

# Graphite Ferrules

the "PERFECT" Connection for GC and Glass Tubes

also Graphite/Polyimide for GC/MS ( Vacuum Application )

**500degC** in air  
 "unlimited" in inert gas  
 Soft and Malleable  
 No phase transitions  
 like plastics

## Graphite Ferrules - ALL sizes from 2mmOD to 2.0 in ID

- have been proven in over 25 years production by **Chromalytic Technology** with "millions" being sold "world-wide" mainly through some of the leading chromatography distributors and OEMs.

Full range of sizes from 0.3mm ID for capillary columns right up to 2.0-in for preparative columns and industrial applications;

Industrial Applications : **glass/ceramic tube** reactor/catalyst tubes, pump glands. **there is a size to fit ALL applications !**

**If we haven't got it already we will guarantee to make it for you !**

- Maximum temperature use to 500 deg-C or much higher in a "capture fitting" or if protected in an inert atmosphere.
- They are soft and malleable and extrude into shape to fill minor imperfections in tubing and "distorted fittings".
- They have an ideal "feel" for use with glass and fused silica capillary tube to help avoid crushing on over-tightening.
- They will not stick or bind to tubing and the nut/ferrule can simply be slid off the tubing for re-use.

**Specifically for GC . . . ALL types of GCs** are catered for including OEM specific ferrules; for example HP/Agilent inlet seals, injector liner O-rings; 8mm, 1/4, 5mmOD for Carlo Erba / Fisons /Thermo / Shimadzu; capture type cup GC column seals. etc

**OEM Enquiries Welcome**

### 3 basic Profiles are available . . .

- **SF** - Single (Piece) Ferrule for **Swagelok** and similar fittings eg **Parker**.
- **GF** - Front ferrule design for use with a "backing ferrule" or in Chromalytic "butt-type" connection fittings, injection systems.
- **Short profile** - "short" specially designed for HP/Agilent GC capillary GC column inlet seals.

Also . . .

**Graphite O-rings** (6.35mm and 6,5mm ID) for HP/Agilent GC injector liners.

**Cup Graphite Seals** for CE/Fisons/ThermoQuest , Shimadzu and the NEW **CT** graphite capture fittings - **Enquire !**

**Capture Ring** graphite seal for 8mm OD Fisons/CE/TQ liners.

## Graphite/Polyimide Ferrules - 1/8"ID max

: material tends to be cost prohibitive - Other Sizes to special Order

These are precision machined ( and NOT moulded ) to give a perfect fit in all Swagelok and Parker 1/16-in fittings.

**Temperature use** is limited to about 320 deg-C.( phase transition )

They are made from **15% graphite/polyimide** selected by . . .

**Chromalytic Technology** as being the best compromise in "softness", non-stickability and crack resistance. They are preferred over **Graphite Ferrules** for vacuum operation or use in GC/MS for reduced air diffusion.

For long term use - they may tend to "dry out" and may crack on re-tightening after use at high temperature.



Single Piece		Front Ferrule Type	
Ferrule Size / Cat.#		Ferrule Size / Cat.#	
1/16" to :		1/16" to :	
0.3mm	SF100/0.3G	0.4mm	GF100/0.4
0.4mm	SF100/0.4G	0.5mm	GF100/0.5
0.5mm	SF100/0.5G	0.8mm	GF100/0.8
0.8mm	SF100/0.8G	1.0mm	GF100/1.0
1.0mm	SF100/1.0G	1/16"	GF100
1.2mm	SF100/1.2G		
1/16"	SF100G	1/8"	GF200
		1/4" to 3/16"	GF400/300
1/8" to :		1/4 to 6mm	GF400/M6
0.4mm	SF200/0.4G	1/4"	GF400
0.5mm	SF200/0.5G		
0.8mm	SF200/0.8G	"Specials"	
1.0mm	SF200/1.0G	Agilent	
1.2mm	SF200/1.2G	O-rings	GFO-6.35HP
1/16"	SF200/100G	6.35mm	GFO-6.5HP
1/8"	SF200G	6.5mm	
3/16"	SF300G	Inlet Seals	
		(Short)	GF0.3HP
1/4" to :		0.3mm	GF0.4HP
0.5mm	SF400/0.5G	0.4mm	GF0.5HP
0.8mm	SF400/0.8G	0.5mm	GF0.8HP
1/16"	SF400/100G	0.8mm	GF1.0HP
1/8"	SF400/200G	1.0mm	GF1.2HP
6mm	SF400/M6G	1.2mm	
1/4"	SF400G	(standard)	
		0.3mm	GF100/0.3HP
3/8"	SF600G	0.4mm	GF100/0.4HP
1/2"	SF800G	0.5mm	GF100/0.5HP
5/8"	SF1000G	0.8mm	GF100/0.8HP
3/4"	SF1200G	1.0mm	GF100/1.0HP
7/8"	SF1400G	1.2mm	GF100/1.2HP
1.0-in	SF1600G	Fisons/CE/	
1-1/4-in	SF2000G	0.3mm	CF0.3Fis
1-1/2-in	SF2400G	0.4mm	CF0.4Fis
1-3/4-in	SF2800G	0.5mm	CF0.5Fis
2.0-in	SF3200G	0.8mm	CF0.8Fis
		1.0mm	CF1.0Fis
<b>Metric</b>		8mm	CF8.0Fis
5mm	SFM5G		
10mm	SFM10G		
12mm	SFM12G		
14mm	SFM14G		
16mm	SFM16G		
18mm	SFM18G		

### Graphite/Polyimide 1/16"OD . . . Tube Fitting

0.3mm	SF100/0.3VG1
0.4mm	SF100/0.4VG1
0.5mm	SF100/0.5VG1
0.7mm	SF100/0.7VG1
0.8mm	SF100/0.8VG1
1.0mm	SF100/1.0VG1
1.2mm	SF100/1.2VG1
1/16"	SF100VG1
1/8"	SF200VG1
3/16"	SF300VG1
1/4"	SF400VG1

**ANY size**  
to your  
specifications  
**Generous Discounts**  
apply to OEMs  
and for  
**"bulk" orders**

**Other Specials** - for small "runs" a tooling cost may apply

### Double-Hole Ferrules

1/16" Double-hole	1/16"	SF100/00G
SF100/2x0.5G	1/8"	SF200/00G
GF2x0.5HP, GF100/2x0.5G	3/16"	SF300/00G
1/8" Double-hole	1/4"	SF400/00G
SF200/2xM0.5G	3/8"	SF400/00G
SF200/2xM0.8G	1/2"	SF800/00G

### No-Hole Ferrules (Blanks)

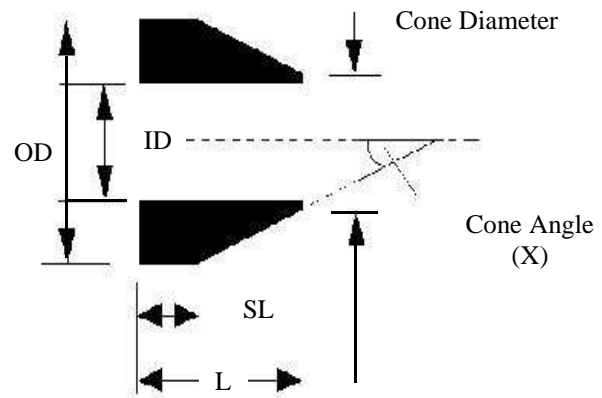
Note : **Teflon** and **PEEK** ferrules are also available for HPLC / LC / FIA applications . . . **Enquire !**

# Graphite Ferrules

## CUSTOM Specifications

**"Not ALL Things  
are possible"**

To Order Custom-made "Specials" ... Ferrule Specifications required		
Size in ... Inches <input type="checkbox"/> or ... mm <input type="checkbox"/>		
Material	Required	Tolerance Required
- Graphite	<input type="checkbox"/>	
- Graphite/Polyimide 15%	<input type="checkbox"/>	
- Teflon (PTFE)	<input type="checkbox"/>	
- PEEK	<input type="checkbox"/>	
- Kel-F / Tefzel	<input type="checkbox"/>	
Other ( specify )		
ID		
OD		
Length		
Shoulder length (SL)		
Cone diameter (CD)		
Quantity Required		



The **Cone Angle** is generally incidental in production - but typically for the SF type ferrules (X)=17 degrees +-1 deg  
The shape is actually determined by all other dimensions  
The **Overall Length** is the easiest parameter to vary in production simply by varying the **Shoulder Length (SL)** whilst retaining a constant **Cone Angle (X)**

**for Specials** - a tooling set-up cost of \$75 to \$150 may apply for small quantities depending on the actual size.

Typical Ferrule Dimensions and Tolerances ( sizes in inches )						ID	Min	Max
Catalog #	ID	L	SL	CD	OD	0.3mm	0.0125	0.0135
SF100/...G	0.3mm-1/16"	0.170	0.100	0.075	0.125	0.4mm	0.160	0.0175
GF...HP	0.3mm-1/16"	0.090	0.050	0.072	0.125	0.5mm	0.020	0.0215
GF100/...HP	0.3mm-1/16"	0.120	0.080	0.072	0.125	0.7mm	0.027	0.0285
GF100/...	0.3mm-1/16"	0.135	0.095	0.075	0.125	0.8mm	0.310	0.320
SF200/...G	0.4mm-1/8"	0.250	0.120	0.135	0.250	1.0mm	0.040	0.042
SF400/...G	0.5mm-1/4"	0.255	0.120	0.260	0.375	1.2mm	0.047	0.049
HP O-ring	6.35mm,6.5mm	0.100	-	-	0.375	1/16"	0.063	0.0645
SF600G	3/8"	0.320	0.160	0.390	0.500	1/8	0.125	0.1265
SF800G	1/2"	0.375	0.160	0.520	0.675	1/4	0.250	0.252
SF1000G	5/8"	0.400	0.160	0.660	0.815	3/8	0.375	0.387
SF1200G	3/4"	0.450	0.180	0.790	0.945	Graphite Ferrules will squash into shape and actual sizes are far less critical than for metal ferrules.		
SF1400G	7/8"	0.525	0.200	0.780	1.125			
SF1600G	1.00"	0.575	0.250	1.040	1.25			
SF2400G	1-1/2"	0.875	0.340	1.560	1.75			
SF3200G	2.00"	1.100	0.275	2.090	2.60			

Typical Manufacturing Tolerances	L	+ 0.005	- 0.005
	SL	+ 0.005	- 0.005
	ID	+ 0.002	- 0.000
	CD	+ 0.002	- 0.000
	OD	+ 0.000	- 0.002
	Cone Angle(X)		
<b>* tighter tolerance is possible but generally at extra cost</b>			

**ANY Size - IF it is practical !**  
... **THEN we can make it !**  
Types include "capture type" and "cup seals" and "encapsulated" ferrules ... **Enquire !**  
**BUT !** We suggest YOU draw it exactly to scale first to PROVE it is feasible in principle in the first place !

### Custom Precision Machining

- Metal ... in ANY material Stainless Steel - any grade 303 / 304/ 316/ Inconel, Brass
- ANY type of plastics ... Vespel / Graphite/polyimide / Teflon / PEEK / Kel-F / Nylon / polypropylene etc etc
- "small" runs a specialty ... **We do NOT try and compete with large auto-repetition shops** ... If you can buy mass-produced / cast or moulded products we can't compete ... we "specialise in specials"