ISO 8434-1 Soft-Sealing Ferrule Fittings Introduction

The previous two articles provided detailed introductions to the single ferrule type within the ISO 8434-1 24° cone ferrule fitting standard series, which is the original metal-to-metal seal design. In addition to this design, ISO 8434-1 also covers standards for combination designs featuring a metal ring plus a sealing ring (O-ring). This article details this type of combination functional ferrule.

Common 24° Cone Ferrule Fittings with Rubber Seals

Fitting System	Manufacturer	Characteristics
EO-2	Parker Hannifin	Built-in O-ring, specifically designed for high-pressure hydraulic systems
VOSS ES-4	VOSS Fluid	Face seal using an elastomer ring, good resistance to vibration
Stauff Connect SEC	Stauff	Specially designed combination of ferrule and O-ring, suitable for stainless steel tubing systems

Classic Design: Parker EO-2

Source：Parker Catalog 4300

EO-2 Fitting Working Principle

The ferrule firmly bites into the tubing according to the proven "bite principle". The special design feature of the EO-2 reduces the risk of over- or under-assembly through its elastomeric seal ring: Before assembly, there is a gap between the flat face of the ferrule and the metal support ring of

the seal ring. Once the ferrule reaches the appropriate bite depth, this gap closes, causing a sudden increase in assembly torque. This makes the assembly process stable and reliable. Checking whether this gap has closed allows for easy verification of correct assembly. The sealing function and the gripping function are performed by two separate elements, effectively solving the common problems of over-tightening or under-tightening found in traditional bite-type ferrule fittings.

Common Ferrule Metal Ring Materials

Material	Characteristics	Suitable Applications
Carbon Steel	High strength, cost-effective	Common in general hydraulic systems (oil, fluids)
Stainless Steel (AISI 316 / 1.4571)	Strong corrosion resistance, suitable for seawater and chemical media	Food, chemical, pharmaceutical, marine applications
Brass	Good machinability, corrosion resistance	Low-pressure systems, air, water, especially in pneumatic applications
Aluminum Alloy	Lightweight, but lower strength	Suitable for weight-sensitive systems with moderate pressure (e.g., aerospace)

Common Rubber Seal Ring (O-ring) Materials

Material	Characteristics	Temperature Range	Suitable Media
NBR (Nitrile Butadiene Rubber)	Low cost, good oil resistance	-30°C ~ +100°C	Hydraulic oil, mineral oil, air, water
FKM (Fluorocarbon Rubber, e.g., Viton®)	High temperature resistance, chemical resistance	-20°C ~ +200°C	Hot oils, acids/bases, gasoline, etc.
EPDM (Ethylene Propylene Diene Monomer)	Aging resistance, resistant to hot water and steam	-40°C ~ +150°C	Hot water, steam, brake fluid, etc.
HNBR (Hydrogenated Nitrile Butadiene Rubber)	Improved NBR, better heat and oil resistance	-30°C ~ +150°C	Refrigerants, hot oils, high-temperature air
PTFE (Polytetrafluoroethylene)	Extremely high	-60°C ~	Corrosive chemicals,

Material	Characteristics	Temperature Range	Suitable Media
Encapsulated O-ring	chemical stability	+260°C	pharmaceutical, clean systems

Differences Compared to Standard ISO 8434-1 Single Ferrule Fittings

Item	EO (Single Ferrule)	EO-2 (Double Ferrule + O-ring)
Sealing Method	Metal-to-metal	Metal + Elastomeric Seal Ring (O-ring)
Assembly Tolerance	Relatively low, requires precise torque	More forgiving assembly, more reliable sealing
Vibration Resistance	Moderate	Stronger
Applicable Pressure	Medium-pressure systems	High-pressure systems (up to 800 bar)
Maintainability	Disassembly may affect sealing surfaces	O-ring replaceable, good maintainability
Cost	Relatively lower	Slightly higher, but superior performance

For more information, please consult www.srt-schneidringe.com
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