

# Fittings and Tubing

## QS Series

### Medium Pressure

*Pressures to 15,000 psi (1034 bar)*

Since 1945 Autoclave Engineers has designed and built premium quality valves, fittings and tubing. This commitment to engineering and manufacturing excellence has earned Autoclave a reputation for reliable, efficient product performance. Autoclave Engineers has long been established as the world leader in high pressure fluid handling components for the chemical/petrochemical, research, and oil and gas industries.



### *QS Medium Pressure Fittings and Tubing:*

- Available sizes are 1/4, 3/8, 9/16 and 3/4”.
- Fittings and tubing manufactured from high strength stainless steel.
- Molybdenum disulfide-coated gland nuts to prevent galling.
- Gland nut positioning mark for assembly.
- Single-ferrule compression sleeve.
- Connection weep holes for safety and leak detection.
- Fast easy make-up of connection.
- Operating Temperatures from 0°F (-17.8°C) to 650°F (343°C).

The Medium Pressure QS Series uses Autoclave’s Quick Set compression sleeve design. This single-ferrule compression sleeve connection delivers fast, easy make-up and reliable bubble-tight performance in liquid or gas service.

**Autoclave  
Engineers**

Fluid Components  
Division of Snap-tite, Inc.  
[www.autoclave.com](http://www.autoclave.com)

**Fittings and Tubing - QS Series**  
Medium Pressure



# Fittings and Tubing - QS Series

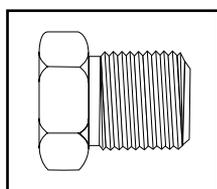
## Pressures to 15,000 psi (1034 bar)

Autoclave Engineers Medium Pressure QS Fittings are designed for use with QS Series valves and medium pressure tubing. These fittings feature improved compression connections with larger orifices for excellent flow capabilities. Autoclave fittings and components are manufactured of high strength stainless steel.

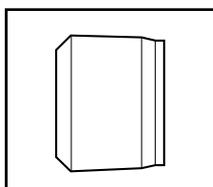


## Connection Components

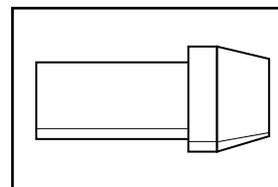
All Autoclave valves and fittings are supplied complete with appropriate glands and sleeves. To order these components separately, use order numbers listed. When using plug, sleeve is not required.



**Gland**  
QSG ( )



**Sleeve**  
QSS ( )



**Plug**  
QSP ( )

Add tube size ( )  
1/4" - 40  
3/8" - 60  
9/16" - 90  
3/4" - 120

Example:  
1/4" Gland - QSG 40

To ensure proper fit use Autoclave tubing. For mounting hole option add suffix PM to catalog number. Consult factory for mounting hole dimensions.

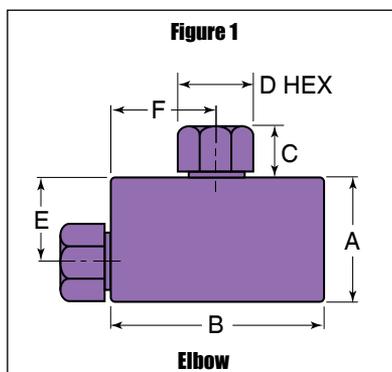
Catalog Number	Connection Type	Outside Diameter Tube	Pressure Rating psi (bar)*	Minimum Opening	Dimensions - inches (mm)							Block Thickness	Fitting Pattern
					A	B	C	D Typical	E	F	G Thickness		

### Elbow

QSL4400	QS250	1/4 (6.35)	15,000 (1034.20)	0.16 (3.99)	1.38 (34.93)	2.00 (50.80)	0.52 (13.23)	0.63 (15.88)	1.00 (25.40)	1.00 (25.40)		0.75 (19.05)	See Figure 1
QSL6600	QS375	3/8 (9.53)	15,000 (1034.20)	0.25 (6.35)	1.50 (38.10)	2.00 (50.80)	0.55 (14.00)	0.75 (19.05)	1.00 (25.40)	1.00 (25.40)		0.81 (20.62)	
QSL9900	QS562	9/16 (14.29)	15,000 (1034.20)	0.36 (9.12)	2.19 (55.58)	3.00 (76.20)	0.82 (20.83)	1.19 (30.18)	1.50 (38.10)	1.50 (38.10)		1.25 (31.75)	
QSL12	QS750	3/4 (19.05)	15,000 (1034.20)	0.52 (13.11)	2.94 (74.63)	4.13 (104.78)	1.04 (26.37)	1.50 (38.10)	2.06 (52.40)	2.06 (52.40)		1.50 (38.10)	

\*Maximum pressure rating is based on the lowest rating of any component.  
Actual working pressure may be determined by tubing pressure rating, if lower.

All dimensions for reference only and subject to change.  
For prompt service, Autoclave stocks select products.  
Consult your local representative.



For mounting hole option add suffix PM to catalog number.  
Consult factory for mounting hole dimensions.

Catalog Number	Connection Type	Outside Diameter Tube	Pressure Rating psi (bar)*	Minimum Opening	Dimensions - inches (mm)							Block Thickness	Fitting Pattern
					A	B	C	D Typical	E	F	G Thickness		

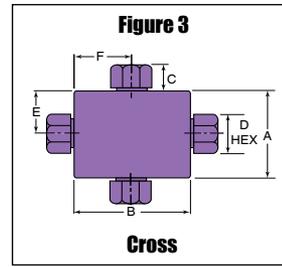
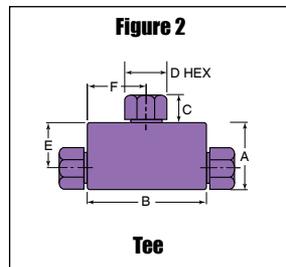
### Tee

QST4440	QS250	1/4 (6.35)	15,000 (1034.20)	0.16 (3.99)	1.38 (34.93)	2.00 (50.80)	0.52 (13.23)	0.63 (15.88)	1.00 (25.40)	1.00 (25.40)		0.75 (19.05)	See Figure 2
QST6660	QS375	3/8 (9.53)	15,000 (1034.20)	0.25 (6.35)	1.50 (38.10)	2.00 (50.80)	0.55 (14.00)	0.75 (19.05)	1.00 (25.40)	1.00 (25.40)		0.81 (20.62)	
QST9990	QS562	9/16 (14.29)	15,000 (1034.20)	0.36 (9.12)	2.19 (55.58)	3.00 (76.20)	0.82 (20.83)	1.19 (30.18)	1.50 (38.10)	1.50 (38.10)		1.25 (31.75)	
QST12	QS750	3/4 (19.05)	15,000 (1034.20)	0.52 (13.11)	2.94 (74.63)	4.13 (104.78)	1.04 (26.37)	1.50 (38.10)	2.06 (52.40)	2.06 (52.40)		1.50 (38.10)	

### Cross

QSX4444	QS250	1/4 (6.35)	15,000 (1034.20)	0.16 (3.99)	2.00 (50.80)	2.00 (50.80)	0.52 (13.23)	0.63 (15.88)	1.00 (25.40)	1.00 (25.40)		0.75 (19.05)	See Figure 3
QSX6666	QS375	3/8 (9.53)	15,000 (1034.20)	0.25 (6.35)	2.00 (50.80)	2.00 (50.80)	0.55 (14.00)	0.75 (19.05)	1.00 (25.40)	1.00 (25.40)		0.81 (20.62)	
QSX9999	QS562	9/16 (14.29)	15,000 (1034.20)	0.36 (9.12)	3.00 (76.20)	3.00 (76.20)	0.82 (20.83)	1.19 (30.18)	1.50 (38.10)	1.50 (38.10)		1.25 (31.75)	
QSX12	QS750	3/4 (19.05)	15,000 (1034.20)	0.52 (13.11)	4.13 (104.78)	4.13 (104.78)	1.04 (26.37)	1.50 (38.10)	2.06 (52.40)	2.06 (52.40)		1.50 (38.10)	

For mounting hole option add suffix PM to catalog number. Consult factory for mounting hole dimensions.



Catalog Number	Connection Type	Outside Diameter Tube	Pressure Rating psi (bar)*	Minimum Opening	Dimensions - inches (mm)							Block Thickness	Fitting Pattern
					A	B	C	D Typical	E	F	G Thickness		

### Straight Coupling

15F44QQ	QS250	1/4 (6.35)	15,000 (1034.20)	0.16 (3.99)	0.75 (19.05)	1.63 (41.28)	0.52 (13.23)	0.63 (15.88)	Straight			See Figure 4
15F66QQ	QS375	3/8 (9.53)	15,000 (1034.20)	0.25 (6.35)	0.81 (20.65)	1.75 (44.45)	0.55 (14.00)	0.75 (19.05)	Straight			
15F99QQ	QS562	9/16 (14.29)	15,000 (1034.20)	0.36 (9.12)	1.38 (34.93)	2.75 (69.85)	0.82 (20.83)	1.19 (30.18)	Straight			
15F12Q	QS750	3/4 (19.05)	15,000 (1034.20)	0.52 (13.11)	1.50 (38.10)	3.75 (95.25)	1.04 (26.37)	1.50 (38.10)	Straight			

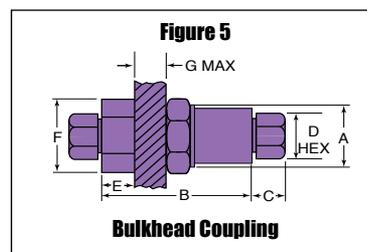
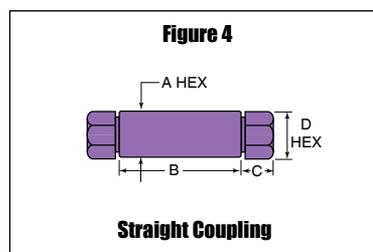
### Bulkhead Coupling

15BF44QQ	QS250	1/4 (6.35)	15,000 (1034.20)	0.16 (3.99)	0.88 (22.23)	2.00 (50.80)	0.52 (13.23)	0.63 (15.88)	0.63 (15.88)	1.00 (25.40)	0.38 (9.53)	See Figure 5
15BF66QQ	QS375	3/8 (9.53)	15,000 (1034.20)	0.25 (6.35)	1.06 (27.00)	2.38 (60.33)	0.55 (14.00)	0.75 (19.05)	0.79 (19.94)	1.38 (34.93)	0.38 (9.53)	
15BF99QQ	QS562	9/16 (14.29)	15,000 (1034.20)	0.36 (9.12)	1.63 (41.40)	2.63 (66.68)	0.82 (20.83)	1.19 (30.18)	0.91 (22.99)	1.75 (44.45)	0.38 (9.53)	
15BF12Q	QS750	3/4 (19.05)	15,000 (1034.20)	0.52 (13.11)	1.88 (47.63)	3.50 (88.90)	1.04 (26.37)	1.50 (38.10)	1.50 (38.10)	2.13 (53.98)	0.38 (9.53)	

\*Maximum pressure rating is based on the lowest rating of any component. Actual working pressure may be determined by tubing pressure rating, if lower.

All dimensions for reference only and subject to change. For prompt service, Autoclave stocks select products. Consult your local representative.

Union Couplings are designed with a removable seat insert allowing disassembly and tubing removal without the necessity of loosening other items in a line.



# Medium Pressure Tubing

## Pressures to 15,000 psi (1034 bar)

Autoclave Engineers offers a complete selection of austenetic, cold drawn stainless steel tubing designed to match the performance standards of Autoclave valves and fittings. Autoclave medium pressure tubing is manufactured specifically for high pressure applications requiring both strength and corrosion resistance. The tubing is furnished in random lengths between 20 feet (6 meters) and 27 feet (8.2 meters). The average is 24 feet (7.3 meters). Medium Pressure Tubing is available in four sizes and a variety of materials.



### Inspection and Testing

Autoclave Engineer's medium pressure tubing is inspected to assure freedom from seams, laps, fissures or other flaws, as well as carburization or intergranular carbide precipitation. The outside and inside diameters of the tubing are subject to special inspection and are controlled within close tolerances to assure proper fit. Sample pieces of tube for each lot are tested to confirm mechanical properties. Hydrostatic testing is also performed on a statistical basis and is conducted at the working pressure of the tube. Autoclave will perform 100% hydrostatic testing at additional cost if desired.

### Tubing Tolerance

Nominal Tubing Size inches (mm)	Tolerance/Outside Diameter inches (mm)
1/4 (6.35)	.248/.243 (6.30/6.17)
3/8 (9.53)	.370/.365 (9.40/9.27)
9/16 (14.27)	.557/.552 (14.15/14.02)
3/4 (19.05)	.745/.740 (18.92/18.80)

Catalog Number	Tube Material	Fits Connection Type	Tube Size Inches (mm)			Flow Area in. <sup>2</sup> (mm <sup>2</sup> )	Working Pressure psi (bar)*			
			Outside Diameter	Inside Diameter	Wall Thickness		-325 to 100°F -198 to 37.8°C	200°F 93°C	400°F 204°C	600°F 316°C
MS15-092**	316SS	QS250	1/4 (6.35)	0.109 (2.77)	0.070 (1.78)	0.009 (5.81)	20,000 (1378.93)	20,000 (1378.93)	19,250 (1327.22)	18,050 (1244.48)
MS15-192**	304SS						20,000 (1378.93)	18,950 (1306.54)	17,200 (1185.88)	17,000 (1172.09)
MS15-093**	316SS	QS375	3/8 (9.53)	0.203 (5.16)	0.086 (2.18)	0.032 (20.65)	20,000 (1378.93)	20,000 (1378.93)	19,250 (1327.22)	18,050 (1244.48)
MS15-193**	304SS						20,000 (1378.93)	20,000 (1378.93)	19,250 (1327.22)	18,050 (1244.48)
MS15-097	316SS	QS562	9/16 (14.29)	0.359 (9.12)	0.101 (2.57)	0.101 (65.16)	15,000 (1034.19)	15,000 (1034.19)	14,400 (992.82)	13,650 (941.12)
MS15-098	316SS	QS750	3/4 (19.05)	0.516 (13.11)	0.117 (2.97)	0.209 (134.84)	15,000 (1034.19)	15,000 (1034.19)	14,400 (992.82)	13,650 (941.12)

\*Maximum pressure rating is based on the lowest rating of any component.  
 Actual working pressure may be determined by tubing pressure rating, if lower.  
 All dimensions for reference only and subject to change.  
 For prompt service, Autoclave stocks select products. Consult your local representative.  
 \*\*Larger inside diameters are available as special order.

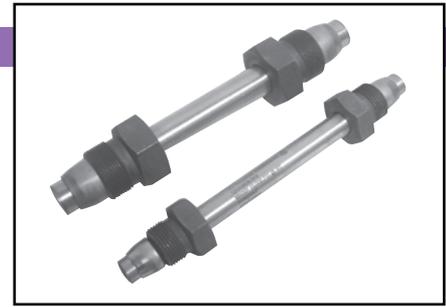
# Nipples - QS Series

**Pressures to 15,000 psi (1034 bar)**

For rapid system make-up, Autoclave Engineers supplies pre-assembled nipples in various sizes and lengths for Autoclave QSS valves and fittings.

## Special Lengths

In addition to the standard lengths listed in the table below, nipples are available in any custom length. Consult factory.



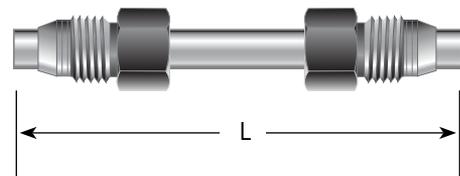
## Materials

Catalog numbers in table refer to Type 316 Stainless Steel.

Catalog Numbers					Fits Connection Type	Tube Size Inches (mm)		Working Pressure at 100° psi (bar)
Nipple Length Inches (mm)						OD	ID	
4.00" (101.60)	6.00" (152.40)	8.00" (203.20)	10.00" (254.60)	12.00" (304.80)				
QNA4404-316	QNA4406-316	QNA4408-316	QNA44010-316	QNA44012-316	QS250	1/4" (6.35)	0.109 (2.77)	15,000 (1034.16)
QNA6604-316	QNA6606-316	QNA6608-316	QNA66010-316	QNA66012-316	QS375	3/8" (9.53)	0.203 (5.16)	15,000 (1034.16)
	QNA9906-316	QNA9908-316	QNA99010-316	QNA99012-316	QS562	9/16" (14.29)	0.359 (9.12)	15,000 (1034.16)
		QNA1208-316	QNA12010-316	QNA12012-316	QS750	3/4" (19.05)	0.516 (13.11)	15,000 (1034.16)

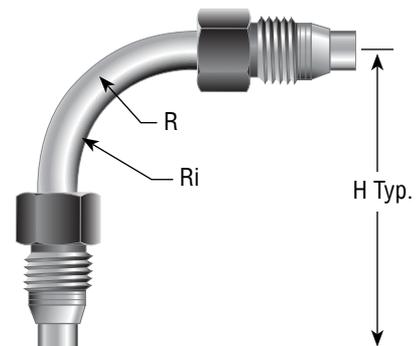
## Close Tube Port Connectors

Model	Size Inches (mm)	Fits Connection Type	Dimension "L" Inches (mm)
QTS4403.25	1/4" (6.35)	QS250	3.25 (82.55)
QTS6603.50	3/8" (9.53)	QS375	3.50 (88.90)
QTS9905.25	9/16" (14.29)	QS562	5.25 (133.35)
QTS1206.375	3/4" (19.05)	QS750	6.38 (162.10)



## Elbow Tube

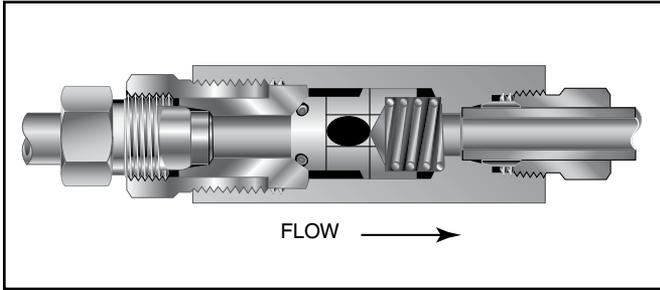
Model	Size Inches (mm)	Fits Connection Type	Dimension "H" Inches (mm)	Mean Radius "R" Inches (mm)	Inside Radius Ri Inches (mm)
QTE44-90	1/4" (6.35)	QS250	3.25 (82.55)	0.563 (14.30)	0.438 (11.13)
QTE66-90	3/8" (9.53)	QS375	3.50 (88.90)	0.938 (23.83)	0.75 (19.05)
QTE99-90	9/16" (14.29)	QS562	7.50 (19.05)	2.906 (73.82)	2.625 (66.68)
QTE12-90	3/4" (19.05)	QS750	10.00 (254.00)	3.875 (98.43)	3.5 (88.9)



# Check Valves - QS Series

Pressures to 15,000 psi (1034 bar)

## O-Ring Check Valves

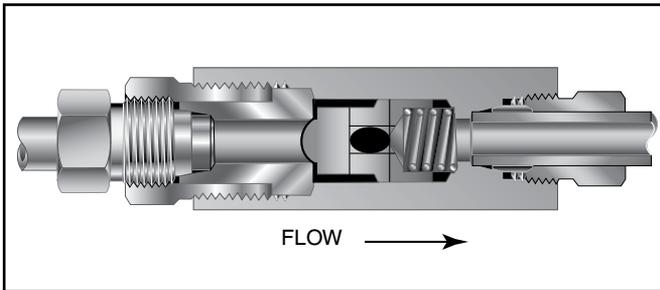


Provide unidirectional flow and tight shut-off for liquids and gases with high reliability. When differential drops below cracking pressure\*, valve shuts off. **(Not for use as relief valve.)**

**Materials:** 316 Stainless Steel: Body, cover, poppet, cover gland. 300 Stainless Steel: Spring.  
Standard O-ring: Viton, for operation to 500° F (260°C). Buna-N or Teflon available for 250°F (121°C) or 400°F (204°C) respectively; specify when ordering.

**\*Cracking Pressure:** 20 psi (1.38 bar) ±30%. Springs for higher cracking pressures (up to 100 psi (6.89bar)) available on special order for O-ring style check valves only.

## Ball Check Valves



Prevent reverse flow where leak-tight shut-off is not mandatory. When differential drops below cracking pressure, valve closes. With all-metal components, valve can be used up to 650°F (343°C). See Technical Information section for connection temperature limitations. **(Not for use as a relief valve.)**

**Ball and poppet are an integral design** to assure positive, in-line seating without “chatter”. Poppet is designed essentially for axial flow with minimum pressure drop.

**Materials:** 316 Stainless Steel: Body, cover, cover gland, ball poppet. 300 Series Stainless Steel: Spring

**CAUTION:** While testing has shown O-Rings to provide satisfactory service life, both cyclic and shelf life may vary widely with differing service conditions, properties of reactants, pressure and temperature cycling and age of the O-ring. FREQUENT INSPECTIONS SHOULD BE MADE to detect any deterioration, and O-rings replaced as required.

**CAUTION:** See Tubing section for proper selection of tubing.

Catalog Number	Fits Connection Type	Pressure Rating psi (bar)*	Orifice inches (mm)	Rated C <sub>v</sub>	Dimensions - inches (mm)				
					A	B	C	D Typical	Hex

## O-Ring Check Valves

QS04400	QS250	15,000 (1034.20)	0.188 (4.78)	0.15	3.18 (80.77)	2.56 (65.02)	0.44 (11.18)	0.63 (16.00)	0.81 (20.57)	See Figure 1
QS06600	QS375	15,000 (1034.20)	0.312 (7.93)	0.63	3.56 (90.42)	3.00 (76.20)	0.53 (13.46)	0.75 (19.05)	1.00 (25.40)	
QS09900	QS562	15,000 (1034.20)	0.359 (9.12)	2.30	5.21 (132.33)	4.50 (114.30)	0.81 (20.57)	1.19 (30.18)	1.75 (44.45)	
QS012	QS750	15,000 (1034.20)	0.516 (13.11)	4.70	6.40 (162.56)	5.50 (139.70)	1.03 (26.16)	1.50 (38.10)	1.88† (47.75)	

## Ball Check Valves

QSB4400	QS250	15,000 (1034.20)	0.188 (4.78)	0.15	3.18 (80.77)	2.56 (65.02)	0.44 (11.18)	0.63 (16.00)	0.81 (20.57)	See Figure 1
QSB6600	QS375	15,000 (1034.20)	0.312 (7.93)	0.63	3.56 (90.42)	3.00 (76.20)	0.53 (13.46)	0.75 (19.05)	1.00 (25.40)	
QSB9900	QS562	15,000 (1034.20)	0.359 (9.12)	2.30	5.21 (132.33)	4.50 (114.30)	0.81 (20.57)	1.19 (30.18)	1.75 (44.45)	
QSB12	QS750	15,000 (1034.20)	0.516 (13.11)	4.70	6.40 (162.56)	5.50 (139.70)	1.03 (26.16)	1.50 (38.10)	1.88† (47.75)	

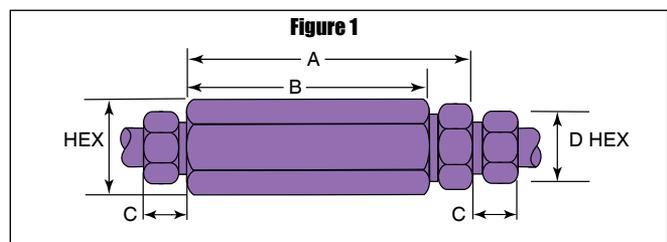
†Distance across flats

Note:  
All check valves are furnished complete with connection components unless otherwise specified.

\*Maximum pressure rating is based on the lowest rating of any component. Actual working pressure may be determined by tubing pressure rating, if lower.

All dimensions for reference only and subject to change.

For prompt service, Autoclave stocks select products. Consult your local representative.



All general terms and conditions of sale, including limitations of our liability, apply to all products and services sold.

**! WARNING !**

FAILURE OR IMPROPER SELECTION OR IMPROPER USE OF THE PRODUCTS AND/OR SYSTEMS DESCRIBED HEREIN OR RELATED ITEMS CAN CAUSE DEATH, PERSONAL INJURY AND/OR PROPERTY DAMAGE.

*This document and other information from Snap-tite, Inc., its subsidiaries and authorized distributors, provides product and/or system options for further investigation by users having technical expertise. It is important that you analyze all aspects of your application and review the information concerning the product or system in the current product catalog. Due to the variety of operation conditions and applications for these products or systems, the user, through its own analysis and testing, is solely responsible for making the final selection of the products and systems and assuring that all performance, safety and warning requirements of the application are met.*

*The products described herein, including without limitation, product features, specifications, designs, availability and pricing, are subject to change by Snap-tite, Inc. and its subsidiaries at any time without notice.*



Industrial Estate  
Whitemill-Wexford  
Republic of Ireland  
PH: 353 53 914 1566 FAX: 353 53 914 1582  
e-mail: [ste\\_sales@snap-tite.com](mailto:ste_sales@snap-tite.com)  
[www.snap-tite.com](http://www.snap-tite.com)



Fluid Components  
Division of Snap-tite, Inc.

8325 Hessinger Drive  
Erie, Pennsylvania 16509-4679 USA  
PH: 814-860-5700 FAX: 814-860-5811  
e-mail: [ae\\_sales@snap-tite.com](mailto:ae_sales@snap-tite.com)  
[www.autoclave.com](http://www.autoclave.com)

**ISO-9001 Certified**

02-1247BE-0109