

PEEK 1/4-28 nut with ETFE ferrule for 1/8" OD tubing



# Stainless steel mobile phase filter/helium sparger

**LOW PRESSURE** 

#### **SPECIFICATIONS**

#### MATERIALS

SS316 Body Pipe SS316 Pipe adapter PTFE Fitting adapter PEEK **Fittings PEEK** Ferrules **ETFE** 

- Ideal for helium sparging
- Different porosity options
- Fitting and pipe connectors



VICI Jour mobile phase filters protect HPLC systems from small particles in the mobile phase. These filters are made from SS316 with PEEK or PTFE connectors and are suitable for most solvents. The complete line has versions for both analytical and preparative applications.

VICI Jour helium spargers (2 µm versions) offer an inexpensive way to prepare and maintain mobile phases free of dissolved gases. Connected to a regulated supply of helium gas (0-400 mL/min.) they effectively remove dissolved oxygen, nitrogen, and other atmospheric gases from the mobile phase.

Fitting	Tubing/		Maximum		
type	pipe size	Pore size	flow rate *	Product No.	
1/4-28	1/16"	2 μm	35 ml/min	JR-367016-2	
		10 μm	35 ml/min	JR-367016-10	9.5 mm
		20 μm	35 ml/min	JR-367016-20	25.0 mm
					45.0 mm
	1/8"	2 μm	35 ml/min	JR-367008-2	Sage
		10 μm	100 ml/min	JR-367008-10	
		20 μm	120 ml/min	JR-367008-20	
Stepped	1/16",	2 μm		JR-8000-0495-2	9.5 mm NEW
	3/32",	10 μm		JR-8000-0495-10	5.2 mm
	and 3.76 mm	20 μm		JR-8000-0495-20	
	tubing				45.0 mm
	ID				
Pipe	1/8"	2 μm	95 ml/min	JR-3675-2	
					17.2 mm
					20.5 mm
					42.5 mm
	1/8"	2 μm	50 ml/min	JR-3678-2	
		25 μm	100 ml/min	JR-3678-25	
					22.0 mm
					38.0 mm
					65.0 mm

# TECH TIPS

- We recommend metal free PTFE filters for sensitive biochromatography applications where metal surfaces may corrode or interact with samples.
- We recommend our impermeable tubing to prevent "regassing" of helium-degassed solvents.



Last Drop mobile phase filters ......57



**FILTERS** 

#### PEEK in-line filter kit

• Replaceable metal-free polyetheylene frits and biocompatible titanium frits

- 100% biocompatible
- Minimal hold-up volume
- Different porosity options

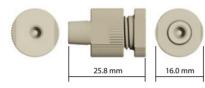
The PEEK in-line filter traps fines and other particles from samples and mobile phases

before they damage valuable instruments and columns.

This female-to-female design is made entirely of PEEK, with PEEK-encased titanium or polyethylene filter elements, for biocompatibility and chemical resistance. The design has virtually no hold-up volume and can be used in analytical applications with virtually no band broadening or loss of efficiency.

#### Sold individually.

		Internal	Maximum	
Frit material	Pore size	volume (μL) *	flow rate **	Product No.
Titanium	0.5 μm	9.50	25 ml/min	JR-68247
	2 μm	11.85	30 ml/min	JR-68253
	5 μm	12.7	30 ml/min	JR-68256
	10 μm	13.2	30 ml/min	JR-68257
Polyethylene	10 μm	13.9	30 ml/min	JR-68257PE



# Sure-Guard in-line filter kit

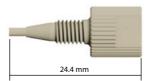
- Disposable filter guard
- Minimal hold-up volume
- Titanium (biocompatible) and stainless steel frits, permanently pressed in place
- Two porosity options

The VICI Jour Sure-Guard disposable in-line filter offers an easy and inexpensive way to protect valuable columns against fines and particles. It is easily connected directly to any column, with an inlet for 1/16" OD tubes and 10-32 threads. The VICI Jour Sure-Guard can be changed in seconds without tools.

Sold in packages of three. Waters type filter kits are sold individually.

		Internal	Maximum		Waters type
Frit material	Pore size	volume (μL) *	flow rate **	Product No.	Product No.
Stainless steel	0.5 μm	0.45 μL	30 ml/min	JR-0611-SS05-3	JR-0641-SS05
	2 μm	0.61 μL	30 ml/min	JR-0611-SS2-3	JR-0641-SS2
Titanium	0.5 μm	0.45 μL	30 ml/min	JR-0611-TI05-3	JR-0641-TI05
	2 μm	0.61 μL	30 ml/min	JR-0611-TI2-3	JR-0641-TI2





#### **HPLC**

0000

#### **SPECIFICATIONS**

#### MATERIALS

Body PEEK Frit Titanium, Polyethylene

RORF

0.25/0.4 mm

TUBING OD / THREADS

1/16" 10-32

PRESSURE RATING <350 bar (< 5000 psi)

#### **SPECIFICATIONS**

#### MATERIALS

**HPLC** 

Body: PEEK Frit: Stainless, Titanium

RORE

0.4 mm

**THREADS** 

10-32 female to 10-32 male

PRESSURE RATING

<350 bar (< 5000 psi)





#### **SPECIFICATIONS**

#### MATERIALS

Body **PEEK** Frit Titanium, Polyethylene

BORE 0.25/0.4 mm

TUBING OD / THREADS

1/16" 10-32

PRESSURE RATING

<350 bar (< 5000 psi)

# PEEK precolumn filter kit

**HPLC** 

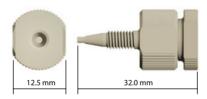
- 100% biocompatible
- Minimal hold-up volume
- Replaceable metal-free polyetheylene frits and biocompatible titanium frits encased in PEEK
- Different porosity options

The VICI Jour precolumn filter kit has a standard 10-32 fitting and fits direct to most column types without introducing additional dead volume.

The filter kit protects expensive columns against fine particles, which may otherwise accumulate on the column frit and lead to split peaks and high backpressure.

Sold individually.

		Internal	Maximum	
Frit material	Pore size	volume (μL) *	flow rate **	Product No.
Titanium	0.5 μm	11.5	30 ml/min	JR-68258
	2 μm	13.85	30 ml/min	JR-68262
	5 μm	14.7	30 ml/min	JR-68263
	10 μm	15.2	30 ml/min	JR-68264
Polyethylene	10 μm	15.9	30 ml/min	JR-68264PE





- \* The internal volume is the hold-up volume between the end of the connecting tube and the filter 10-32 connector outlet, including the frit volume.
- \* \* Flowrate measured with methanol/ water (1:1), ultrasonic degassed, helium sparging to prevent regassing.



#### TECH TIP

We recommend 2 µm frits for columns with 5 µm or larger particles, and 0.5 µm frits for smaller particles.

#### NOTE

Polyethylene frits are for single use only.



#### SEE ALSO

09
88

# **Replacement frits**

#### FOR PEEK IN-LINE AND PRECOLUMN FILTER KITS

Replacement frits for PEEK precolumn filter kit and PEEK in-line filter kit (see facing page).

		Internal		
Frit material	Pore size	volume (μL) *	Qty/pkg	Product No.
Titanium	0.5 μm	6.87	5	JR-1125-05P-5
	2 μm	9.24	5	JR-1125-2P-5
	5 μm	10.04	5	JR-1125-5P-5
	10 μm	10.56	5	JR-1125-10P-5
Polyethylene	10 μm	11.31	5	JR-1151-10P-5



**FILTERS** 

# Stainless steel precolumn filter

**UHPLC** 

- UHPLC
- Mimimized hold-up volume
- Three porosity options
- Fewer connections compared to in-line filters
- Works with 1/16" column connections from all manufacturers

VICI Jour's new stainless steel precolumn filter is based on our well-known in-line filter. The design of this precolumn filter reduces the number of connections compared to a standard in-line filter, increasing the stability and reducing the potential of leakage.

The small bore sizes (0.15 mm in the nut/body and 0.13 mm in the tubing) guarantee a very small (virtually zero) hold-up volume.

With minimal dead-volume and available with three porosities, these filters are the best column protectors.

		Internal		
Bore size	Pore size	volume		Product No.
0.13/0.15 mm	0.2 μm	0.59 μL		JR-69230-02
	0.5 μm	0.61 μL		JR-69230-05
	2 μm	0.66 μL	465	JR-69230-2
	5 μm	0.68 μL	46.5 mm	JR-69230-5

#### **SPECIFICATIONS**

#### MATERIALS

Body 316 SS

PEEK-encased SS

#### THREADS

10-32 Female for inlet Male for outlet

#### PRESSURE RATING

With ZN1 nut and ZF1S6 ferrule:

1375 bar (20,000 psi)

# **Replacement PEEK-encased SS frits**

		Frit	
	Pore size	volume	Product No.
(Package/5)	0.2 um	0.11 uL	JR-1110-02P-5
	0.5 um	0.13 uL	JR-1110-05P-5
	2 um	0.18 uL	JR-1110-2P-5
	5 um	0.20 ul	JR-1110-5P-5



**UHPLC** 

**FILTERS** 



#### **SPECIFICATIONS**

#### MATERIALS

Body 316 SS Frit **PEEK-encased SS** BORE

0.25 or 0.75 mm **THREADS** 

10-32 female to 10-32 male

PRESSURE RATING

With ZN1 nut and ZF1S6 ferrule:

1375 bar (20,000 psi)

#### Stainless steel in-line filter

- UHPLC (up to 1375 bar / 20,000 psi)
- Minimized hold-up volume
- Two bores for analytical and semi-prep flow rates
- Three porosity options



The stainless steel in-line filter has virtually no hold-up volume and can be used in various applications without significant band broadening or loss of efficiency.

The 0.25 mm bore versions are intended for analytical use between autosampler/ injection valve and column. The 0.75 mm bore versions are suitable for higher flow rates in semi-prep systems or for solvent supply from pump to autosampler.

With minimal dead volume and available frit porosities of 0.5, 2 or 5 µm, these in-line filters are the ideal column protectors.

Sold individually.

		Internal	
Bore size	Pore size	volume	Product No.
0.25 mm	0.2 μm	0.2 μL	JR-68230-02
	0.5 μm	0.2 μL	JR-68230-05
	2 μm	0.3 μL	JR-68230-2
	5 μm	0.3 μL	JR-68230-5
0.75 mm	0.5 μm	1.7 μL	JR-68231-05
	2 μm	1.9 μL	JR-68231-2
	5 μm	1.9 μL	JR-68231-5



# **Replacement PEEK-encased SS frits**

#### **FOR FILTER ABOVE**

			Frit	
	Bore size	Pore size	volume	Product No.
(Package/5)	0.25 mm	0.2 μm	0.11 μL	JR-1110-02P-5
		0.5 μm	0.13 μL	JR-1110-05P-5
		2 μm	0.18 μL	JR-1110-2P-5
		5 μm	0.20 μL	JR-1110-5P-5
	0.75 mm	0.5 μm	0.55 μL	JR-1111-05P-5
		2 μm	0.74 μL	JR-1111-2P-5
		5 μm	0.80 μL	JR-1111-5P-5
		10 μm	0.87 μL	JR-1111-10P-5





\* The internal volume is the hold-up volume between the end of the connecting tube and the filter 10-32 connector outlet, including the frit volume.

# SAFETY PRODUCTS



AND MOBILE PHASE HANDLING SYSTEMS

- Save cost on solvents
- Avoid hazardous air (evaporation) in the laboratories
- Increase reproducibility of chromatographic analyses

VICI strives to provide customers with the best solutions for their problems, making the work better and/or easier with respect to environment and health.

# **SAFETY PRODUCTS INDEX**

# **VICI SAFETY FILTERS** Air inlet valves .....page 67 Air outlet valve...... 67 Exhaust filters......68-69 **SPECIAL APPLICATION FILTERS** Carbon dioxide filter ..... 85 Humidity filter ...... 85 CAPS Safety cap kits **NEW** . . . . . . . . . . . . 70 DIN50 and GL45 threads VICI caps......72-73 GL38, DIN50, GL45, and S40 threads GL45, B53, B83, GLS80, DIN60, S51, and S61 threads Multi caps **NEW** . . . . . . . . . . . . 80-82 GL38, GL45, DIN50, S51, B53, DIN60, S61, GLS80, and B83 threads Eco cap ...... 83 Eco cap kit . . . . . . . . . . . . . . . . . 83

# 

Flexible coiled PFA tubing expands and contracts, giving flexibility to move mobile phase bottles on the bench.



# **SPECIFICATIONS**

CONNECTIONS		
Valve to cap	1/4-28	
Filter	Female Luer	
MATERIALS		

MATERIAL	S
Housing	Р

	(Polypropylene)
Filter	Cellulose
O-ring	NBR (O-ring is not a

wetted part)



# Safety air inlet valves

- No evaporation of volatile compounds into lab air
- Better composition stability of the mobile phases
- Less shift of retention times
- No bacterial contamination
- Fit any VICI cap or VICI safety cap

The air inlet valve has a check valve which blocks vapors of the solution in a bottle, preventing the vapors from escaping into the lab. The mobile phase composition remains stable, resulting in constant retention times.

The check valve regulates the pressure when the negative pressure reaches 1.5 psi or 0.1 bar. This small negative pressure prevents evaporation of the liquid (lower vapor pressure) and still guarantees the stability of the flow rate. A negative pressure which is too high can influence the aspiration of a constant flow.

Several tests have indicated that the 0.2 µm cellulose filter will keep mobile phase free of bacteria and dust particles over time. If you use a filter and still have bacteria growth in your liquid, it is likely due to the presence of bacteria in the deionized water used.

Air inlet valves fit on any VICI safety cap or VICI cap.

Description		Product No.
With 4 mm filter		JR-S-20003
With 15 mm filter	1	JR-S-20009
Without filter	1	JR-S-20006
Spare parts		
Replacement cellulose filter	0.2 μm x 4 mm	JR-S-20007
	0.2 μm x 15 mm	JR-S-20008





# TECH TIPS

- The air inlet valve is not suitable when helium sparging is used.
- We recommend that safety air inlet valves and safety air outlet valves be replaced every 6-7 months to guarantee correct operation of the check valve. The lifetime of the check valve and the filter depend on the intensity of use and the quality of the ambient



Safety caps70-71	
VICI caps72-74	

# Safety air outlet valves

SPECIFICATIONS		
CONNECTIONS		
Valve to cap	1/4-28	
Filter Female Luer		
MATERIALS		
Housing	PP (Polypropylene)	
Filter	Cellulose	
O-ring	NBR (O-ring is not a wetted part)	

The VICI safety air outlet valve regulates the pressure during helium sparging.

Air outlet filters fit on any VICI safety cap or VICI cap.

Description	Product No.
Safety air outlet filter	JR-S-20004





SAFETY PRODUCTS

#### SAFETY EXHAUST FILTERS

- Prevents ambient air pollution
- Large capacity and long lifetime
- Break-through detector available, alerting users to saturation of the filter absorbent
- Universal 1/4-28 connection fits all VICI safety caps and VICI caps
- Adapter to competitor products available

Our improved exhaust filter is the center of the VICI Jour safety program, ridding ambient air of solvent vapors which could adversely affect the health of lab workers. When placed on the waste bottle of an HPLC system, the specially-treated absorbent filters out nearly all organic solvent vapor evaporating out of the waste solution.

With 65 g of absorbent, our filters have a larger capacity than competing brands. Typical lifetime is up to 10 months\* for methanol and 8 months\* for acetonitrile.

The optional **NEW** break-through detector recognizes trace amounts of acetone, acetonitrile, aliphatic and aromatic hydrocarbons, ethanol, ethyl acetate, methanol,

methylene chloride and THF.

When the absorbent is saturated. break-through is indicated by a color change in the detector from orange/pink to red. A small charcoal filter absorbs the vapors after they pass the detector.

\*Based on results of our tests (water/ organics = 50/50; flow rate 1.0 ml/min during the day, 0.5 ml/min overnight, 0.1 ml/min during weekends).



**DETECTOR IS UNEXPOSED** (Color is orange/pink)



**DETECTOR IS EXPOSED** (Color is red)



**EXHAUST FILTER** WITHOUT DETECTOR



**EXHAUST FILTER** WITH NEW DETECTOR

We highly recommend using the exhaust filter with a breakthrough detector!

# Safety exhaust filters

SPECIFICATIONS			
CONNECTIONS			
1/4-28			
MATERIALS			
Filter housing	POM		
Detector housing	PC		
Frits	Polyethylene		
O-ring	NBR (O-ring is not a wetted part)		

Description		Product No.
Exhaust filter	With	JR-S-20005
	breakthrough	
	detector	
	Without detector	JR-S-20002
Adapter *		JR-S-40004
* Connects VICI safety exhaust filter to SCAT® waste		

caps and A.I.T. smart waste caps

Carrying case



JR-S-35I



# **NEW Replacement exhaust filter kits**

Includes three exhaust filters, three breakthrough detectors (if ordered), and a carrying case.



Description		Product No.
Exhaust filter kit		JR-S-35
Kit includes:	Qty	Product No.
Exhaust filters	3	JR-S-20005
with breakthrough detectors		
Carrying case	1	JR-S-35L
Description	Product No.	
Exhaust filter kit without detectors		JR-S-36
Kit includes:	Qty	Product No.
Exhaust filters	3	JR-S-20002
without breakthrough detectors	I	1

# 1/4-28

1/4-28

# **NOTE**

Disposal of the saturated filters must be done according to the local regulations for chemical waste.

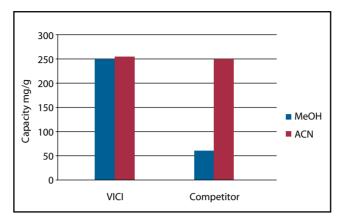
# TECH TIPS

- Larger capacity = longer lifetime = lower costs
- · As a general rule, halving the flow rate doubles the lifetime at constant composition and temperature. Doubling the flow rate halves it.



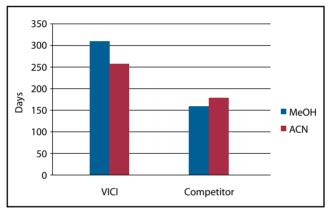
VICI caps ......72-74





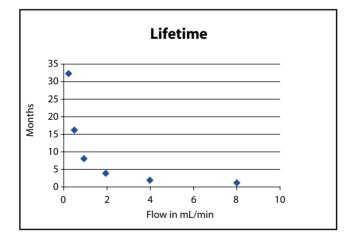
# **OPTIMIZED ADSORBENT OF SAFETY EXHAUST FILTERS**

In our continuous work to improve our products, VICI has optimized the adsorbent for increased capacity. Each detector contains 65 q of absorbent which guarantees a prolonged life time of the VICI exhaust filter.



The excellent capacity of our new adsorbent leads to longer lifetimes up to 10 months for methanol and 8 months for acetonitrile.\*

\*Based on results of our tests (water/organics = 50/50; flow rate 1.0 ml/min during the day, 0.5 ml/min overnight, 0.1 ml/min during weekends).



# SAFETY EXHAUST FILTER LIFETIME

The lifetime of the filter depends on:

- Composition of the mobile phase
- Flow rate
- Ambient temperature: higher temperature leads to increased vapor pressure of the volatile compound

The theoretical lifetime of an exhaust filter, depending on the flow rate, is shown in the chart at left.

# TECH TIP

Acetonitrile and water form an "azeotropic" mixture at 85% acetonitrile. Due to this physical property, the vapor of an acetonitrile/ water mixture always corresponds to the 85/15 mixture. This explains the non-linearity of the lifetime for acetonitrile compared to methanol.

#### **ADDITIONAL APPLICATIONS**

Other applications for safety filters are possible, e.g. an exhaust filter for the GC split vent.

For more information, contact Tech Support support@vici.ch.



SAFETY PRODUCTS

#### **SAFETY CAPS**

Safety caps have built-in stopcocks to close off unused ports or to provide a convenient cut off of the liquid stream when tubing is removed.

- Stopcocks rated up to 72 psi gas at 25°C
- Prevent evaporation of volatile compounds
- Ideal for delivery of mobile phase or collection of waste LC solutions
- 2, 3, or 4 ports with 1/4-28 threads for 1/8" or 1/16" tubing
- Optional bottom-sealing barbed adapter to connect 1/8" (3.2 mm) ID tubing (shown at right – order separately from "Spare Parts", page 71)



# Safety cap / bottle kit

#### **INCLUDES**

- 1 safety cap, GL45 thread, with fittings
- 1 safety-coated glass bottle (1L or 2L)
- 3 m, PFA tubing
- 1 No-Met mobile phase filter, 5 µm
- Additional nuts and ferrules for the bottom side connections

In addition to a GL45 safety cap with color-coded fittings, this kit offers a safety bottle (1 or 2 liter), PFA tubing, and a mobile phase filter.

GL45 safety caps seal to the bottle with an O-ring\* (EPDM) which is resistant to commonly used HPLC solvents. If improved chemical resistance is required (e.g. for halogenated hydrocarbons), order an FEP-coated O-ring separately.

Bottle size:		1 Liter	2 Liters
	No. of ports	Product No.	Product No.
Safety cap kit, GL45	2	JR-S-11111	JR-S-11211
	3	JR-S-11112	JR-S-11212
	4	JR-S-11113	JR-S-11213

Product No.

For improved chemical resistance, order:		
O-ring, FEP-coated, GL45	JR-S-40008	

# **Spare parts**

# FOR SAFETY CAP/BOTTLE KITS

			Qty/pkg	Product No.
1/4-28 flangeless nuts	PPS	1/16" OD	10	JR-55070-10
		1/8" OD	10	JR-55071-10
Inverted ferrules	ETFE	1/16" OD	10	JR-041-10
		1/8" OD	10	JR-051-10
Safety-coated bottle with solid cap 1 L		1 Liter	1	JR-9000-0005
		2 Liters	1	JR-9000-0010
Plug, 1/4-28 , PEEK			1	JR-409
Barbed hose adapter for 1/8" ID tubing			1	JR-075013
Color-Sleeve adapters, 12 colors (2 each)			24	JR-5508X-24
No-Met biocompatible mobile phase filter,			1	JR-32174
economy slip-on connection, 5 μm pore				
PFA tubing, 1/8" x 1.59 mm x 3m		1	JR-T-4003-M3	

# **GL45** THREADS

SPECIFICATIONS CONNECTIONS		
MATERIALS		
Closure	PP (Polypropylene)	
Insert	PTFE	
Stopcock	PCTFE	
O-ring	EPDM (optional FEP-coated)	
Nuts	PPS	
Ferrules	ETFE	
Sleeves	PP	
Bottle	Borosilicate 3.3, safety coated	
Filter	Polyethylene	



Spare parts for Safety caps and kits..71 Chemical resistance ..110



#### TECH TIP

PFA tubing provides less re-gassing of the mobile phase.



#### SEE ALSO

Color-Sleeve adapters.....23



No-Met mobile phase filters ......59 PFA tubing . . . . . . . . . . 13 Safety-coated bottles (for additional sizes) . 84 Safety air inlet valves .. 67



Safety cap **GL45** THREADS

### **SPECIFICATIONS** CONNECTIONS 1/4-28 **MATERIALS** Closure PP (Polypropylene) PTFE Insert Stopcock PCTFE O-ring **EPDM** (optional FEP-coated) Nuts PPS ETFE Ferrules PP Sleeves



• Fits all bottles or canisters with GL45 thread

- Built-in stopcocks for easy interruption of solvent lines
- 2, 3, or 4 ports with 1/4-28 threads for 1/8" or 1/16" tubing

GL45 safety caps seal to the bottle with an O-ring\* (EPDM) which is resistant to commonly used HPLC solvents.

	8	-	1
-			-
1		0	

	No. of ports	Product No.
Safety cap, GL45	2	JR-S-11011
	3	JR-S-11012
	4	JR-S-11013

If improved chemical resistance is required (such as for halogenated hydrocarbons), we offer an FEP-coated O-ring. Order separately.

For improved chemical resistance, order:		
O-ring, FEP-coated, GL45	JR-S-40008	

### **INCLUDES**

- 1 cap, GL45 thread, with stopcocks
- 1 O-ring, EPDM
- 1 set: 1/16" nut/ferrule/ color-sleeve adapter
- 1, 2, or 3 sets: 1/8" nut/ferrule/ color-sleeve adapter
- Additional nuts and ferrules for the bottom side connections

Safety cap

### **SPECIFICATIONS** CONNECTIONS 1/4-28 **MATERIALS** Closure PP (Polypropylene) PTFE Insert Stopcock PCTFE O-ring EPDM/NBR PPS Nuts ETFE Ferrules Sleeves PP





- Fits all bottles or canisters with DIN50 thread
- Built-in stopcocks for easy interruption of solvent lines
- 2, 3, or 4 ports with 1/4-28 threads for 1/8" or 1/16" tubing

DIN50 safety caps seal to the bottle/canister with an O-ring behind a PTFE lip, so the O-ring is therefore not a wetted part.

	No. of ports	Product No.
Safety cap, DIN50	2	JR-S-15011
	3	JR-S-15012
	4	JR-S-15013

### **DIN50** THREADS

### **INCLUDES**

- 1 cap, DIN50 thread, with stopcocks
- 10-ring,
- 1 set: 1/16" nut/ ferrule/ color-sleeve adapter
- 1, 2, or 3 sets: 1/8" nut/ferrule/ color-sleeve adapter Additional nuts and ferrules for the bottom side connections



Spare parts

### **FOR SAFETY CAPS**

			Qty/pkg	Product No.
1/4-28 flangeless nuts	PPS	1/16" OD	10	JR-55070-10
		1/8" OD	10	JR-55071-10
Inverted ferrules	ETFE	1/16" OD	10	JR-041-10
		1/8" OD	10	JR-051-10
Barbed hose adapter for 1/8" ID tubing			1	JR-075013
Color-Sleeve adapters, 12 colors (2 each)			24	JR-5508X-24
PFA tubing, 1/8" x 1.59 mm x 3m		1	JR-T-4003-M3	

One port must be reserved for the exhaust filter or the air inlet valve.



Air inlet valves......67 Exhaust filters .....68-69



### **VICI CAP KITS**

HPLC systems use up to 4 different mobile phases. We offer two safety cap kits for use with (up to quaternary) gradient HPLC systems.

### **NEW VICI cap kit**

### **GL45** THREADS

1/4-28

EPDM

PPS

ETFE

Polyethylene

PP (Polypropylene)

**SPECIFICATIONS** 

CONNECTIONS

**MATERIALS** 

Closure

Insert

O-ring

### **INCLUDES**

- 4 VICI caps, 3 ports, GL45 thread, with fittings
- 4 Air inlet valves with 4 mm filters
- 4 PP plugs
- Carrying case

Description		Product No.
VICI cap kit		JR-S-31
Kit includes:	Qty	Product No.
VICI caps, GL45, three ports	4	JR-S-11002
Air inlet valves	4	JR-S-20003
with 4 mm filters		
PP plugs	4	JR-201999
Carrying case	1	JR-S-31L



### **GL45** THREADS

### **INCLUDES**

• 3 VICI caps, 2 ports, GL45 thread, with fittings

**NEW VICI cap kit** 

- 1 VICI cap, 3 ports, GL45 thread, with fittings
- 4 Air inlet valves with 4 mm filters
- 1 PP plug
- Carrying case

	Product No.
	JR-S-32
Qty	Product No.
3	JR-S-11001
1	JR-S-11002
4	JR-S-20003
1	JR-201999
1	JR-S-31L
	3 1 4

SPECIFICATIONS			
CONNECTIONS			
1/4-28			
MATERIALS			
Closure	PP (Polypropylene)		
Insert	PTFE		
O-ring	EPDM		
Nuts	PPS		
Ferrules	ETFE		
Sleeves	PP		
Filter	Polyethylene		



### **VICI CAPS**

VICI caps seal to the bottle with an O-ring which is resistant to commonly used HPLC solvents. Unused ports should be closed with plugs, available in PEEK or polypropylene.

- Prevent evaporation of volatile compounds
- 2, 3, or 4 ports with 1/4-28 threads for 1/8" or 1/16" tubing
- 6 or 7 ports available in some models
- Optional barbed adapter JR-075013 to connect 1/8" (3.2 mm) ID tubing (order from "Spare Parts", page 75).



**GL45** THREADS

### VICI cap / bottle kit

### **INCLUDES**

- 1 VICI cap, GL45 thread, with fittings
- 1 safety-coated glass bottle (option: 1L or 2L)
- 3 m, PFA tubing
- 1 No-Met mobile phase filter, 5 μm

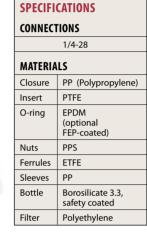
In addition to a GL45 VICI cap with fittings, this kit includes a safety bottle (1 or 2 liter), PFA tubing, and a mobile phase filter.

Bottle size:		1 Liter	2 Liters
	No. of ports	Product No.	Product No.
VICI cap kit, GL45	2	JR-S-11101	JR-S-11201
	3	JR-S-11102	JR-S-11202
	4	JR-S-11103	JR-S-11203



Product No.

For improved chemical resistance, order:		
O-ring, FEP-coated, GL45	JR-S-40008	



### **VICI** cap

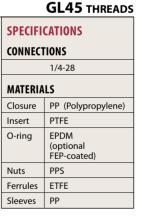
### **INCLUDES**

- 1 cap, GL45 thread
- 1 O-ring, EPDM
- 1 set: 1/16" nut/ferrule/ color-sleeve adapter
- 1, 2, 3, 5, or 6 sets:1/8" nut/ferrule/ color-sleeve adapter
- Fits all bottles or canisters with GL45 thread
- 2, 3, 4, 6, and 7 ports with 1/4-28 threads for 1/8" or 1/16" tubing

GL45 safety caps seal the bottle with an O-ring behind a PTFE lip; therefore the O-ring is not a wetted part. If improved chemical resistance is required (*e.g.* for halogenated hydrocarbons), order an FEP-coated O-ring separately.

	No. of ports	Product No.
VICI cap, GL45	2	JR-S-11001
	3	JR-S-11002
	4	JR-S-11003
	6	JR-S-11005
	7	JR-S-11006

For improved chemical resistance, order:			
O-ring, FEP-coated, GL45	JR-S-40008		





6 port 7 port
PTFE CAP INSERTS

### MORE INFO

Spare parts for VICI caps and kits . . . . 75 Chemical resistance . . 110



PFA tubing provides less re-gassing of the mobile phase.



VICI cap **S40** THREADS

### **INCLUDES**

- 1 cap, S40 thread
- 1 set: 1/16" nut/ ferrule/ color-sleeve adapter
- 1/8" nut/ferrule/ color-sleeve adapter



- Fits all bottles with S40 thread
- 3 ports with 1/4-28 threads for 1/8" or 1/16" tubing

The latest addition to the Jour Safety product line, the S40 VICI cap seals to the bottle with an O-ring (EPDM) which is resistant to commonly used HPLC solvents.

	No. of ports	Product No.
VICI cap, S40	3	JR-S-14002

SPECIFICATIONS				
CONNECTIONS				
1/4-28				
MATERIALS				
Closure	PP* (Polypropylene)			
Insert	PTFE			
O-ring	EPDM			
Nuts	PPS*			
Ferrules	ETFE			
Sleeves	PP*			
*not a wetted part				

VICI cap

### **INCLUDES**

- 1 cap, DIN50 thread
- 10-ring,
- 1 set: 1/16" nut/ ferrule/ color-sleeve adapter
- 1, 2, or 3 sets: 1/8" nut/ferrule/ colorsleeve adapter



• Fits all bottles or canisters with DIN50 thread

• 2, 3, or 4 ports with 1/4-28 threads for 1/8" or 1/16" tubing

DIN50 VICI caps seal to the bottle/canister with an O-ring behind a PTFE lip, so the O-ring is therefore not a wetted part.

	No. of ports	Product No.
VICI cap, DIN50	2	JR-S-15001
	3	JR-S-15002
	4	JR-S-15003



SPECIFICATIONS					
CONNECTIONS					
1/4-28					
MATERIALS					
Closure	PP (Polypropylene)				
Insert	PTFE				
)-ring	EPDM/NBR				
luts	PPS				
errules	ETFE				
leeves	PP				

### **VICI** cap

### **INCLUDES**

- 1 cap, GL37/430 thread
- 10-ring
- 1 set: 1/16" nut/ ferrule/ color-sleeve adapter
- 1. 2. or 3 sets: 1/8" nut/ferrule/ color-sleeve adapter
- 1 adapter ring

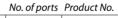


 Fits all bottles or canisters with GI 38/430 thread. (See NOTES, below right)

• 2, 3, or 4 ports with 1/4-28 threads for 1/8" or 1/16" tubing

Color-coded PP sleeves fit on all ports on 2 and 3 port caps. With 4 port caps, the use of PP sleeves is limited to two sleeves per cap. (Four colors are included.)

3	
-	



	No. or port	3 Troductivo.
VICI cap, GL38	2	JR-S-13001
	3	JR-S-13002
	4	JR-S-13003



Product No.

For improved chemical resistance, order:			
O-ring, FEP-coated, GL45	JR-S-40009		

### **GL38** THREADS

### **SPECIFICATIONS** CONNECTIONS 1/4-28 **MATERIALS** PP (Polypropylene) Closure Insert PTFE O-ring **EPDM** (optional FEP-coated) Adapter PA/PP ring Nuts PPS Ferrules ETFE Sleeves PP

### **GL38 NOTES**

GL38 thread is available in different variations. Please check the inside diameter of the neck:

- For 21-24 mm ID (e.g. Wheaton® bottles), use the GL38 cap as is, without an adapter.
- For 24-28 mm ID (e.g. Nalgene® bottles), use the adapter ring (JR-S-40006) which is included with this VICI cap.



### **Spare parts**

### FOR VICI CAP/BOTTLE KITS

		Qty/pkg	Product No.
Safety-coated bottle	1 Liter	1	JR-9000-0005
with solid cap	2 Liters	1	JR-9000-0010
No-Met biocompatible mobile phase filter, economy slip-on connection, 5 µm pore PFA tubing, 1/8" x 1.59 mm x 3m		1	JR-32174
		1	JR-T-4003-M3

### **Spare parts**

### FOR VICI CAPS

			Qty/pkg	Product No.
1/4-28 flangeless nuts	PPS	1/16" OD	10	JR-55070-10
		1/8" OD	10	JR-55071-10
Inverted ferrules	ETFE	1/16" OD	10	JR-041-10
		1/8" OD	10	JR-051-10
Plug, 1/4-28	Plug, 1/4-28 PEEK Polypropylene Barbed hose adapter for 1/8" ID tubing		1	JR-409
			1	JR-201999
Barbed hose adapter for 1			1	JR-075013
Color-Sleeve adapters, 12 colors (2 each)		24	JR-5508X-24	

Color-Sleeve adapters . 23 No-Met mobile phase filters ...... 59 Safety-coated bottles (for additional sizes) . 84 Safety air inlet valves . . 67



### **WASTE CAPS**

Waste caps seal the bottle/canister with an O-ring behind a PTFE lip; therefore the O-ring is not a wetted part. Unused ports should be closed with plugs, available in PEEK or polypropylene.

- Prevent evaporation of volatile compounds
- 3 or 4 ports with 1/4-28 threads for 1/8" or 1/16" tubing
- Additional port with 1/2-20 thread for 1/4" OD tubing or M10 x 1 thread for a barbed adapter
- Thread-sealing barbed adapters available in three sizes, to connect 4 mm, 6 mm, or 8 mm ID tubing (shown at right – order separately from "Spare Parts" on page 79)



One port must be reserved for the exhaust filter or the air inlet valve.

### Waste cap

### **INCLUDES**

- 1 cap
- 10-ring
- 1 set: 1/16" nut/ ferrule/ color-sleeve adapter
- 1/8" nut/ferrule/ color-sleeve adapter
- Fits all bottles or canisters with GL45 thread
- 4 ports with with one M10 x 1 port for barbed/angled adapters

This waste cap seals the bottle/cannester with an O-ring behind a PTFE lip, so the O-ring is therefore not a wetted part.



	2		
-	3	-	
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			l

### **SPECIFICATIONS** CONNECTIONS 1/4-28, 1/2-20 **MATERIALS** PP (Polypropylene) Closure PTFE Insert O-ring NBR Nuts PPS/POM Ferrules ETFE/CTFE PTFF Plug Barbed PA/PP

**GL45** THREADS

### Product No.

Waste cap, GL45				
Fourth port:	1/2-20 thread for 1/4" OD tubing, with 1/4" plug	JR-S-11003W		
	M10 x 1 thread for barbed adapter	JR-S-11023		

### Waste cap

### **INCLUDES**

- 1 cap
- 10-ring • 1 set: 1/16" nut/ ferrule/ color-sleeve adapter
- 1 set: 1/4" nut/ferrule
- 3 sets: 1/8" nut/ferrule/ color-sleeve adapter
- 1 plug, 1/4" (1/2-20), where noted in product number chart

- Fits all bottles or canisters with GLS80 thread
- 4 ports with 1/4-28 thread for 1/8" or 1/16" tubing
- Fifth port with choice of threads

Product No.

Waste cap, GLS80				
Fifth port:	Fifth port: 1/2-20 thread for 1/4" OD tubing,			
	with 1/4" plug			
	JR-S-18014			

<sup>\*</sup> Order barbed adapter separately, bottom of page XXX





### **GLS80** THREADS

adapter

SPECIFICATIONS		
CONNECT	TIONS	
	1/4-28, 1/2-20	
MATERIA	LS	
Closure	PP (Polypropylene)	
Insert	PTFE	
O-ring	NBR	
Nuts	PPS/POM	
Ferrules	ETFE/CTFE	
Plug	PTFE	
Barbed adapter	PA/PP	

### MORE INFO Spare parts for Chemical resistance ..110 SEE ALSO Waste caps B53 threads .......... 78 B83 threads .......... 78



Waste cap **DIN60** THREADS

SPECIFICATIONS CONNECTIONS			
	1/4-28, 1/2-20		
MATERIALS			
Closure PE (Polyethylene)			
Insert PTFE			
O-ring NBR			
Nuts PPS/POM			
Ferrules ETFE/CTFE			
Plug PTFE			
Barbed PA/PP adapter			



- Fits all bottles or canisters with DIN60 thread
- 3 ports with 1/4-28 thread for 1/8" or 1/16" tubing
- Fourth port with choice of threads

Product No.

Waste cap, DIN60		
Fourth port: 1/2-20 thread for 1/4" OD tubing, with 1/4" plug		JR-S-16003
M10 x 1 thread for barbed adapter *		JR-S-16013

<sup>\*</sup> Order barbed adapter separately, bottom of page 79

### **INCLUDES**

- 1 cap
- 10-ring
- 1 set: 1/16" nut/ ferrule/ color-sleeve adapter
- 1 set: 1/4" nut/ferrule
- 2 sets: 1/8" nut/ferrule/ color-sleeve adapter
- 1 plug, 1/4" (1/2-20), where noted in product number chart

Waste cap **S51** THREADS

SPECIFICATIONS			
CONNECT	CONNECTIONS		
	1/4-28, 1/2-20		
MATERIA	LS		
Closure	PE (Polyethylene)		
Insert PTFE			
O-ring NBR			
Nuts PPS/POM			
Ferrules	ETFE/CTFE		
Plug PTFE			
Barbed PA/PP adapter			





• 3 ports with 1/4-28 thread for 1/8" or 1/16" tubing

1/2-20 thread for 1/4" OD tub

• Fourth port with choice of threads

Waste cap, S51

Fourth port:

	rioductivo.
ing,	JR-S-15103

Product No.

JR-S-16103

JR-S-16113

M10 x 1 thread for barbed adapter \* JR-S-15113 \* Order barbed adapter separately, bottom of page 79

with 1/4" plug

### **INCLUDES**

- 1 cap
- 10-ring
- 1 set: 1/16" nut/ ferrule/ color-sleeve adapter
- 1 set: 1/4" nut/ferrule
- 1/8" nut/ferrule/ color-sleeve adapter
- 1 plug, 1/4" (1/2-20), where noted in product number chart

**Waste cap S61** THREADS

### **SPECIFICATIONS** CONNECTIONS 1/4-28, 1/2-20 **MATERIALS** Closure PE (Polyethylene) Insert PTFE O-ring NBR Nuts PPS/POM Ferrules ETFE/CTFE Plug PTFE Barbed PA/PP adapter



- Fits all bottles or canisters with S61 thread
- 3 ports with 1/4-28 thread for 1/8" or 1/16" tubing
- Fourth port with choice of threads

A.	Waste cap, S61	
	Fourth port:	1/2-20 thread for 1/4" OD tubing, with 1/4" plug
		M10 x 1 thread for barbed adapter *

<sup>\*</sup> Order barbed adapter separately, bottom of page 79

### **INCLUDES**

### • 1 cap

- 10-ring
- 1 set: 1/16" nut/ ferrule/ color-sleeve adapter
- 1 set: 1/4" nut/ferrule
- 2 sets: 1/8" nut/ferrule/ color-sleeve adapter
- 1 plug, 1/4" (1/2-20), where noted in product number chart



adapters.....23 Exhaust filters ..... 68-69 Air inlet valves.....67





Waste cap **B53** THREADS

### **INCLUDES**

- 1 cap
- 10-ring
- 1 set: 1/16" nut/ ferrule/ color-sleeve adapter
- 1 set: 1/4" nut/ferrule
- 2 sets: 1/8" nut/ferrule/ color-sleeve adapter
- 1 plug, 1/4" (1/2-20), where noted in product number chart

- Fits all bottles or canisters with B53 thread
- 3 ports with 1/4-28 thread for 1/8" or 1/16" tubing
- Fourth port with choice of threads

Product No.

Waste cap, B53		
Fourth port:	Fourth port: 1/2-20 thread for 1/4" OD tubing, with 1/4" plug	
	M10 x 1 thread for barbed adapter*	JR-S-15313

<sup>\*</sup> Order barbed adapter separately, on the page opposite



SPECIFICATIONS		
CONNECT	TIONS	
	1/4-28, 1/2-20	
MATERIALS		
Closure	PP (Polypropylene)	
Insert	PTFE	
O-ring NBR		
Nuts PPS/POM		
Ferrules	ETFE/CTFE	
Plug	PTFE	
Barbed adapter	PA/PP	

Waste cap **B83** THREADS

### **INCLUDES**

- 1 cap
- 10-ring
- 1 set: 1/16" nut/ ferrule/ color-sleeve adapter
- 1 set: 1/4" nut/ferrule
- 3 sets: 1/8" nut/ferrule/ color-sleeve adapter
- 1 plug, 1/4" (1/2-20), where noted in product number chart

- Fits all bottles or canisters with B83 thread
- 4 ports with 1/4-28 thread for 1/8" or 1/16" tubing
- Fifth port with choice of threads

Product No.

Waste cap, B83		
Fifth port:	1/2-20 thread for 1/4" OD tubing, with 1/4" plug	JR-S-18304
	M10 x 1 thread for barbed adapter*	JR-S-18314

<sup>\*</sup> Order barbed adapter separately, on the page opposite





SPECIFICATIONS CONNECTIONS					
	1/4-28, 1/2-20				
MATERIALS					
Closure PP (Polypropylene)					
Insert PTFE					
O-ring NBR					
Nuts PPS/POM					
Ferrules ETFE/CTFE					
Plug PTFE					
Barbed PA/PP adapter					



One port must be reserved for the exhaust filter or the air inlet valve.



### MORE INFO

Chemical resistance 96-98



DIN60 threads . . . . . . 77 GL45 threads . . . . . . . 76 GLS80 threads . . . . . . 76 S51 threads......77 S61 threads......77 Color-Sleeve adapters......23 Exhaust filters ..... 68-69 Air inlet valves......67



### **Spare parts**

### FOR WASTE CAPS

			Qty/pkg	Product No.
1/4-28 flangeless nuts	PPS	1/16" OD	10	JR-55070-10
		1/8" OD	10	JR-55071-10
Inverted ferrules	ETFE	1/16" OD	10	JR-041-10
		1/8" OD	10	JR-051-10
1/2-20 nut	POM	1/4" OD	1	JR-CFL-4D
Collapsible ferrule	CTFE	1/4" OD	1	JR-CFL-CB4KF-S
Plug, 1/4-28	PEEK		1	JR-409
	Polyprop	Polypropylene		JR-201999
Plug, 1/2-20	PTFE PA		1	JR-S-40007
Plug, M10 x 1			1	JR-073001
Barbed hose adapter for 1/8" ID tubing			1	JR-075013
Color-Sleeve adapters, 12 colors (2 each)			24	JR-5508X-24

### Tubing size Qty/pkg Product No.

Adapters				
1/2-20 to 1/4-28	POM		10	JR-S-40200
Barbed hose adapter	PA/PP	1/8" ID	1	JR-075013

### Tubing size Qty/pkg Product No.

Barbed adapters, M10 x 1				
Angled	PA	4 mm ID	1	JR-S-40104
	PA	6 mm ID	1	JR-S-40106
	PA	8 mm ID	1	JR-S-40108
Straight	PA	4 mm ID	1	JR-S-40304
	PA	6 mm ID	1	JR-S-40306
	PA	8 mm ID	1	JR-S-40308
Т	PA	4 mm ID	1	JR-S-40404
	PA	6 mm ID	1	JR-S-40406



### **MULTI CAPS**

NEW VICI multi caps are available for bottles with GL38, GL45, DIN50, S51, B53, DIN60, S61, GLS80 and B83 threads. They can be used for mobile phase or waste bottles/canisters.

All multi caps come with three angled PA barbed adapters for connecting tubing with 4mm, 6mm and 8mm ID, a PA plug for the M10x1 bore, and PP plugs for the 1/4-28 bores.

Optionally, the caps can be equipped with PA straight and T-adapters for different ID tubing.

### **NEW Multi cap**

### **INCLUDES**

- 1 cap
- 1 O-ring
- 1 set: 1/8" nuts/ferrules/ colored sleeve adapters
- 1 set: angled barbed adapters for 4mm, 6mm and 8mm ID tubina
- 1 set: plugs (PA and PP)



- Fits all bottles or canisters with GL38 thread
- 1 port with 1/4-28 thread for 1/8" OD tubing
- Second port with M10x1 threads for barbed adapters

	Product No.
Multi cap, GL38	JR-S-13011

SPECIFICATIONS			
CONNECT	CONNECTIONS		
1/4-28, M10 x 1			
MATERIALS			
Closure	PP/PE		
Insert	PTFE		
O-ring	NBR		
Nuts	PPS/POM		
Ferrules	ETFE		
Sleeves	PP (1/4-28) PA (M10x 1)		

**GL38** THREADS

### **NEW Multi cap**

### INCLUDES

- 1 cap
- 1 O-ring
- 2 sets: 1/8" nuts/ ferrules/colored sleeve adapters
- 1 set: angled barbed adapters for 4mm, 6mm and 8mm ID tubina
- 1 set: plugs (PA and PP)



- Fits all bottles or canisters with GL45 thread
- 2 ports with 1/4-28 thread for 1/8" OD tubing
- Third port with M10x1 threads for barbed adapters

Product No. JR-S-11052 Multi cap, GL45

### **GL45** THREADS

SPECIFICATIONS			
CONNECTIONS			
1/4-28, M10 x 1			
MATERIALS			
Closure	PP/PE		
Insert	PTFE		
O-ring	NBR		
Nuts	PPS/POM		
Ferrules	ETFE		
Sleeves	PP (1/4-28) PA (M10x 1)		

### **NEW** Multi cap

### **INCLUDES**

- 1 cap
- 1 O-ring
- 2 sets: 1/8" nuts/ ferrules/colored sleeve adapters
- 1 set: angled barbed adapters for 4mm, 6mm and 8mm ID tubina
- 1 set: plugs (PA and PP)



- Fits all bottles or canisters with DIN50 thread
- 2 ports with 1/4-28 thread for 1/8" OD tubing
- Third port with M10x1 threads for barbed adapters

Product No.

JR-S-15052 Multi cap, DIN50

### **DIN50** THREADS

SPECIFICATIONS			
CONNECTIONS			
1/4-28, M10 x 1			
MATERIALS			
PP/PE			
PTFE			
NBR			
PPS/POM			
ETFE			
PA			
PP (1/4"-28) PA (M10x1)			



**NEW** Multi cap **S51** THREADS

SPECIFICATIONS CONNECTIONS		
1/4-28, M10 x 1		
MATERIALS		
Closure	PP/PE	
Insert	PTFE	
O-ring	NBR	
Nuts	PPS/POM	
Ferrules	ETFE	
Barbed adapters	PA	
Plugs	PP (1/4"-28) PA (M10x1)	



- Fits all bottles or canisters with S51 thread
- 2 ports with 1/4-28 thread for 1/8" OD tubing
- Third port with M10x1 threads for barbed adapters

Product No.

Multi cap, S51	JR-S-15152
----------------	------------

### **INCLUDES**

- 1 cap
- 1 O-ring
- 2 sets: 1/8" nuts/ ferrules/colored sleeve adapters
- 1 set: angled barbed adapters for 4mm, 6mm and 8mm ID tubing
- 1 set: plugs (PA and PP)

### **NEW** Multi cap

### **SPECIFICATIONS** CONNECTIONS 1/4-28, M10 x 1 **MATERIALS** PP/PE Closure Insert PTFE NBR O-ring Nuts PPS/POM Ferrules ETFE Barbed adapters Plugs PP (1/4"-28) PA (M10x1)



- Fits all bottles or canisters with B53 thread
- 2 ports with 1/4-28 thread for 1/8" OD tubing
- Third port with M10x1 threads for barbed adapters

Product No.

Multi cap, B53	JR-S-15352
·	

### **INCLUDES**

- 1 cap
- 1 O-ring
- 2 sets: 1/8" nuts/ ferrules/colored sleeve adapters

**B53** THREADS

- 1 set: angled barbed adapters for 4mm, 6mm and 8mm ID tubing
- 1 set: plugs (PA and PP)

### **NEW** Multi cap

### **SPECIFICATIONS** CONNECTIONS

### 1/4-28, M10 x 1

**MATERIALS** Closure PP/PE Insert PTFE O-ring NBR Nuts PPS/POM Ferrules **ETFE** Barbed PΑ adapters Plugs PP (1/4"-28) PA (M10x1)



- Fits all bottles or canisters with DIN60 thread
- 2 ports with 1/4-28 thread for 1/8" OD tubing-
- Third port with M10x1 threads for barbed adapters

Product No.

Multi cap, DIN60 JR-S-16052

**DIN60** THREADS

### **INCLUDES**

- 1 cap
- 1 O-ring
- 2 sets: 1/8" nuts/ ferrules/colored sleeve adapters
- 1 set: angled barbed adapters for 4mm, 6mm and 8mm ID tubing
- 1 set: plugs (PA and PP)



**NEW** Multi cap

### **INCLUDES**

- 1 cap
- 1 O-ring
- 2 sets: 1/8" nuts/ ferrules/colored sleeve adapters
- 1 set: angled barbed adapters for 4mm, 6mm and 8mm ID tubing
- 1 set: plugs (PA and PP)



• Fits all bottles or canisters with S61 thread

• 1 port with 1/4-28 thread for 1/8"

• Second port with M10x1 threads for barbed adapters

	Product No.
Multi cap, S61	JR-S-16152

SPECIFICATIONS			
CONNECTIONS			
1/4-28, M10 x 1			
MATERIALS			
Closure	PP/PE		
Insert	PTFE		
O-ring	NBR		
Nuts	PPS/POM		
Ferrules	ETFE		
Barbed adapters	PA		
Plugs	PP (1/4"-28) PA (M10x1)		

**S61** THREADS

### **NEW** Multi cap

### **INCLUDES**

- 1 cap
- 1 O-ring
- 2 sets: 1/8" nuts/ ferrules/colored sleeve adapters
- 1 set: angled barbed adapters for 4mm, 6mm and 8mm ID tubing
- 1 set: plugs (PA and PP)



- Fits all bottles or canisters with GLS80 thread
- 2 ports with 1/4-28 thread for 1/8"
- Third port with M10x1 threads for barbed adapters

	Product No.
Multi cap, GLS80	JR-S-18053

### **GLS80** THREADS

SPECIFICATIONS		
CONNECTIONS		
1/4-28, M10 x 1		
MATERIALS		
Closure	PP/PE	
Insert	PTFE	
O-ring	NBR	
Nuts	PPS/POM	
Ferrules	ETFE	
Barbed adapters	PA	
Plugs	PP (1/4"-28) PA (M10x1)	

### **NEW Multi cap**

### **INCLUDES**

- 1 cap
- 1 O-ring
- 2 sets: 1/8" nuts/ ferrules/colored sleeve adapters
- 1 set: angled barbed adapters for 4mm, 6mm and 8mm ID tubing
- 1 set: plugs (PA and PP)



- Fits all bottles or canisters with B83 thread
- 2 ports with 1/4-28 thread for 1/8"
- Third port with M10x1 threads for barbed adapters

	Product No.
Multi cap, B83	JR-S-18353

### **B83** THREADS

	<b>200</b> 1111(2)(2)		
SPECIFICATIONS			
CONNECT	CONNECTIONS		
1/4-28, M10 x 1			
MATERIALS			
Closure	PP/PE		
Insert	PTFE		
O-ring	NBR		
Nuts	PPS/POM		
Ferrules	ETFE		
Barbed adapters	PA		
Plugs	PP (1/4"-28) PA (M10x1)		



### **ECO CAPS**

The Eco cap consists of a three-hole ETFE insert (two bores for 1/8" and one for 4 mm OD tubing) with a polyethylene collar, compatible with all standard GL45 thread bottles. The Eco cap has no threading for fittings on the inside of the tubing ports – the tubing is simply inserted.

### Eco cap/ safety bottle kit

### **GL45** THREADS

### **SPECIFICATIONS MATERIALS** PP (Polypropylene) Screw Pouring ring ETFE Insert O-ring **EPDM** Luer PP plug



In addition to an Eco cap with polypropylene male Luer plug, this kit offers a safety bottle (1 or 2L).

	Bottle size	Product No.
Eco cap kit	1 Liter	JR-9000-0013
	2 Liter	JR-9000-0014

### **INCLUDES**

- 1 cap, GL45 thread, with three ports
- 1 safety-coated glass bottle (option: 1 L or 2 L)
- 1 male Luer plug, polypropylene, for 4 mm bore
- 3 m PFA tubing
- 1 No-met filter, 20 µm

### Eco cap **GL45** THREADS

SPECIFICATIONS			
MATERIA	MATERIALS		
Screw collar	PP (Polypropylene)		
Pouring ring	PP		
Insert	ETFE		
O-ring	EPDM		
Luer plug	PP		



- Competitively priced alternative to sparge and deliver mobile phases
- Also available as bottle kit

	Product No.	
Eco cap	JR-9000-0007	

### **INCLUDES**

- 1 cap, GL45 thread, with three ports
- 1 male Luer plug, polypropylene, for 4 mm bore
- 3 m PFA tubing
- 1 No-met filter, 20 μm

### **NOTE**

These caps are not usable for building up a helium atmosphere within in the solvent bottle, but only for continuous helium sparging.



### **(1)** TECH TIP

Once the mobile phase is degassed, we recommend our impermeable tubing between bottle cap and pump to prevent regassing of helium degassed solvents.



Impermeable tubing .. 17 Polymeric tubing ... 13-17 Waste caps . . . . . . . . 76-79

### **Spare parts**

**FOR ECO CAP** 

	Qty/pkg	Product No.
Male Luer plug, polypropylene	10	JR-070350-10



### **SolviFlex**

### **INCLUDES**

- ~3m coiled 1/8" PFA tubing
- 2 sets: 1/4-28 nut/ ferrules for 1/8" OD tubing
- 1 No-Met mobile phase with economy slip-on connection (JR-32174)
- Be "mobile" with mobile phase bottles
- Ideal for with VICI safety caps or VICI caps
- Customized version on request

The SolviFlex is made of flexible telephone cable-like PFA tubing which expands and contracts, providing flexibility to move mobile phase bottles up to 1.5 m radius on the bench. Approximately 3 m of tubing is coiled with straight stretches of tubing at each end.

	Product No.	
SolviFlex assembly	JR-6120-50030	1000000
		/ , ] /
		The state of the s

SPECIFICATIONS		
TUBING SIZE		
1/8 OD		
MATERIALS		
Tubing	PFA	
Nuts	PPS	
Ferrules	ETFE	
Filter	PE	



### Safety-coated glass bottles

- Special design for helium sparging of LC mobile phases
- Safety coating to minimize risk of injury
- Available in 0.25, 0.5, 1 and 2 Liter sizes

These glass bottles with GL45 screw threading are made of chemical resistant Borosilicate 3.3 and are coated on the outside with a layer of sturdy polymer, decreasing the chances of breakage if the bottle is dropped. Even if the bottle breaks, glass fragments will be kept within the polymer coating. Solvents will be kept within the coating for a short while. The coating also protects solvents against UV light up to 385 nm.

These safety-coated glass bottles cannot be autoclaved.

Bottles include a solid cap.

	Bottle size	Product No.
Safety-coated bottle	0.25 L	JR-9000-0011
	0.5 L	JR-9000-0012
	1 L	JR-9000-0005
	2 L	JR-9000-0010





**SPECIFICATIONS** 

**PRESSURE RATING** 

**MATERIALS** 

Bottle

Pouring ring

Cap

0.8 bar (11.6 psi)

Borosilicate 3.3 glass

### NOTES

- The bottles are not suitable to be stressed with pressures above 0.8 bar (11.6 psi), but only for continuous helium sparging.
- The safety coating on a bottle is not intended to replace safe working conditions and precautions in laboratories.



No-Met biocompatible
•
mobile phase filter59
Safety caps 70-71
Safety cap kit70
Safety exhaust filter 68-69
VICI caps72-73
VICI cap kit





### **Carbon dioxide filter**

 $CO_2$ 

In ion chromatography, a basic solution is often used as mobile phase. Because of their low buffer capacity, the pH of these eluents can easily be affected by the carbon dioxide in the air.

Using a bottle in combination with a VICI cap and a carbon dioxide filter prevents any change in the pH of the mobile phase, thus increasing the stability and reproducibility of the analysis. In this application, the carbon dioxide filter also functions as an air inlet valve.

	Product No.
Carbon dioxide filter	JR-S-20100



### **Humidity filter**

H<sub>2</sub>0

In applications requiring a non-aquaeous organic solvent – chiral separations, for example – traces of moisture in the ambient air can influence the results.

The use of a humidity filter in combination with a VICI cap solves this problem.

	Product No.
Humidity filter	JR-S-20200

## **FRITS**



REPRODUCIBILITY AND PRECISION

VICI Jour unidense frits, with uniform flow across the entire frit, offer unexcelled reproducibility and precision. Proprietary manufacturing processes ensure uniformity and precise, repeatable dimensional control.

PEEK-encased frits surround the frit with a ring of PEEK, reducing the actual porous surface to the ID of an HPLC column or filter.

### **FRITS INDEX**

### **UNIDENSE FRITS**

Stainlesspa	age 87
Titanium	87
Polyethylene	86
PEEK-ENCASED FRITS	
PEEK-ENCASED FRITS Stainless	88

Polyethylene......89

### Polyethylene frits

### **UNIDENSE TYPE**

- Biocompatible
- Metal free

Our completely metal-free polymer frits are made of UHMWPE (Ultra High Molecular Weight PolyEthylene), and offer a competitively priced alternative to titanium.

For single use only. Sold in packages of 5.

OL	)	Thickness		Porosity	Frit volume	Product No.
inches	mm	inches	mm	μm	$\mu$ L	
.255	6.50	.079	2.00	10	26.5	JR-F-255-079-10PE-5

# SPECIFICATIONS MATERIAL UHMWPE TOLERANCES ±0.08 mm (.003")

**PRESSURE RATING** <210 bar (3000 psi)



See facing page.



PEEK-encased polyethylene frits . . . . 89



### **SPECIFICATIONS**

MATERIAL Stainless sta

Stainless steel Type 316L sintered TOLERANCES See chart below



### OPTIONS

- Standard frits do not have chamfers.
   Chamfered frits are available on request.
- Other dimensions and porosities are available on request. Minimum order quantity: 100 pieces. Please contact your local distributor or VICI directly.

### **1** TOLERANCES

OD (mm) Tolerance <5 ±0.05 mm (.002")

5-12 ±0.08 mm (.003")

12.5-25.4 ±0.20 mm (.008")



- Stated porosities are only nominal and do not reflect the maximum pore size of a frit.
- See frit volume chart for help chosing the right frit and porosity for your application... page 109
- Frit volumes are theoretical and are calculated by multiplying overall frit volume times the porosity proportion.



PEEK-encas	sed frits	
Stainless		88
Titanium		٩a

### Stainless steel frits

**UNIDENSE TYPE** 

For both standard frits and those produced to custom specifications, these frits offer unexcelled reproducibility and precision. Proprietary manufacturing processes ensure uniformity and precise, repeatable dimensional control.

Stainless steel frits are manufactured of SS316L, which has extra-low carbon content. The sintering process used results in a strong bonding of the sinter metal particles. Depending on the grade of powder used, the porosity of the frit can be precisely tuned.

Sold in packages of 5.

Ol	D	Thick	Thickness		Frit volume	Product No.																		
inches	mm	inches	mm	μm	μL																			
1/16"	1.59	.030	0.76	0.5	0.39	JR5FR1-5																		
				1	0.45	JR-1FR1-5																		
				2	0.53	JR-2FR1-5																		
				10	0.60	JR-10FR1-5																		
1/8"	3.18	.040	1.02	0.5	2.10	JR5FR2-5																		
				1	2.43	JR-1FR2-5																		
				2	2.83	JR-2FR2-5																		
				10	3.24	JR-10FR2-5																		
1/4"	6.35	.040	1.02	0.5	8.39	JR5FR4-5																		
				2	11.30	JR-2FR4-5																		
				10	12.91	JR-10FR4-5																		
3/8"	9.53	.040	1.02	0.5	18.91	JR5FR6-5																		
																						2	25.45	JR-2FR6-5
				10	29.09	JR-10FR6-5																		
1/2"	12.70	.040	1.02	0.5	33.58	JR5FR8-5																		
				2	45.2	JR-2FR8-5																		
				10	51.66	JR-10FR8-5																		
1"	25.40	.060	1.52	2	269.43	JR-2FR1K-5																		
				10	307.92	JR-10FR1K-5																		

### **SPECIFICATIONS**

MATERIAL
Titanium, sintered
TOLERANCES
See chart at left

### **Titanium frits**

- Biocompatible
- Recommended for protein analysis
- UNIDENSE TYPE
- High corrosion resistance
- Various pore sizes and diameters

Titanium is preferred over stainless steel for applications related to the analysis of sensitive substances in general and large biomolecules in particular. Evidently proteins have a tendency to adsorb on the stainless steel (iron) frit and consequently reduce recovery or may even decompose. Titanium also offers higher corrosion resistance and can be used with solvents containing halides. Sold in packages of 5.



0	OD Thickness Porosity Frit volum				Frit volume	Product No.
inches	mm	inches	mm	μm	μL	
1/16"	1.59	.062	1.57	0.5	0.82	JR5FR1TI-5
		.040	1.02	2	0.71	JR-2FR1TI-5
1/8"	3.18	.040	1.02	2	2.83	JR-2FR2TI-5
1/4"	6.35	.040	1.02	2	11.30	JR-2FR4TI-5
3/8"	9.53	.040	1.02	2	25.45	JR-2FR6TI-5
1/2"	12.70	.040	1.02	2	45.2	JR-2FR8TI-5
				10	51.66	JR-10FR8TI-5
1"	25.40	.040	1.02	2	180.80	JR-2FR1KTI-5



**ERFESTY PRODUCTS** 

### PEEK-ENCASED FRITS

PEEK-encased frits surround the frit with a ring of PEEK, reducing the actual porous surface to the ID of an HPLC column or filter.

The compressed PEEK ring forms a seal between the bottom of the fitting and the column end, preventing the mobile phase and the sample from entering the previously accessible poorly swept areas.

### Stainless steel frits

### **PEEK-ENCASED**

- For HPLC columns or in-line filters
- Eliminate poorly swept volume and improves peak symmetry
- Various porosity and dimension options

Our PEEK-encased frits with 0.118" or 1/4" OD ring are intended for HPLC columns with IDs of 3.2, 3.9, and 4.6 mm. With the frit surrounded by a PEEK ring, the actual porous surface is reduced to the column ID.

The compressed PEEK ring forms a seal between the bottom of the fitting and the column end, preventing the mobile phase and the sample from entering the previously accessible poorly swept areas.

Sold in packages of 5.

Ring	OD	Frit (	OD	Thick	ness	Porosity	Frit volume	Product No.
inches	mm	inches	mm	inches	mm	μm	μL	
.115"	2.92	.038	0.97	.028	0.70	0.5	0.13	JR-1110-05P-5
						2	0.18	JR-1110-2P-5
						5	0.20	JR-1110-5P-5
		.077	1.96	.028	0.70	0.5	.0.55	JR-1111-05P-5
						2	0.74	JR-1111-2P-5
						5	0.80	JR-1111-5P-5
						10	0.87	JR-1111-10P-5
.25"	6.35	.078	2.00	.062	1.59	0.5	1.30	JR-1104-05P-5
						2	1.74	JR-1104-2P-5
		.125	3.20	.062	1.59	0.5	3.32	JR-1102-05P-5
						2	4.47	JR-1102-2P-5
		.153	3.90	.062	1.59	0.5	4.94	JR-1101-05P-5
						2	4.47	JR-1101-2P-5
		.181	4.60	.062	1.59	0.5	6.87	JR-1100-05P-5
						2	9.24	JR-1100-2P-5
		.125	3.20	.032	0.80	0.5	1.75	JR-1103-05P-5
						2	2.25	JR-1103-2P-5



### **SPECIFICATIONS**

MATERIAL

Frit Stainless S316L PEEK Ring **TOLERANCES** 

±0.05 mm (.002")

### SEE OPTIONS

Other dimensions and porosities are available on request. Minimum order quantity: 100 pieces. Please contact your local distributor or VICI directly.



- Stated porosities are only nominal and do not reflect the maximum pore size of a frit.
- See frit volume chart for help chosing the right frit and porosity for your application......109
- Frit volumes are theoretical and are calculated by multiplying overall frit volume times the porosity proportion.



Unidense type frits
Polyethylene86
Stainless87
Titanium87

**FRITS** 



### **SPECIFICATIONS**

### MATERIAI

Frit Titanium
Ring PEEK
TOLERANCES
±0.05 mm (.002")



### Titanium frits

PEEK-ENCASED

- For HPLC columns or in-line filters
- Biocompatible recommended for protein analysis
- Eliminate poorly swept volume and improves peak symmetry
- Higher corrosion resistance
- Various porosity and dimension options

In terms of biocompatibility, the frit is the critical spot for contributing metal ions to the mobile phase and for interaction with protein samples.

VICI Jour PEEK-encased frits with 1/5" or 1/4" OD ring are intended for HPLC columns with IDs of 3.2 and 4.6 mm. With the frit surrounded by a PEEK ring, the actual porous surface is reduced to the column ID.

The compressed PEEK ring forms a seal between the bottom of the fitting and the column end, preventing the mobile phase and the sample from entering the previously accessible poorly swept areas.

Sold in packages of 5.

Ring	OD	Frit (	OD	Thick	ness	Porosity	Frit volume	Product No.
inches	mm	inches	mm	inches	mm	μm	μL	
1/5	5.08	.102	2.60	.062	1.59	5	3.20	JR-1128-5P-5
.25	6.35	.125	3.20	.062	1.59	0.5	3.32	JR-1127-05P-5
						2	4.47	JR-1127-2P-5
		.181	4.60	.062	1.59	0.5	6.87	JR-1125-05P-5
						2	2.94	JR-1125-2P-5
						5	10.04	JR-1125-5P-5
						10	10.56	JR-1125-10P-5

### **SPECIFICATIONS**

MATERIAL

Frit UHMWPE
Ring PEEK
TOLERANCES
±0.05 mm (.002")

### **Polyethylene frits**

PEEK-ENCASED

- Biocompatible
- Metal free

Our polymer frits are made of UHMWPE (Ultra High Molecular Weight PolyEthylene). They are a competitively priced alternative to titanium and are completely metal free.

With the frit surrounded by a PEEK ring, the actual porous surface is reduced to the column ID. The compressed PEEK ring forms a seal between the bottom of the fitting and the column end, preventing the mobile phase and the sample from entering the previously accessible poorly swept areas.

Sold in packages of 5.

Ring	OD	Frit (	OD	Thick	ness	Porosity	Frit volume	Product No.
inches	mm	inches	mm	inches	mm	μm	μL	
1/5	5.08	.098	2.50	.059"	1.50	10	2.94	JR-1150-10P-5
.25	6.35	.181	4.60	.059"	1.50	10	11.31	JR-1151-10P-5

# OPTIONS AND MORE INFORMATION

See facing page.



- PEEK-encased titanium frits can also be used as spare parts frits for the PEEK in-line filter kit ...62
- PEEK-encased
   polyethylene frits can be
   used as spare parts for:
   PEEK in-line

filter kit .........62 PEEK columns......91

# OLUMNS

# COLUMNS



**PEEK COLUMNS • GUARD COLUMNS** 

### **COLUMNS INDEX**

### 

titanium contact the mobile

phase and sample.

### **COLUMN COUPLERS AND PLUGS**

Column coupler,	
one-piece fingertight 93	3
Column end plugs 93	3
Column end plugs, logotype 93	3
Packing kits 92	2
VICI Jour column packing	
kits are ready to use tools to	

VICI Jour column packing kits are ready-to-use tools to pack our PEEK columns and PEEK guard columns. Includes needed slurry reservoir, packing adapter, and packing seals.



### **SPECIFICATIONS**

MATERIAL
PEEK, black and natural
TOLERANCES
±0.05 mm (.002")

PRESSURE RATING (MAXIMUM)

210 bar (3000 psi) During packing, using a VICI Jour packing kit: 350 bar (5000 psi) PEEK columns 2.1 mm ID

• Biocompatible

• High pressure applications

Packing devices available

We have designed this column for narrow-bore applications, and for those when a limit amount of sample is available for analysis.

Because 2.1 mm ID columns operate at 1/5th of the flow rate of their 4.6 mm counterparts, the same sample mass injected on a 2.1 mm column will increase the detector signal response by a factor of 5. This greater mass sensitivity provides the same analysis as on a 4.6 mm column with only 20% of the sample.

All our columns are delivered without frits. Purchase frits separately.

	Length	Qty/pkg	Product No.
2.1 mm ID	30 mm	1	JR-65001NF
PEEK columns	50 mm	1	JR-65002NF
	100 mm	1	JR-65003NF
	150 mm	1	JR-65005NF
	250 mm	1	JR-65006NF
Spare parts			
Column end fitting		1	JR-062-C
PEEK-encased frit	Titanium, 5 μm	5	JR-1128-5P-5
	Polyethylene, 10 μm	5	JR-1150-10P-5



PEEK columns 4.0 mm ID

### **SPECIFICATIONS**

### MATERIAL

PEEK, black and natural **TOLERANCES** 

±0.05 mm (.002")

PRESSURE RATING (MAXIMUM) 350 bar (5000 psi)

During packing, using a VICI Jour packing kit: 350 bar (5000 psi)

Biocompatible

• High pressure applications

Packing devices available

Today's HPLC and IC applications are more demanding than ever. The limitations of traditional stainless steel cause significant problems for a growing number of important biotechnology and ion chromatography applications.

All our columns are delivered without frits. Purchase frits separately.

	Length	Qty/pkg	Product No.
4.0 mm ID	50 mm	1	JR-68181NF
PEEK columns	100 mm	1	JR-68182NF
	125 mm	1	JR-68183NF
	150 mm	1	JR-68184NF
	250 mm	1	JR-68185NF
	300 mm	1	JR-68186NF
Spare parts			
Column end fitting		1	JR-66140
PEEK-encased frit	Titanium, 5 μm	5	JR-1125-5P-5
	Polyethylene, 10 μm	5	JR-1151-10P-5



PEEK-encased frits
Titanium .................................89
Polyethylene frits ......89

4.0 mm ID PEEK

COLUMN TUBE

PEEK
COLUMN END
FITTING

COLUMNS

### In-line biocompatible guard column

- Biocompatible
- Easy to fill
- Packing device for do-it-yourself packing available

The VICI Jour in-line PEEK guard column system extends the life of valuable analytical columns by trapping contaminants from the sample and mobile phase, thereby preventing loss of retention.

Only PEEK and titanium contact the mobile phase and sample. This system is ideal for use with proteins or other biopolymers that may be contaminated or absorbed by steel surfaces. VICI Jour guard columns can be easily dry packed or slurry packed. Guard columns may be changed in minutes without the use of tools – all connections may be made by hand.

Guard column system includes:

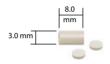
- Guard column cartridge
- 2 Titanium frits
- Housing
- O-ring

Guard column cartridge includes:

• Guard column cartridge

Replacement CTFE packing seal

• 2 Titanium frits (2 μm or 5 μm)



•	-		
		Qty/pkg	Product No.
Guard column system	2 μm	1	JR-68252TI2
	5 μm	1	JR-68252TI
Guard cartridge with	2 μm	1	JR-68242TI2
2 frits	5 μm	1	JR-68242TI

### **SPECIFICATIONS**

MATERIAI PEEK, titanium PRESSURE RATING < 350 bar (< 5000 psi)





### **SPECIFICATIONS**

### MATERIAL PEEK

### PRESSURE RATINGS

During packing, using a VICI Jour packing kit:

Column Packina pressure 350 bar 2.1 mm (5000 psi) 4.0 mm 560 bar

(8000 psi)

See column pages for operating pressure ratings.

### TECH TIP

Our packing kit is a "ready-to-use" tool to pack our PEEK guard cartridges. Every kit consists of the needed slurry reservoir, packing adapter, and packing seals.



This item requires a mechanical press to force the frits into position.



CE		Λ	LS0
) E	E	A	LJU

PEEK columns
2.1 mm ID9
4.0 mm ID 9

### **Packing kits**

**Spare parts** 

VICI Jour column packing kits are ready-to-use tools to pack our PEEK columns and PEEK guard columns. Every kit consists of the needed slurry reservoir, packing adapter, and packing seals.

### Product No.

JR-9

For 2.1 mm ID columns				
JR-67-250-2A				
JR-67140-1B				
JR-65011				
JR-67-250-4				
JR-67140-2B				
JR-66158				
For in-line biocompatible guard columns				
JR-27305				
JR-9				



### **SPECIFICATIONS**

### MATERIAI

Tubing **PEEK** Fittings PEEK PP Sleeve (Polypropylene)

### **THREADS**

10-32 male to 10-32 male PRESSURE RATING

<350 bar (5000 psi)

**SPECIFICATIONS** 

±0.05 mm (.002")

**SPECIFICATIONS** 

THREADS / MATERIAL

Nylon

POM

10-32

**TOLERANCES** ±0.05 mm (.002")

6-40

MATERIAL

Nylon

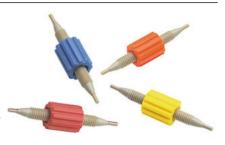
10-32 **TOLERANCES** 

**THREADS** 

### One-piece fingertight column couplers

- Self-adjusting zero dead volume for all fitting types
- · Four bore sizes
- Biocompatible

Choose from a variety of coupler IDs, indicated by the color of the sleeve. A unique feature of this column coupler is that it adapts automatically to fit all pilot lengths - Valco, Waters, Upchurch, Rheodyne, etc. Since the tubing bottoms out in any fitting detail, added void volume is minimal.



### Sold individually.

Color	ID	Product No.
Red	0.13 mm	JR-26501
Yellow	0.17 mm	JR-26502
Blue	0.25 mm	JR-26503
Orange	0.50 mm	JR-26504



Coupler shown installed between two columns (columns not included)

### Column end plugs – logotype

- Customizable with your logo and color (OEM version)
- Same features as column end plugs below

Ensure safe closure of valuable columns with your own customized column end plugs. Easy handling is guaranteed by the 5/16" wrench flat. Fit all columns with 10-32 thread.

Sold in packages of 10.

Color	Product No.
White	JR-4081-10
Black	JR-4082-10
Red	JR-4083-10
Green	JR-4084-10
Blue	JR-4085-10



### Column end plugs

- Seal analytical columns
- Fingertight (with wrench flats on 10-32 versions)

Fingertight column end plugs fit all columns with 10-32 threads. Easy handling is guaranteed by an additional 5/16" wrench flat, which allows the plug to be loosened by a wrench if it gets stuck. The long design and threading down to the ferrule ensure safe closing of valuable columns. Sold in packages of 10.

For small columns with 6-40 threads, fingertight (no wrench flat) plugs are available. Sold individually.

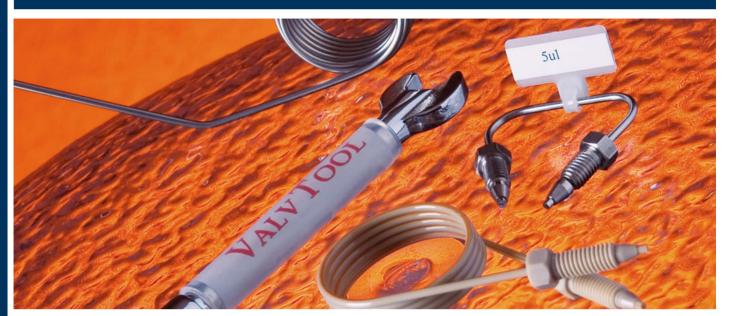
Threads	Qty/pkg	Color	Product No.
10-32	10	White	JR-4071-10
		Black	JR-4072-10
		Red	JR-4073-10
		Green	JR-4074-10
		Blue	JR-4075-10
6-40	1	Natural POM	JR-4061





PEEK tubing .....10-12

# SAMPLE LOOPS



VALCO • CHEMINERT® • RHEODYNE™

Sample loops are accurately sized for each valve type. However, with small volume loops, the tolerance on the ID of the tubing (±0.001") can have a significant effect on the volume. Therefore loop volume and loop appearance may differ from batch to batch.

### **SAMPLE LOOPS INDEX**

PEEK LOOPS	STAINLESS STEEL LOOPS
PEEK loops for:	Stainless loops for:
Cheminertpage 95	Cheminert
Rheodyne 95	Rheodyne 97
Valco 05	Valco 96

### PEEK LOOPS

- Wide range of volumes available
- Biocompatible

VICI Jour PEEK sample loops are made from striped color-coded PEEK tubing and PEEK fittings. PEEK is a mechanically strong, chemically inert polymer ideal for HPLC applications. Since our PEEK sample loops contain no metals or other extractable compounds, no foreign materials will be introduced into the system. Softener-free polyethylene caps are used to avoid contamination of the tubing.

PEEK sample loops are particularly well suited for separations involving proteins, peptides, nucleic acids or other samples of biological origin as well as in IC systems where metal traces may interact with ionic samples or release transition metals that may deactivate ion exchange columns.

PEEK hex-head nuts and PEEK ferrules provide reliable connections, and avoid twisting of the tube.



### **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.



### 🚺 TECH TIP

The tighter ID tolerance of the tubing minimizes the tolerance of the loop volume.



### SEE ALSO

ValvTool......102

### **SAMPLE LOOPS**



### **SPECIFICATIONS**

### MATERIAL

Loops PEEK Nuts PEEK Ferrules PEEK

Caps PE (Polyethylene)

**TOLERANCES** 

±0.025 mm (.001")

\* Recommended maximum permanent working pressure

### **PEEK loops**

### **FOR CHEMINERT VALVES**

Fit all Cheminert injection valves for 1/16" OD tubing (for example, C2).

Sample size	Pressure *		Product No.
	bar	psi	
<b>NEW</b> 1 μl	400	5800	JR-SLC-85-1
<b>NEW</b> 2 μl	400	5800	JR-SLC-85-2
<b>NEW</b> 3 μl	400	5800	JR-SLC-85-3
NEW 4 μl	400	5800	JR-SLC-85-4
5 μΙ	400	5800	JR-SLC-85-5
10 μΙ	400	5800	JR-SLC-85-10
20 μΙ	400	5800	JR-SLC-85-20
50 μl	400	5800	JR-SLC-85-50
100 μΙ	400	5800	JR-SLC-85-100
200 μΙ	240	3500	JR-SLC-85-200
250 μΙ	240	3500	JR-SLC-85-250

San	nple size	Pressure *		Product No.
		bar	psi	
3	00 μΙ	240	3500	JR-SLC-85-300
5	00 μl	240	3500	JR-SLC-85-500
	1 ml	240	3500	JR-SLC-85-1000



### **PEEK loops**

### FOR RHEODYNE VALVES

Fit all Rheodyne metal and metal-free valves.



Sample size	Pressure *		Product No.
	bar	psi	
<b>NEW</b> 1 μl	435	6300	JR-SLR-2190
<b>NEW</b> 2 μl	420	6100	JR-SLR-2191
<b>NEW</b> 3 μl	420	6100	JR-SLR-2192
<b>NEW</b> 4 μl	420	6100	JR-SLR-2193
5 μΙ	400	5800	JR-SLR-2194
10 μΙ	400	5800	JR-SLR-2196
20 μΙ	386	5600	JR-SLR-2195
30 μΙ	386	5600	JR-SLR-2200

Sample size	Pressure *		Product No.
	bar	psi	
40 µl	386	5600	JR-SLR-2201
50 μl	350	4500	JR-SLR-2202
100 µl	350	4500	JR-SLR-2204
200 μΙ	240	3500	JR-SLR-2206
250 μΙ	240	3500	JR-SLR-2207
500 μl	240	3500	JR-SLR-2210
1 ml	240	3500	JR-SLR-2222

### **PEEK loops**

### **FOR VALCO VALVES**

### Fit all 1/16" Valco W and UW type valves.

Sample size	Pressure *		Product No.
	bar	psi	
<b>NEW</b> 1 μl	400	5800	JR-SLV-75-1
NEW 2 μl	400	5800	JR-SLV-75-2
<b>NEW</b> 3 μl	400	5800	JR-SLV-75-3
NEW 4 μl	400	5800	JR-SLV-75-4
5 µl	400	5800	JR-SLV-75-5
10 µl	400	5800	JR-SLV-75-10
20 µl	400	5800	JR-SLV-75-20
50 μl	400	5800	JR-SLV-75-50
100 μΙ	400	5800	JR-SLV-75-100

Sample size	Press	ure *	Product No.
	bar	psi	
250 µl	240	3500	JR-SLV-75-250
500 μl	240	3500	JR-SLV-75-500
1 ml	240	3500	JR-SLV-75-1000





TECH TIPS • See general information about PEEK loops on facing page. • The ValvTool tightens nuts with tube or loop installed, providing easy access to many hard-toreach areas. . . . . . 102

Other sample sizes are available on request. Please contact your distributor or VICI Jour directly.



Chemical resistance ..110 About PEEK ......113

### **Spare parts**

### FOR PEEK CHEMINERT, RHEODYNE, AND VALCO LOOPS

Sold in packages of 5.

3010 III packaç	ges of 3.	Product No.
PEEK nuts	for use with double ferrules, 1/16" hex head long, 10-32	JR-5510-5
PEEK ferrules	single ferrules, 1/16" (Use 2 per nut, as shown)	JR-5005-5

**SAMPLE LOOPS** 

### STAINLESS STEEL LOOPS

- Wide range of volumes available
- Ultra high pressure resistance

VICI Jour stainless steel sample loops are made of high quality SS316. They are cut using an electrolytic cutting process, cleaned with ultrasound and high pressure steam to remove contaminants, dried, and capped with softener-free caps to avoid recontamination of the tubing.

All loops are supplied with stainless hex-head nuts and stainless ferrules for reliable connections.

### **SPECIFICATIONS**

### MATERIAL

Loops SS316 Nuts SS303 Ferrules SS316

Caps PE (Polyethylene)

### **TOLERANCES**

±0.05 mm (.002")

### PRESSURE RATING

≤ 1375 bar (≤ 20,000 psi)

### **Stainless steel loops**

### **FOR CHEMINERT VALVES**

Fit all Cheminert C1, C1CF, C2, C2V, C3, C52, C72H, and C72X type valves.

Sample size	Product No.
<b>NEW</b> 1 μl	JR-SLC-86-1
<b>NEW</b> 2 μl	JR-SLC-86-2
<b>NEW</b> 3 μl	JR-SLC-86-3
NEW 4 μl	JR-SLC-86-4
5 μΙ	JR-SLC-86-5
10 μΙ	JR-SLC-86-10
20 μΙ	JR-SLC-86-20
50 µl	JR-SLC-86-50
100 μΙ	JR-SLC-86-100
250 μΙ	JR-SLC-86-250
500 μl	JR-SLC-86-500
1 ml	JR-SLC-86-1000





### **Stainless steel loops**

### **FOR VALCO VALVES**

Fit all 1/16" Valco W and UW type valves.

Sample size	Product No.
5 μΙ	JR-SLV-76-5
10 μΙ	JR-SLV-76-10
20 μΙ	JR-SLV-76-20
50 µl	JR-SLV-76-50
100 μΙ	JR-SLV-76-100
250 μΙ	JR-SLV-76-250
500 μl	JR-SLV-76-500
1 ml	JR-SLV-76-1000



### **Spare parts** FOR STAINLESS CHEMINERT AND VALCO LOOPS

Sold in packages of 5.

Product No.
-------------

1/16" stainless nuts, 10-32	JR-ZN1-5
1/16" stainless ferrules	JR-ZR1S6-5



See facing page.



### **Stainless steel loops**

### FOR RHEODYNE VALVES

- Fit all Rheodyne valves
- Special loops for valve Model 7725

### Sample size Product No.

Jumple Size	Troductivo.
5 μΙ	JR-SLR-111
10 µl	JR-SLR-112
20 µl	JR-SLR-113
50 µl	JR-SLR-114
100 µl	JR-SLR-115
200 µl	JR-SLR-116
500 μl	JR-SLR-117
1 ml	JR-SLR-118
Loops for Rheodyne valve 7725, 1/16"	
3 µl	JR-SLR-110-77
5 μl	JR-SLR-111-77
10 μΙ	JR-SLR-112-77
20 μΙ	JR-SLR-113-77
50 μl	JR-SLR-114-77
100 µl	JR-SLR-115-77
200 µl	JR-SLR-116-77
200 μι	
500 μl	JR-SLR-117-77
	JR-SLR-117-77 JR-SLR-118-77



### **TECH TIPS**

- Not recommended for use with halides.
- We offer nuts in three lengths to facilitate wrench access on valves. For loops that will be replaced frequently, we recommend our longest nut - particularly when space is restricted. See long nuts......37
- The ValvTool tightens nuts with tube or loop installed, providing easy access to many hard-to-





Other sample sizes are available on request. Please contact your distributor or VICI Jour directly.



About stainless steel..114

### **Spare parts**

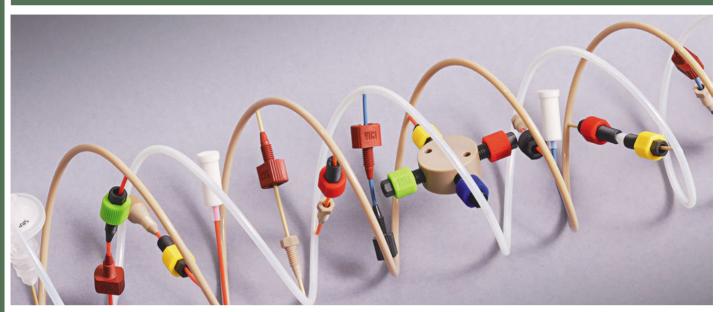
### FOR STAINLESS RHEODYNE LOOPS

Sold in packages of 5.

Product No.

1/16" Rheodyne type	For valve 7725, long head	JR-57-5
stainless nuts	X-long	JR-58-5
Stainless ferrules	1/16"	JR-59-5
	2-step Rheodyne type, 1/16"	JR-60-5

# ACCESSORIES



**TOOLS • STARTER KITS • BACK-PRESSURE REGULATOR** 

Our low pressure fittings are ideally suited for flow injection analysis, low pressure liquid chromatography, and stream sampling devices. They may be safely used at pressures up to 500 psi and temperatures to 50°C.

### **ACCESSORIES INDEX**

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Easy-Flange combi kit 99	File101
PEEK tubing elbows100	Hex key set103
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Color-It fingertight adapters 23	Tubing cutters
Work great with all our PEEK	For polymeric100
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1/16" tubing.	STARTER KITS
Color-Sleeve adapters	Easy flange combi kit
BACK-PRESSURE REGULATORS 102	PEEK fittings and tubing
Our back-pressure regulators improve baseline stability by preventing bubble formation in the flow cell.	Stainless starter kit

### **TOOLS**

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Stainless starter kit
Stainless steel fittings and
tubing
ChromBox kit
PEEK and stainless fittings and
tubing

### MORE INFO

### Color-Sleeve adapters turn PPS nuts into fingertight fittings and color-code different

solvent lines. . . . . . . . . 23



Color-It fingertight adapters work great with all our PEEK and stainless hex head nuts for 1/16" tubing......23







### **Easy-Flange kit**

- Handy tool for perfect flanges
- No heat or electricity required
- No contamination

The Easy-Flange flange-rolling tool for flanged fittings is suitable for PTFE and PTFE-like tubes with OD between 1/16" and 1/8". The tool forms the flange by applying a mechanical force and does not require electrical power.

The quality of the flange is considerably improved over other available methods, since the tubing is not stressed by heat and because the specially-designed negative conical profile of the flange-forming part yields an ideal shape for optimized sealing properties.

	Product No.
Easy-Flange kit	JR-201540
	*

Kit includes:		Qty	Product No.
Easy Flange Handle, co	Easy Flange Handle, complete		JR-201540B
Flanging discs with:	0.5 mm SS pin for PEEK tubing	1	JR-202235
	0.8 mm polymer pin	1	JR-201541
	0.8 mm titanium pin	1	JR-201554
	1.3 mm polymer pin	1	JR-201536
	1.3 mm titanium pin	1	JR-201537
Clean-Cut tubing cutte	er	1	JR-797
Tubing, PTFE, 1/16" x 0.75 mm ID		2 m	JR-T-4036
Plastic box		1	JR-201540L
Flanger/distance gauge		1	JR-201532

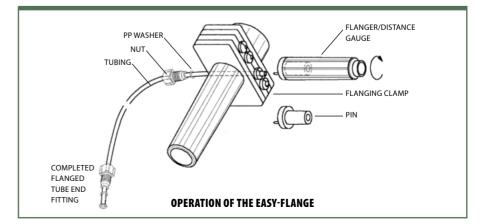


### Easy-Flange combi kit

In addition to the contents of the Easy-Flange kit, the combi kit includes 1/8" PTFE tubing, nuts/rings for tube end fittings, and color-coded adapters.

	Product No.
Easy-Flange combi Kit	JR-201539

Kit includes:		Qty	Product No.
Easy-Flange kit above		1	JR-201540
PP nuts,1/4-28,	White, for 1/16" tubing	1 pkg	JR-201094WH-10
flanged	Black, for 1/8" tubing	1 pkg	JR-201580BK-10
PP washers	For 1/16" tubing	10	JR-201926-10
	For 1/8" tubing	10	JR-201928-10
PTFE tubing	1/16" x 0.75 mm ID	3m	JR-T-4036-M3
	1/8" x 1/16" ID	3m	JR-T-6800-M3



### **OPTIONS**

Additional sizes of flanging discs are available.

Flanging disc with:

Polymer pin Product No.

1.0 mm JR-201662

1.5 mm JR-201663



Flanged fittings.... 44, 49 Polymeric tubing....9-17



ACCESSORIES

### **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.

Sold individually.

	Product No.
90° elbow	JR-357090
180° elbow	JR-357180

### **Tubing clip**

### THE LC TUBING ORGANIZER

- Fixes 1/16" and 1/8" tubing to beakers, flasks, or bottles
- Stainless steel spring for long life

This convenient device holds both 1/16" and 1/8" polymer tubes precisely where they should be in your beakers, flasks and bottles etc. up to 4 mm wall thickness. The stainless steel spring will keep your tubing clip working for a long time, and helps keep the solvent line in the solvent.

	Product No.
Tubing clip	JR-9001



### **Clean-Cut tubing cutter**

### FOR POLYMERIC TUBING

- Cuts PEEK, PTFE, ETFE, and other polymeric tubing
- No distortion to OD or ID
- Ideal for the most demanding LC applications
- For 1/16", 2mm, 3mm, 1/8" and 4mm tubing OD
- Safety lock secures the blade

Right angles and clean cuts are essential in LC to avoid leaks and dead volume. This handy tool makes it easy to get burr-free, perpendicular ends on polymeric tubing without distorting the outside diameter and/or closing the inside diameter of the tubing.

It is designed to cut PTFE, ETFE and polymers in general and PEEK capillary tubing in particular. The compact design and unique safety locking mechanism allow every chromatographer to keep one in their pocket.

	Product No.
Clean-Cut tubing cutter	JR-797
Replacement blade	JR-798

### **Guillotine tubing cutter**

- Cuts PEEK, PTFE, ETFE, and other polymeric tubing
- Ideal for less demanding LC applications

	Product No.
Guillotine tubing cutter	JR-794
Replacement blade	JR-795







### Stainless steel tubing cutter

**CUTTING WHEEL TYPE** 



- For 1/16" and 1/8" SS tubing
- Leaves smooth, uniform cuts
- Minimal deburring and/or reaming required
- Easy replacement of the cutting wheel

This is the ideal tool for cutting 1/16" and 1/8" stainless steel tubing, leaving smooth, uniform cuts requiring a minimum of deburring and/or reaming. The easily replaced cutting wheel scores tubing, leaving cuts which allow tube-totube and tube-to-frit connections.

Tubing cutter for metal tubing	JR-792
Replacement cutting wheel	JR-793



### Stainless steel tubing cutter

**PLIER TYPE** 

- For easy cutting of 1/16" tubing off a coil
- Reach "hard-to-get" places in an HPLC system
- Delivered in a plastic sheath

These pliers can be used for quick cuts for non-critical applications or at "hard to get" places. However, for scientific equipment, we strongly recommend our precut and cleaned stainless tubing.

Pro	
Tubing pliers for metal tubing J	R-796



### File

This deburring file is handy tool for cleaning up metal tubing ends.

	Product No.
Deburring file	JR-802



### TECH TIP

Between the sample injector, column, and detector, use our pre-cut stainless steel tubing, which has been electrolytically cut and steam cleaned......20



### SEE ALSO

Pre-cut stainless steel tubing......20



ACCESSORIES

### **HPLC Backpressure regulators**

- Improve baseline stability by preventing bubble formation in the flow cell
- Adjust backpressure without disconnecting anything
- Easy mount with 17 mm panel hole
- Three models, all with low dead volume
- Two models with completely biocompatible fluid path
- One model in stainless steel for preparative chromatography and SFC

Even properly degassed mobile phases may contain some dissolved gases that can release bubbles in the detector flow cell resulting in baseline noise and drift. VICI Jour backpressure regulators provide a quick and convenient way to improve the stability of detector baseline by providing a constant backpressure on the flow cell, which stops the release of dissolved gases from the mobile phase.

Because of their unique design, the backpressure regulators have a very small internal volume. The peak shape is not affected when the regulator is installed between two detectors in a multi-detector system, or between a detector and a fraction collector or fraction collector system. Typically, 90% or more of a given component's efficiency will be retained upon passing through the regulator.

A spring-loaded diaphragm provides the force that generates the back-pressure. Spring tension may be adjusted using the backpressure adjustment screw on the top of the regulator to vary the backpressure without disconnecting any lines.

Backpressure regulators are available in three ranges as noted below.

	капде		Housing	Product No.
Biocompatible	1-20 bar 15-300 psi		PEEK	JR-BPR1
			PCTFE	JR-BPR-1KF
	20-103 bar	300-1500 psi	PEEK	JR-BPR2
			PCTFE	JR-BPR-2KF
Stainless steel	90-300 bar	1300-4200 psi	SS	JR-BPR3

### **SPECIFICATIONS**

TUBING OD / THREADS

1/16" 10-32

MATERIAL

Wetted parts:

JR-BPR-1 and JR-BPR-2

Housing PEEK/PCTFE *Membrane* Polyimide

JR-BPR-3

Housing SS *Membrane* Polyimide

**DEAD VOLUME** 

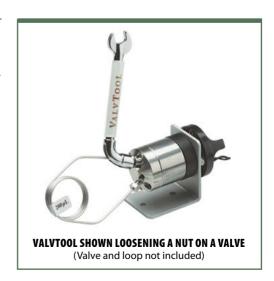
0.25 µl (theoretical)

### ValvTool

- For making connections in hard-to-reach areas
- Ideal for nuts with 1/4" hex and 5/16" heads

The ValvTool is a time-saving device which provides easy access to many hard-toreach areas. The unique design with its slotted wrench allows tightening of nuts where a loop or a capillary might otherwise make it difficult. The ValvTool is ideal for Valco and Rheodyne® valves and fittings, as well as most of the HPLC and PEEK fittings on the market with 1/4" and 5/16" heads.











### Ferrule removal kits

- Remove polymeric ferrules stuck in fitting details
- One version for 1/32" and 360 micron ferrules
- Another version for 1/16" and 1/8" ferrules

Ferrule removal kits are easy-to-handle tools for removing ferrules stuck in a fitting detail. Two versions cover four different ID's of ferrules.

		For use with	Product No.
Ferrule remov	/al kits	360 µm and 1/32" ferrules	JR-FRK1
		1/16" and 1/8" ferrules	JR-FRK2

### Hex key set

The hex key set has a wrench to fit any socket head screw on any VICI valve or actuator. Includes the following sizes: .050", 1/16", 5/64", 3/32", 7/64", 1/8", 9/64", and 5/32".

Product No	
Hex ket set	JR-HKS3

### **Tightening tools for PEEK fittings**

These handy tools make it fast and easy to tighten hexhead fittings. The green tool is for any 1/32" fitting with a 3/16" hex head nut, and the blue version fits the 1/4" hex common in fittings for 1/16" tubing.

Color	For use with	Product No.	
Green	1/32" fittings	JR-CNFT	
Blue	1/16" fittings	JR-ZNFT	

### Tweezer

Ideal for picking up small fittings, etc.

	Product No.	
Tweezer	JR-806	

### Wrenches

Open end wrenches for nuts with 1/4", 5/16", 3/8", or 7/16" heads.

		Product No.
Open end wrench	1/4" and 5/16"	JR-804
	3/8" and 7/16"	JR-805

### Socket wrenches

Hex-head socket wrench for nuts with 1/4" head.

	Product No.
Hex-head socket wrench	JR-SWH4





Deburring file ......101
Tools for tubing . 100-101



ACCESSORIES

### **PEEK starter kit**

- All parts biocompatible
- Ideal kit for all HPLC users

The PEEK starter kit is ideal for anyone working in the field of biochromatography. It consists of fittings, ferrules, tubing, and mobile phase filters, as well as a union, our Clean-Cut tubing cutter, and other useful accessories like our tubing elbows – all boxed together for a very competitive price.

For a number of interesting LC applications involving proteins, peptides, nucleic acids, or other samples of biological origin, metal systems may interact with samples or release transition metals that will deactivate columns. Replacing stainless steel parts (such as tubing fittings, ferrules, filters, etc.) with PEEK creates a biocompatible environment for samples and mobile phase.

Description		Product No.	
PEEK starter kit		JR-35P	
Kit includes:		Qty	Product No.
PEEK fittings	One-piece 10-32 fittings	10	JR-55020-1
	Fingertight 10-32 nuts	5	JR-5580
	Hex-head long 10-32 nuts	5	JR-5510
	1/16" double ferrules	20	JR-5004
	Union body, 0.25 mm bore	1	JR-061
PEEK tubing, 1/16" OD	0.25 mm ID x 3 m, blue stripe	1	JR-T-6001-M3
	0.50 mm ID x 3 m, orange stripe	1	JR-T-6002-M3
Filters	PEEK in-line filter kit	1	JR-68256
	Last Drop mobile phase filter, 5 μm, PTFE	1	JR-9000-0521
Accessories	Tubing elbow, 90°	2	JR-357090
	Tubing elbow, 180°	2	JR-357180
Tools	Clean-Cut polymeric tubing cutter	1	JR-797
	Tweezer	1	JR-806



### Stainless steel starter kit

**UHPLC** 

The kit consists of stainless fittings, ferrules, tubing, and solvent filters, as well as a union, our cutting-wheel type metal tubing cutter, and other useful items like our ValvTool. All boxed together for a very competitive price.

Description		Product No.	
Stainless steel starter kit		JR-35S	
Kit includes:		Qty	Product No.
Stainless	1/16" nuts, 10-32	10	JR-ZN1
fittings	1/16" nuts, 10-32, 19 mm long	10	JR-LZN1
	1/16" ferrules	20	JR-ZF1S6
	1/16" union with nuts/ferrules, 0.25 mm bore	1	JR-ZU1CS6
Stainless	1/16" x 0.25 mm x 3 m	1	JR-T-625-10-M3
tubing	1/16" x 0.50 mm ID x 3 m	1	JR-T-625-20-M3
	1/16" x 0.18 mm ID x 100 mm	2	JR-T-97030
	1/16" x 0.25 mm ID x 200 mm	2	JR-T-97060
Filters Mobile phase, 2 µm, 1/8" pipe OD		1	JR-3675-2
Stainless in-line, 0.25 mm ID		1	JR-68230-5
	Last Drop, 10 μm	1	JR-9000-0532
Tools	ValvTool 1/4" x 5/16" wrench	1	JR-800
	Open end wrench, 1/4" x 5/16"	1	JR-804
	Tubing cutter	1	JR-792
	Tweezer	1	JR-806



### MORE INFO

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### **ChromBox kit**

### Includes

- PEEK, PTFE, and stainless tubing
- PEEK and stainless nuts, ferrules, and unions
- Tubing cutters and wrenches
- More accessories, all in a convenient carrying case

The ChromBox is an all-purpose analytical spare parts kit for all our customers using HPLC. It contains the most often used spare parts made both of high quality Type 316L stainless steel as well as PEEK and PTFE.





Additional empty utility boxes are available to store all the chromatographic accessories in your lab, providing convenient storage near the chromatographic system.

Prod No.

Utility box JR-35U



### MORE INFO

### IN THE CHROMBOX KIT

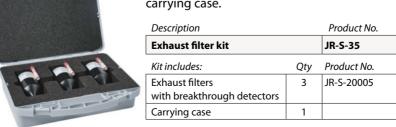
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Plier style stainless
tubing cutter101
ValvTool102
Open end wrench103
Deburring file101
Tweezer103

Description	Product No.			
ChromBox kit	JR-34N			
ChromBox kit includes:			Qty	Product No.
PEEK fittings	One-piece 10-32 fittings		5	JR-55020-1
	Fingertight 10-32 nuts		5	JR-5580
	Long hex-head 10-32 nuts		5	JR-5510
	1/16" double ferrules		10	JR-5004
	Union, 0.25 mm bore, body only		1	JR-061
SS fittings	1/16" nuts, 10-32, 13 mm long		5	JR-MZN1
	1/16" nuts, 10-32, 19 mm long		5	JR-LZN1
	1/16" ferrules		10	JR-ZF1S6
	1/16" union w/ nuts and ferrules, 0.50 mm bore		1	JR-ZU1MS6
Tubing	PEEK	1/16" x 0.25 mm ID x 3 m, blue stripe	1	JR-T-6001-M3
		1/16" x 0.50 mm ID x 3 m, orange stripe	1	JR-T-6002-M3
	PTFE	1/8" x 1/16" ID x 3 m	1	JR-T-6800-M3
	Stainless	1/16" x 0.25 mm x 3 m	1	JR-T-625-10-M3
		1/16" x 0.50 mm ID x 3 m	1	JR-T-625-20-M3
Filters	PEEK in-line filter kit		1	JR-68256
	Stainless Last Drop, 2 µm		1	JR-9000-0530
Accessories	Tubing elbow, 90°		1	JR-357090
	Tubing elbow, 180°		1	JR-357180
	Tubing clip		2	JR-9001
Tools	Clean-Cut polymeric tubing cutter		1	JR-797
	Plier style SS tubing cutter		1	JR-796
	ValvTool 1/4" x 5/16" wrench		1	JR-800
	Open end wrench, 1/4" x 5/16"		1	JR-804
	Deburring file		1	JR-802
	Tweezer		1	JR-806

### **NEW** Replacement exhaust filter kits

1/4-28

Includes three exhaust filters, three breakthrough detectors, and a carrying case.



# GENERAL REFERENCE

# GENERAL REFERENCE



CHEMICAL RESISTANCE • MATERIALS • GLOSSARY

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### **GENERAL CONVERSION FACTORS**

inches to mm	inches x 25.4 = mm
feet to meters	feet x 0.3048 = meters
meters to feet	meter x 3.28 = feet

bar to psi	bar x 14.5 = psi
psi to bar	psi x 0.069 = bar
psi to kPa	psi x 6.9 = kPa

### SEE ALSO Tubing ETFE.....13 FEP......16 PEEK ......9-12 Dual-layer ......11 Natural . . . . . . . . . 9 Solid-color.....12 Striped ..... 10 PFA......13 PTFE Natural . . . . . . . . . 15 Solid-color.....14 Stainless steel Premium grade .... 19 Welded......19



# **TUBING VOLUME/LENGTH CONVERSION CHART**

1/16" OD tubing sold by VICI typically has an ID tolerance of  $\pm 0.025$  mm. 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, according to the equation

 $V = \Pi (\frac{1}{2} D)^2 L$ .

Tubing ID			ume/ gth
mm	inches	μl/cm	μl/in
0.050	.002"	0.02	0.05
0.064	.0025"	0.03	0.08
0.075	.003"	0.04	0.12
0.10	.004"	0.08	0.21
0.13	.005"	0.13	0.32
0.17	.0067"	0.23	0.58
0.18	.007"	0.25	0.63
0.25	.010"	0.51	1.29
0.38	.015"	1.14	2.90
0.50	.020"	2.03	5.15
0.64	.025"	3.17	8.04
0.75	.030"	4.56	11.58

Tubing ID		Volume	/length
mm	inches	μl/cm	μl/in
1.00	.040"	8.11	20.59
1.40	.055"	15.39	38.93
1.52	.060"	18.24	46.33
1.59	.062"	19.86	49.47
1.65	.065"	21.38	54.38
1.70	.067"	22.70	57.78
1.78	.070"	24.83	63.06
2.00	.079"	31.42	80.32
2.10	.083"	34.64	88.66
2.16	.085"	36.61	92.99
2.40	.094"	45.24	113.72
3.18	.125"	79.4	201
3.76	.148"	111	282
4.35	.171"	149	376

# MAXIMUM RECOMMENDED WORKING PRESSURES FOR STAINLESS STEEL TUBING

# WORKING PRESSURE FOR STAINLESS STEEL TUBING

The working pressure for stainless tubing is calculated from the burst pressure by dividing by 2.5.

The theoretical burst pressure(s) were calculated using Lame's formula and a safety factor of 2. Additionally, these results assume the tubing is not subject to any other stresses (e.g. temperature different from ambient, bends) that would influence the calculations. The end user must decide the safe maximum working pressure based on this information and the specific application.

Note: All pressure ratings are calculated for room temperature.

	PREMIUM GRADE STAINLESS TUBING						
OD	ID (mm)	bar	psi		OD	ID (mm)	
1/32"	0.13	1735	25,160		1/8"	0.68	
	0.18	1601	23,225			0.75	
	0.25	1395	20,230			1.00	
	0.50	734	10,645			1.50	
1/16"	0.13	1902	27,580			1.70	
	0.18	1835	26,610			2.16	
	0.25	1735	25,160		1/4"	4.65	
	0.50	1395	20,230				
	0.75	1067	15,480				
	1.00	734	10,645				

OD	ID (mm)	bar	psi
1/8"	0.68	1622	23,520
	0.75	1572	22,800
	1.00	1406	20,400
	1.50	1075	15,600
	1.70	960	13,920
	2.16	662	9,600
1/4"	4.65	554	8,040

WELDED STAINLESS TUBING				
OD	ID (mm)	bar	psi	
1/16"	0.13	1871	27,140	
	0.18	1794	26,025	
	0.25	1717	24,910	
	0.50	1384	20,080	
	0.75	1076	15,610	
	1.00	743	10,780	
1/8"	2.10	680	9,860	
1/4"	4.65	538	7,800	



ACCESSORIES

# **MAXIMUM RECOMMENDED WORKING PRESSURES - PEEK TUBING**

OD	<b>ID</b> (μm)	bar	psi
360 μm	50	358	5200
	75	345	5000
	100	300	4400
	125	275	4000
	150	240	3500

			PEEK	TU	BING
OD	ID (mm)	bar	psi		OD
1/32"	0.050	455	6600		1/16"
	0.064	455	6600		
	0.075	455	6600		
	0.100	455	6600		
	0.13	414	6000		
	0.15	400	5800		
	0.18	386	5600		
	0.20	369	5350		
	0.25	338	4900		
	0.38	269	3900		
	0.50	207	3000		

שוווע			
OD	ID (mm)	bar	psi
1/16"	0.050	480	7000
	0.064	480	7000
	0.075	470	6800
	0.100	460	6700
	0.13	460	6700
	0.18	440	6400
	0.25	420	6100
	0.50	345	5000
	0.75	262	3800
	1.00	179	2600
	1.40	55	800

OD	ID (mm)	bar	psi
1/8"	0.75	379	5500
	1.59	248	3600
	2.00	179	2600
1/4"	3.17	227	3300

# **MAXIMUM RECOMMENDED WORKING PRESSURES - POLYMERIC TUBING**

OD	ID (mm)	bar	psi
1/32"	0.13	78	1100
	0.15	78	1100
	0.18	72	1050
	0.25	68	980
	0.38	51	750
	0.50	35	500
1/16"	0.25	117	1700
	0.50	96	1400
	0.75	76	1100
	1.00	52	750

FEP TUBING				
OD	ID (mm)	bar	psi	
1/8"	1.59	69	1000	
	2.10	41	600	
	2.40	30	345	
3/16"	3.18	41	600	
1/4"	3.96	45	660	
	4.35	45	650	
	3/16"	29	420	
5/16"	1/4"	22	330	

OD	ID (mm)	bar	psi
1.0 mm	0.50	62	900
2.0 mm	1.00	62	900
3.0 mm	1.00	82	1200
	2.00	41	600
4.0 mm	3.00	28	420

ETFE TUBING									
OD	ID (mm)	bar	psi						
1/32"	0.25	152	2200						
1/16"	0.25	186	2700						
	0.50	152	2200						
	0.75	117	1700						
	1.00	83	1200						
1/8"	1.59	110	1600						
	2.40	49	710						
1/4"	4.80	48	710						
3.0 mm	1.00	138	2000						
6.0 mm	4.00	69	1000						

PFA TUBING									
<b>ID</b> (μm)	bar	psi							
0.50	100	1450							
0.75	76	1100							
1.00	55	800							
1.59	72	1050							
1.70	65	940							
3.20	41	600							
4.00	49	720							
4.35	45	650							
4.80	31	450							
	ID (μm) 0.50 0.75 1.00 1.59 1.70 3.20 4.00 4.35	ID (μm) bar 0.50 100 0.75 76 1.00 55 1.59 72 1.70 65 3.20 41 4.00 49 4.35 45							

	PTFE TUE	BING			
OD	ID (mm)	bar	psi		
1/16"	0.18	62	900		
	0.25	55	800		
	0.50	48	700		
	0.75	37	550		
	1.00	25	350		
1/8"	1.59	35	500		
	2.40	18	250		
1/4"	4.75	17	250		
2.0 mm	1.70	10	150		
4.0 mm	3.00	17	250		
4.76 mm	3.76	14	200		



The quoted maximum working pressure(s) were calculated from the burst pressure and the factor 2.5. These results assume the tubing is at room temperature.



# **TOLERANCES - PEEK TUBING**

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.

PEEK TUBING									
Tubing OD	ID (±)								
1/32"	0.025 mm	0.025 mm							
1/16"	0.050 mm	0.025 mm							
1/8"	0.075 mm	0.075 mm							
1/4"	0.100 mm	0.100 mm							

# **TOLERANCES - POLYMERIC TUBING**

ETFE and PFA								
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:								

 $OD \pm 0.07$ Wall  $\pm 0.08$ 

	FEP								
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								

P	TFE
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

# **FRIT VOLUME** STAINLESS, TITANIUM, AND POLYMER FRITS

Internal frit volumes are theoretical and are calculated by multiplying the total frit volume by the proportion of the pores in the frit (porosity proportion). Stated frit porosities are only nominal and do not relect the maximum pore size of a frit. The chart below will help you in selecting the right frit for your application.

Porosity in µm	Max pore size in µm	Particles retained in μm	Porosity in %			
0.2	1	≥ 1.0	22			
0.5	2	≥ 1.5	26			
1	3	≥ 3.0	30			
2	5	≥ 3.5 - 5.0	35			
5	15	≥ 15.0	38			
10	30	≥ 30	40			

# STANDARD THREADS

Following are illustrations of standard threads for VICI Jour fittings. Place your fitting on the drawings below to identify the thread size.

2-56	6-40	10-32	5/16-24	1/4-28	1/2-20
for 360 µm OD tubing	for 1/32" OD tubing	for 1/16" OD tubing	for 1/8" OD tubing	for 1/16" and 1/8" OD tubing	for 1/4" OD tubing



# **CHEMICAL RESISTANCE OF** PEEK AT HIGH TEMPERATURE

Chemical	°C	°F	Rating
Acetic acid	200	420	
Ammonia gas	200	420	
Carbon monoxide gas	200	420	
Ethylene glycol	200	420	0
Ethylene glycol (50%)	140	284	
Hydrogen sulphide gas	200	420	
Liquid ammonia	200	420	0
Methane	200	420	
Methylethylketone	200	420	
Nitrobenzene	200	420	
Phosphoric acid (50%)	200	420	
Sodium hydroxide solution	200	420	
Sulphuric acid (50%)	200	420	
Sulphur dioxide gas	200	420	

# CHEMICAL CHARACTERISTICS OF PEEK®

PEEK exhibits excellent resistance to a wide range of organic and inorganic chemicals. The compatibility of PEEK with many chemicals at 20°C (68°F) has been investigated and the results for unreinforced grades are given in the table below.

PEEK is compatible with almost any of the solvents used in HPLC. The only solvents which will attack PEEK are concentrated nitric acid and sulphuric acids. However, PEEK tubing can safely withstand 20-30% nitric acid when passivating a system.

Methylene chloride, DMSO, and THF may cause swelling in PEEK. The highest temperature we recommend for PEEK is 100°C. The tubing will maintain the stated pressure rating up to this temperature.

# **CHEMICAL RESISTANCE OF PEEK AND OTHER POLYMERS**

# A

Resistance at 20°C	PEEK	PA	PE	PP	PPS	FEP	ETFE	PFA	PTFE	NBR	EPDM	PCTFE
Acetaldehyde			_	_	_		_		_			-
Acetic acid (20 %)												-
Acetic acid (80 %)							_			-	-	-
Acetic acid (glacial)												-
Acetone			-									
Acetonitrile			_	_								
Acrylic acid		-	_	_			_		-	-	-	-
Ammonia, anhydrous			_	_			_		_	-	-	
Ammonia (10 %)			-							-	-	
Ammonia (Liquid)			_	_			_		-	-	_	
Ammonium hydroxide		-								-	_	_
Aqua regia			-	-			-		-			
Aromatic hydrocarbons		-					-		_	-	-	-

### B

Resistance at 20°C	PEEK	PA	PE	PP	PPS	FEP	ETFE	PFA	PTFE	NBR	EPDM	PCTFE
Benzene										_	-	-
Benzoic acid		_	_	_			_		_	_	_	_
Benzaldehyde		_	_	_			_		_	_	_	
Bromine/dibromoethane		_	_	_			_		_	_	_	_
Bromine (dry)		_	_	_			_		_	_	_	_
Bromine (wet)	_	0	_	_			_		_			
Boric acid		_	-	-			_		-	-	_	
Butanol		_								_	_	

# **LEGEND**

- Suitable
- Marginal; dependent on application
- Not recommended
- No data available



# C

Resistance at 20°C	PEEK	PA	PE	PP	PPS	FEP	ETFE	PFA	PTFE	NBR	EPDM	PCTFE
Calcium hydroxide		-	_	-			_		_	-	_	_
Carbon tetrachloride		-	_	-			-		-	-	_	_
Chlorine (gas)			-	-			-		-			
Chlorine (liquid)	-		_	_	-		_		_	_	_	_
Chloroacetic acid		_								-	_	_
Chlorobenzene			_	_			_		_	-	_	_
Chloroform			-							-	_	-
Cyclohexane			-							-	_	_
Cyclohexanone				_						_	-	_

Resistance at 20°C	PEEK	PA	PE	PP	PPS	FEP	ETFE	PFA	PTFE	NBR	EPDM	PCTFE
Diethylamine		_	•	•	-					_	_	_
Diethylether			_	_			-		_	-	_	_
Diethylformamide												_
Dioxane			_	_					_	_	_	_

Resistance at 20°C	PEEK	PA	PE	PP	PPS	FEP	ETFE	PFA	PTFE	NBR	EPDM	PCTFE
Ethanol									•	•		
Ether				•						-	_	
Ethyl acetate												
Ethylene chloride	_		-							-	_	
Ethlene glycol												

# H

Resistance at 20°C	PEEK	PA	PE	PP	PPS	FEP	ETFE	PFA	PTFE	NBR	EPDM	PCTFE
Heptane												_
Hexane			-							-	_	
Hydrobromic acid (100%)	-	_	-				_			-	_	_
Hydrobromic acid (20%)	-	-	-		_					-	_	
Hydrochloric acid (100%)		-	_							-	_	
Hydrochloric acid (20%)		_								-	_	
Hydrofluoric acid (100%)	-	-	_							-	_	_
Hydrofluoric acid (20%)	_	-								-	_	
Hydrogen peroxide (100%)		_					_			_	-	_
Hydrogen peroxide (50%)		_			_					_	_	-
Hydrogen peroxide (10%)		_								_	_	_

Resistance at 20°C	PEEK	PA	PE	PP	PPS	FEP	ETFE	PFA	PTFE	NBR	EPDM	PCTFE
Iso-octane		_	_				_			-	_	_
Isopropanol							-			0		
Isopropyl ether	_				_		_			_	_	_

# K

Resistance at 20°C	PEEK	PA	PE	PP	PPS	FEP	ETFE	PFA	PTFE	NBR	EPDM	PCTFE
Ketones		_					_			_	_	

# Chemical resistance • PEEK and other polymers



# **GENERAL REFERENCE**

# M

Resistance at 20°C	PEEK	PA	PE	PP	PPS	FEP	ETFE	PFA	PTFE	NBR	EPDM	PCTFE
Methanol												
Methyl dichloride	-		_		_		_		_	-	_	_
Methyl ethylketone										-	_	
Methlyene chloride												

# N

Resistance at 20°C	PEEK	PA	PE	PP	PPS	FEP	ETFE	PFA	PTFE	NBR	EPDM	PCTFE
Nitric acid (100%)		_			-					_	_	
Nitric acid (20%)		_								_	_	

# P

Resistance at 20°C	PEEK	PA	PE	PP	PPS	FEP	ETFE	PFA	PTFE	NBR	EPDM	PCTFE
Pentane		_	•	-	-		-			-	_	_
Perchloric acid		-			-					-	-	_
Phenol (dilute)		-	_	-			_		_	-	_	_
Phenol (concentrated)	-	-	_	-			_		_	-	_	_
Phosphoric acid (100%)		_								_	-	_
Phosphoric acid (40%)		_								_	-	_
Potassium hydroxide (dilute)		_	_	-			_		_	_	_	
Potassium hydroxide (70%)		_	_	-			_		_	_	_	_
Propanol		0	_	_	_		_		_			_
Pyridine		_								_	_	_

# S

Resistance at 20°C	PEEK	PA	PE	PP	PPS	FEP	ETFE	PFA	PTFE	NBR	EPDM	PCTFE
Sodium hydroxide (80%)			-				_			_	_	
Sodium hydroxide (20%)										_	_	
Sulfuric acid (100%)		-					•		•	_	_	_
Sulfuric acid (75%)	-	0					•	•	•	_	-	_
Sulfuric acid (40%)										_	_	_

# T

Resistance at 20°C	PEEK	PA	PE	PP	PPS	FEP	ETFE	PFA	PTFE	NBR	EPDM	PCTFE
Tetrahydrofuran										-	_	
Toluene										-	_	_
Trichloroacetic acid										-	_	_
Trichloroethane			_		_		_			-	_	_
Trichloroethylene			_	_			_		_	-	_	_
Triethylamine	_		_		_					-	_	_

Resistance at 20°C	PEEK	PA	PE	PP	PPS	FEP	ETFE	PFA	PTFE	NBR	EPDM	PCTFE
Water												
Water (distilled)		_								_	_	

# X

Resistance at 20°C	PEEK	PA	PE	PP	PPS	FEP	ETFE	PFA	PTFE	NBR	EPDM	PCTFE
Xylene			_	_			_		_		_	п

# **LEGEND**

- Suitable
- Marginal; dependent on application
- Not recommended
- No data available



# PROPERTIES OF POLYMERS

### CTFE / PCTFE

Polychlorotrifluoroethylene, abbreviated as CTFE or PCTFE, is the generic name for the material produced as Kel-F®. CTFE/PCTFE features high tensile strength and good chemical resistance. It is nonflammable, with heat resistance up to 175°C. The presence of a chlorine atom, which has a greater atomic radius than fluorine, results in a melting point of ~210 - 215°C – relatively low for a fluoropolymer. CTFE/PCTFE is resistant to attack by most chemicals and oxidizing agents; however, it swells slightly in halocarbon compounds, ethers, esters, and aromatic solvents.

### **EPDM**

Ethylene Propylene Diene Monomer. Ethylenepropylene synthetic rubbers offer excellent heat resistance as well as resistance to aging from oxidation, ozone, and weather due to their stable, saturated polymer backbone structure. As non-polar elastomers, they have good electrical resistivity as well as resistance to polar solvents such as water, acids, alkanes, phosphates, esters, and many ketones and alcohols.

### **ETFE**

Ethyltrifluoroethylene is the generic name for the material such as Tefzel®. A fluoropolymer used for sealing surfaces, it is resistant to most chemical attack; however, some chlorinated chemicals will cause a physical swelling of ETFE tubing.

### FEP

Fluorinated ethylene propylene is another member of the fluorocarbon family with similar chemical properties. It is generally more rigid than PTFE, with somewhat increased tensile strength. It is typically more transparent than PTFE, slightly less porous, and less permeable to oxygen. FEP is not as subject to compressive creep at room temperature as PTFE, and because of its slightly higher coefficient of friction is easier to retain in a compression fitting.

### **FFKM**

FFKM (perfluorinated rubber) is a perfluoroelastomer, a class of materials such as Kalrez<sup>®</sup>. It is chemically resistant to polar solvents, organic solvents, inorganic and organic acids and bases, fuels, oils, lubricants, inorganic salts, aldehydes, metal halogen compounds, chlorine, sodium hydroxide, aromatics, alcohols, steam, and strong oxidizing agents. The normal temperature service range is -40°C to 315°C, with up to 343°C in intermittent service.

### **PEEK™**

Considered relatively inert and biocompatible, polyetheretherketone 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.

### PEEK-HT / PEK

PEEK-HT or PEK, like PEEK™, belongs to the class of PolyArylEtherKetones (PAEK). This class of semi-crystalline high performance engineering thermoplastics exhibits a unique combination of thermal stability, chemical resistance, and excellent mechanical properties over a wide temperature range. In comparison to PEEK, PEEK-HT provides better thermal stability and higher rigidity, which establishes more extensive processing and better durability under compression load.

### PFA

Perfluoroalkoxy is a fluorocarbon with chemical and mechanical properties similar to FEP. More rigid than either PTFE or FEP. Commonly used for injection molded parts.

Continued, next page.



### PPS

Polyphenylene sulphide is the generic name for the material produced as Fortron<sup>®</sup>, Ryton<sup>®</sup>, and Techtron®. It is very resistant to all solvents, acids, and bases.

Polytetrafluoroethylene is the generic name for the class of materials such as Teflon®. It offers superior chemical resistance but is limited in pressure and temperature capabilities. Because it's so easy to handle, it is often used in low pressure situations where stainless steel might cause adsorption. PTFE tubing is relatively porous, and compounds of low molecular weight can diffuse through the tubing wall.

### **POLYACETAL**

Polyacetal or polyoxymethylene (POM) is the generic name for the material produced as Delrin®. It is an engineering polymer with high mechanical strength and rigidity, excellent dimensional stability and excellent resistance to moisture and solvents. It has a wide useful temperature range in air of -50°C to +90°C. It is not suitable for use with acids, alkalis, or oxidizing agents, and has limited resistance to dichloromethane and methyl ethyl ketone.

### **POLYAMIDE**

Polyamide is a thermoplastic polymer also known as nylon. Nylon has very good physical properties, but moisture can have a significant effect. It exhibits very good heat resistance and excellent chemical and wear resistance.

### **POLYETHYLENE**

Polyethylene is a semi-crystalline material with excellent chemical resistance, plus good fatigue and wear resistance. Polyethylenes provide good resistance to organic solvents and staining, and have low moisture absorption rates.

### **POLYPROPYLENE**

Widely used polymer for non-wetted parts. Attacked by strong oxidizers as well as aromatic and chlorinated hydrocarbons.

### **PVDF**

PVDF, or polyvinylidene fluoride, has excellent resistance to most mineral and organic acids, aliphatic and aromatic hydrocarbons, and halogenated solvents. Poor resistance to acetone, MEK, THF, and potassium and sodium hydroxide. Often supplied as Kynar®.

# **PROPERTIES OF METALS**

### 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.

### **STAINLESS STEEL, TYPE 303**

Recommended for GC use and general purpose connections, combining excellent machining characteristics with good resistance to corrosion and high temperature oxidation. Susceptible to attach by chlorides, iodides, and bromides.

### TITANIUM

Although it is more difficult to machine than common alloys containing aluminum and vanadium, VICI 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.



# **SAFETY**

- 1. Never tighten or loosen a fitting or valve connection while it is pressurized. Provisions should be made within the system to release pressure via suitable valve components.
- 2. Do not exceed pressure or temperature specifications. Note that in many cases, the system pressure is limited by the tubing used, not the fittings.
- 3. The use of toxic or hazardous fluids requires extra caution during operation or maintenance. The user is responsible for insuring safe operation and for understanding the nature of the fluids and chemistry involved.
- 4. The use of thread lubricants or sealants is required only on tapered pipe threads. These sealants and lubricants may have different temperature limits or chemical compatibility than the valves or fittings.

# **TRADEMARKS**

Trademarks of materials and products found in VICI Jour products or referred to in this website. Please contact us regarding errors, omissions, or discrepancies.

Cheminert® Valco Instruments Co. Inc. and VICI AG International

Delrin<sup>®</sup> E.I. duPont de Nemours

Duran® Schott AG

Fortron® Fortron Industries LLC Kalrez® DuPont Dow Elastomers

Kel-F<sup>®</sup> 3M Company

Kynar<sup>®</sup> Elf Atochem North America Inc. Nanovolume<sup>®</sup> Valco Instruments Co. Inc.

PEEK™ Victrex plc
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### **CAUTION**

The improper selection or use of components or systems described herein can cause personal injury or property damage.

The system designer and user are solely responsible for the selection of products suitable for the specific requirements of the application, as well as proper installation, operation, and maintenance of these products.

Compatibility with hazardous fluid streams, environmental conditions, and mechanical requirements are the responsibility of the user.



### **ADAPTER**

A type of fitting which provides a method of joining two components of differing thread types or systems.

### **ANALYTICAL COLUMN**

A long narrow tube packed or coated with one of many available chemically diverse compounds that can separate the components in a sample according to their boiling point, polarity, molecular size, or combination thereof. A column of some kind is used with most chromatographic techniques.

B

### **BIOCOMPATIBILITY**

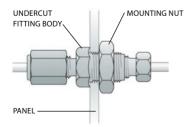
Defines the materials used in a system (i.e. fittings, tubing, and valves) that do not change the bioactivity of the biological substances that come into contact with the surface of these materials. Note that in chromatographic systems, the tubing and column contribute over 99% of the surface area and the valves and fittings are insignificant.

### **BORE**

The diameter of the minimum orifice through the fitting. See capillary bore, through-type bore, and large bore.

### **BULKHEAD FITTING**

A type of fitting in which the fitting body is inserted through an instrument panel or mounting bracket, to which it is affixed with a mounting nut. The Valco fitting body is uniquely undercut so that it "bites" into the panel when the mounting nut is tightened, eliminating the need for a lock washer.



### **BUTT CONNECTION**

A type of connection in which the two tube ends are directly and squarely in contact, usually effected with a through-type union. Typically used with fused silica connections, or small bore metal tubing.

# C

### CAP

A cap is used to dead-end a piece of tubing with a nut and ferrule attached.

### **CAPILLARY BORE**

The smallest available standard orifice in a given fitting design (usually 0.25 mm). Typically denoted by suffix "C" in the product number.

### **COLLAPSIBLE FERRULE**

A one-piece ferrule engineered to collapse as it is tightened. The collapse takes place in two very narrow areas, and results in a very effective seal with virtually no distortion of the tubing ID and no dead volume. Patent No. 6,575,501

### **COMPRESSION FITTING**

A style of fitting in which a threaded nut compresses a tapered ferrule onto tubing as the nut is tightened. Valco metal ferrules cut a ring into the tubing wall while polymer types rely on surface compression to form a seal.

### **CONNECTING VOLUME**

The volume between two or more connections. This may be cleanly swept, thus not contributing to peak distortion, or may be "dead volume" such as that found in fittings with larger bores than the connecting tubing.

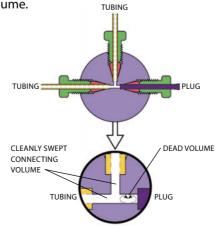
### **CROSS**

A type of distribution fitting which connects four pieces of tubing, arranging them in the pattern of a cross.



### **DEAD VOLUME**

Any volume which a component introduces to a system that is not cleanly swept and relies on diffusion to clear the space. See connecting volume.





### **DETAIL**

See fitting detail.

### **DISTRIBUTION FITTING**

A generic term for tees, crosses, and manifolds, used to provide multiple access points to "distribute" a gas or liquid through a system. CAUTION! Using a distribution fitting in reverse to coalesce multiple streams may create dead volume. Special manifolds are available for this application.

### F

### FIA

Flow Injection Analysis.

A simple and versatile analytical technique for automating wet chemical analyses based on the manipulation of a sample zone formed from the injection of the sample into a continuous stream of fluid used as a carrier.

### **FEMALE NUT**

A nut with female threads; also called external nut.

### **FERRULE**

One of the components of a compression fitting; the conical piece of metal or plastic that compresses onto the tube as it is forced into a tapered seat. Valco metal ferrules are unique in that they attach to and seal at the tube by cutting a shallow ring into it, instead of by actually swaging it. This is preferable since it introduces no flow restriction.

### **FILTER**

A type of union or reducing union which traps the particulates in a stream. The filtering element is typically a mesh screen or sintered frit.

### FINGERTIGHT FITTING

A fingertight fitting is a knurled or winged nut which is hand tightened to compress the ferrule. Note: Polymeric ferrules rely on surface compression to form a seal and hold the tube by friction.

### FITTING DETAIL

A fitting detail includes the thread to accept the nut, a tapered ferrule seat, and the pilot for the tube. The nut, ferrule, and tube go into the fitting detail to make the seal.

Valco fitting details have the perfect shape, with a smooth transition from the ferrule seat into the cylindrical and threaded part. Many other fitting details are poor in design where the ferrule is forced in a too shallow ferrule seat. The result is a "nicked" ferrule which can no longer apply its sealing force to the front of the ferrule.

# Valco fitting detail Other style

## **FLANGED FITTING**

A type of fitting used with fluoropolymer tubing (PTFE, FEP) in which a flange is made at the tube end. Connections are made at the flange either by compressing the flange into a flat detail (typically 1/4-28 threaded) or by butting two flanges together. A special flanging tool forms the flanges.

### **FLANGELESS FITTING**

Similar in application to the flanged fitting, but the flange is not required. A ferrule system is used which grips/compresses the tube. This fitting type can be used with virtually any polymeric tubing since the tube end does not have to be formed, but simply square cut. Typically used in 1/4-28 threaded fittings, it is usually interchangeable with flanged fittings.

### FRIT

A filter element typically made of stainless, Hastelloy, Titanium, or polymers, usually 0.75 mm or 1 mm thick. Frits may provide better filtration than screens, but because they are thicker there is greater mixing potential, and they typically result in increased pressure drop.



### G

### GC

Gas Chromatography.

An analytical method incorporating an injection system, analytical column, controlled temperature zone, and detector. An inert carrier gas moves the sample through the column, which separates the sample components into discrete bands which are measured as they pass through the detector.

### **GUARD COLUMN**

A column used in series between the injector and analytical column to prevent certain types of components from entering the analytical column.

### н

### HPLC

High Performance Liquid Chromatography. An analytical system consisting of an injector, pump, analytical column, and detector. Using a liquid mobile phase, the sample is pumped through the column, where it is separated into discrete sample component bands which are detected and measured as the bands elute from the column.

Internal diameter.

### INFRT

Technically, unreactive with other substances; however, in the instrumentation field, "inert" is a relative term. Often polymers are termed inert but are soluble in some fluids and can react with some compounds.

### INTERNAL FITTING

A type of compression fitting in which the fitting body has female threads; an internal nut has male threads.

## LC

Liquid Chromatography.

Any of a variety of low to medium pressure techniques which use a liquid mobile phase as the carrier to move sample. Similar to HPLC.

### **LARGE BORE**

A bore that is larger than the standard for a given fitting; a fitting ordered with a large bore will have a larger flow orifice than the standard or capillary bore fitting of the same design. Denoted by suffix "L" in the product number.

### **LUER ADAPTER**

An adapter that connects a tapered luer fitting (square nib) of a syringe to a tube or tube fitting.

### M

### MALE NUT

A nut with male threads.

The point at which a ferrule, nut, and tube are assembled in the fashion which will effect a leak-free seal. In most compression fittings, that is accomplished by compressing the tube with the small end of the ferrule. With Valco metal ferrules, the ferrule usually makes up on the tube by cutting a shallow ring in it.

### MANIFOLD

A type of distribution fitting in which a single source is directed to multiple outlets, or vice versa. Caution! Using a common distribution fitting in reverse to merge multiple streams may create dead volume. Special manifolds are available for this application.

### MICROBORE COLUMN

A liquid chromatography column of narrow bore (typically 2 mm or less) for improved resolution.

# N

### NPT

National Pipe Thread; a standardized tapered pipe fitting. See pipe thread.

Nanobore generally refers to components with bore sizes less than 250  $\mu$ m (0.010").

### **NANOVOLUME®**

The trademark registered to Valco Instruments Co. Inc. and VICI AG International, applied to our nanobore components with bore sizes less than 250 µm (0.010").



### NUT

The tensioning component of a compression fitting. As the threaded nut is tightened into the fitting detail, it pushes the ferrule forward into the tapered ferrule seat, causing it to make up on the tube.



### **O**D

Outside diameter.

### **ONE-PIECE FINGERTIGHT**

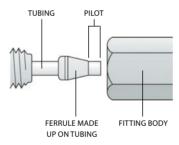
A one-piece fingertight fitting is a knurled or winged nut with integrated ferrule. It is convenient to use since the ferrule is retrieved from the port with the nut.

Note: Polymer type ferrules rely on surface compression to form a seal and hold the tube by friction.



### **PILOT**

The tubing which extends beyond the ferrule in a made-up fitting, or the integral portion of a ZRF internal reducing ferrule which extends beyond the ferrule. See also pilot depth, below.



### PILOT DEPTH

The length of the tubing diameter cavity beyond the tapered ferrule seat within a fitting detail. Valco fitting pilot depths are tightly controlled to facilitate the interchangeability of components without the risk of leaks or dead volume.

### **PIPE THREAD**

The external or internal threads of a fitting designed to effect a metal-to-metal seal on the conical thread faces. This type of fitting does not "bottom out" in the detail. Typically used with PTFE tape or other compound to lubricate the threads; however, since the diffusion rate of air components through the PTFE tape is considerable, pipe fittings should not be used in systems where leakage rates are critical.

### **PLUG**

A plug is used to block a fitting detail in a union, tee, cross, or valve.



### **REDUCING FERRULE**

A ferrule which allows a smaller tube to be used in a fitting detail designed for a larger tube. Caution should be taken if standard reducing ferrules without integral pilots are used, since dead volume may be created in the fitting pilot depth.

### **REDUCING UNION**

A fitting which joins two tubes of different ODs. The bore of the fitting should typically match the ID of the smaller tube.

# S

### SFE

Supercritical Fluid Extraction.

An extraction technique using a fluid in its supercritical state as the extraction medium. Some liquids and mixtures maintained above a critical temperature and pressure exhibit properties of both the liquid and gas phases of the element. These are defined as supercritical. CO<sub>2</sub> is a common supercritical fluid. Extreme caution must be used with supercritical CO<sub>2</sub>, since uncontrolled expansion (leaks) can be very hazardous due to the substantial stored energy.

### SFC

Supercritical Fluid Chromatography.

An analytical technique using a supercritical fluid (see SFE) as the mobile phase/carrier.

### STANDARD BORE

A bore which was chosen as the standard for a particular fitting, typically based on the most common tubing ID used with that fitting.



### TEE

A type of distribution fitting which connects three pieces of tubing, arranging them in the pattern of a "T".

### THROUGH-TYPE BORE

A bore which is slightly larger than the OD of the tubing which is used with the given fitting. A union with a through-type bore allows the tube ends to butt directly together, or for one tube to run completely through the fitting. Denoted by suffix "T" in the product number. In order to assure correct pilot lengths, we recommend that ferrules be made up on the tubing in a standard union.

### UNION

A fitting for connecting two pieces of tubing of the same OD. See also reducing union.

### **Female union**

A type of compression fitting in which the fitting body has female threads. Also referred to as internal union.

### Male union

A type of compression fitting in which the fitting body has male threads. Also referred to as external union.

### **UNSWEPT VOLUME**

The volume of any portion of a fitting which is in the flowpath but which is a different diameter than the primary flow orifice through the tubing/fitting assembly, or any area not directly swept by the fluid flow. This can also be known as "dead volume" if it is very poorly swept.

### VICI

VICI® is an acronym for Valco Instruments Company Inc.

VICI now defines multiple companies which manufacture various products for the analytical industry.

# **WETTED SURFACES**

The surfaces which are contacted by the sample stream.

### Y ("WYE")

A type of distribution fitting which connects three pieces of tubing, arranging them in the pattern of a "Y". Occasionally referred to as a "wye".

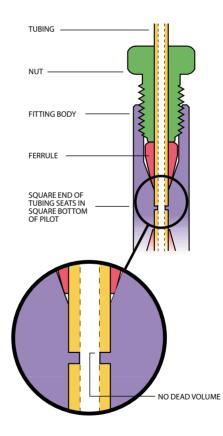
### Z

### ZDV

Zero dead volume. See definition below.

### **ZERO DEAD VOLUME**

Describes a connection which does not add volume to the system beyond what an extension of tubing would in its place.



### **ZERO VOLUME**

While often used interchangeably with zero dead volume, it ideally describes a fitting design in which there is no internal volume, such as a through-type union designed to buttfit two pieces of tubing.



# **TEMPERATURE CONVERSIONS**

°C °	
	°F
-40 -	40
-35 -	31
-30 -	22
-25 -	13
-20	-4
-15	5
-10	14
-5	23
0 3	32
5	41
10	50
15	59
20	58
25	77
30 8	86
35	95
40 1	04
45 1	13
50 1	22
55 1	31
60 1	40

°C	°F
65	149
70	158
75	167
80	176
85	185
90	194
95	203
100	212
105	221
110	230
115	239
120	248
125	257
130	266
135	275
140	284
145	293
150	302
155	311
160	320
165	329

°C	°F
170	338
175	347
180	356
185	365
190	374
195	383
200	392
205	401
210	410
215	419
220	428
225	437
230	446
235	455
240	464
245	473
250	482
255	491
260	500
265	509
270	518

°C	°F
275	527
280	536
285	545
290	554
295	563
300	572
305	581
310	590
315	599
320	608
325	617
330	626
335	635
340	644
345	653
350	662
375	707
400	752
425	797
450	842
475	887

°F	°C	°F
527	500	932
536	525	977
545	550	1022
554	575	1067
563	600	1112
572	625	1157
581	650	1202
590	675	1247
599	700	1292
608	725	1337
617	750	1382
626	775	1427
635	800	1472
644	825	1517
653	850	1562
662	875	1607
707	900	1652
752	925	1697
797	950	1742
842	975	1787
887	1000	1832

# **PRESSURE CONVERSIONS**

bar	psi	kPa	MPa
0.1	1.5	10	0.01
0.2	2.9	20	0.02
0.3	4.4	30	0.03
0.4	5.8	40	0.04
0.5	7.3	50	0.05
0.6	8.7	60	0.06
0.7	10.2	70	0.07
0.8	11.6	80	0.08
0.9	13.1	90	0.09
1	14.5	100	0.1
2	29.0	200	0.2
3	43.5	300	0.3
4	58.0	400	0.4
5	72.5	500	0.5

bar	psi	kPa	MPa
6	87.0	600	0.6
7	101.5	700	0.7
8	116.0	800	0.8
9	130.5	900	0.9
10	145	1,000	1
20	290	2,000	2
30	435	3,000	3
40	580	4,000	4
50	725	5,000	5
60	870	6,000	6
70	1,015	7,000	7
80	1,160	8,000	8
90	1,305	9,000	9

bar	psi	kPa	MPa
100	1,450	10,000	10
200	2,900	20,000	20
300	4,350	30,000	30
400	5,800	40,000	40
500	7,250	50,000	50
600	8,700	60,000	60
700	10,150	70,000	70
800	11,600	80,000	80
900	13,050	90,000	90
1,000	14,500	100,000	100
1,100	15,950	110,000	110
1,200	17,400	120,000	120
1,300	18,850	130,000	130

# LENGTH

μm	inches
100	.004"
150	.006"

mm	inches
0.050	.002"
0.064	.0025"
0.075	.003"
0.100	.004"
0.13	.005"
0.15	.006"
0.18	.007"
0.20	.008"
0.25	.010"
0.38	.015"
0.40	.016"
0.50	.020"
0.75	.030"
1.00	.039"
1.50	.059"
2.00	.079"
3.00	.118"
4.00	.157"
4.60	.181"
6.00	.236"
6.35	.250"
6.40	.252"
7.00	.276"
10.00	.394"
12.70	.500"
12.70	.500

inches	mm
1/32"	0.79
1/16"	1.59
3/32"	2.38
1/8"	3.18
1/4"	6.35
5/16"	7.94
3/8"	9.50
1/2"	12.70
1"	25.40

feet	mm
1 ft	304.8



JR-5FR1-587 JR-106550 JR-2FR8-587 JR-55088-1023 JR-794100 JR-CBUMPK50	JR-S-1611377
JR-5FRITI-5	JR-S-1615282
JR-5FR2-5	JR-S-1800476 JR-S-1801476
JR-3FR6-5. 87 JR-10FR1-5 87 JR-32174 59 JR-5508X-12 23 JR-798 100 JR-CEE-S10-5 56	JR-S-1805382
JR-5FR8-587 JR-10FR1K-587 JR-3217859 JR-5508X-2423 JR-800102 JR-CFE-S2-556	JR-S-1830478
JR-031-1047 JR-10FR2-587 JR-3217959 JR-55090-1023 JR-8000-0495-1061 JR-CFE-S75-556	JR-S-1831478
JR-032-1023 JR-8000-0495-261 JR-CFL-2W-S	JR-S-1835382
JR-040BK-1048 JR-10FR6-587 JR-357180100 JR-55091-1023 JR-8000-0495-2061 JR-CFL-4D79	JR-S-2000268
JR-040BL-1048 JR-10FR8-587 JR-367008-1061 JR-55091-523 JR-802101 JR-CFL-4PPS51	JR-S-2000467
JR-040GR-1048 JR-10FR8TI-587 JR-367008-261 JR-55100-523 JR-804	JR-S-2000568
JR-040RE-1048 JR-1100-05P-588 JR-367008-2061 JR-5510-529 JR-805103 JR-CFL-CB1KF47 JR-040WH-1048 JR-1100-2P-588 JR-367016-1061 JR-55110-523 JR-80-541 JR-CFL-CB1PK47	JR-S-2000974 JR-S-2010085
JR-040WL-10	JR-S-2020085
JR-040YL-1048 JR-1101-2P-588 JR-367016-2061 JR-5513-526 JR-9000-000584 JR-CFL-CB2PK-S51	JR-S-3174
JR-041-1047 JR-1102-05P-588 JR-3675-261 JR-5518-526 JR-9000-000783 JR-CFL-CB4KF-S51	JR-S-3274
JR-042-1051 JR-1102-2P-588 JR-3678-261 JR-5520N-1023 JR-9000-001084 JR-CM1XPK53	JR-S-3568
JR-049-1047 JR-1103-05P-588 JR-3678-2561 JR-5525N-1025 JR-9000-001184 JR-CM2XPK53	JR-S-35L68
JR-050BK-1048 JR-1103-2P-588 JR-4071-1093 JR-5570-528 JR-9000-001284 JR-CMLAPK35	JR-S-4000468
JR-050BL-1048 JR-1104-05P-588 JR-4072-1093 JR-559535 JR-9000-001383 JR-C-NERU1FPK43	JR-S-4000779
JR-050GR-1048 JR-1104-2P-588 JR-4073-1093 JR-56-537 JR-9000-001483 JR-C-NEU.5FPK43 JR-050RE-1048 JR-1110-02P-564 JR-4074-1093 JR-57-537 JR-9000-052057 JR-C-NEU.5XFP43K	JR-S-4000870 JR-S-4000973
JR-050RE-1048 JR-1110-02P-564 JR-4074-1093 JR-57-537 JR-9000-052057 JR-C-NEU.5XFP43K JR-050WH-1048 JR-1110-05P-588 JR-4075-1093 JR-58000-523 JR-9000-0520B58 JR-CNFT103	JR-S-4010479
JR-050WL-10	JR-S-4010679
JR-050YL-1048 JR-1110-5P-588 JR-4081-1093 JR-59-538 JR-9000-052157 JR-C-NL.15S-543	JR-S-4010879
JR-051-1047 JR-1111-05P-588 JR-4082-1093 JR-602952 JR-9000-0521F57 JR-C-NL.20L-543	JR-S-4020079
JR-060-5	JR-S-4030479
JR-06152 JR-9000-0522F57 JR-C-NL.25L-5	JR-S-4030679
JR-0611	JR-S-4030879
JR-0611-SS05-362 JR-1125-05P-589 JR-40931 JR-6033	JR-S-4040479
JR-0611-S52-3	JR-S-4040679
JR-0611-TI05623 JR-1125-2P-589 JR-4676-1057 JR-603952 JR-9000-0526G58 JR-C-NL.35L-543 JR-0611-TI2-362 JR-1125-5P-589 JR-4676-10TF57 JR-604052 JR-9000-0528G58 JR-C-NL.35S-543	JR-SLC-85-195
JR-0611-Tl2-362 JR-1125-5P-589 JR-4676-10TF57 JR-604052 JR-9000-0528G58 JR-C-NL:35S-543 JR-061235 JR-1127-05P-589 JR-4676-257 JR-604152 JR-9000-053057 JR-C-NNFFPK43	JR-SLC-85-1095 JR-SLC-85-10095
JR-061735 JR-1127-031-3	JR-SLC-85-10095
JR-06252 JR-9000-053157 JR-F-255-079-	JR-SLC-85-295
JR-062252 JR-9000-0531F57 10PE-589 JR-4677-1057 JR-604452 JR-9000-0531F57 10PE-5	JR-SLC-85-2095
JR-062335 JR-1151-10P-589 JR-4677-10TF57 JR-60-538 JR-9000-053257 JR-FPKBSS.5-1030	JR-SLC-85-20095
JR-062535 JR-1FR1-587 JR-4677-257 JR-6120-5003084 JR-9000-0532F57 JR-FPKBSS1-1030	JR-SLC-85-25095
JR-062617 JR-9000-060260 JR-FRK118 JR-4677-2.5TF	JR-SLC-85-395
JR-062-C91 JR-201094BK-1049 JR-4677-5TF57 JR-6141-1017 JR-9000-060360 JR-FRK2103	JR-SLC-85-30095
JR-064,	JR-SLC-85-495
JR-0640	JR-SLC-85-595
JR-0641-SS0562 JR-20124-1048 JR-5-2000667 JR-65003NF91 JR-9000-064060 JR-LZNF1PK-527 JR-0641-SS262 JR-20153299 JR-5-2000767 JR-65005NF91 JR-9000-064160 JR-LZP1PK31	JR-SLC-85-5095
JR-0641-SS262 JR-20153299 JR-5-2000767 JR-65005NF91 JR-9000-064160 JR-LZP1PK31 JR-0641-TI0562 JR-20153699 JR-5-2000867 JR-65006NF91 JR-9000-064260 JR-MZN1-537	JR-SLC-85-50095 JR-SLC-86-1096
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JR-070113-1054 JR-20199979 JR-55016-1223 JR-67140-2B92 JR-C360NFFS45 JR-S-11013	JR-SLR-11397
JR-070123-1054 JR-201999-1055 JR-55020-526 JR-67-250-2A92 JR-C360NFPK44 JR-S-1105280	JR-SLR-113-7797
JR-070124-1054 JR-202118-1049 JR-55020-PVDF-526 JR-67-250-492 JR-C360NFS645 JR-S-1110172	JR-SLR-11497
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JR-070350-1083 JR-202125-1049 JR-5504-526 JR-68230-0265 JR-C360QUPK644 JR-5-1120272	JR-SLR-117-7797
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JR-073230-1054 JR-204234 JR-5507-526 JR-68252TI92 JR-C360RU1PK644 JR-S-1500173	JR-SLR-220095
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JR-075013	JR-SLR-220295
JR-082	JR-SLR-220495
JR-083-5	JR-SLR-220695
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JR-1032     34     JR-2FR1TI-5     87     JR-55084-5     23     JR-68264PE     63     JR-C360U566     45     JR-5-15303     78       JR-1033     34     JR-2FR2T-5     87     JR-55085-10     23     JR-69230-02     64     JR-C5M2PK     52     JR-515313     78       JR-1040     34     JR-2FR2T-5     87     JR-55085-5     23     JR-69230-05     64     JR-C5M2PK     52     JR-515352     81       JR-1042     34     JR-2FR4-5     87     JR-55086-10     23     JR-69230-2     64     JR-C9M1PK     52     JR-5-16003     77	JR-SLV-75-10095 JR-SLV-75-100095 JR-SLV-75-295 JR-SLV-75-2095
JR-1032	JR-SLV-75-10095 JR-SLV-75-100095 JR-SLV-75-295 JR-SLV-75-2095 JR-SLV-75-25095
JR-1032     34     JR-2FR1TI-5     87     JR-55084-5     23     JR-68264PE     63     JR-C360U566     45     JR-5-15303     78       JR-1033     34     JR-2FR2T-5     87     JR-55085-10     23     JR-69230-02     64     JR-C5M2PK     52     JR-515313     78       JR-1040     34     JR-2FR2T-5     87     JR-55085-5     23     JR-69230-05     64     JR-C5M2PK     52     JR-515352     81       JR-1042     34     JR-2FR4-5     87     JR-55086-10     23     JR-69230-2     64     JR-C9M1PK     52     JR-5-16003     77	JR-SLV-75-10095 JR-SLV-75-100095 JR-SLV-75-295 JR-SLV-75-2095



JR-SLV-75-595	JR-T-4036-M1.5 15	JR-T-5804-M1510	JR-T-6020-M1512	JR-T-6800-M1.5 15	JR-T-9602021	JR-TSS.505-M1019
JR-SLV-75-5095	JR-T-4036-M1015	JR-T-5804-M2510	JR-T-6020-M2512	JR-T-6800-M1015	JR-T-9602521	JR-TSS.505-M319
JR-SLV-75-50095	JR-T-4036-M1515	JR-T-5804-M310	JR-T-6020-M312	JR-T-6800-M1515	JR-T-9603021	JR-TSS.507-M1.519
JR-SLV-76-1096	JR-T-4036-M2515	JR-T-5804-M510	JR-T-6030-M1.5 12	JR-T-6800-M25 15	JR-T-9603521	JR-TSS.507-M1019
JR-SLV-76-10096	JR-T-4036-M315	JR-T-5993-M1.59	JR-T-6030-M1012	JR-T-6800-M315	JR-T-9610521	JR-TSS.507-M319
JR-SLV-76-100096	JR-T-4036-M515	JR-T-5993-M109	JR-T-6030-M1512	JR-T-6800-M399	JR-T-9610821	JR-TSS.510-M1.519
JR-SLV-76-2096	JR-T-4037-M1.5 15	JR-T-5993-M39	JR-T-6030-M2512	JR-T-6800-M515	JR-T-9611021	JR-TSS.510-M1019
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JR-SLV-76-596	JR-T-4037-M1515	JR-T-5998C-M1.510	JR-T-6040-M1.512	JR-T-6801-M1015	JR-T-9611521	JR-TSS.520-M1.5 19
JR-SLV-76-5096	JR-T-4037-M2515	JR-T-5998C-M1010	JR-T-6040-M1012	JR-T-6801-M1515	JR-T-9612021	JR-TSS.520-M1019
JR-SLV-76-50096	JR-T-4037-M315	JR-T-5998C-M1510	JR-T-6040-M1512	JR-T-6801-M25 15	JR-T-9612521	JR-TSS.520-M319
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JR-T-079-M1.513	JR-T-4039-M1.515	JR-T-5998C-M310	JR-T-6040-M312	JR-T-6802-M1.516	JR-T-9613521	JR-TSS105-M1019
JR-T-079-M1013	JR-T-4039-M1015	JR-T-5998C-M510	JR-T-6105-M1.516	JR-T-6802-M1016	JR-T-9614521	JR-TSS105-M319
JR-T-079-M1513	JR-T-4039-M315	JR-T-5998-M1.5 9	JR-T-6105-M1016	JR-T-6802-M1516	JR-T-9620521	JR-TSS110-M1.519
JR-T-079-M2513	JR-T-404115	JR-T-5998-M109	JR-T-6105-M1516	JR-T-6802-M25 16	JR-T-9620821	JR-TSS110-M1019
JR-T-079-M313	JR-T-404215	JR-T-5998-M39	JR-T-6105-M2516	JR-T-6802-M316	JR-T-9621021	JR-TSS110-M319
JR-T-080-M1.513	JR-T-404315	JR-T-5999-M1.510	JR-T-6105-M316	JR-T-6803-M1.516	JR-T-9621321	JR-TSS115-M1.519
JR-T-080-M1013	JR-T-405015	JR-T-5999-M1010	JR-T-6130-M1017	JR-T-6803-M1016	JR-T-9621521	JR-TSS115-M1019
JR-T-080-M1513	JR-T-4183C-M1014	JR-T-5999-M1510	JR-T-6130-M317	JR-T-6803-M1516	JR-T-9622021	JR-TSS115-M319
JR-T-080-M2513	JR-T-4183C-M2514	JR-T-5999-M2510	JR-T-620159	JR-T-6803-M25 16	JR-T-9622521	JR-TSS120-M1.519
JR-T-080-M313	JR-T-4183C-M314	JR-T-5999-M310	JR-T-6210-M1.516	JR-T-6803-M316	JR-T-9623021	JR-TSS120-M1019
JR-T-082-M1.513	JR-T-4183-M1.515	JR-T-5999-M510	JR-T-6210-M1016	JR-T-6804-M1.516	JR-T-9623521	JR-TSS120-M319
JR-T-082-M1013	JR-T-4183-M1015	JR-T-6000-M1.510	JR-T-6210-M1516	JR-T-6804-M1016	JR-T-9630521	JR-TSS130-M1.5 19
JR-T-082-M1513	JR-T-4183-M1515	JR-T-6000-M1010	JR-T-6210-M2516	JR-T-6804-M1516	JR-T-9630821	JR-TSS130-M1019
JR-T-082-M2513	JR-T-4183-M2515	JR-T-6000-M1510	JR-T-6210-M316	JR-T-6804-M25 16	JR-T-9631021	JR-TSS130-M319
JR-T-082-M313	JR-T-4183-M315	JR-T-6000-M2510	JR-T-623-0319	JR-T-6804-M316	JR-T-9631321	JR-TSS140-M1.519
JR-T-083-M1.513	JR-T-4183-M515	JR-T-6000-M310	JR-T-623-0619	JR-T-6805-M1.515	JR-T-9631521	JR-TSS140-M1019
JR-T-083-M1013	JR-5580-529	JR-T-6000-M510	JR-T-625-03-M1.519	JR-T-6805-M1015	JR-T-9632021	JR-TSS140-M319
JR-T-083-M1513	JR-T-5602-M112	JR-T-6001-M1.510	JR-T-625-03-M1019	JR-T-6805-M1515	JR-T-9632521	JR-TSS230-M1.519
JR-T-083-M2513	JR-T-5602-M312	JR-T-6001-M1010	JR-T-625-03-M319	JR-T-6805-M2515	JR-T-9633021	JR-TSS230-M1019
JR-T-083-M313	JR-T-5603-M112	JR-T-6001-M1510	JR-T-625-04-M1.519	JR-T-6805-M315	JR-T-9633521	JR-TSS230-M319
JR-T-084-M1.513	JR-T-5603-M312	JR-T-6001-M2510	JR-T-625-04-M1019	JR-T-6805-M515	JR-T-9700520	JR-TSS240-M1.519
JR-T-084-M1013	JR-T-5604-M112	JR-T-6001-M310	JR-T-625-04-M319	JR-T-6806-M1.516	JR-T-9701020	JR-TSS240-M1019
JR-T-084-M1513	JR-T-5604-M312	JR-T-6001-M510	JR-T-625-05-M1.5 19	JR-T-6806-M1016	JR-T-9701220	JR-TSS240-M319
JR-T-084-M2513	JR-T-5605-M112	JR-T-6002-M1.510	JR-T-625-05-M1019	JR-T-6806-M1516	JR-T-9701320	JR-TSS260-M1.519
JR-T-084-M313	JR-T-5605-M312	JR-T-6002-M1010	JR-T-625-05-M319	JR-T-6806-M2516	JR-T-9701520	JR-TSS260-M1019
JR-T-085-M1.513	JR-T-5606-M112	JR-T-6002-M1510	JR-T-625-10-M1.519	JR-T-6806-M316	JR-T-9702020	JR-TSS260-M319
JR-T-085-M1013	JR-T-5606-M312	JR-T-6002-M2510	JR-T-625-10-M1019	JR-T-6807-M1.515	JR-T-9702520	JR-TSS267-M1.5 19
JR-T-085-M1513	JR-T-5607-M112	JR-T-6002-M310	JR-T-625-10-M319	JR-T-6807-M1015	JR-T-9703020	JR-TSS267-M1019
JR-T-085-M2513	JR-T-5607-M312	JR-T-6002-M510	JR-T-625-20-M1.5 19	JR-T-6807-M1515	JR-T-9703220	JR-TSS267-M319
JR-T-085-M313	JR-T-5608-M112	JR-T-60031-M1.510	JR-T-625-20-M1019	JR-T-6807-M2515	JR-T-9703320	JR-TSS285-M1.519
JR-T-086-M1.513	JR-T-5608-M312	JR-T-60031-M1010	JR-T-625-20-M319	JR-T-6807-M315	JR-T-9703520	JR-TSS285-M1019
JR-T-086-M1013	JR-T-5610-M112	JR-T-60031-M1510	JR-T-625-30-M1.5 19	JR-T-6807-M515	JR-T-9704020	JR-TSS285-M319
JR-T-086-M1513	JR-T-5610-M312	JR-T-60031-M2510	JR-T-625-30-M1019	JR-T-6808-M1014	JR-T-9704520	JR-ZBU1CFPK32
JR-T-086-M2513	JR-T-5620-M112	JR-T-60031-M310	JR-T-625-30-M319	JR-T-6808-M2514	JR-T-9705520	JR-ZBU1FPK32
JR-T-086-M313	JR-T-5620-M312	JR-T-60031-M510	JR-T-625-40-M1.519	JR-T-6808-M314	JR-T-9705720	JR-ZBU1MFPK32
JR-T-087-M113	JR-T-5664-M112	JR-T-60032-M1.510	JR-T-625-40-M1019	JR-T-680916	JR-T-9705820	JR-ZC.539
						JR-ZC.5FPK31
JR-T-087-M313	JR-T-5664-M312	JR-T-60032-M1010	JR-T-625-40-M319	JR-T-681015	JR-T-9706020	
JR-T-088-M113	JR-T-5702-M110	JR-T-60032-M1510	JR-T-626-00-M1.5 19	JR-T-6811-M1014	JR-T-9706520	JR-ZC139
JR-T-088-M313	JR-T-5702-M1.510	JR-T-60032-M2510	JR-T-626-00-M1019	JR-T-6811-M2514	JR-T-9707520	JR-ZC1PK31
JR-T-089-M1.513	JR-T-5702-M310	JR-T-60032-M310	JR-T-626-00-M319	JR-T-6811-M314	JR-T-9708020	JR-ZC239
JR-T-089-M1013	JR-T-5703-M110	JR-T-60032-M510	JR-T-628-0019	JR-T-6812-M1.516	JR-T-9708220	JR-ZF.5PK33
JR-T-089-M1513	JR-T-5703-M1.510	JR-T-6003-M1.510	JR-T-6310-M1.516	JR-T-6812-M1016	JR-T-9708320	JR-ZF.5PK-528
JR-T-089-M2513	JR-T-5703-M310	JR-T-6003-M1010	JR-T-6310-M1016	JR-T-6812-M1516	JR-T-9708520	JR-ZF.5S6-538
JR-T-089-M313	JR-T-5704-M110	JR-T-6003-M1510	JR-T-6310-M1516	JR-T-6812-M2516	JR-T-9709020	JR-ZF1S6-538
JR-T-090-M113	JR-T-5704-M1.5 10	JR-T-6003-M2510	JR-T-6310-M2516	JR-T-6812-M316	JR-T-9709520	JR-ZF2PK-528
JR-T-090-M313	JR-T-5704-M310	JR-T-6003-M310	JR-T-6310-M316	JR-T-6813-M1.516	JR-T-9710020	JR-ZF2S6-538
					JR-T-9710220	
JR-T-4001-M1.513	JR-T-5705-M110	JR-T-6003-M510	JR-T-6320-M1.516	JR-T-6813-M1016		JR-ZGF.5PK43
JR-T-4001-M1013	JR-T-5705-M1.510	JR-T-60041-M109	JR-T-6320-M1016	JR-T-6813-M1516	JR-T-9710320	JR-ZGF1PK43
JR-T-4001-M1513	JR-T-5705-M310	JR-T-60041-M39	JR-T-6320-M1516	JR-T-6813-M2516	JR-T-9710520	JR-ZN.5-537
JR-T-4001-M2513	JR-T-5706-M1.5 9	JR-T-60042-M109	JR-T-6320-M2516	JR-T-6813-M316	JR-T-9711020	JR-ZN.5FPK33
JR-T-4001-M313	JR-T-5706-M109	JR-T-60042-M39	JR-T-6320-M316	JR-T-6835-M1.516	JR-TD-5804-M1.511	JR-ZN.5FPK-528
	JR-T-5706-M39					JR-ZN1-537
JR-T-4002-M1.513		JR-T-6004-M109	JR-T-6605-M116	JR-T-6835-M1016	JR-TD-5804-M1011	
JR-T-4002-M1013	JR-T-5707-M110	JR-T-6004-M39	JR-T-6605-M1016	JR-T-6835-M1516	JR-TD-5804-M1511	JR-ZN2-537
JR-T-4002-M1513	JR-T-5707-M1.510	JR-T-60069	JR-T-6605-M316	JR-T-6835-M2516	JR-TD-5804-M2511	JR-ZN2PK-528
JR-T-4002-M2513	JR-T-5707-M310	JR-T-6007-M1.512	JR-T-6606-M116	JR-T-6835-M316	JR-TD-5804-M311	JR-ZNF1FPK-527
JR-T-4002-M313	JR-T-5708-M110	JR-T-6007-M1012	JR-T-6606-M1016	JR-T-684016	JR-TD-6007-M1.511	JR-ZNF1PK-527
JR-T-4003-M1.513	JR-T-5708-M1.5 10	JR-T-6007-M1512	JR-T-6606-M316	JR-T-684116	JR-TD-6007-M1011	JR-ZNF1PK-F-527
JR-T-4003-M1013	JR-T-5708-M310	JR-T-6007-M2512	JR-T-6607-M116	JR-T-686016	JR-TD-6007-M1511	JR-ZNFT103
JR-T-4003-M1513	JR-T-5710-M110	JR-T-6007-M312	JR-T-6607-M1016	JR-T-7360-02518	JR-TD-6007-M2511	JR-ZP.538
JR-T-4003-M2513	JR-T-5710-M1.510	JR-T-6008-M1.512	JR-T-6607-M316	JR-T-7360-05018	JR-TD-6007-M311	JR-ZP.5FPK31
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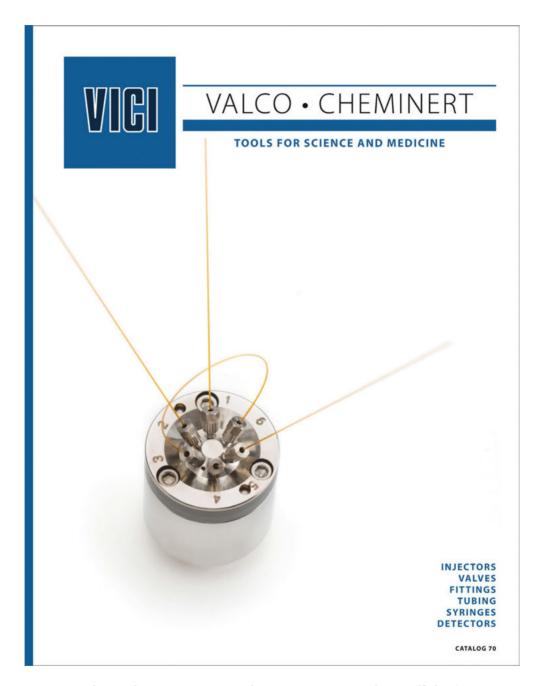
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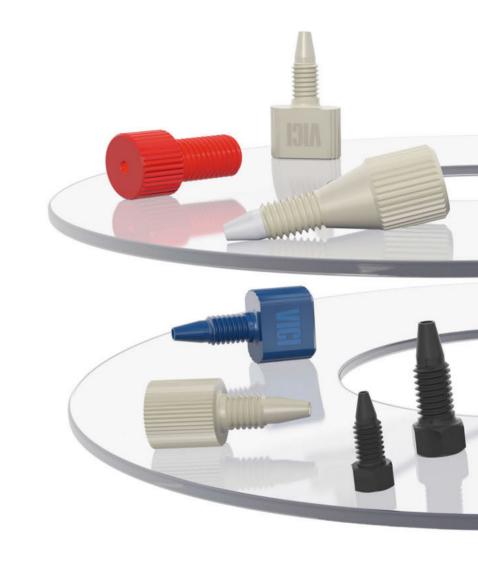
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