

# GC Ferrule Selection

## PTFE Ferrules

PTFE ferrules are completely inert and an economical choice. They have an upper temperature limit of 250°C. PTFE ferrules conform well to the shape of the column upon compression and can be reused if handled carefully.

## Graphite Ferrules

These 99.95% pure graphite ferrules can be used at temperatures up to 450°C without producing bleed or decomposition products. The one-piece design requires no back ferrules. Graphite ferrules are very soft and conform well to the column on compression. These ferrules can be reused as long as care is taken not to overtighten them.

## Vespel® Ferrules

Vespel® ferrules do not cold flow, are easily reusable, and withstand temperature up to 350°C. At high temperatures, Vespel® may adhere to glass or metal.

## Vespel®/Graphite Ferrules



Composites of Vespel® and graphite combine the advantages of the two materials. They are less likely to adhere to the column than Vespel® but are more durable than graphite. Ferrules are easy to reuse and stable at temperatures to 400°C.

Two types of composites are available. The VG1 composite is 85% Vespel®/15% graphite and suitable for all-purpose applications. The VG2 type is 60% Vespel®/40% graphite and exhibits added lubricity.

Ferrule Properties					
Material	Temp. Limit	Reusability	Resealing Properties	Suitability for Glass	Temp. Prog.
PTFE	250°C	Good	Excellent	Excellent	No
Graphite	450°C	Good	Excellent	Excellent	Yes
Vespel®	350°C+	Excellent	Good	Good	Yes
VG1	400°C	Excellent	Good	Excellent	Yes
VG2	400°C	Excellent	Good	Excellent	Yes




What ferrule type do you need?	
Ferrule Type	Use for:
<b>0.4mm Hole:</b>	Capillaries with i.d. of 0.10-0.25mm
<b>0.5mm Hole:</b>	Capillaries with i.d. of 0.28-0.35mm
<b>0.8mm Hole:</b>	Capillaries with i.d. of 0.45-0.53mm
<b>NO-HOLE:</b>	As plugs, or drill for special needs
<b>2-HOLE:</b>	Connecting two pieces of capillary tubing or columns to the same endfitting

### PTFE and Graphite Ferrules





Description	Fitting Size	Tubing Size	Qty.	PTFE Part No.	Graphite Part No.
<i>Straight Ferrules</i>					
	1"	1"	2	—	14361
	7/8"	7/8"	2	—	14360
	3/4"	3/4"	2	—	14358
	5/8"	5/8"	2	—	14357
	1/2"	1/2"	10	—	SF-800-G
	3/8"	3/8"	10	SF-600-T	SF-600-G
	1/4"	1/4"	10	SF-400-T	SF-400-G
	3/16"	3/16"	10	SF-300-T	SF-300-G
	1/8"	1/8"	10	SF-200-T	SF-200-G
	1/16"	1/16"	10	SF-100-T	SF-100-G
<i>Reducing Ferrules</i>					
	1/4"	1/16"	10	RF-400/100-T	RF-400/100-G
	1/4"	0.8mm	10	—	RF-400/0.8-G
	1/4"	1/8"	10	RF-400/200-T	RF-400/200-G
	1/4"	3/16"	10	RF-400/300-T	14327
	1/4"	4mm	10	—	14384
	1/4"	6mm	10	RF-400/6MM-T	RF-400/6MM-G
	1/8"	1/16"	10	RF-200/100-T	RF-200/100-G
	1/8"	1.2mm	10	—	14326
	1/8"	1.0mm	10	—	14311
	1/8"	0.8mm	10	—	RF-200/0.8-G
	1/8"	0.5mm	10	—	RF-200/0.5-G
	1/8"	0.4mm	10	—	RF-200/0.4-G
	1/8"	1.2mm	10	—	14305
	1/16"	1.0mm	10	—	RF-100/1.0-G
	1/16"	0.8mm	10	—	RF-100/0.8-G
	1/16"	0.5mm	10	—	RF-100/0.5-G
	1/16"	0.4mm	10	—	RF-100/0.4-G
	1/16"	0.3mm	10	—	14308

## GC Ferrules (continued)

## PTFE and Graphite Ferrules (continued)

Description	Fitting Size	Tubing Size	Qty.	PTFE Part No.	Graphite Part No.
<i>HP/Agilent Short Ferrules</i>					
	1/16"	1.2mm	10	—	14370
	1/16"	1.0mm	10	—	14325
	1/16"	0.8mm	10	—	14324
	1/16"	0.5mm	10	—	14323
	1/16"	0.4mm	10	—	14322
	1/16"	0.3mm	10	—	14321
<i>Two-Hole Ferrules</i>					
	1/8"	0.8mm	10	—	14334
	1/8"	0.5mm	10	—	14307
	1/16"	0.5mm	10	—	14330
<i>No-Hole Ferrules</i>					
	3/8"	—	10	—	14332
	1/4"	—	10	RF-400/0-T	14328
	1/8"	—	10	RF-200/0-T	14314
	1/16"	—	10	RF-100/0-T	14310
<i>Graphite Ferrules for HP/Agilent Nuts</i>					
0.5mm	—	—	10	—	1547901
1.0mm Hole	—	—	10	—	1548001

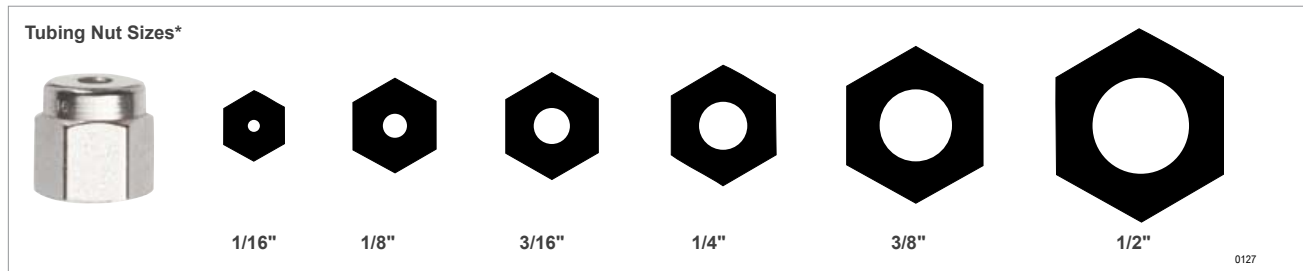
## Vespel® and Vespel®/Graphite Ferrules

Description	Fitting Size	Tubing Size	Qty.	Vespel® Part No.	VG1 Part No.	VG2 Part No.
<i>Straight Ferrules</i>						
	1/4"	1/4"	10	SF-400-V	SF-400-VG1	SF-400-VG2
	1/4"	1/4"	10	15449*	15449*	15451*
	1/8"	1/8"	10	SF-200-V	SF-200-VG1	SF-200-VG2
	1/8"	1/8"	10	—	15450*	15452*
	1/16"	1/16"	10	SF-100-V	SF-100-VG1	SF-100-VG2
<i>Reducing Ferrules</i>						
	1/4"	6mm	10	RF-400/6MM-V	400/6MM-VG1	400/6MM-VG2
	1/4"	3/16"	10	RF-400/300-V	400/300-VG1	400/300-VG2
	1/4"	1/8"	10	RF-400/200-V	400/200-VG1	400/200-VG2
	1/4"	1/16"	10	RF-400/100-V	400/100-VG1	400/100-VG2
	1/4"	0.8mm	10	—	400/0.8-VG1	400/0.8-VG2
	1/8"	1/16"	10	RF-200/100-V	200/100-VG1	200/100-VG2
	1/8"	0.8mm	10	—	200/0.8-VG1	200/0.8-VG2
	1/8"	0.5mm	10	—	200/0.5-VG1	200/0.5-VG2
	1/8"	0.4mm	10	—	200/0.4-VG1	200/0.4-VG2
	1/16"	1.0mm	10	RF-100/1.0-V	100/1.0-VG1	100/1.0-VG2
	1/16"	0.9mm	10	RF-100/0.9-V	100/0.9-VG1	100/0.9-VG2
	1/16"	0.8mm	10	RF-100/0.8-V	100/0.8-VG1	100/0.8-VG2
	1/16"	0.5mm	10	RF-100/0.5-V	100/0.5-VG1	100/0.5-VG2
	1/16"	0.4mm	10	RF-100/0.4-V	100/0.4-VG1	100/0.4-VG2
	1/16"	0.3mm	10	—	100/0.3-VG1	—
<i>No-Hole Ferrules</i>						
	1/4"	—	10	RF-400/0-V	400/0-VG1	400/0-VG2
	1/8"	—	10	RF-200/0-V	200/0-VG1	200/0-VG2
	1/16"	—	10	RF-100/0-V	100/0-VG1	100/0-VG2
<i>Two-Hole Ferrules</i>						
	1/16"	0.5mm	10	—	15486	15488
	1/16"	0.4mm	10	—	15481	15487

\*Equivalent to Parker one-piece metal ferrule.

## Fittings Selection Guide

To determine the size of a nut or female pipe thread, compare it to the silhouettes below. To determine the size of a ferrule, measure its inside diameter. Please note that tubing fitting sizes are based on the outside diameter of the tube, while pipe thread fitting sizes are based on the inside dimension of the pipe. Pipe and tubing fittings are not interchangeable.



\*Silhouettes shown at actual size.









## Parker Fittings

Parker fittings are available in two forms: the CPI one-piece ferrule and the A-Lok two-piece ferrule. Most parts are available in brass or stainless steel and should be matched to the tubing, particularly in thermal applications.

Parker Fittings					
Description	Dimensions	Qty.	CPI Brass Part No.	Qty.	CPI Stainless Steel Part No.
<i>Nuts</i>					
	1/16"	10/pk	<b>14057</b>	10/pk	<b>141575</b>
	1/8"	10/pk	<b>14058</b>	10/pk	<b>14158</b>
	1/4"	10/pk	<b>14059</b>	10/pk	<b>14159</b>
<i>Ferrules</i>					
	1/16"	10/pk	<b>14060</b>	10/pk	<b>141605</b>
	1/8"	10/pk	<b>14061</b>	10/pk	<b>14161</b>
	1/4"	10/pk	<b>14062</b>	10/pk	<b>14162</b>
<i>Tees</i>					
	1/16"	ea	<b>14075</b>	ea	<b>14175</b>
	1/8"	ea	<b>14053</b>	ea	—
	1/4"	ea	<b>14077</b>	ea	<b>14177</b>

## Parker Fittings (continued)

## Parker Fittings (continued)

Description	Dimensions	Qty.	CPI Brass Part No.	Qty.	CPI Stainless Steel Part No.
<i>Unions</i>					
	1/16"	ea	14063	ea	14163
	1/8"	ea	14065	ea	14165
	1/4"	ea	14068	ea	14168
<i>Reducing Unions</i>					
	1/8" to 1/16"	ea	14064	ea	14164
	1/4" to 1/16"	ea	60026	ea	14166
	1/4" to 1/8"	ea	60028	ea	61028
	3/8" to 1/4"	ea	60030	ea	61030
<i>Capillary Union</i>					
	1/16"	ea	—	ea	28812
<i>Female Pipe Thread Connectors (Tube to FPT)</i>					
	1/8" to 1/8" FPT	ea	60048	ea	61048
	1/8" to 1/4" FPT	ea	14071	ea	61084
	1/4" to 1/8" FPT	ea	60050	ea	61050
<i>Male Pipe Thread Connectors (Tube to MPT)</i>					
	1/8" to 1/8" MPT	ea	60038	ea	61038
	1/8" to 1/4" MPT	ea	60039	ea	61039
	1/4" to 1/8" MPT	ea	60042	ea	61042
	1/4" to 1/4" MPT	ea	14069	ea	61082
<i>Tube End Connectors (Reducers)</i>					
	1/8" to 1/4" tube	ea	60060	ea	61060
	1/4" to 1/8" tube	ea	14073	ea	14169
	3/8" to 1/4" tube	ea	60068	ea	61068
<i>Caps</i>					
	1/8"	ea	14051	ea	14152
	1/4"	ea	14052	ea	14153
<i>Plugs</i>					
	1/8"	ea	14055	ea	14155

# SWAGELOK® Tube Fittings








SWAGELOK® tube fittings provide a leak-proof, torque-free seal at all tubing connections and eliminate costly, hazardous leaks in instrumentation and process tubing.

All the action in the fitting moves along the tube axially instead of with a rotary motion. Since no torque is transmitted from the fitting to the tubing, there is no initial strain which might weaken the tubing.

**tech tip**







**CAUTION:** Do not mix or interchange parts of tube fittings made by other manufacturers with SWAGELOK® tube fitting parts.

**SWAGELOK® Fittings**

Description	Dimensions	Qty.	Brass Part No.	Qty.	Stainless Steel Part No.
<i>Nuts</i>					
	1/16"	10	<b>55002</b>	10	<b>55199</b>
	1/8"	10	<b>55003</b>	10	<b>55193</b>
	1/4"	10	<b>55005</b>	10	<b>55195</b>
<i>Front Ferrules</i>					
	1/16"	10	<b>55006</b>	10	<b>55196</b>
	1/8"	10	<b>55007</b>	10	<b>55197</b>
	1/4"	10	<b>55013</b>	10	<b>55093</b>
<i>Back Ferrules</i>					
	1/16"	10	<b>55014</b>	10	<b>55094</b>
	1/8"	10	<b>55015</b>	10	<b>55095</b>
	1/4"	10	<b>55017</b>	10	<b>55097</b>
<i>Union (Low Dead Volume)</i>					
	1/16"	ea	<b>55001</b>	ea	<b>55101</b>
<i>Unions</i>					
	1/16"	ea	<b>55009</b>	ea	<b>55109</b>
	1/8"	ea	<b>55010</b>	ea	<b>55110</b>
	1/4"	ea	<b>55012</b>	ea	<b>55112</b>
<i>Bulkhead Unions</i>					
	1/16"	ea	<b>51017</b>	ea	<b>55117</b>
	1/8"	ea	<b>55018</b>	ea	<b>55118</b>
	1/4"	ea	<b>55020</b>	ea	<b>55120</b>
<i>Reducing Unions</i>					
	1/8" to 1/16"	ea	<b>55021</b>	ea	<b>55121</b>
	1/4" to 1/16"	ea	<b>55024</b>	ea	<b>55124</b>
	1/4" to 1/8"	ea	<b>55025</b>	ea	<b>55125</b>

## SWAGelok® Fittings (continued)

### SWAGelok® Fittings (continued)

Description	Dimensions	Qty.	Brass Part No.	Qty.	Stainless Steel Part No.
<i>Female Pipe Thread Connectors (Tube to FPT)</i>					
	1/8" to 1/4" FPT	ea	<b>55047</b>	ea	<b>55147</b>
	1/4" to 1/4" FPT	ea	<b>55050</b>	ea	<b>55150</b>
<i>Male Pipe Thread Connectors (Tube to MPT)</i>					
	1/8" to 1/4" MPT	ea	<b>55037</b>	ea	<b>55137</b>
	1/4" to 1/4" MPT	ea	<b>55043</b>	ea	<b>55143</b>
<i>Tees</i>					
	1/16"	ea	<b>55027</b>	ea	<b>55127</b>
	1/8"	ea	<b>55028</b>	ea	<b>55128</b>
	1/4"	ea	<b>55030</b>	ea	<b>55130</b>
<i>Crosses</i>					
	1/8"	ea	<b>55031</b>	ea	<b>55131</b>
	1/4"	ea	<b>55032</b>	ea	<b>55132</b>
<i>Caps</i>					
	1/16"	ea	—	ea	<b>55185</b>
	1/8"	ea	<b>55086</b>	ea	<b>55186</b>
<i>Plugs</i>					
	1/16"	ea	—	ea	<b>55189</b>
	1/8"	ea	<b>55090</b>	ea	<b>55190</b>
	1/4"	ea	<b>55092</b>	ea	<b>55192</b>



### related products

#### Need tubing?

See pages 384–391 for a complete selection of stainless steel, metal, and polymeric tubing.

### technical assistance

Contact Tech Support: Phone: 1.800.255.8324 (North America)

Email: [contact.alltech@grace.com](mailto:contact.alltech@grace.com)

Online: [www.discoverysciences.com](http://www.discoverysciences.com)