

Ferrules & Fittings



CRS provides a wide range of ferrules made from Vespel®, Vespel®/Graphite, Graphite and PTFE. Ferrule sizes refer to the size of the fittings into which they fit; they are not the diameter of the ferrule. (For example, 1/16" ferrules are 1/8" diameter and fit in 1/16" fittings.)

Please note for all ferrules:

- 0.4 mm ID ferrules fit 0.25 mm ID capillary columns
- 0.5 mm ID ferrules fit 0.32 mm ID capillary columns
- 0.8 mm ID ferrules fit 0.53 mm ID capillary columns
- Straight ferrules are used for packed columns

Vespel® Ferrules - Sold in Packages of 10

- Upper temperature limit: 350°C.
- 100% high-temperature DuPont polyimide
- Precision-drilled ID; no imperfections from molding
- One-piece design requires no back ferrule
- Fairly hard; tends to seal permanently to the column

Description	Item No.	
Straight Ferrules - for tubing with ods as listed		
1/16" Ferrules	212100	
1/8" Ferrules	212200	
1/4" Ferrules	212400	
Blank Ferrules - no holes		
1/16" Blank Ferrules	2121XX	
1/8" Blank Ferrules	2122XX	
1/4" Blank Ferrules	2124XX	
Capillary Column Ferrules		
	For Capillary Size	
1/16" to 0.3 mm	0.10 - 0.18 mm ID	212103
1/16" to 0.4 mm	0.25 mm ID	212104
1/16" to 0.5 mm	0.32 mm ID	212105
1/16" to 0.8 mm	0.53 mm ID	212108
1/16" to 1.0 mm	0.65 mm ID	212110
1/16" to 1.2 mm	0.75 mm ID	212112
1/16" to 0.4 mm - Agilent style*	0.25 mm ID	212164
1/16" to 0.5 mm - Agilent style*	0.32 mm ID	212165
1/16" to 0.8 mm - Agilent style*	0.53 mm ID	212168
1/16", 2-hole, 0.4 mm ea	0.25 mm ID	212124
1/16", 2-hole, 0.5 mm ea	0.32 mm ID	212125
Reducing Ferrules		
1/8" to 0.4 mm	0.25 mm ID	212204
1/8" to 0.5 mm	0.32 mm ID	212205
1/8" to 0.8 mm	0.53 mm ID	212208
1/8", 2-hole, 0.5 mm ea	0.32 mm ID	212222
1/8" to 1/16"	1/16" OD	212210
1/4" to 1/16"	1/16" OD	212410
1/4" to 1/8"	1/8" OD	212420

* Short ferrule for Agilent inlet systems: 4890, 5890 and 6890.



Vespel® Ferrules



1/16" Vespel Ferrules: Blank, 0.5 mm ID, Straight



212104

212100

212222

Ferrules & Fittings

Graphite Ferrules - Sold 10/pack except as noted.

- Upper temperature limit: 450°C
- High-purity Graphite; preferred for capillary GC use
- Ideal for glass-to-metal connections; doesn't stick to glass
- Precision formed; flash-free ID
- Reusable if not overtightened
- One-piece design requires no back ferrule



Graphite Ferrules

Description	Item No.	
Straight Ferrules - for tubing with ods as listed		
1/16" Ferrules	211100	
1/8" Ferrules	211200	
1/4" Ferrules	211400	
3/8" Ferrules	211600	
1/2" Ferrules, 5/pk	211800	
3/4" Ferrules, 5/pk	211120	
Blank Ferrules - no holes		
1/16" Blank Ferrules	2111XX	
1/8" Blank Ferrules	2112XX	
1/4" Blank Ferrules	2114XX	
Capillary Column Ferrules		
	For Capillary Size	
1/16" to 0.4 mm	0.25 mm ID	211104
1/16" to 0.5 mm	0.32 mm ID	211105
1/16" to 0.8 mm	0.53 mm ID	211108
1/16" to 1.0 mm	0.65 mm ID	211110
1/16" to 1.2 mm	0.75 mm ID	211112
1/16", 2-hole, 0.4 mm ea	0.25 mm ID	211124
1/16", 2-hole, 0.5 mm ea	0.32 mm ID	211125
Short Ferrules for Agilent Inlets*		
1/16" to 0.4 mm	0.18 mm ID	211164
1/16" to 0.5 mm	0.25–0.32 mm ID	211165
1/16" to 0.8 mm	0.53 mm ID	211168
1/16" to 1.0 mm	0.53–0.65 mm ID	211160
1/16" to 1/16" straight ferrule	1/16" OD	211170



1/16" Graphite Ferrules:
Blank, 0.5 mm ID, Straight



211164

* Short ferrule for Agilent inlet systems; 4890, 5890 and 6890

Graphite ferrules continued on next page.

Ferrule Remover Set

These are effective tools for removing ferrules. The threaded end locks in the ferrule hole to allow removal from the fitting. Two tools are supplied for ferrules from 0.4 mm to 0.8 mm ID.



205315

Description	Item No.
Ferrule Remover Set	205315

Ferrules & Fittings

Graphite Ferrules - Sold 10/pack except as noted.

- Upper temperature limit: 450°C
- High-purity Graphite; preferred for capillary GC use
- Ideal for glass-to-metal connections; doesn't stick to glass
- Precision formed; flash-free ID
- Reusable if not overtightened
- One-piece design requires no back ferrule



211410



211983



211500

211905



216948



216973

Description	Item No.
Reducing Ferrules	For Capillary Size
1/8" to 0.4 mm	0.25 mm ID 211204
1/8" to 0.5 mm	0.32 mm ID 211205
1/8" to 0.8 mm	0.53 mm ID 211208
1/8", 2-hole, 0.5 mm ea	0.32 mm ID 211222
1/8" to 1/16"	1/16" OD 211210
1/4" to 0.5 mm	0.32 mm ID 211405
1/4" to 0.8 mm	0.53 mm ID 211408
1/4" to 4 mm	4 mm OD 211440
1/4" to 6 mm	6 mm OD 211406
1/4" to 1/16"	1/16" OD 211410
1/4" to 1/8"	1/8" OD 211420
Specialty Ferrules / Liner Seals	
5 mm, for Shimadzu 5 mm OD columns, 10/pk	211500
0.5 mm ID (M8 nut), for ThermoFinnigan (formerly CE) 10/pk	211905
0.8 mm ID (M8 nut), for ThermoFinnigan (formerly CE) 10/pk	211908
Cup Ferrule for Thermo, 0.25 mm ID (M4 nut), 10/pk	211982-10
Cup Ferrule for Thermo, 0.35 mm ID (M4 nut), 10/pk	211983-10
Cup Ferrule for Thermo, 0.45 mm ID (M4 nut), 10/pk	211984-10
Cup Ferrule for Thermo, 0.8 mm ID (M4 nut), 10/pk	211988-10
8 mm Graphite Liner Seal for ThermoFinnigan Trace GC (each)	216948

Liner Seals for Agilent Instruments

Graphite liner seals are designed for Agilent-style liners, in two different I.D.s.

Description	Similar Part No.	Qty.	Item No.
Graphite Liner Seal, 6.35 mm ID	5180-4168	10/pk	216635
Graphite Liner Seal, 6.52 mm ID	5180-4173	10/pk	216652
O-ring made of Viton® for Agilent		12/pk	216973

Ferrules & Fittings

Vespel®/Graphite Ferrules - Sold in Packages of 10

- Upper temperature limit: 400°C
- Made from quality DuPont polyimide/graphite blend
- Recommended for GC/MS interface applications
- One-piece design requires no back ferrule
- Precision-drilled ID



Vespel®/Graphite Ferrules

Description		Item No.
Straight Ferrules - for tubing with ods as listed		
1/16" Ferrules		213100
1/8" Ferrules		213200
1/4" Ferrules		213400
1/2" Ferrules, 5/pk		213800
Blank Ferrules - no holes		
1/16" Blank Ferrules		2131XX
1/8" Blank Ferrules		2132XX
1/4" Blank Ferrules		2134XX
Capillary Column Ferrules	For Tube Size	
1/16" to 0.3 mm		213103
1/16" to 0.4 mm	0.25 mm ID	213104
1/16" to 0.5 mm	0.32 mm ID	213105
1/16" to 0.8 mm	0.53 mm ID	213108
1/16" to 1.0 mm	0.65 mm ID	213110
1/16" to 1.2 mm	0.75 mm ID	213112
1/16", 2-hole, 0.4 mm ea	0.25 mm ID	213124
1/16", 2-hole, 0.5 mm ea	0.32 mm ID	213125
1/16" to 0.3 mm - Agilent style*	0.10 mm ID	213163
1/16" to 0.4 mm - Agilent style*	0.25 mm ID	213164
1/16" to 0.5 mm - Agilent style*	0.32 mm ID	213165
1/16" to 0.8 mm - Agilent style*	0.53 mm ID	213168
Reducing Ferrules		
1/8" to 0.4 mm	0.25 mm ID	213204
1/8" to 0.5 mm	0.32 mm ID	213205
1/8" to 0.8 mm	0.53 mm ID	213208
1/8", 2-hole, 0.5 mm ea	0.32 mm ID	213222
1/8", 2-hole, 0.8 mm ea	0.53 mm ID	213228
1/8" to 1/16"	1/16" OD	213210
1/4" to 0.4 mm	0.25 mm ID	213404
1/4" to 0.5 mm	0.32 mm ID	213405
1/4" to 0.8 mm	0.53 mm ID	213408
1/4" to 1/16"	1/16" OD	213410
1/4" to 6 mm	6 mm OD	213406
1/4" to 1/8"	1/8" OD	213420



1/16" Vespel®/Graphite Ferrules:
Blank, 0.5 mm ID, Straight



213105

213200



1/16" Short Ferrule
for Agilent GCs

* Short ferrule for Agilent inlet systems; 4890, 5890 and 6890

Ferrules & Fittings

PTFE Ferrules - Sold in Packages of 10

- Upper temperature limit 250°C
- 100% PTFE; completely inert
- One-piece design requires no back ferrule



PTFE Ferrules



2144XX














Description	Item No.
Straight Ferrules - for tubing with ods as listed	
1/16" Ferrules	214100
1/8" Ferrules	214200
3/16" Ferrule	214300
1/4" Ferrules	214400
Blank Ferrules - no holes	
1/16" Blank Ferrules	2141XX
1/8" Blank Ferrules	2142XX
1/4" Blank Ferrules	2144XX
Capillary Column Ferrules	For Tube Size
1/16" to 0.3 mm	214103
1/16" to 0.4 mm	0.25 mm ID 214104
1/16" to 0.5 mm	0.32 mm ID 214105
1/16" to 0.8 mm	0.53 mm ID 214108
1/16" to 1.0 mm	0.65 mm ID 214110
1/16" to 1.2 mm	0.75 mm ID 214112
Reducing Ferrules	
1/8" to 0.4 mm	0.25 mm ID 214204
1/8" to 0.5 mm	0.32 mm ID 214205
1/8" to 0.8 mm	0.53 mm ID 214208
1/8" to 1/16"	1/16" OD 214210
1/4" to 6 mm	6 mm OD 214406
1/4" to 1/16"	1/16" OD 214410
1/4" to 1/8"	1/8" OD 214420
1/4" to 3/16"	3/16" OD 214430

Ferrules & Fittings

Swagelok® Fittings

CRS carries a full line of quality Swagelok fittings for GC and HPLC. Please call if you do not see the size you need.

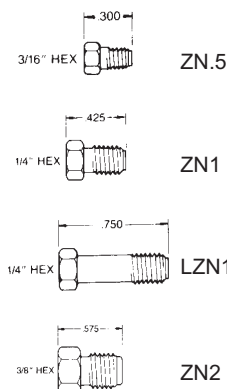
Please note: When ordering Swagelok® fittings, prefix the catalog number with one of the following letters: B for brass, SS for stainless steel, or T for PTFE. (For example, a 1/4" OD tube union in stainless steel is part number SS-400-6.)

Description	Size	Item No.	
Nut	1/16"	102-1	202-1 
	1/8"	202-1	
	1/4"	402-1	
Front Ferrule	1/16"	103-1	203-1 
	1/8"	203-1	
	1/4"	403-1	
Back Ferrule	1/16"	104-1	204-1 
	1/8"	204-1	
	1/4"	404-1	
Cap	1/16"	100-C	200-C 
	1/8"	200-C	
	1/4"	400-C	
Plug	1/16"	100-P	200-P 
	1/8"	200-P	
	1/4"	400-P	
Unions	1/16" to 1/16"	100-6	200-6 
	1/8" to 1/8"	200-6	
	1/4" to 1/4"	400-6	
Bored-Through Union	1/16" to 1/16"	100-6BT	200-6BT 
	1/8" to 1/8"	200-6BT	
	1/4" to 1/4"	400-6BT	
Low Dead Volume Union	1/16" to 1/16"	1FO-6GC	1FO-6GC 
	1/8" to 1/16"	200-6-1ZV	
Reducing Unions	1/16" to 1/8"	200-6-1	400-6-2 
	1/16" to 1/4"	400-6-1	
	1/8" to 1/4"	400-6-2	
Union Tees	1/16" x 1/16" x 1/16"	100-3	200-3 
	1/8" x 1/8" x 1/8"	200-3	
	1/4" x 1/4" x 1/4"	400-3	
Male Connector	1/16" to 1/16" NPT	100-1-1	200-1-2 
	1/8" to 1/8" NPT	200-1-2	
	1/4" to 1/4" NPT	400-1-4	
	1/16" to 1/8" NPT	100-1-2	
	1/8" to 1/16" NPT	200-1-1	
	1/4" to 1/8" NPT	400-1-2	
Female Connector	1/8" to 1/8" NPT	200-1-4	200-7-4 
	1/8" to 1/4" NPT	200-7-2	
	1/4" to 1/8" NPT	400-7-2	
	1/4" to 1/4" NPT	400-7-4	
Reducers	1/16" to 1/8" tube	100-R-2	200-R-4 
	1/8" to 1/4" tube	200-R-4	
	1/4" to 1/8" tube	400-R-2	

Ferrules & Fittings

Valco Fittings

Valco Nuts

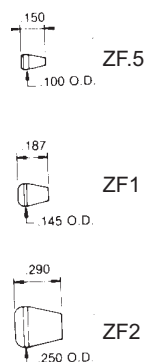


All standard nuts are labeled with the letters ZN. They can be used with Valco fittings as well as most other manufacturers. The longer nut is used when the fitting head may not be accessible or may interfere with adjacent fittings, as on some Valco multiposition valves. Nuts are made from stainless steel.

Description	Size	Item No.
Standard Nut	1/32"	ZN.5
Standard Nut	1/16"	ZN1
Long Nut	1/16"	LZN1
Standard Nut	1/8"	ZN2

Valco Ferrules

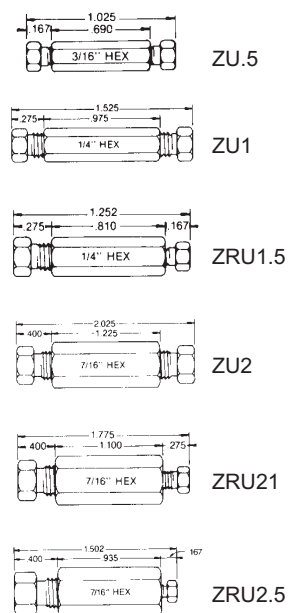
Valco ferrules may be used with all Valco fittings and those of most other manufacturers. Ferrules made of stainless steel can be used with metal or PTFE tubing. The polyimide ferrules can be used up to 350°C. Glass-filled PTFE ferrules can be used on metal or glass tubing if the temperature is less than 200°C, or 125°C with PTFE tubing.



Description	Size	Material	Item No.
Ferrule	1/32"	300 Series Stainless	ZF.5
	1/32"	Polyimide	ZF.5V
Ferrule	1/16"	300 Series Stainless	ZF1
	1/16"	PTFE	ZF1TFG
Ferrule	1/16"	Polyimide	ZF1V
	1/8"	300 Series Stainless	ZF2
Ferrule	1/8"	Polyimide	ZF2V

Valco Unions













These join two tubes of uniform bore, without introducing unswept or "dead" volume. Nuts and ferrules included. Made from stainless steel.



Description	Size	Bore	Item No.
Union	1/32"	.25 mm (.010")	ZU.5
	1/32"	.8 mm (1/32")	ZU.5T
Union	1/16"	.75 mm (.029")	ZU1
	1/16"	.25 mm (.010")	ZU1C
	1/16"	1/16"	ZU1T
Reducing Union	1/16" to 1/32"	.25 mm (.010")	ZRU1.5
	1/16" to 1/32"	.8 mm (1/32")	ZRU1.5T
Union	1/8"	.75 mm (.029")	ZU2
	1/8"	2 mm (.080")	ZU2L
	1/8"	1/8"	ZU2T
Reducing Union	1/8" to 1/16"	.75 mm (.029")	ZRU21
	1/8" to 1/16"	.25 mm (.010")	ZRU21C
	1/8" to 1/16"	1/16"	ZRU21T
Reducing Union	1/8" to 1/32"	.25 mm (.010")	ZRU2.5
	1/8" to 1/32"	.8 mm (1/32")	ZRU2.5T

Parker A-Lok® Fittings

CRS offers the full line of Parker A-Lok® fittings for GC and HPLC, at competitive prices. Please call if you do not see the size you need. **Please note:** When ordering A-Lok® fittings, end the catalog number with one of the following letters: B for brass, SS for stainless steel, or T for PTFE. (For example, a 1/4" OD tube union in stainless steel is part number 4SC4-SS.)

Description	Size	Item No.	
Nut	1/16"	1NU1	
	1/8"	2NU2	
	1/4"	4NU4	
Front Ferrule	1/16"	1FF1	
	1/8"	2FF2	
	1/4"	4FF4	
Back Ferrule	1/16"	1BF1	
	1/8"	2BF2	
	1/4"	4BF4	
Cap	1/16"	1BLEN1	
	1/8"	2BLEN2	
	1/4"	4BLEN4	
Plug	1/16"	1BLP1	
	1/8"	2BLP2	
	1/4"	4BLP4	
Unions	1/16" to 1/16"	1SC1	
	1/8" to 1/8"	2SC2	
	1/4" to 1/4"	4SC4	
Bored-Through Union	1/16" to 1/16"	1SC1-BT	
	1/8" to 1/8"	2SC2-BT	
	1/4" to 1/4"	4SC4-BT	
Low Dead Volume Union	1/16" to 1/16"	1-1Z7HLZ7	
Reducing Unions	1/16" to 1/8"	2RU1	
	1/16" to 1/4"	4RU1	
	1/8" to 1/4"	4RU2	
Union Tees	1/16" x 1/16" x 1/16"	1ET1	
	1/8" x 1/8" x 1/8"	2ET2	
	1/4" x 1/4" x 1/4"	4ET4	
Male Connector	1/16" to 1/16" NPT	1MSC1N	
	1/8" to 1/8" NPT	2MSC2N	
	1/4" to 1/4" NPT	4MSC4N	
	1/16" to 1/8" NPT	1MSC2N	
	1/8" to 1/16" NPT	2MSC1N	
	1/4" to 1/8" NPT	4MSC2N	
Female Connector	1/8" to 1/4" NPT	2MSC4N	
	1/8" to 1/8" NPT	2FSC2N	
	1/8" to 1/4" NPT	2FSC4N	
	1/4" to 1/8" NPT	4FSC2N	
Reducers	1/16" to 1/8" tube	2TUR1	
	1/8" to 1/4" tube	4TUR2	
	1/4" to 1/8" tube	2TUR4	