

 **tech tip**
Choosing the Right Ferrule

Graphite ferrules are soft, easy to seal, stable to 450 °C, and contain no binders that might off-gas. Vespel®/graphite ferrules work better for vacuum and high-pressure applications (e.g., GC-MS) because they will not fragment or allow oxygen to permeate into the system, whereas graphite ferrules will. Because Vespel®/graphite ferrules are made from a harder material, they might require retightening after several temperature cycles.



Graphite Ferrules



Vespel®/Graphite Ferrules



Encapsulated Graphite Ferrules

Vespel® Ferrules

- 100% high-temperature polyimide.
- Stable to 350 °C.
- Durable, leak-tight.



Vespel® Ferrules

Graphite Ferrules

- Preconditioned to eliminate out-gassing.
- High-purity, high-density graphite.
- Smoother surface and cleaner edges than conventional graphite ferrules.
- Contain no binders that can off-gas or adsorb analytes.
- Stable to 450 °C.

Vespel®/Graphite Ferrules

- VG2, 60% Vespel®/40% graphite blend offers the best combination of sealing and ease of workability.
- VG1, 85% Vespel®/15% graphite blend offers equivalent composition to Agilent Vespel®/graphite ferrules.
- Seal with minimal torque, reusable, and preferred for vacuum and high-pressure uses.
- Stable to 400 °C.
- Recommended for mass spec transfer lines.

Capillary Ferrules for 1/16-Inch Compression-Type Fittings

Available in Vespel®, graphite, or Vespel®/graphite material.

Ferrule ID	Fits Column ID	qty.	Vespel	Graphite	NEW! VG1 (85/15)	VG2 (60/40)
0.3 mm		10-pk.	22213	20233	27061	20275
0.4 mm	0.10/0.15/0.18/ 0.25/0.28 mm	10-pk.	22214	20200	27062	20211
0.4 mm	0.10/0.15/0.18/ 0.25/0.28 mm	50-pk.	—	20227	27063	20229
0.5 mm	0.32 mm	10-pk.	22215	20201	27064	20212
0.5 mm	0.32 mm	50-pk.	—	20228	27065	20231
0.6 mm	0.28 mm**	10-pk.	—	—	27066	20232
0.8 mm	0.45/0.53 mm	10-pk.	22216	20202	27067	20213
0.8 mm	0.45/0.53 mm	50-pk.	—	20224	27068	20230
1.0 mm	0.75 mm*	10-pk.	22217	21058	27069	24912
1.2 mm	0.75 mm*	10-pk.	22218	—	—	—
1.6 mm	1.00 mm*	10-pk.	—	21060	—	—

*For micropacked columns.

**For 0.28 mm MXT columns.

Encapsulated Ferrules for 1/16-Inch Compression Fittings

- Reusable—will not deform and stick in fittings.
- Less torque needed to seal ferrule.
- Restek's unique blend of graphite minimizes fragmentation and out-gassing.

Ferrule ID	Fits Column ID	qty.	cat.#
0.4 mm	0.25 mm	10-pk.	21036
0.5 mm	0.32 mm	10-pk.	21037
0.8 mm	0.53 mm	10-pk.	21038

Compact Ferrules for Agilent 5890/6890/6850/7890 GCs

Available in graphite or Vespel®/graphite material.

NEW!

Ferrule ID	Fits Column ID	qty.	Graphite	VG1 (85/15)	VG2 (60/40)
0.4 mm	0.25/0.28 mm	10-pk.	20250	27070	20238
0.4 mm	0.25/0.28 mm	50-pk.	20251	27071	20239
0.5 mm	0.32 mm	10-pk.	21007	27072	20248
0.5 mm	0.32 mm	50-pk.	21008	27073	20249
0.8 mm	0.45/0.53 mm	10-pk.	20252	27074	20263
0.8 mm	0.45/0.53 mm	50-pk.	20253	27075	20264
1.0 mm	0.75 mm*	10-pk.	21059	—	—
1.6 mm	1.00 mm*	10-pk.	21061	—	—

*For micropacked columns.

**Standard Ferrules** for 1/16-, 1/8-, and 1/4-Inch Fittings

Available in Vespel®, graphite, or Vespel®/graphite material.

NEW!

Fitting Size	Ferrule ID	qty.	Vespel	Graphite	VG1 (85/15)	VG2 (60/40)
1/4"	3/16"	5-pk.	—	—	—	20258
1/16"	1/16"	10-pk.	22210	20207	27076	20218
1/8"	1/8"	10-pk.	22211	20208	27077	20219
1/8"	reduce to 1/16"	10-pk.	—	20209	—	20220
1/4"	1/4"	10-pk.	22212	20210	27078	20221
1/4"	reduce to 1/8"	10-pk.	22219	20225	—	20222
1/4"	reduce to 1/16"	10-pk.	—	20226	—	20223

**Two-Hole Ferrules** for 1/8-Inch and 1/16-Inch Compression-Type Fittings

- Use 1/16-inch, two-hole ferrules with the 1/16-inch capillary inlet adaptor fitting kit (cat.# 27185).
- Use 1/8-inch, two-hole ferrules with the 1/8-inch capillary inlet adaptor fitting kit (cat.# 20645).

Fitting Size	Ferrule ID	Fits Column ID	qty.	VG2 (60/40)
1/16"	0.4 mm	0.25/0.28 mm	5-pk.	24848
1/16"	0.5 mm	0.32 mm	5-pk.	24849
1/8"	0.8 mm	0.45/0.53 mm	5-pk.	20246

**Reducing Ferrules**

Available in graphite or Vespel®/graphite material.

NEW!

Fitting Size	Ferrule ID	Fits Column ID	qty.	Graphite	VG1 (85/15)	VG2 (60/40)
1/8"	0.4 mm	0.25 mm	5-pk.	20205	27079	20254
1/8"	0.5 mm	0.32 mm	5-pk.	20205	27080	20255
1/8"	0.8 mm	0.53 mm	5-pk.	20206	27081	20215
1/4"	0.4 mm	0.25 mm	5-pk.	20203	—	—
1/4"	0.5 mm	0.32 mm	5-pk.	20203	—	20257
1/4"	0.8 mm	0.45/0.53 mm	5-pk.	20204	—	20217

**Blank Ferrules** for 1/16-Inch Fittings

Fitting Size	Ferrule ID	qty.	VG2 (60/40)
1/16"	no hole	10-pk.	20240



Ferrules

**PTFE Ferrules**

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

Fitting Size	Ferrule ID	qty.	cat.#
1/16"	1/16"	10-pk.	21122
1/16"	0.4 mm	10-pk.	21123
1/16"	0.5 mm	10-pk.	21124
1/16"	0.8 mm	10-pk.	21125
1/8"	1/8"	10-pk.	21126
3/16"	3/16"	10-pk.	21127
1/4"	1/4"	10-pk.	21128

Graphite Ferrules

(M4 Fittings) for Thermo Scientific TRACE, 8000, 8000 TOP & Focus GCs

- Preconditioned to eliminate out-gassing.
- High-purity, high-density graphite.
- Smoother surface and cleaner edges than conventional graphite ferrules.
- Contain no binders that can off-gas or adsorb analytes.
- Stable to 450 °C.



Ferrule ID	Fits Column ID	Similar to TS Part #	Graphite 2-pk.	Graphite 10-pk.
0.3 mm	0.10–0.15 mm	—	22221	22222
0.4 mm	0.18–0.28 mm	29013488 (2-pk.) 29053488 (10-pk.)	20280	20281
0.5 mm	0.32 mm	29013487 (2-pk.) 29053487 (10-pk.)	20282	20283
0.8 mm	0.45–0.53 mm	29013486 (2-pk.) 29053486 (10-pk.)	20284	20285

**5 mm Ferrules** for Shimadzu 17A GCs

- For use with packed columns.
- Graphite construction.

Description	qty.	cat.#
5 mm Ferrules for Shimadzu 17A GCs	10-pk.	21121

Graphite Ferrules for Shimadzu 17A, 2010, and 2014 GCs

- Graphite two-piece construction.
- Available in 0.4, 0.5, and 0.8 mm sizes.
- Packaged on mandrel for easy handling.



Ferrule ID	Fits Column ID	Similar to Shimadzu Part #	qty.	cat.#
0.4 mm	0.25 mm and less	220-90765-00	10-pk.	24827
0.5 mm	0.32 mm	221-32126-05	10-pk.	24828
0.8 mm	0.53 mm	221-32126-08	10-pk.	24829

GRAPHPACK® 2M Ferrules for Gerstel CIS 3 and CIS 4 PTV Inlets

Fits Column ID	Similar to Gerstel Part #	qty.	cat.#
0.25 mm	001805-040-00	10-pk.	22223
0.32 mm	001805-045-00	10-pk.	22224
0.53 mm	001805-007-00	10-pk.	22225