

Ferrules and Nuts

Ferrules

GC ferrules should provide a leak-tight seal, accommodate column O.D. variations, seal with minimum torque and not stick to the column or fittings. Additionally, they should be resilient enough to maintain their seal when column temperature and corresponding back pressure increases. Three popular ferrule compositions that meet these requirements are listed below. Ferrules of other compositions and/or with other internal diameters can be found in our catalog and on our website.

Supeltex® M-2A Ferrules

- Max. Temp.: 400 °C
- Composition: Vespel™ SP-21 (85% polyimide/15% graphite)
- Characteristics: Seal at 1/4-turn past fingertight.
- Benefits: High reusability. Won't stick to metal or glass. Form leaktight seals without sticking to the column. Do not require back ferrules.

Supeltex® M-4 Ferrules

- Max. Temp.: 450 °C
- Composition: Flexible graphite
- Characteristics: Seal at 1/4-turn past fingertight.
- Benefits: An improved design that offers a clean, sharp profile with minimal flash. Maximum sealing surface contact. Reduced risk of column contamination at installation.

CapSeal Bullet® Ferrules

- Exclusively available from the Supelco® product portfolio
- Max. Temp.: 450 °C
- Composition: Graphite material captured in aluminum base
- Characteristics: Seal at 1/8-turn past fingertight
- Benefits: Reusable. A special end taper reduces graphite extrusion into fitting. Aluminum base keeps the ferrule from adhering to the fitting, making it easy to remove.

Ferrule Designs

Short design ferrules fit:

- The original nuts that ship with Agilent® GCs

Long design ferrules fit:

- MSD source nuts for Agilent GCs
- The original nuts that ship with PerkinElmer® GCs
- The original nuts that ship with Varian® GCs

General purpose ferrules fit:

- Supelco® Ferrule Nut Adapters for Agilent® GCs
- 1/16 inch compression nuts for PerkinElmer GCs

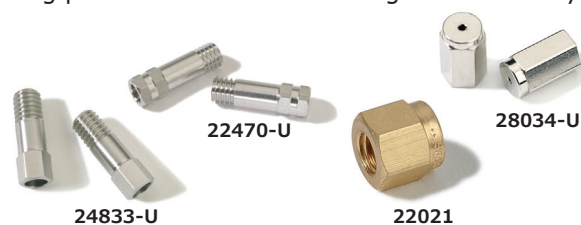


0.10–0.25 mm Column I.D., 0.4 mm Ferrule I.D.

Column I.D.	Pkg	Cat. No.
Supeltex® M-2A, Short Design	10 ea	24803-U
	50 ea	24807-U
Supeltex® M-4, Short Design	10 ea	24811-U
CapSeal Bullet, Short Design	10 ea	23864
	50 ea	23867
Supeltex® M-2A, Long Design	10 ea	24826-U
	50 ea	28022-U
Supeltex® M-4, Long Design	10 ea	28025-U
	50 ea	28028-U
CapSeal Bullet, Long Design	12 ea	23488
	48 ea	23493
Supeltex® M-2A, General Purpose	10 ea	503258
	50 ea	22474
Supeltex® M-4, General Purpose	10 ea	22498
	50 ea	22480-U
CapSeal Bullet, General Purpose	12 ea	23480-U
	48 ea	23485

Column Nuts

Improper nut/ferrule combinations create dead volume (empty space between the ferrule and the injection port that is not swept by carrier gas). This may result in poor chromatography, as evidenced by fronting peaks and band broadening. Ensure that your



chromatography is the best by always using the proper nut/ ferrule combination. For assistance in determining the correct nut/ ferrule combination, contact Technical Service at 800-325-5832 or email techserv@sial.com.

Description	Ferrules Used	Pkg	Cat. No.
Agilent nut	Short design	2 ea	24833-U
Supelco ferrule nut adapter	General purpose	2 ea	22470-U
Agilent MSD source nut	Long design	5 ea	28034-U
PerkinElmer nut	Long design	5 ea	28034-U
1/16 inch compression nut	General purpose	10 ea	22021
Varian nut	Long design	1 ea	28033-U

GC Accessories

Agilent Technologies Instruments

Supeltex Capillary Column Ferrules (Short)

Use with original Agilent/HP nut or Supelco replacement nut (P/N 24833-U).

24803-U



We offer the short style ferrules for Agilent/HP GC's. This design will fit the standard Agilent/HP capillary nut. They are offered in M-2A (85% polyamide/15% graphite), M-4 (100% graphite), and CapSeal (graphite/aluminum) versions.

FERRULE TYPE	TEMP. LIMIT	QTY.	CAT. NO.	PRICE
0.20-0.25mm COLUMN ID x 0.4mm FERRULE ID				
M-2A	400°C	10	24803-U	
		50	24807-U	
M-4	450°C	10	24811-U	
		50	24819-U	
CapSeal Bullet	450°C	10	23864	
		50	23867	
0.32mm COLUMN ID x 0.5mm FERRULE ID				
M-2A	400°C	10	24802-U	
		50	24806-U	
M-4	450°C	10	24809-U	
		50	24813-U	
CapSeal Bullet	450°C	10	23865	
		50	23868	
0.53mm COLUMN ID x 0.8mm FERRULE ID				
M-2A	400°C	10	24801-U	
		50	24804-U	
M-4	450°C	10	24808-U	
		50	24812-U	
CapSeal Bullet	450°C	10	23866	
		50	23869	

Column Nuts for Agilent/HP

Use with short Supeltex ferrules (see above). 24833-U

These column nuts are replacements for damaged or misplaced original Agilent/HP nuts. They are to be used with the shorter design ferrules for Agilent/HP GC's.

DESCRIPTION	CAT. NO.	PRICE
Column Nuts (pk. of 2)	24833-U	

Accessory Case for Agilent/HP GC Capillary Products

We offer a clear plastic storage case with a foam insert. The foam easily stores your capillary accessories. The foam has been cut out to hold your Pk/5 inlet liners, Pk/50 septa, Pk/50 ferrules, Pk/25 Therm-O-Rings, Column nuts, and Pk/10 Inlet Seals.

DESCRIPTION	CAT. NO.	PRICE
GC Accessory Case for Agilent Technologies	28035-U	

Supeltex Capillary Column Ferrules (General Purpose)

Use with Supelco Ferrule Nut Adapter (P/N 22470-U or 22509).

503258



These are the original Supeltex ferrules. Use these ferrules if you have replaced the original Agilent/HP nut with Supelco's Ferrule Nut Adapter. They are offered in M-1 (ceramic-filled Teflon), M-2A (85% polyamide/15% graphite), M-2B (75% polyamide/25% graphite), M-4 (100% graphite), and CapSeal (graphite/aluminum) versions.

FERRULE TYPE	TEMP. LIMIT	QTY.	CAT. NO.	PRICE
0.20-0.25mm COLUMN ID x 0.4mm FERRULE ID				
M-2A	400°C	10	503258	
		50	22474	
M-2A 2-hole	400°C	5	22467	
M-2A Indented Blank ¹	400°C	10	22488	
M-2B	350°C	10	22510-U	
M-4	450°C	10	22498	
		50	22480-U	
CapSeal Bullet	450°C	12	23480-U	
		48	23485	
0.32mm COLUMN ID x 0.5mm FERRULE ID				
M-2A	400°C	10	22461	
M-2A 2-hole	400°C	5	22463	
M-2A Indented Blank ¹	400°C	10	22488	
M-2B	350°C	10	22511	
M-4	450°C	10	22462	
		50	22412	
CapSeal Bullet	450°C	12	23481	
		48	23486	
0.53mm COLUMN ID x 0.8mm FERRULE ID				
M-1	250°C	10	22499	
M-2A	400°C	10	22489	
		50	22473	
M-2A Indented Blank ¹	400°C	10	22488	
M-2B	350°C	10	22512	
M-4	450°C	10	20628	
		50	22479	
CapSeal Bullet	450°C	12	23482	
		48	23487	
0.75mm COLUMN ID x 1.0mm FERRULE ID				
M-2A Indented Blank ¹	400°C	10	22488	
M-4	450°C	10	22494	
0.50-0.75mm COLUMN ID x 1.2mm FERRULE ID				
M-2A	400°C	10	22459	
M-2A Indented Blank ¹	400°C	10	22488	
M-4	450°C	10	22460	

¹ Drill to fit your column.

Supelco Ferrule Nut Adapters

Use with general purpose Supeltex ferrules (see above).

Install fused silica capillary columns without restrictions on ferrule choice. These adapters enable you to use general purpose Supeltex and other 1/16" compression capillary ferrules in your Agilent/HP 5710, 5790, 5840, 5880, 5890, or 6890 system.

DESCRIPTION	CAT. NO.	PRICE
Adapters (pk. of 2)	22470-U	
Adapters, Knurled (pk. of 2)	22509	

22470-U



Order: 1.800.325.3010 Technical Service: 1.800.359.3041 Web: www.sigma-aldrich.com/supelco

Gas Chromatography

GC Accessories Agilent Technologies Instruments

Supeltext Capillary Ferrules (Long)

Use with original Agilent/HP MSD Source Nut, SSNE Style Nut (P/N 28034-U), or Supelco MSD Source Nut (P/N 22517).

We offer a preconditioned ferrule for Agilent/HP GC/MS applications in M-2A material (85% polyamide/15% graphite).

DESCRIPTION	QTY.	CAT. NO.	PRICE
0.20-0.25mm column ID	10	24826-U	
x 0.4mm ferrule ID	50	28022-U	
0.32mm column ID	10	24824-U	
x 0.5mm ferrule ID	50	28023-U	
0.53mm column ID	10	24823-U	
x 0.8mm ferrule ID	50	28024-U	

Column Nut for Agilent/HP MSD

Use with long Supeltext ferrules.

These column nuts are replacements for damaged or misplaced original Agilent/HP MSD nuts. They are to be used with the longer design ferrules for Agilent/HP GC's.

DESCRIPTION	QTY	CAT. NO.	PRICE
SSNE style columns nut	5	28034-U	

MSD Source Nut for GC/MS Interface

Use with long Supeltext ferrules or general purpose Supeltext ferrules.

These column nuts can be used to replace damaged or misplaced original Agilent/HP source nuts. The nuts are made of brass to prevent damage to MSD source threads. An enlarged knurled end allows easy finger tightening for a leak tight seal.

DESCRIPTION	CAT. NO.	PRICE
MSD Source Nut	22517	

Thermogreen LB-2 Septa

Lowest bleed of any septum we have tested.

- Extremely low bleed over a wide range of inlet temperatures – 100°C to 350°C
- Already conditioned, ready to use
- Easier needle penetration and high puncture tolerance – ideal for autosamplers
- Rubber formulation exclusive to Supelco

(Pk. of 50).

DESCRIPTION	DIAMETER	CAT. NO.	PRICE
5880A, 5890	11mm (7/16")	20654	
5700 Series, 5880	9.5mm (3/8")	20652	
5880/90, 6890, OCl Ports	5mm (3/16")	20638	

Inlet Seals

The inlet seal on an Agilent/HP GC must be regularly changed to prevent sample adsorption due to accumulation of sample residue and/or septum fragments. We manufacture replacement seals of high quality stainless steel for analyses of non-reactive compounds, and stainless steel seals plated with gold for applications requiring more inertness. No brighteners are used in the plating process. Stainless steel washers are included with each type of seal.

DESCRIPTION	CAT. NO.	PRICE
Stainless Steel Inlet Seals (pk. of 2)	23316-U	
Stainless Steel Inlet Seals (pk. of 10)	23317-U	
Stainless Steel Inlet Seals, 100 Seals w/50 washers	23363-U	
Gold Plated Inlet Seals (pk. of 2)	23318-U	
Gold Plated Inlet Seals (pk. of 10)	23319-U	

Therm-O-Ring Seals for Capillary Inlet Liners

Exclusive from Supelco. New high temperature O-ring seals can be used with inlet temperatures up to 375°C without sticking or fragmenting. Fit both 6.3mm OD (split) and 6.5mm OD (splitless) Agilent/HP capillary liners, and any 1/4" OD capillary liner that uses an O-ring seal. Superior replacement for Viton O-rings.

DESCRIPTION	CAT. NO.	PRICE
Therm-O-Ring Seals (pk. of 10)	21003-U	
Therm-O-Ring Seals (pk. of 25)	21004-U	

Deactivated Glass Inlet Liners

Our liners feature:

- High temperature silanization, to ensure inertness
- Consistent dimensions, tolerances and quality
- In-house manufacturing that meets or exceeds instrument manufacturer's specifications

All Models, 4890, 5880, 5890, 6890. (pk/5).

DESCRIPTION	CAT. NO.	PRICE
SPLIT INJECTION		
78.5 x 6.3mm, 4mm ID, wool packed	2048605	
78.5 x 6.3mm, cup design	2051005	
78.5 x 6.3mm, cup design, wool packed	2048205	
SPLITLESS		
78.5 x 6.5mm, tapered	2046605	
78.5 x 6.5mm, tapered, wool packed	2047805	
78.5 x 6.5mm, 2mm ID	2051305	
78.5 x 6.5mm, dual tapered	2048505	
DIRECT/WIRE-BORE		
78.5 x 6.5mm, 1.5mm ID	2051705	
78.5 x 6.3mm, 0.75mm ID, SPME	2637505	

Order: 1.800.325.3010 Technical Service: 1.800.359.3041 Web: www.supelco.com

Gas Chromatography

SUPELCO

GC Accessories

PerkinElmer Instruments

Supeltex Capillary Column Ferrules

Use with original PerkinElmer 1/16" or SSNE Style Nuts (p/n 28034-U).

24826-U



FERRULE TYPE	TEMP. LIMIT	QTY.	CAT. NO.	PRICE
0.20-0.25mm COLUMN ID x 0.4mm FERRULE ID				
M-2A	400°C	10	24826-U	
		50	28022-U	
M-4	450°C	10	28025-U	
		50	28028-U	
CapSeal Bullet	450°C	12	23488	
		48	23493	
0.32mm COLUMN ID x 0.5mm FERRULE ID				
M-2A	400°C	10	24824-U	
		50	28023-U	
M-4	450°C	10	28026-U	
		50	28031-U	
CapSeal Bullet	450°C	12	23489	
		48	23494-U	
0.53mm COLUMN ID x 0.8mm FERRULE ID				
M-2A	400°C	10	24823-U	
		50	28024-U	
M-4	450°C	10	28027-U	
		50	28032-U	
CapSeal Bullet	450°C	12	23490	
		48	23495	
0.50-0.75mm COLUMN ID x 1.0mm FERRULE ID				
CapSeal Bullet	450°C	12	23491-U	

SSNE Style Column Nut

DESCRIPTION	QTY.	CAT. NO.	PRICE
SSNE Style Column Nut	5	28034-U	

Therm-O-Ring Seals

Exclusive from Supelco. New high temperature O-ring seals can be used with inlet temperatures up to 375°C without sticking or fragmenting. They fit 1/4" capillary liners.

DESCRIPTION	QTY.	CAT. NO.	PRICE
Therm-O-Ring Seals	25	21004-U	

Thermogreen LB-2 Septa

Lowest bleed of any septum we have tested.

- Extremely low bleed over a wide range of inlet temperatures – 100°C to 350°C
- Already conditioned, ready to use
- Easier needle penetration and high puncture tolerance – ideal for autosamplers
- Rubber formulation exclusive to Supelco

Sigma series, 900 & 990, 8000 Auto Sampler

DESCRIPTION	QTY.	CAT. NO.	PRICE
11.0mm	50	20654	

Supeltex Capillary Column Ferrules (General Purpose)

Use with 1/16" compression nuts.



FERRULE TYPE	TEMP. LIMIT	QTY.	CAT. NO.	PRICE
0.20-0.25mm COLUMN ID x 0.4mm FERRULE ID				
M-2A	400°C	10	503258	
		50	22474	
M-4	450°C	10	22498	
		50	22480-U	
0.32mm COLUMN ID x 0.5mm FERRULE ID				
M-2A	400°C	10	22461	
M-4	450°C	10	22462	
		50	22412	
0.53mm COLUMN ID x 0.8mm FERRULE ID				
M-2A	400°C	10	22489	
		50	22473	
M-4	450°C	10	20628	
		50	22479	

Swagelok™ 1/16" Compression Nut

These nuts permit use of general purpose Supeltex and other 1/16" compression capillary ferrules.

DESCRIPTION	QTY.	CAT. NO.	PRICE
Swagelok 1/16" brass nut	10	22021	

Inlet Liners

Our liners feature:

- High temperature silanization, to ensure inertness
- In-house manufacturing that meets or exceeds instrument manufacturer's specifications

(Pk/5)

DESCRIPTION	CAT. NO.	PRICE
AUTO SYSTEM 9000 SPLIT/SPLITLESS CAPILLARY INJECTOR		
Split Injection		
92mm x 0.25", 4mm ID	2630905	
92mm x 0.25", 4mm ID	2631005	
Splitless		
92mm x 0.25", 2mm ID	2631105	
92mm x 0.25", 0.75mm ID, SPME	2631205	
PPS (PROGRAMMED SPLIT/SPLITLESS)		
Split Injection		
86mm x 4mm, 2mm ID	2631305	
Splitless		
86mm x 4mm, 1mm ID	2631405	
Direct/On-Column/Other		
86mm x 4mm, On-Column	2631505	

Accessory Cases for PerkinElmer GC Capillary Products

We offer a clear plastic storage case with a foam insert. The foam easily stores your capillary accessories. The foam has been cut out to hold your Pk/5 inlet liners, Pk/50 septa, Pk/50 ferrules, Pk/25 Therm-O-Rings, and Column nuts.

DESCRIPTION	CAT. NO.	PRICE
GC Accessory Case for Perkin-Elmer	28037-U	







GC Accessories Varian Instruments

24826-U



Supeltex Capillary Column Ferrules

Use with Varian Nut (p/n 28033-U).

FERRULE TYPE	TEMP. LIMIT	QTY.	CAT. NO.	PRICE
0.20-0.25mm COLUMN ID x 0.4mm FERRULE ID				
M-2A 	400°C	10	24826-U	
		50	28022-U	
M-4 	450°C	10	28025-U	
		50	28028-U	
CapSeal Bullet	450°C	12	23488	
		48	23493	
0.32mm COLUMN ID x 0.5mm FERRULE ID				
M-2A 	400°C	10	24824-U	
		50	28023-U	
M-4 	450°C	10	28026-U	
		50	28031-U	
CapSeal Bullet	450°C	12	23489	
		48	23494-U	
0.53mm COLUMN ID x 0.8mm FERRULE ID				
M-2A 	400°C	10	24823-U	
		50	28024-U	
M-4 	450°C	10	28027-U	
		50	28032-U	
CapSeal Bullet	450°C	12	23490	
		48	23495	
0.50-0.75mm COLUMN ID x 1.0mm FERRULE ID				
CapSeal Bullet	450°C	12	23491-U	

Column Nuts



DESCRIPTION	CAT. NO.	PRICE
Column Nut for Varian GC (pk. of 5)	28033-U	

Thermogreen LB-2 Septa



Lowest bleed of any septum we have tested.

- Extremely low bleed over a wide range of inlet temperatures – 100°C to 350°C
- Already conditioned, ready to use

DESCRIPTION	DIAMETER	CAT. NO.	PRICE
1177 Injectors	9mm	28021-U	
Packed column injectors	9.5mm	20652	
SPI	11mm	20654	
Capillary Injectors	11mm	20654	
	11.5mm	23154	
Saturn GC/MS	11.5mm	23154	

Accessory Case for Varian GC Capillary Products

We offer a clear plastic storage case with a foam insert. The foam easily stores your capillary accessories. The foam has been cut out to hold your Pk/5 inlet liners, Pk/50 septa, Pk/50 ferrules, and Column nuts.

DESCRIPTION	CAT. NO.	PRICE
GC Accessory Case for Varian	28036-U	

Deactivated Glass Inlet Liners

Our liners feature:

- High temperature silanization, to ensure inertness
- Consistent dimensions, tolerances and quality
- In-house manufacturing that meets or exceeds instrument manufacturer's specifications

(Pk/5)

DESCRIPTION	CAT. NO.	PRICE
MODEL 1177 CP INJECTOR		
Split Injection		
78.5 x 6.3mm, 4mm ID, wool packed	2048605	
78.5 x 6.3mm, cup design	2051005	
78.5 x 6.3mm, cup design, wool packed	2048205	
78.5 x 6.3mm, cup design, 10% OV-1 on Chromosorb packed	2055105	
Splitless		
78.5 x 6.5mm, tapered	2046605	
78.5 x 6.5mm, tapered, wool packed	2047805	
78.5 x 6.5mm, 2mm ID	2051305	
78.5 x 6.5mm, dual taper	2048505	
Direct/On-Column		
78.5 x 6.5mm, 1.5mm ID	2051705	
SPME		
78.5 x 6.3mm, 0.75mm ID	2637505	
MODEL 1075/1077 INJECTOR		
Split Injection		
72 x 6.3mm, with frit	2050505	
72 x 6.3mm, Packed with 10% OV-1 on Chromosorb packed	2055505	
72 x 6.3, unpacked	2636105	
72 x 6.3mm, with baffle	2050105	
72 x 6.3mm, wool packed	2636005	
72 x 6.3mm, w/cup unpacked	2049805	
Splitless		
74 x 6.3mm, straight	2050205	
74 x 6.35mm, SPME, 0.75mm ID	2635805	
Direct/On-Column		
72 x 6.3mm, fused silica	2636205	
73 x 0.25", universal flash, 0.53mm ID columns	2636805	
MODEL 1093-94 SPI		
Direct/On-Column		
54 x 4.6mm, direct injection,	2636305	
54 x 5mm, 3.4mm ID, frit	2636405	
54 x 4.6mm, wool packed	2636505	
MODEL 1078 INJECTOR		
Split Injection		
54 x 5mm, 3.4mm ID, unpacked	2637105	
54 x 5mm, 3.4mm ID, frit	2637205	
54 x 5mm, 3.4mm ID, packed	2637305	
54 x 5mm, 2mm ID, split/splitless, wool packed	2637705	
Splitless		
54 x 5mm, 2mm ID, unpacked	2637405	
54 x 5mm, 0.8mm ID, unpacked	2637805	
54 x 5mm, 0.5mm ID, temp ramp mode	2637605	

Order: 1.800.325.3010 Technical Service: 1.800.359.3041 Web: www.sigma-aldrich.com/supelco

Gas
Chromatography

SUPELCO

GC Accessories

Ferrules and Accessories

Select the best ferrule for your application:

Supeltex ferrules form leaktight seals without sticking to your column. And they don't require back ferrules.

We highly recommend:

- Supeltex M-4 and CapSeal Bullet ferrules for fused silica capillary columns
- Supeltex M-4 and Supeltex M-2A ferrules for glass columns
- Supeltex M-2A and Supeltex M-2 ferrules for metal columns

FERRULE SPECIFICATIONS

Supeltex M-1

Max. Temp.: 250°C

Composition: ceramic-filled Teflon

Characteristics: Ideal for connections to mass spectrometers. High reusability. Isothermal use only.

Supeltex M-2

Max. Temp.: 350°C

Composition: DuPont VESPEL SP-1 (100% polyimide)

Characteristics: High reusability.

Supeltex M-2A

Max. Temp.: 400°C

Composition: DuPont VESPEL SP-21 (85% polyimide/15% graphite)

Characteristics: Seals at 1/4 turn past fingertight. High reusability. Won't stick to metal or glass.

Supeltex M-2B

Max. Temp.: 350°C

Composition: DuPont VESPEL SP-211 (75% polyimide/25% graphite)

Characteristics: Conforms easily to capillary column, ensuring an effective seal and less chance of breakage.

Supeltex M-4

Max. Temp.: 450°C

Composition: flexible graphite

Characteristics: Seals at 1/4 turn past fingertight. Maximum sealing surface contact, reduced risk of column contamination at installation.

An improved design . Supelco has refined the design of graphite ferrules so that we can offer you the finest quality ferrule available. Compare these ferrules to the graphite ferrules you are now using – Supeltex M-4 ferrules offer a clean, sharp profile with minimal flash.

CapSeal Bullet

Max. Temp.: 450°C

Composition: graphite in an aluminum base

Characteristics: Seals at 1/8-turn past fingertight. Reusable. A special end taper reduces graphite extrusion into fitting.

Will not adhere to fittings. Reusable CapSeal Bullet ferrules consist of a graphite material captured in an aluminum base. This unique design keeps the ferrule from adhering to the fitting, making it easy to remove. Eliminate the headache of digging out a stuck ferrule and risking damage to your fitting.

O-Ring

Max. Temp.: 200°C

Composition: silicone

Characteristics: Seals column having OD over or under specifications.

Therm-O-Ring

Max. Temp.: 375°C

Characteristics: Won't stick to metal or glass. Superior replacement for Viton O-rings.

Supeltex Packed Column Ferrules

FERRULE TYPE	TEMP. LIMIT	QTY.	CAT. NO.	PRICE
1/4" COLUMN OD x 1/4" FERRULE ID				
M-1	250°C	10	22086-U	
		100	22087-U	
M-2	350°C	10	22320-U	
		50	22475	
M-2A	400°C	10	22481	
		50	22471	
M-4	450°C	10	22492	
		50	22478	
O-Rings	200°C	100	20407	
6mm COLUMN OD x 6mm FERRULE ID				
M-1	250°C	10	22089-U	
M-2A	400°C	10	22393	
M-4	450°C	10	22493	
1/8" COLUMN OD x 1/8" FERRULE ID				
M-1	250°C	10	22496	
		100	22309	
M-2	350°C	10	22321	
		50	22476	
M-2A	400°C	10	22483-U	
		50	22472	
M-4	450°C	10	22491	
Teflon Front ²	300°C	10	22058	
Teflon Back ²	300°C	10	22059	
1/16" COLUMN OD x 1/16" FERRULE ID				
M-1	250°C	10	22386	
M-2	350°C	10	20644-U	
M-2A	400°C	10	22487-U	
M-2A Indented Blank ¹	400°C	10	22488	
M-4	450°C	10	22495-U	

¹ Drill to fit your column.

² For Purge Traps.

Supeltex Reducing Ferrules

DIMENSIONS	QTY.	PRICE	CAT. NO.
SUPELTEX M-1			
1/8" to 1/16"	10	22387	
SUPELTEX M-2			
1/4" to 1/16"	10	22384	
1/4" to 1/8"	10	22314	
SUPELTEX M-2A			
1/8" to 1/16"	10	22484-U	
1/4" to 1/16"	10	22486	
1/4" to 1/8"	10	22485-U	
SUPELTEX M-4			
1/8" to 0.50mm	2	22458	
1/4" to 0.50mm	2	22457	



Order: 1.800.325.3010 Technical Service: 1.800.359.3041 Web: www.sigma-aldrich.com/supelco

Gas Chromatography

GC Accessories

Ferrules and Accessories

Supeltex Capillary Column Ferrules (General Purpose)

FERRULE TYPE	TEMP. LIMIT	QTY.	CAT. NO.	PRICE
0.20-0.25mm COLUMN ID x 0.4mm FERRULE ID				
M-2A	400°C	10	503258	
		50	22474	
M-2A 2-hole	400°C	5	22467	
M-2A Indented Blank ¹	400°C	10	22488	
M-2B	350°C	10	22510-U	
M-4	450°C	10	22498	
		50	22480-U	
CapSeal Bullet	450°C	12	23480-U	
		48	23485	
0.32mm COLUMN ID x 0.5mm FERRULE ID				
M-2A	400°C	10	22461	
M-2A 2-hole	400°C	5	22463	
M-2A Indented Blank ¹	400°C	10	22488	
M-2B	350°C	10	22511	
M-4	450°C	10	22462	
		50	22412	
CapSeal Bullet	450°C	12	23481	
		48	23486	
0.53mm COLUMN ID x 0.8mm FERRULE ID				
M-1	250°C	10	22499	
M-2A	400°C	10	22489	
		50	22473	
M-2A Indented Blank ¹	400°C	10	22488	
M-2B	350°C	10	22512	
M-4	450°C	10	20628	
		50	22479	
CapSeal Bullet	450°C	12	23482	
		48	23487	
0.75mm COLUMN ID x 1.0mm FERRULE ID				
M-2A Indented Blank ¹	400°C	10	22488	
M-4	450°C	10	22494	
0.50-0.75mm COLUMN ID x 1.2mm FERRULE ID				
M-2A	400°C	10	22459	
M-2A Indented Blank ¹	400°C	10	22488	
M-4	450°C	10	22460	

¹ Drill to fit your column.

Ferrules for 5mm Shimadzu Columns and Inlet Liners

Ferrules with metal spacers for 5mm OD Shimadzu columns and inlet liners. Replace Shimadzu part number 221-15563-91.

DESCRIPTION	CAT. NO.	PRICE
Ferrules for Shimadzu Columns (pk. of 4)	23311	



Ferrule Kits

Finding the right ferrule can be difficult. Simplify this chore with one of our ferrule starter kits. Each kit contains several types of Supeltex ferrules – you can determine which type is best for your applications. Kits include instructions for installing each ferrule.

Kit for Fused Silica Capillary Columns (0.40mm to 0.51mm OD): 4 drilled Supeltex M-2A, 4 indented blank Supeltex M-2A, 4 Supeltex M-4 ferrules, plus pin vise drill kit (Cat. No. 23820-U) and instructions.

Kit for Wide Bore Fused Silica Capillary Columns (0.8mm to 1.19mm OD): 4 Supeltex M-1, 4 Supeltex M-2A, 4 Supeltex M-4 ferrules, plus pin vise drill kit (Cat. No. 23820-U) and instructions.

Ferrule Kit for Glass Packed Columns (1/4" OD): 4 Supeltex M-1, 4 Supeltex M-2A, 4 Supeltex M-4 ferrules, a 6"/15cm x 1/4" practice piece of glass tubing, and instructions.

DESCRIPTION	CAT. NO.	PRICE
For Fused Silica Capillary Columns	22469	
For Wide Bore Fused Silica Capillary Columns	22468	
For Glass Packed Columns	20648	
Pin Vise Drill Kit	23820-U	



Pin Vise Drill Kit

Drill the exact bore you need in hard or soft ferrules. Includes pin vise and 14 drill bits:

0.33mm/0.0135"	0.77mm/0.031"	1.06mm/0.042"
0.40mm/0.016"	0.83mm/0.033"	1.17mm/0.046"
0.56mm/0.022"	0.91mm/0.036"	1.40mm/0.055"
0.63mm/0.025"	0.97mm/0.038"	1.61mm/0.061"
0.72mm/0.028"	1.02mm/0.040"	

The vise handle holds all bits to keep them at your fingertips. The vise also is handy for gripping fine wire when cleaning FID jets, syringe needles, or any other small orifice.

DESCRIPTION	CAT. NO.	PRICE
Pin Vise Drill Kit	23820-U	
DRILL BITS		
0.35mm	23811-U	
0.40mm	23810	
0.51mm	23809	

RELATED INFORMATION

For Leak Free Connections a guide to ferrule selection, connection techniques, and accessories, request the following free literature by phone or fax, or see our website.

No. Subject
T100741 ferrule selection and installation

Order: 1.800.325.3010 Technical Service: 1.800.355.3041 Web: www.sigma-aldrich.com/supelco

Gas Chromatography

SUPELCO