

Sample Cylinders Compliant with the Transportable Pressure Equipment Directive (TPED)



FITOK

Application

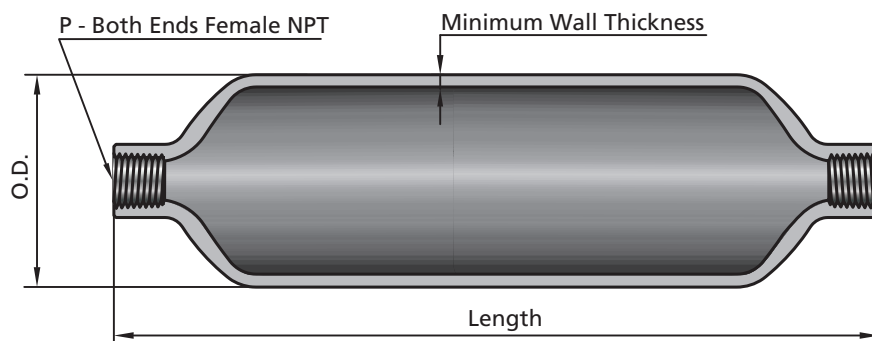
- Hydrocarbon sampling for refineries
- Gas sampling for chromatography experiments
- Condensate sampling for fossil fuel power plants and nuclear power plants
- As surge accumulators or reaction vessels
- Snubbers in reactor feed lines

Features

- Volumes from 40 to 3785 cm³ (1 gal)
- 1/8", 1/4" and 1/2" female NPT connections
- Spinned cylinder body machined from seamless tubing to provide consistent wall thickness, size and capacity
- Cold-formed female NPT threads to provide high strength
- All models internally sandblasted to ensure smooth surface without foreign particles
- 304L SS and 316L SS available
- Cylinders compliant with Transportable Pressure Equipment Directive 2010/35/EU

Technical Data

Dimensions are for reference only and are subject to change.



| Basic Ordering No. | Working Pressure psig (bar) | Internal Volume (cm ³ ±10%) | P - Female NPT | Dimensions, in. (mm) | | | Weight lb (kg) |
|--------------------|-----------------------------|--|----------------|----------------------|-------------|------------------------|----------------|
| | | | | O.D. | Length | Minimum Wall Thickness | |
| 4L-SC13-N2-40 | 1885 (130) | 40 | 1/8" | 1.25 (31.8) | 3.88 (98.6) | 0.070 (1.8) | 0.31 (0.14) |
| 4L-SC13-N4-50 | | 50 | 1/4" | 1.50 (38.1) | 3.75 (95.2) | 0.093 (2.4) | 0.38 (0.17) |
| 4L-SC13-N4-75 | | 75 | | | 4.94 (125) | | 0.62 (0.28) |
| 4L-SC10-N4-150 | 150 | 2.00 (50.8) | | 5.25 (133) | 0.94 (0.43) | | |
| 4L-SC10-N4-300 | 300 | | | 8.94 (227) | 1.80 (0.83) | | |
| 4L-SC10-N4-400 | 400 | | | 11.4 (290) | 2.10 (0.95) | | |
| 4L-SC10-N4-500 | 500 | | | 13.8 (351) | 2.61 (1.20) | | |
| 4L-SC10-N4(8)-1000 | 1450 (100) | 1000 | 1/4" or 1/2" | 3.50 (88.9) | 10.9 (277) | 0.180 (4.6) | 6.50 (2.90) |
| 4L-SC10-N4(8)-2250 | | 2250 | | 4.00 (102) | 17.2 (437) | 0.206 (5.2) | 14.0 (6.40) |
| 4L-SC10-N4(8)-3785 | | 3785 | | | 26.7 (678) | | 21.0 (9.50) |
| 6L-SC10-N4-300 | 1450 (100) | 300 | 1/4" | 2.00 (50.8) | 8.94 (227) | 0.093 (2.4) | 1.80 (0.83) |
| 6L-SC10-N4-500 | | 500 | 1/4" or 1/2" | | 13.8 (351) | | 2.61 (1.20) |
| 6L-SC10-N4(8)-1000 | | | 1000 | 1/4" or 1/2" | 3.50 (88.9) | 10.9 (277) | 0.180 (4.6) |
| 6L-SC30-N4-150 | 4350 (300) | 150 | 1/4" | 1.90 (48.2) | 8.00 (203) | 0.240 (6.1) | 3.00 (1.40) |
| 6L-SC30-N4-300 | | 300 | | | 14.5 (368) | | 5.60 (2.50) |
| 6L-SC30-N4-500 | | 500 | | | 23.5 (597) | | 9.10 (4.10) |

Options of Internal Surface Treatments

PTFE Coating

The cylinder internal surface can be coated with PTFE to provide nonstick surface for easy cleaning.

Electropolishing

Electropolishing can provide a clean internal surface with a high degree of passivation.

Testing

Each TPED-compliant sample cylinder is hydrostatically tested at 1.5 times the working pressure.

Cleaning and Packaging

All FITOK TPED-compliant sample cylinders are cleaned and packaged in accordance with FITOK *FC-01 Standard Cleaning and Packaging*.

FITOK FC-02 Special Cleaning and Packaging compliant with the requirements of ASTM G93 Level C is optional.

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 gas being used.
- ⚠ Proper filling of the cylinder according to the TPED, ADR/RID, or other local regulations, is critical in preventing overpressurization.

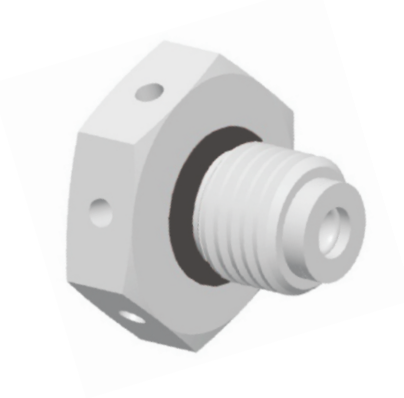
Rupture Disc Kits

Rupture disc models are supplied with a pre-bulged rupture disc which provides excellent resistance to a broad range of corrosive materials, protecting sample cylinder from over-pressurization 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 elastomer o-ring. The rupture disc can be easily replaced without removing the valve or the tee from the cylinder.

Note: FITOK rupture disc kits are marked with the "CE" symbol.

Materials of Construction

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



3 Sample Cylinders Compliant with TPED

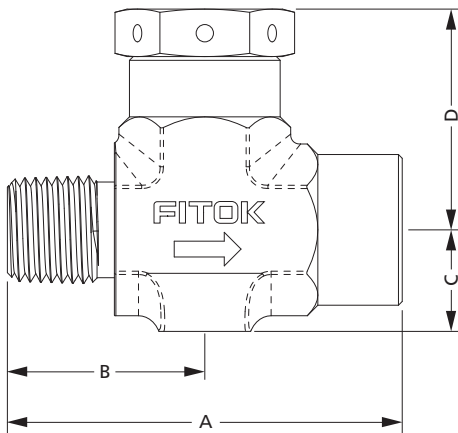
Ordering Information

| Nominal Burst Pressure at 70°F 20°C) | Ordering Number |
|--|--------------------|
| 2850 psig ± 150 psig 196 bar ± 10.3 bar | SS-RDD-7BS-2850-PD |
| 1900 psig ± 100 psig 130 bar ± 6.8 bar | SS-RDD-7BS-1900-PD |

Note: The rupture disc kits should be used with FITOK rupture disc tees.

Rupture Disc Tees

These compact assemblies are designed for using with a variety of FITOK valves. Tees are made of 316 SS. Each tee includes a rupture disc kit.



Ordering Information and Dimensions

| End connections | | Ordering Number | Dimensions, in. (mm) | | | |
|---------------------------------------|--------------------------|-------------------|----------------------|----------------|----------------|----------------|
| Inlet | Outlet | | A | B | C | D |
| With 2850 psig (196 bar) Rupture Disc | | | | | | |
| 1/4 in. Male NPT | 1/4 in. Female NPT | SS-TM4-F4-RD28-PD | 2.06 (52.4) | 1.03 (26.2) | 0.53 (13.5) | 1.16 (29.4) |
| 1/2 in. Male NPT | | SS-TM8-F4-RD28-PD | 2.63 (66.7) | 1.50 (38.1) | 0.75 (19) | 1.42 (36) |
| With 1900 psig (130 bar) Rupture Disc | | | | | | |
| 1/4 in. Male NPT | 1/4 in. Female NPT | SS-TM4-F4-RD19-PD | 2.06 (52.4) | 1.03 (26.2) | 0.53 (13.5) | 1.16 (29.4) |
| 1/2 in. Male NPT | | SS-TM8-F4-RD19-PD | 2.63 (66.7) | 1.50 (38.1) | 0.75 (19) | 1.42 (36) |



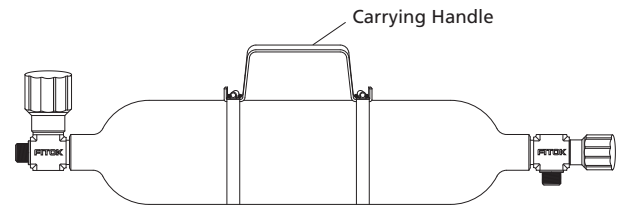
Sample Cylinder Accessories

Carrying Handle

The carrying handle provides convenience for transportation of sample cylinders. The handle is made of 304 SS and is available for 300 cm³ cylinders or larger cylinders.

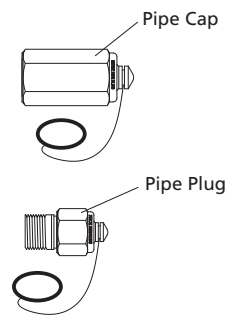
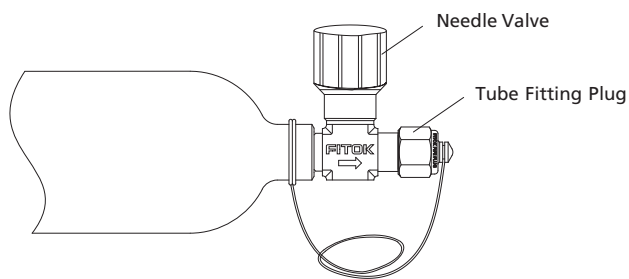
Ordering Information

| Outside Diameter in. (mm) | Internal Volume cm ³ | Basic Ordering No. |
|------------------------------|------------------------------------|-----------------------|
| 1.9 (48.2) | 300~500 | HD-CY2-H2 |
| 2.0 (50.8) | | |
| 3.5 (88.9) | 1000 | HD-CY3-H2 |
| 4.0 (102) | 2250/3785 | HD-CY4-H4 |



Caps and Plugs

Caps and plugs are used for cylinder valves to protect the connections (tube fitting or NPT thread) from damages during cylinder transportation. For details, please contact FITOK Group or our authorized distributors.



Outage Tubes

Features

- 316 SS and 304 SS
- 1/4" or 1/2" NPT

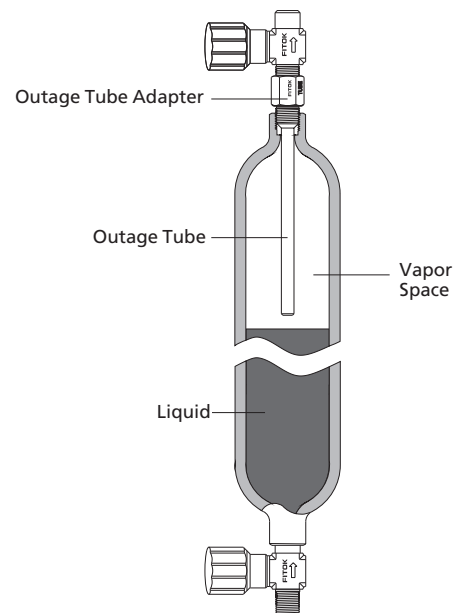
Construction

Outage tube is welded to the male thread end of an adapter. Screw the adapter with outage tube into the female thread end of a sample cylinder.

Purpose

The outage tube provides a vapor space of desired volume in a cylinder with liquefied gas. Therefore, liquids can expand when the temperature increases. A small temperature increase can make the liquids expanded and the pressure increased dramatically if there is not enough vapor space.

Note: For safe filling limits of your application, please refer to local regulations or other guidelines.



Usage

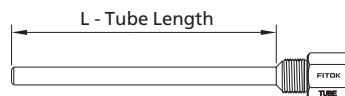
Outage tube is used to keep a certain vapor space in a cylinder. The space is determined by the length of outage tube. Outage is the vapor space in the cylinder expressed as a percentage of the total volume of the cylinder.

$$\% \text{ outage} = (\text{vapor space} / \text{total volume}) \times 100$$

To obtain an exact outage, each outage tube and cylinder assembly should be calibrated by a suitable method.

Outage Tube Length

The outage tube length (L) is measured from the end of the pipe fitting to the end of the tubing. The table below shows approximate outage tube length for standard sample cylinders.

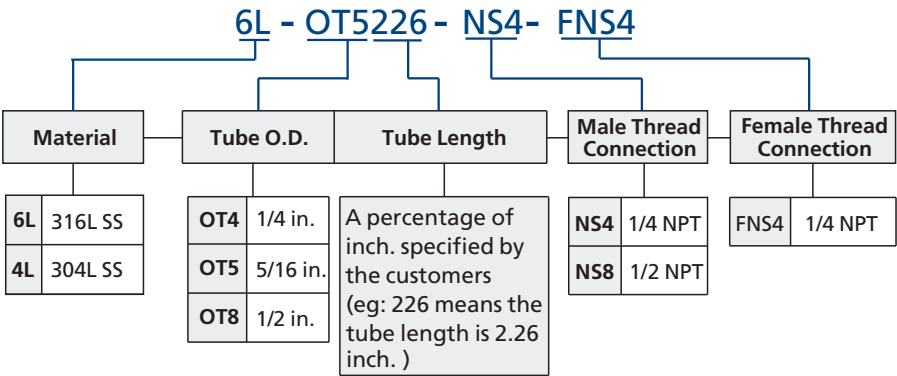


Tube of desired length is available upon request.

| Tube O.D. | Cylinder Volume (cm ³ ± 10%) | Code | | Minimum Outage, % | | | | |
|--------------|---|---|-------|-------------------|------|------|-------|-------|
| | | | | 10 | 20 | 30 | 40 | 50 |
| | | | | Tube Length, in. | | | | |
| 1/4" | 40 | Applicable to cylinders rated to 100 bar and 130 bar | 4087 | 0.87 | 1.11 | 1.35 | 1.59 | 1.84 |
| 5/16" | 50 | | 5085 | 0.85 | 1.07 | 1.28 | 1.50 | 1.71 |
| | 75 | | 5102 | 1.02 | 1.34 | 1.66 | 1.98 | 2.31 |
| | 150 | | 5112 | 1.12 | 1.45 | 1.79 | 2.13 | 2.46 |
| | 300 | | 5165 | 1.65 | 2.32 | 2.99 | 3.67 | 4.34 |
| | 400 | | 5200 | 2.00 | 2.90 | 3.79 | 4.69 | 5.59 |
| | 500 | | 5226 | 2.26 | 3.38 | 4.50 | 5.62 | 6.74 |
| | 1000 | | 5231 | 2.31 | 3.06 | 3.81 | 4.56 | 5.31 |
| | 2250 | | 5717 | 3.30 | 4.59 | 5.88 | 7.17 | 8.46 |
| | 3785 (1 gal) | | 51114 | 4.62 | 6.79 | 8.96 | 11.14 | 13.31 |
| 1/2" | 1000 | | 8221 | 2.21 | 2.96 | 3.71 | 4.46 | 5.21 |
| | 2250 | | 8846 | 3.30 | 4.59 | 5.88 | 7.17 | 8.46 |
| | 3785 (1 gal) | | 8452 | 4.52 | 6.69 | 8.86 | 11.04 | 13.21 |
| 5/16" | 150 | Applicable to cylinders rated to 300 bar | 5162 | 1.62 | 2.17 | 2.71 | 3.26 | 3.81 |
| | 300 | | 5274 | 2.74 | 3.84 | 4.93 | 6.03 | 7.12 |
| | 500 | | 5439 | 4.39 | 6.21 | 8.04 | 9.86 | 11.68 |

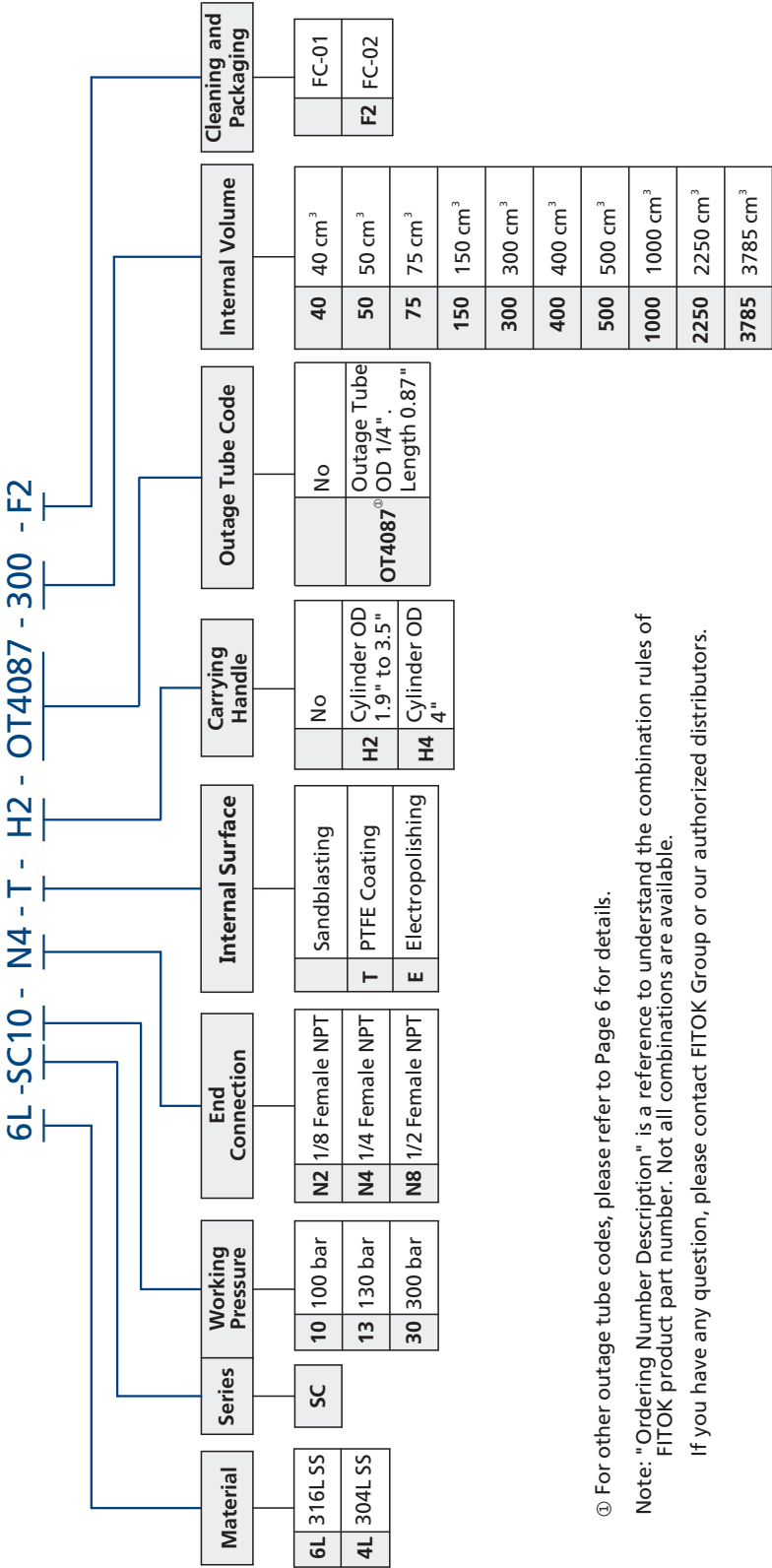
For the use of sample cylinder and outage tube, please refer to ASTM D1265, *Standard Practice for Sampling Liquefied Petroleum (LP) Gases, Manual Method*.

Part Number Description



Note: "Ordering Number Description" is a reference to understand the combination rules of FITOK product part number. Not all combinations are available.

Ordering Number Description



① For other outage tube codes, please refer to Page 6 for details.

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If you have any question, please contact FITOK Group or our authorized distributors.

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