



Ferrules

Valco metal ferrules cut a ring near the end of the tube, preventing tube release at high pressures without significantly deforming and restricting the tube interior. (However, if the hardness of the tubing is equal to or greater than that of the ferrule, deformation of the tube rather than a cut ring is likely.) Make up usually takes only about a 1/4 turn beyond the point where the ferrule first starts to grab the tubing. Polymeric ferrules seal by the increased friction from compression.

Valco zero volume ferrules may be used with all Valco fittings and with those of most other manufacturers. The maximum pressure limit is generally determined by the yield strength of the tubing. The maximum pressure for softer materials (such as brass and polymers) is lower, and depends on the tubing used. If in doubt about a particular combination, consult our technical staff.



For trace gas analysis, use gold-plated ferrules to achieve sealing with $<10^{-9}$ cc/atm/sec leakage.

MORE INFORMATION

For more detailed information on metals, refer to the discussion on pages 254-255.

Metal ferrules

	Prod No	Price	Prod No	Price	Prod No	Price
Package of 10:	Stainless, Type 303		Stainless, Type 316		Stainless, Gold-plated	
1/32"	ZF5-10		ZF5S6-10	\$40	ZF5GP-10	
1/16"	ZF1-10		ZF1S6-10	30	ZF1GP-10	
1/8"	ZF2-10		ZF2S6-10	22	ZF2GP-10	
1/4"	-		ZF4S6-10	19	ZF4GP-10	
Sold individually:	Hastelloy C		Nickel		Titanium	
1/32"	ZF5HC		ZF5NI	\$9	ZF5TI	
1/16"	ZF1HC		ZF1NI	8	ZF1TI	
1/8"	ZF2HC		ZF2NI	8	ZF2TI	
1/4"	ZF4HC		ZF4NI	9	ZF4TI	
Package of 10:	Brass					
1/32"	ZF5B-10					
1/16"	ZF1B-10					
1/8"	ZF2B-10					
1/4"	ZF4B-10					

- Not available

Larger sizes and/or specific materials may be available on special order.

METALS AT A GLANCE

Hastelloy C®HC
Resistant to pitting;
Resists oxidizing atmospheres

Nickel NI
Resistant to caustics,
high temp halogens,
and hydrogen halides

Stainless steel,
Gold-platedGP
More inert than standard stainless

Stainless steel,
Type 303
GC, gas lines, general purpose

Stainless steel,
Type 316S6
LC with high chloride ion in solutions

TitaniumTI
Outstanding resistance to most media except hydrofluoric acids

Brass B
Not recommended for most chromatographic applications

0.25 mm = .010"
0.50 mm = .020"
0.75 mm = .030"
1.0 mm = .040"
1.5 mm = .060"
2.0 mm = .080"
4.6 mm = .180"
6.0 mm = .236"
6.4 mm = .253"
7.0 mm = .275"
10.0 mm = .400"
27.0 mm = 1.08"
1/32" = 0.8 mm
1/16" = 1.6 mm
1/8" = 3.2 mm
1/4" = 6.4 mm
3/8" = 9.5 mm
1/2" = 12.7 mm



Polymeric ferrules



	Prod No	Price	Prod No	Price	Prod No	Price
<i>Package of 10:</i>	PTFE, Virgin		PTFE, Glass-filled		FEP	
1/32"	ZF.5TF-10		ZF.5TFG-10		ZF.5FEP-10	
1/16"	ZF1TF-10		ZF1TFG-10		ZF1FEP-10	
1/8"	ZF2TF-10		ZF2TFG-10		ZF2FEP-10	
1/4"	ZF4TF-10		ZF4TFG-10		ZF4FEP-10	
3/8"	ZF6TF-10		ZF6TFG-10		ZF6FEP-10	
1/2"	ZF8TF-10		ZF8TFG-10		ZF8FEP-10	

	Prod No	Price	Prod No	Price
<i>Package of 10:</i>	PFA		CTFE	
1/32"	ZF.5PFA-10		ZF.5KF-10	
1/16"	ZF1PFA-10		ZF1KF-10	
1/8"	ZF2PFA-10		ZF2KF-10	
1/4"	ZF4PFA-10		ZF4KF-10	
3/8"	ZF6PFA-10		ZF6KF-10	
1/2"	ZF8PFA-10		ZF8KF-10	

	Prod No	Price	Prod No	Price	Prod No	Price
<i>Package of 5:</i>	Polyimide, Graphite		Polyimide, Valcon		Polyimide, Virgin	
1/32"	ZF.5GV-5		ZF.5V-5		ZF.5V1-5	
1/16"	ZF1GV-5		ZF1V-5		ZF1V1-5	
1/8"	ZF2GV-5		ZF2V-5		ZF2V1-5	
1/4"	ZF4GV-5		ZF4V-5		ZF4V1-5	
3/8"	ZF6GV-5		ZF6V-5		ZF6V1-5	
1/2"	ZF8GV-5		ZF8V-5		ZF8V1-5	

IDENTIFICATION
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 Grooved PEEK
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For more detailed information on polymers, refer to the discussion on page 256.

POLYMERS AT A GLANCE

CTFE KF
*Resists all inorganic corrosives.
 Produced as Kel-F®*

FEP FEP
Chemical resistance equals PTFE, but lower creep and higher friction

PTFE, Glass-filled..... TFG
Inert, mechanically stable

PTFE, Virgin..... TF
*Inert; very soft, easily cold flows.
 Produced as Teflon®*

Polyimide, Graphite.... GV
Soft, easy to form ferrules

Polyimide, Valcon..... V
High temp, graphite reinforced

Polyimide, Virgin..... V1
High temp, electrical insulator

FERRULE IDENTIFICATION

To differentiate among the most commonly ordered metal ferrules, ring(s) are engraved on the non-sealing surfaces.

