

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	
Ferrule Size / Cat.#	
1/16" to :	
0.3mm	SF100/0.3G
0.4mm	SF100/0.4G
0.5mm	SF100/0.5G
0.8mm	SF100/0.8G
1.0mm	SF100/1.0G
1.2mm	SF100/1.2G
1/16"	SF100G
1/8" to :	
0.4mm	SF200/0.4G
0.5mm	SF200/0.5G
0.8mm	SF200/0.8G
1.0mm	SF200/1.0G
1.2mm	SF200/1.2G
1/16"	SF200/100G
1/8"	SF200G
3/16"	SF300G
1/4" to :	
0.5mm	SF400/0.5G
0.8mm	SF400/0.8G
1/16"	SF400/100G
1/8"	SF400/200G
6mm	SF400/M6G
1/4"	SF400G
3/8"	SF600G
1/2"	SF800G
5/8"	SF1000G
3/4"	SF1200G
7/8"	SF1400G
1.0-in	SF1600G
1-1/4-in	SF2000G
1-1/2-in	SF2400G
1-3/4-in	SF2800G
2.0-in	SF3200G
Metric	
5mm	SFM5G
10mm	SFM10G
12mm	SFM12G
14mm	SFM14G
16mm	SFM16G
18mm	SFM18G

Front Ferrule Type	
Ferrule Size / Cat.#	
1/16" to :	
0.4mm	GF100/0.4
0.5mm	GF100/0.5
0.8mm	GF100/0.8
1.0mm	GF100/1.0
1/16"	GF100
1/8"	GF200
1/4" to 3/16"	GF400/300
1/4 to 6mm	GF400/M6
1/4"	GF400
"Specials"	
Agilent O-rings	GFO-6.35HP
6.35mm	GFO-6.5HP
6.5mm	
Inlet Seals (Short)	
0.3mm	GF0.3HP
0.4mm	GF0.4HP
0.5mm	GF0.5HP
0.8mm	GF0.8HP
1.0mm	GF1.0HP
1.2mm	GF1.2HP
(standard)	
0.3mm	GF100/0.3HP
0.4mm	GF100/0.4HP
0.5mm	GF100/0.5HP
0.8mm	GF100/0.8HP
1.0mm	GF100/1.0HP
1.2mm	GF100/1.2HP
Fisons/CE/	
0.3mm	CF0.3Fis
0.4mm	CF0.4Fis
0.5mm	CF0.5Fis
0.8mm	CF0.8Fis
1.0mm	CF1.0Fis
8mm	CF8.0Fis

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	No-Hole Ferrules (Blanks)
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

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

Graphite Ferrules

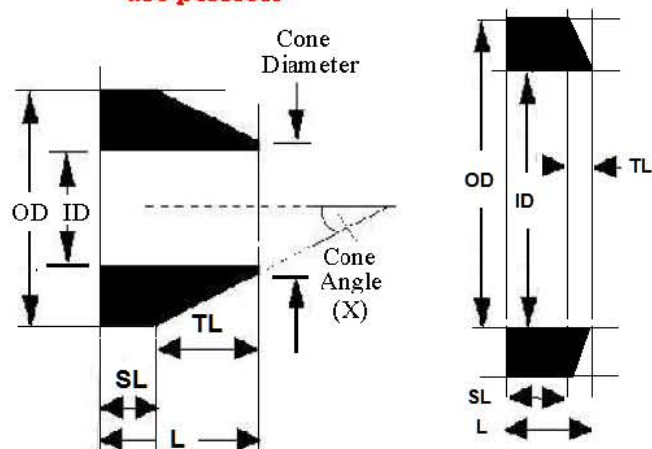
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CUSTOM Specifications

**"Not ALL Things
are possible"**

"pseudo" O-RING

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 (L)		
= (ShoulderLength + TaperLength) SL TL		
Cone diameter (CD)	ID + 0.3 to 0.6 mm for TIP strength	
Quantity Required		



One-Piece Swagelok Cone Ferrule SF400G SF30.0/25.4/6.0-4.2-1.8G

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)

Catalog #	ID	L	SL	CD	OD	ID	Min	Max
SF100/...G	0.3mm-1/16"	0.170	0.100	0.075	0.125	0.3mm	0.0125	0.0135
GF...HP	0.3mm-1/16"	0.090	0.050	0.072	0.125	0.4mm	0.160	0.0175
GF100/...HP	0.3mm-1/16"	0.120	0.080	0.072	0.125	0.5mm	0.020	0.0215
GF100/...	0.3mm-1/16"	0.135	0.095	0.075	0.125	0.7mm	0.027	0.0285
SF200/...G	0.4mm-1/8"	0.250	0.120	0.135	0.250	0.8mm	0.310	0.320
SF400/...G	0.5mm-1/4"	0.255	0.120	0.260	0.375	1.0mm	0.040	0.042
HP O-ring	6.35mm, 6.5mm	0.100	-	-	0.375	1.2mm	0.047	0.049
SF600G	3/8"	0.320	0.160	0.390	0.500	1/16"	0.063	0.0645
SF800G	1/2"	0.375	0.160	0.520	0.675	1/8"	0.125	0.1265
SF1000G	5/8"	0.400	0.160	0.660	0.815	1/4"	0.250	0.252
SF1200G	3/4"	0.450	0.180	0.790	0.945	3/8"	0.375	0.387
SF1400G	7/8"	0.525	0.200	0.780	1.125	Graphite Ferrules will squash into shape and actual sizes are far less critical than for metal ferrules.		
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)			
* tighter tolerance is possible but generally at extra cost			

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"

Australian / International FERRULES - Price List July 2014-16

Graphite Ferrules - Straight - in USD / AUD

Custom GFs

Catalog #	Fitting Size	Hole ID	Description	USD/AUD	QTY
In AUSTRALIA Prices are the same but in AUD					
SF100G	1/16"	1/16"	Ferrules, Graphite, 1/16"ID	25.00	10-pk
GF100	1/16"	1/16"	Ferrules, Graphite, FRONT, 1/16"ID	25.00	10-pk
SF200G	1/8"	1/8"	Ferrules, Graphite, 1/8"ID	25.00	10-pk
GF200	1/8"	1/8"	Ferrules, Graphite, FRONT, 1/8"ID	25.00	10-pk
SF300G	3/16"	3/16"	Ferrules, Graphite, 3/16mmID	25.00	10-pk
SFM5G	5mm	5mm	Ferrules, Graphite, Varian 5mmID	25.00	10-pk
GF400	1/4"	1/4"	Ferrules, Graphite, FRONT, 1/4"ID	25.00	10-pk
SF400G	1/4"	1/4"	Ferrules, Graphite, 1/4"ID	25.00	10-pk
SF400SPEC	1/4"	1/4"	Ferrules, Graphite, 1/4"ID	30.00	10-pk
SF600G	3/8"	3/8"	Ferrules, Graphite, 3/8"ID	36.00	10-pk
SFM10G	10mm	10mm	Ferrules, Graphite, 10mmID Metric	36.00	10-pk
SFM12G-1	12mm	12mm	Ferrules, Graphite, 12mmID Metric	4.20	ea
SF800G	1/2"	1/2"	Ferrules, Graphite, 1/2"ID	42.00	10-pk
SFM14G-1	14mm	14mm	Ferrules, Graphite, 14mmID Metric	4.80	ea
SF1000G-1	5/8"	5/8"	Ferrules, Graphite, 5/8"ID	4.80	ea
SF1200G-1	3/4"	3/4"	Ferrules, Graphite, 3/4"ID	5.60	ea
SF1400G-1	7/8"	7/8"	Ferrules, Graphite, 7/8"ID	6.80	ea
SF1600G-1	1.0"	1.0"	Ferrules, Graphite, 1.0"ID	8.10	ea
SFM25G-1	25mm	25mm	Ferrules, Graphite, 1-1/4"ID	8.10	ea
SF2000G-1	1-1/4"	1-1/4"	Ferrules, Graphite, 1-1/4"ID	12.00	ea
SF2400G-1	1-1/2"	1-1/2"	Ferrules, Graphite, 1-1/2"ID	15.00	ea
SF2800G-1	1-3/4"	1-3/4"	Ferrules, Graphite, 1-3/4"ID	18.00	ea
SF3200G-1	2.0"	2.0"	Ferrules, Graphite, 2.0"ID	21.00	ea

NOTES : Graphite Ferrules

2 Sizes of HP ferrules for HP/Agilent 5890

GF100/- - HP size to fit standard HP inlet seal nut (0.125-in long)

GF- - HP a short version to fit shallow recess HP nut (0.090-in Long

Custom Ferrules : ANY size to order - *providing it is physically feasible for us to make.*

We need accurate dimension "specs" OD / ID / Overall Length / Shoulder Length and OD at Cone Tip. Note : For Swagelok Ferrule shapes the cone angle is normally 17-deg

There may be a "one-off" tooling charge of USD90(<1/2"ID) to- \$150 depending on size

- if this is required for a "special" ie not a stock item.

Discounts : apply depending on **Total \$ Order** value or on Qty(each) . . . at **your** best rate!

USD10-99, 0%; USD100-500, 10% . . . Also OEM and Distributor Discounts : **. Enquire !**

Qty Discount

min10-99 less 0%
100-499 less 10%
500-1000 less 20%
1000+ less 25%
in \$ or each
at your best rate

Plus Freight Cost

Int'l Air Courier
USD75 per 500g
\$95/1kg . . . at cost

Delivery Times : Availability - **most standard sizes are ex stock in reasonable Qty's**

Production Lead Time : most sizes are ex-stock or 4-5 days production for **qty to 500** each;
larger qty approx 7+ days from date of order . . . **PLUS transit time**

Shipping :

In Australia via Local Courier Aud 5 per 3kg; \$30 Interstate metro

International - Air Express Courier Door-to-door.

USA : USD 75.00 per 500g, USD95/ 1kg,

Transit time : approx 3 to 5 days (most countries eg. UK, USA, Canada . . .)

Other Countries - **please enquire !**

Payment by Bank Transfer or Credit Card via on-line PayPal (we send a separate PP Invoice on request)

. . . **plus Company Name; Street Delivery address; Contact Phone Number required.**

Prices include packing in plastic vials 10-pk unless specified otherwise. Also available "bulk-packed" for large quantities.
-1 suffix designates order qty : each - 50 for a 50-pk at 20% Discount . . . packed in plastic vials or separately for large sizes

Australian / International FERRULES - Price List July 2014-16

Graphite Ferrules - Reducing Prices per 10-pk - in USD / AUD

Custom GFs

Cat.#	Size	Hole ID	Description	USD/AUD	QTY
<i>In AUSTRALIA Prices are the same but in AUD</i>					
SF100/0.3G	1/16"	0.3mm	Ferrules, Graphite, 1/16"x0.3mmID	30.00	10-pk
SF100/0.4G	1/16"	0.4mm	Ferrules, Graphite, 1/16"x0.4mmID	25.00	10-pk
SF100/0.5G	1/16"	0.5mm	Ferrules, Graphite, 1/16"x0.5mmID	25.00	10-pk
SF100/0.8G	1/16"	0.8mm	Ferrules, Graphite, 1/16"x0.8mmID	25.00	10-pk
SF100/00G	1/16"	No-Hole	Ferrules, Graphite, 1/16"xNo-Hole	25.00	10-pk
SF100/1.0G	1/16"	1.0mm	Ferrules, Graphite, 1/16"x1.0mmID	25.00	10-pk
SF100/1.2G	1/16"	1.2mm	Ferrules, Graphite, 1/16"x1.2mmID	25.00	10-pk
SF100/2xM0.5G	1/16"	Dble-Hole	Ferrules, Graphite, 1/16"xDouble0.5mmID	35.00	10-pk
GF200/100	1/8"	1/16"	Ferrules, Graphite, FRONT, 1/8x1/16"ID	25.00	10-pk
SF200/0.4G	1/8"	0.4mm	Ferrules, Graphite, 1/8"x0.4mmID	25.00	10-pk
SF200/0.5G	1/8"	0.5mm	Ferrules, Graphite, 1/8"x0.5mmID	25.00	10-pk
SF200/0.8G	1/8"	0.8mm	Ferrules, Graphite, 1/8"x0.8mmID	25.00	10-pk
SF200/00G	1/8"	No-Hole	Ferrules, Graphite, 1/8"xNo-Hole	25.00	10-pk
SF200/1.0G	1/8"	1mm	Ferrules, Graphite, 1/8"x1.0mmID	25.00	10-pk
SF200/1.2G	1/8"	1.2mm	Ferrules, Graphite, 1/8"x1.2mmID	25.00	10-pk
SF200/100G	1/8"	1/16"	Ferrules, Graphite, 1/8"x1/16"ID	25.00	10-pk
SF200/2x0.5G	1/8"	Dble-Hole	Ferrules, Graphite, 1/8"xDouble0.5mmID	35.00	10-pk
SF200/2x0.8G	1/8"	Dble-Hole	Ferrules, Graphite, 1/8"xDouble0.8mmID	35.00	10-pk
SF300/100G	3/16"	1/16"	Ferrules, Graphite, 3/16"ID	25.00	10-pk
SFM8.5/5/4.5G	5mm	5mm	Ferrules, Graphite, Shimadzu 5mmID	25.00	10-pk
GF400/200SP	1/4"	1/8"	Ferrules, Graphite, 1/4-1/8" Flat	25.00	10-pk
SF400/00G	1/4"	No-Hole	Ferrules, Graphite, 1/4"xNo-Hole	25.00	10-pk
SF400/100G	1/4"	1/16"	Ferrules, Graphite, 1/4"x1/16"ID	25.00	10-pk
SF400/0.8G	1/4"	0.8mm	Ferrules, Graphite, 1/4"x0.8mmID	25.00	10-pk
SF400/0.5G	1/4"	0.5mm	Ferrules, Graphite, 1/4"x0.5mmID	30.00	10-pk
SF400/200G	1/4"	1/8"	Ferrules, Graphite, 1/4"x1/8"ID	25.00	10-pk
SF400/300G	1/4"	3/16"	Ferrules, Graphite, 1/4"x3/16"ID	25.00	10-pk
SF400/M6G	1/4"	6mm	Ferrules, Graphite, 1/4"x6mmID	25.00	10-pk
GF400/200	1/4"	1/8"	Ferrules, Graphite, FRONT, 1/4"x1/8"	25.00	10-pk
GF400/100	1/4"	1/16"	Ferrules, Graphite, FRONT, 1/4"x1/16"	25.00	10-pk
GF200/100	1/8"	1/16"	Ferrules, Graphite, FRONT, 1/8"x1/16"	25.00	10-pk
SF600/00G	3/8"	No-Hole	Ferrules, Graphite, 3/8"xNo-Hole	42.00	10-pk
CF0.3FIS	1/16"	0.3mm	Ferrules, Graphite Capture Cup 0.3mmID	85.00	10-pk
CF0.4FIS	1/16"	0.4mm	Ferrules, Graphite Capture Cup 0.4mmID	85.00	10-pk
CF0.5FIS	1/16"	0.5mm	Ferrules, Graphite Capture Cup 0.5mmID	85.00	10-pk
CF0.8FIS	1/16"	0.8mm	Ferrules, Graphite Capture Cup 0.8mmID	85.00	10-pk
CF1.0FIS	1/16"	1.0mm	Ferrules, Graphite Capture Cup 1.0mmID	85.00	10-pk
GF0.3HP	1/16"	0.3mm	Ferrules, Graphite, 0.3mm ID HP Short	25.00	10-pk
GF0.4HP	1/16"	0.4mm	Ferrules, Graphite, 0.4mm ID HP Short	25.00	10-pk
GF0.5HP	1/16"	0.5mm	Ferrules, Graphite, 0.5mm ID HP Short	25.00	10-pk
GF0.8HP	1/16"	0.8mm	Ferrules, Graphite, 0.8mm ID HP Short	25.00	10-pk
GF1.0HP	1/16"	1.0mm	Ferrules, Graphite, 1.0mm ID HP Short	25.00	10-pk
GF1.2HP	1/16"	1.2mm	Ferrules, Graphite, 1.2mm ID HP Short	25.00	10-pk
GF100/0.4	1/16"	0.4mm	Ferrules, Graphite, FRONT, 1/16"IDx0.4mmID	25.00	10-pk
GF100/0.5	1/16"	0.5mm	Ferrules, Graphite, FRONT, 1/16"IDx0.5mmID	25.00	10-pk
GF100/0.8	1/16"	0.8mm	Ferrules, Graphite, FRONT, 1/16"x0.8mmID	25.00	10-pk
GF100/1.0	1/16"	1.0mm	Ferrules, Graphite, FRONT, 1/16"x1.0mmID	25.00	10-pk
GF100/1.2	1/16"	1.2mm	Ferrules, Graphite, FRONT, 1/16"x1.2mmID	25.00	10-pk
GF100/0.3HP	1/16"	0.3mm	Ferrules, Graphite, 0.3MM ID HP Standard	30.00	10-pk
GF100/0.4HP	1/16"	0.4mm	Ferrules, Graphite, 0.4MM ID HP Standard	25.00	10-pk
GF100/0.5HP	1/16"	0.5mm	Ferrules, Graphite, 0.5mm ID HP Standard	25.00	10-pk
GF100/0.8HP	1/16"	0.8mm	Ferrules, Graphite, 0.8mm ID HP Standard	25.00	10-pk
GF100/1.0HP	1/16"	1.0mm	Ferrules, Graphite, 1.0mm ID HP Standard	25.00	10-pk

Prices include packing in plastic vials 10-pk unless specified otherwise. Also available "bulk-packed" for large quantities.
-1 suffix designates order qty : each - 50 for a 50-pk at 20% Discount . . . packed in plastic vials or separately for large sizes