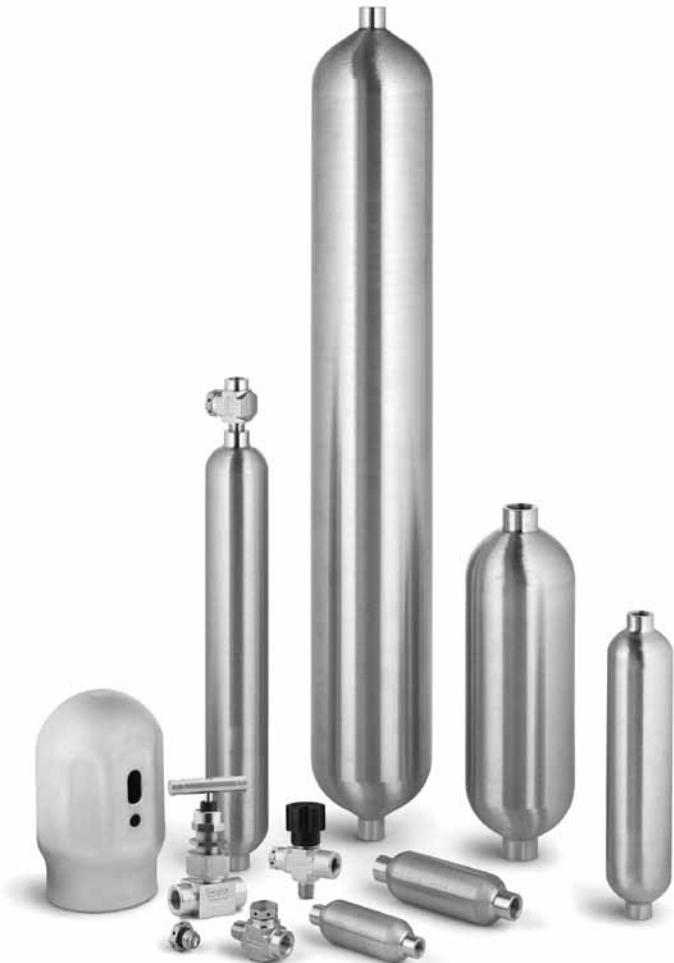


# Swagelok® Products Compliant with the Transportable Pressure Equipment Directive (TPED)



## Products

- Double-ended sample cylinders in 304L and 316L stainless steel
- Cylinder valves
- Rupture disc units and rupture disc tees
- Sample cylinder accessories

## Transportable Pressure Equipment Directive (TPED)

The Transportable Pressure Equipment Directive (TPED) provides requirements relating to the design, manufacture, and testing of transportable pressure vessels and accessories, including sample cylinders and cylinder valves, used in gas service. The intent of the directive is to provide a uniform level of product safety throughout the countries of the European Union.

### Swagelok Compliance to TPED

- Swagelok *sample cylinders and cylinder valves* comply with directive 2010/35/EU as established by a Notified Body and include an EC-type examination.
- Swagelok *rupture disc assemblies* comply with TPED by meeting the requirements of the Pressure Equipment Directive (PED) 97/23/EC, because TPED does not contain technical requirements specific to this type of product.
- Swagelok *rupture disc assemblies* comply with directive 97/23/EC (PED) as established by a Notified Body and include an EC-type examination.

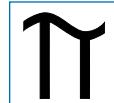
## General Information on TPED-Compliant Products

### Pressure Ratings

The pressure ratings for Swagelok *sample cylinders and cylinder valves* shown in this catalog are in accordance with the EC-type examination for the product.

### Product Markings

Swagelok TPED-compliant *sample cylinders and cylinder valves* are marked with the pi ( $\pi$ ) symbol and the identification number of the Notified Body which performed the assessment.



Swagelok TPED-compliant *rupture disc assemblies* are marked with the CE (€) symbol and the identification number of the Notified Body which performed the assessment.



### Testing

Every TPED-compliant *sample cylinder* is hydrostatically tested at 1.5 times the pressure rating.

Every TPED-compliant Swagelok *cylinder valve* is factory tested with nitrogen at 69 bar (1000 psig). Seats have a maximum allowable leak rate of 0.1 std cm<sup>3</sup>/min. Shell testing is performed at 1.5 times the pressure rating to a requirement of no detectable leakage with a liquid leak detector.

### Cleaning and Packaging

All Swagelok TPED-compliant *sample cylinders, rupture disc assemblies, and cylinder valves* are cleaned and packaged in accordance with Swagelok Standard Cleaning and Packaging (SC-10), MS-06-62.

Cleaning and packaging in accordance with Swagelok Special Cleaning and Packaging (SC-11), MS-06-63, to ensure compliance with product cleanliness requirements stated in ASTM G93 Level C are available as an option for *cylinder valves*. To order, insert **-SC11** into the valve ordering number.

Example: SS-16DPF4-BC-**SC11**-PD

### Ordering Numbers

Swagelok TPED-compliant sample cylinder and cylinder valve ordering numbers include a **-PD** designator.

### Documentation

A Declaration of Conformity is available for all Swagelok TPED-compliant products. Contact your authorized Swagelok sales and service representative.

### Related Information

For information on other Swagelok sample cylinders, overpressure protection devices, and accessories including cylinders compliant with U.S. DOT and Transport Canada requirements, see the *Swagelok Sample Cylinders, Accessories, and Outage Tubes* catalog, MS-01-177.

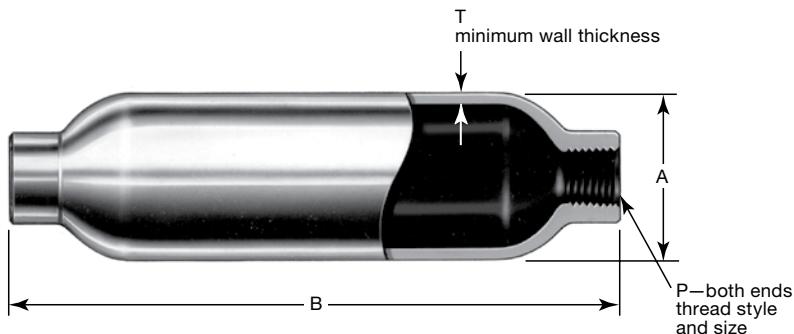
## Double-Ended Sample Cylinders

### Features

- 304L and 316L stainless steel materials
- 40 to 3785 cm<sup>3</sup> (1 gal) sizes
- 1/8 to 1/2 in. female NPT and 1/4 in. female ISO 7/1 end connections

### Ordering Information, Pressure Ratings, and Dimensions

Dimensions, in millimeters (inches), are for reference only and are subject to change.



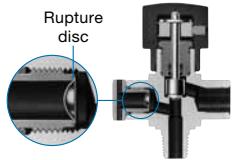
Material Grade	Pressure Rating at -50 to 50°C (-58 to 122°F) bar (psig)	Internal Volume cm <sup>3</sup> ± 5 %	P Thread	Ordering Number	Dimensions, mm (in.)			Weight kg (lb)
					A	B	T	
304L SS	130 (1885)	40	1/8 in. NPT	304L-HDF2-40-PD	31.4 (1.238)	98.6 (3.88)	1.78 (0.070)	0.14 (0.31)
		50	1/4 in. NPT	304L-HDF4-50-PD	37.7 (1.485)	95.2 (3.75)	2.29 (0.090)	0.17 (0.38)
		75		304L-HDF4-75-PD		125 (4.94)		0.28 (0.62)
	100 (1450)	150	1/4 in. NPT	304L-HDF4-150-PD	50.3 (1.980)	133 (5.25)		0.43 (0.94)
		300	1/4 in. NPT	304L-HDF4-300-PD		227 (8.94)		0.73 (1.6)
		400	1/4 in. NPT	304L-HDF4-400-PD		290 (11.4)		0.95 (2.1)
		500	1/4 in. NPT	304L-HDF4-500-PD		351 (13.8)		1.2 (2.6)
		1000	1/4 in. ISO 7/1	304L-HDF4RT-1000-PD		88.0 (3.465)	277 (10.9)	4.32 (0.170)
		1000	1/2 in. NPT	304L-HDF8-1000-PD				2.9 (6.5)
	2250	1/4 in. NPT	304L-HDF4-2250-PD	100.6 (3.960)	437 (17.2)	4.95 (0.195)	6.4 (14)	
		1/2 in. NPT	304L-HDF8-2250-PD					
		1/4 in. NPT	304L-HDF4-1GAL-PD		678 (26.7)		9.5 (21)	
		1/2 in. NPT	304L-HDF8-1GAL-PD					
316L SS	100 (1450)	150	1/4 in. NPT	316L-HDF4-150-PD	50.3 (1.980)	133 (5.25)	2.24 (0.088)	0.43 (0.94)
		300		316L-HDF4-300-PD		227 (8.94)		0.73 (1.6)
		500		316L-HDF4-500-PD		351 (13.8)		1.2 (2.6)
		1000		316L-HDF8-1000-PD	88.0 (3.465)	277 (10.9)	4.32 (0.170)	2.9 (6.5)
	300 (4350)	150	1/4 in. NPT	316L-50DF4-150-PD	47.8 (1.881)	203 (8.00)	5.97 (0.235)	1.4 (3.0)
		300		316L-50DF4-300-PD		368 (14.5)		2.5 (5.6)
		500		316L-50DF4-500-PD		597 (23.5)		4.1 (9.1)

## Cylinder Valves

### D Series Nonrotating-Stem Needle Valve

#### Features

- Orifice size 5.6 mm (0.218 in.).
- Flow coefficient ( $C_v$ ) 0.53.
- Compact, rugged design.
- Protective handle prevents contaminants from entering functional valve parts.
- Valve can be configured with rupture disc.



#### Pressure-Temperature Ratings

- Temperature rating: -20 to 65°C (-4 to 150°F)
- Pressure rating within the range: 172 bar (2496 psig)

#### Materials of Construction



**⚠ To increase service life, ensure proper valve performance, and prevent leakage, apply only as much torque as is required to achieve positive shutoff.**

Component	Material Grade/ ASTM Specification
1 Handle	Anodized aluminum/B221
Set screw	Nickel cadmium-plated steel
2 Retaining ring	Zinc-plated steel
3 Spool	Aluminum/B209, B211
4 Packing bolt	<i>Molybdenum disulfide-coated 316 SS/A276</i>
5 Backup ring	PTFE/D1710
6 O-ring	<i>Buna C or ethylene propylene</i>
7 Washer	<i>Fluorocarbon-coated 316 SS/A167</i>
8 Stem	316 SS/A276
Stem tip	<i>PEEK</i>
Machine screw	316 SS/A276
9 Body	316 SS/A182
Lubricants	<i>Molybdenum disulfide in hydrocarbon carrier; O-ring—silicone-based; machine screw—hydrocarbon thread lock</i>

Wetted components listed in *italics*.

#### Ordering Information and Dimensions

Dimensions, in millimeters (inches), are for reference only and are subject to change.

#### Angle-Pattern Valves

Select a valve with a C dimension listed and insert **-A** into the ordering number.

Example: SS-16DPS6-A-BC-PD

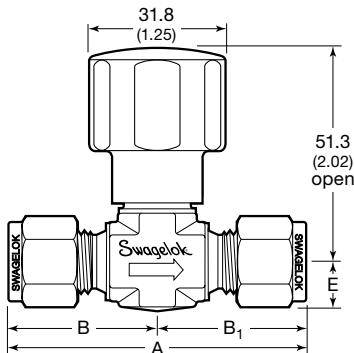
#### Valve with Rupture Disc Units

Straight and angle-pattern valves with 1/4 in. female NPT outlets can be assembled with rupture disc units.

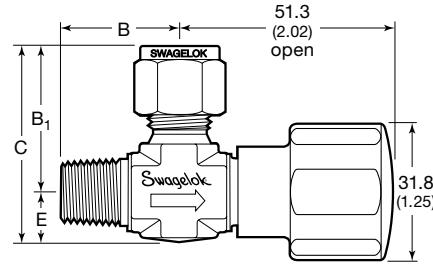
To order, insert **-1** for a 131 bar (1900 psig) rupture disc unit or **-2** for a 196 bar (2850 psig) rupture disc unit into the ordering number.

Examples: SS-16DPM4-F4-BC-1-PD  
SS-16DPM8-F4-A-E-2-PD

#### Straight Pattern



#### Angle Pattern



End Connections		Ordering Number		Dimensions, mm (in.)				
Inlet/Outlet	Size	Buna C O-Ring	Ethylene Propylene O-Ring	A	B	B <sub>1</sub>	C	E
Female NPT	1/4 in.	SS-16DPF4-BC-PD	SS-16DPF4-E-PD	53.8 (2.12)	26.9 (1.06)		—	12.7 (0.50)
Male NPT	1/4 in.	SS-16DPM4-BC-PD	SS-16DPM4-E-PD	57.2 (2.25)	28.4 (1.12)		—	12.7 (0.50)
	3/8 in.	SS-16DPM6-BC-PD	SS-16DPM6-E-PD					14.2 (0.56)
Male/ female NPT	1/4 in.	SS-16DPM4-F4-BC-PD	SS-16DPM4-F4-E-PD	55.6 (2.19)	28.4 (1.12)	26.9 (1.06)	39.6 (1.56)	12.7 (0.50)
	1/2 to 1/4 in.	SS-16DPM8-F4-BC-PD	SS-16DPM8-F4-E-PD	63.5 (2.50)	1.25 (31.8)		46.0 (1.81)	14.2 (0.56)
Male NPT/ Swagelok tube fitting	1/4 to 3/8 in.	SS-16DPM4-S6-BC-PD	SS-16DPM4-S6-E-PD	60.5 (2.38)	28.4 (1.12)	32.0 (1.26)	45.5 (1.79)	12.7 (0.50)
Swagelok tube fittings	3/8 in.	SS-16DPS6-BC-PD	SS-16DPS6-E-PD	65.5 (2.58)	32.8 (1.29)		45.5 (1.79)	12.7 (0.50)

Additional end connections available on request.

## Cylinder Valves

### N Series Severe-Service Union-Bonnet Needle Valves

#### Features

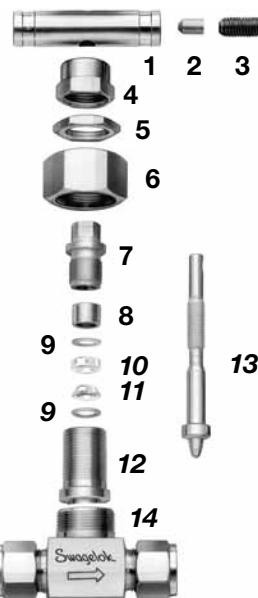
- Orifice size 4.0 mm (0.156 in.).
- Flow coefficient ( $C_v$ ) 0.35.
- Union-bonnet construction prevents accidental valve disassembly.
- Packing bolt design permits packing adjustments in the open position.
- Safety back seating seals in fully open position.

#### Pressure-Temperature Ratings

- Temperature rating: -20 to 65°C (-4 to 150°F)
- Pressure rating within the range: 345 bar (5003 psig)

- ⚠ A packing adjustment may be required periodically to increase service life and to prevent leakage.**
- ⚠ Valves that have not been cycled for a period of time may have a higher initial actuation torque.**

#### Materials of Construction



Component	Material Grade/ ASTM Specification
1 Handle	Stainless steel
2 Handle pin	Nickel cadmium-plated steel/A108
3 Set screw	Nickel cadmium-plated steel
4 Lock nut	316 SS/A276 or A479
5 Panel nut	316 SS/B783
6 Union nut	
7 Packing bolt	316 SS/A276
8 Gland	
9 Packing supports	
10 Upper packing	PEEK
11 Lower packing	
12 Bonnet	316 SS/A479
13 Soft-seat stem shank	Silver-plated 316 SS/A276
Soft-seat stem tip	PEEK
14 Body	316 SS/A479
Lubricant	Nickel antiseize with hydrocarbon carrier

Wetted components listed in *italics*.

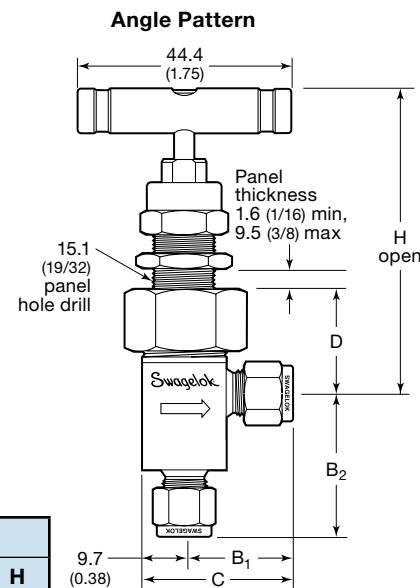
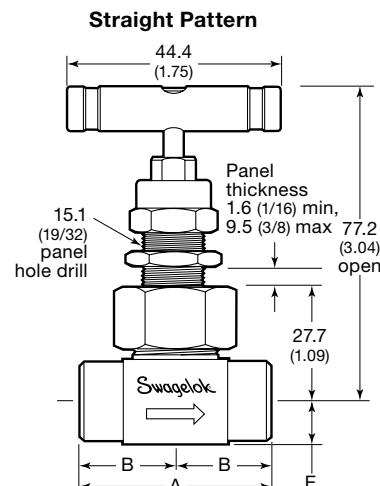
#### Ordering Information and Dimensions

Dimensions, in millimeters (inches), are for reference only and are subject to change.

#### Angle-Pattern Valves

Select a valve with a  $B_2$  dimension listed and insert -A into the ordering number.

Example: SS-3NPRF2-A-PK-SH-PD



End Connections	Inlet/Outlet	Size	Ordering Number	Dimensions, mm (in.)							
				A	B	B <sub>1</sub>	B <sub>2</sub>	C	D	E	H
Female NPT	1/8 in.	SS-3NPRF2-PK-SH-PD	50.8 (2.00)	25.4 (1.00)	22.6 (0.89)	25.4 (1.00)	32.3 (1.27)	32.5 (1.28)	9.7 (0.38)	82.0 (3.23)	9.9 (0.39)
	1/4 in.	SS-3NPRF4-PK-SH-PD	52.3 (2.06)	26.2 (1.03)			35.1 (1.38)	27.7 (1.09)	9.7 (0.38)	77.2 (3.04)	—
Male NPT	1/4 in.	SS-3NPRM4-PK-SH-PD	50.8 (2.00)	25.4 (1.00)	22.6 (0.89)	32.3 (1.27)	32.5 (1.28)	9.9 (0.39)	82.0 (3.23)	—	—
Male/female NPT	1/4 in.	SS-3NPRM4-F4-PK-SH-PD	51.6 (2.03)	26.2 (1.03)	22.6 (0.89)	39.1 (1.54)	27.7 (1.09)	9.7 (0.38)	77.2 (3.04)	—	—
Swagelok tube fittings	1/4 in.	SS-3NPRS4-PK-SH-PD	61.0 (2.40)	29.5 (1.16)	37.6 (1.48)	39.1 (1.54)	27.7 (1.09)	9.7 (0.38)	77.2 (3.04)	—	—
	6 mm	SS-3NPRS6MM-PK-SH-PD		30.5 (1.20)	—	—	—	—	—	—	—
	8 mm	SS-3NPRS8MM-PK-SH-PD		—	—	—	—	—	—	—	—

## Overpressure Protection

Compressed gas cylinders may require the use of pressure-relief devices depending on the application. The user shall assess the applicable requirements regarding overpressure protection and the selection of pressure-relief devices.

- ⚠ Be sure to use the correct pressure-relief device for the fluid being used.**
- ⚠ Proper filling of the cylinder in accordance with the TPED, ADR/RID, and other local regulations, is critical in preventing overpressurization.**

### Rupture Disc Precautions

1. Do not use rupture disc devices in a location where the release of the cylinder contents might create a hazard. The rupture disc vents to the atmosphere through six radial holes in the body. Pressure is released suddenly with a loud noise, and gases escape at high velocity.
2. Know the burst pressure. This rating is marked on the end face of the rupture disc unit.
3. Inspect rupture discs regularly. The strength of rupture discs deteriorates with time due to temperature, corrosion, and fatigue. Pulsating pressure, vacuum/pressure cycling, heat, and corrosive fluids and atmospheres can reduce the disc's burst pressure.
4. Do not use rupture discs to protect vessels with volumes greater than 11 355 cm<sup>3</sup> (3 gal) for compressed gases or 5677 cm<sup>3</sup> (1 1/2 gal) for liquefied gases.
5. Provide suitable means to isolate the sample cylinder from the system in case the rupture disc bursts while taking a sample.
6. In cylinders with liquefied gases, a small temperature increase during transportation or storage will cause the liquid to expand and may cause the rupture disc to release its contents. See local regulations and other appropriate guidelines for safe filling limits for your application.

### Rupture Disc Units

Swagelok rupture disc units protect sample cylinders from overpressurization by venting the cylinder contents to atmosphere. The rupture disc is welded to a body that is threaded into a valve body or a rupture disc tee and sealed by an O-ring. The rupture disc can be easily replaced without removing the valve or the tee from the cylinder.



### Materials of Construction

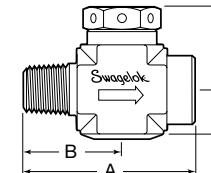
Component	Material Grade/ ASTM Specification
Body, inlet ring	316L/A479 or A213
O-ring	Fluorocarbon FKM
Rupture disc	Alloy 600/B168

### Ordering Information

Nominal Burst Pressure at 20°C (70°F)	Ordering Number
196 bar ± 10 bar (2850 psig ± 150 psig)	SS-RDK-16-2850
131 bar ± 6.9 bar (1900 psig ± 100 psig)	SS-RDK-16-1900

### Rupture Disc Tees

Tees are made of 316 stainless steel. Each tee includes a rupture disc unit.



Dimensions are for reference only and are subject to change.

### Ordering Information and Dimensions

End Connections		Ordering Number	Dimensions, mm (in.)			
Inlet	Outlet		A	B	C	D
With 196 bar (2850 psig) Rupture Disc						
1/4 in. male NPT	1/4 in. female NPT	SS-RTM4-F4-2	47.7 (1.88)	26.9 (1.06)	23.9 (0.94)	12.7 (0.50)
1/2 in. male NPT		SS-RTM8-F4-2	55.6 (2.19)	31.0 (1.22)	30.2 (1.19)	14.2 (0.56)
With 131 bar (1900 psig) Rupture Disc						
1/4 in. male NPT	1/4 in. female NPT	SS-RTM4-F4-1	47.7 (1.88)	26.9 (1.06)	23.9 (0.94)	12.7 (0.50)
1/2 in. male NPT		SS-RTM8-F4-1	55.6 (2.19)	31.0 (1.22)	30.2 (1.19)	14.2 (0.56)

## Sample Cylinder Options

### PTFE Coating

Internal cylinder surfaces can be coated with PTFE to provide a nonstick surface, which aids in cleaning. To order, insert **-T** into the cylinder ordering number.

Example: 304L-HDF2-40-T-PD

### Electropolishing

Electropolishing provides a clean internal surface with a high degree of passivation. To order, insert **-EP** into the cylinder ordering number.

Example: 304L-HDF2-40-EP-PD

### Additional Marking

Cylinders can be furnished roll stamped or laser etched to meet specific identification requirements, such as company name, address, serial number, or order number. Swagelok will not mark cylinders with the intended contents.

**Roll Stamping**—To order, insert **-RS** into the cylinder ordering number, followed by the specific information on a separate line.

Example: 304L-HDF2-40-RS-PD

#### Company Name and Address

Cylinders 50.8 mm (2 in.) or less in diameter or with a pressure rating 124 bar (1800 psig) or lower are roll stamped in the cylinder sidewall below the standard product marking.

Cylinders over 50.8 mm (2 in.) in diameter or with a pressure rating higher than 124 bar (1800 psig) are roll stamped on the cylinder shoulder on the end opposite the standard product marking.

**Laser Etching**—To order, insert **-LE** into the cylinder ordering number, followed by the specific information on a separate line.

Example: 304L-HDF2-40-LE -PD

#### Company Name and Address

This information will be laser etched on the cylinder sidewall below the standard product marking.

## Sample Cylinder Accessories

### End Caps

End caps protect valves from damage. Each cap threads onto a neck ring that has been peened to the cylinder neck. End caps are made from plated carbon steel and are available for use on 2250 and 3785 cm<sup>3</sup> (1 gal) cylinders.

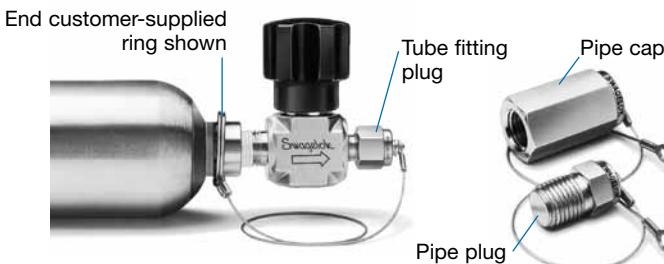
To order, insert **-C** into the cylinder ordering number.

Example: 304L-HDF8-2250-C-PD



### Caps and Plugs

Caps and plugs protect Swagelok tube fitting or NPT end connections on valves during cylinder transport. To order, contact your authorized Swagelok representative.



### Carrying Handle

This accessory provides a convenient way to carry sample cylinders. The handle is made from 304 stainless steel and is available for use on 300 cm<sup>3</sup> and larger cylinders.

To order a sample cylinder to be shipped with a carrying handle, insert **-H** into the cylinder ordering number.

Example: 304L-HDF4-400-H-PD

To order a carrying handle as a separate component, use one of the following ordering numbers:

Cylinder OD mm (in.)	Ordering Number
48.2, 50.8 (1.9, 2)	MS-5K-CY-2"
88.9, 102 (3.5, 4)	MS-5K-CY-4"

## Ordering Multiple Options and Accessories

Insert designators in *alphabetical* order, always keeping **-PD** at the *end* of the ordering number.

Examples: 304L-HDF8-2250-C-H-PD for a sample cylinder with end caps and carrying handle  
304L-HDF4-300-H-T-PD for a sample cylinder with carrying handle and internal PTFE coating.

#### **Safe Product Selection**

**When selecting a product, the total system design must be considered to ensure safe, trouble-free performance. Function, material compatibility, adequate ratings, proper installation, operation, and maintenance are the responsibilities of the system designer and user.**

#### **Warranty Information**

Swagelok products are backed by The Swagelok Limited Lifetime Warranty. For a copy, visit [swagelok.com](http://swagelok.com) or contact your authorized Swagelok representative.