

## Female NPT/10,000 psi Pipe Connection Valves

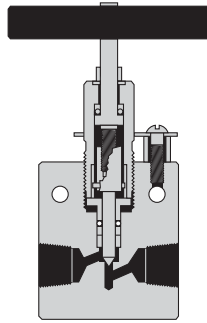
$\frac{1}{8}$ " •  $\frac{1}{4}$ " •  $\frac{3}{8}$ " •  $\frac{1}{2}$ " NPT

**Non-rotating tip stems** are standard for on-off service and insure long life on valve seats. Regulating tip stems are available for all valves at no additional cost.

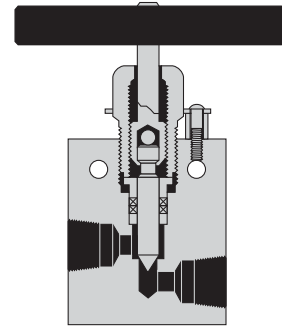
**Materials** include high tensile Type 316 stainless steel for valve bodies, and hardened 17-4PH stainless steel for lower section stems.

**Packing** is Teflon (450°F) standard with optional Viton (350°F), BUNA-N (200°F) and Grafoil (650°F) available at no additional cost.

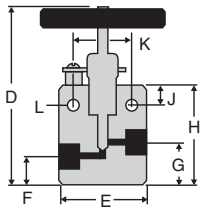
**Air operators** for remote control operation are available for all valves. (See Air Operator section of catalog).



NFA ( $\frac{1}{8}$ " ), NFB ( $\frac{1}{4}$ " ) and NFC ( $\frac{3}{8}$ " )

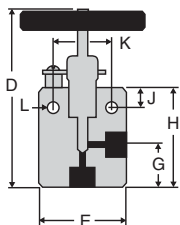


NFD ( $\frac{1}{2}$ " )



### Two Way Straight Valves

Pipe Size	Catalog No.*	psi	Connection	Orifice	D	E	F	G	H	J	K	L	Thickness
$\frac{1}{8}$ " NPT	10-11NFA	10,000	NFA	$\frac{1}{8}$ "	$4\frac{3}{4}$ "	2"	$\frac{7}{8}$ "	$\frac{7}{8}$ "	$2\frac{7}{16}$ "	$\frac{1}{2}$ "	$1\frac{3}{8}$ "	$\frac{7}{32}$ "	1"
$\frac{1}{4}$ " NPT	10-11NFB	10,000	NFB	$\frac{1}{8}$ "	$4\frac{3}{4}$ "	2"	$\frac{7}{8}$ "	$\frac{7}{8}$ "	$2\frac{7}{16}$ "	$\frac{1}{2}$ "	$1\frac{3}{8}$ "	$\frac{7}{32}$ "	1"
$\frac{3}{8}$ " NPT	10-11NFC	10,000	NFC	$\frac{1}{8}$ "	$4\frac{3}{4}$ "	2"	$\frac{7}{8}$ "	$\frac{7}{8}$ "	$2\frac{7}{16}$ "	$\frac{1}{2}$ "	$1\frac{3}{8}$ "	$\frac{7}{32}$ "	1"
$\frac{1}{2}$ " NPT	10-11NFD	10,000	NFD	$\frac{5}{16}$ "	$5\frac{5}{8}$ "	$2\frac{5}{8}$ "	$\frac{3}{4}$ "	$1\frac{3}{8}$ "	$3\frac{1}{8}$ "	$\frac{1}{2}$ "	$1\frac{5}{8}$ "	$\frac{5}{16}$ "	$1\frac{1}{2}$ "



### Two Way Angle Valves

Pipe Size	Catalog No.*	psi	Connection	Orifice	D	E	F	G	H	J	K	L	Thickness
$\frac{1}{8}$ " NPT	10-12NFA	10,000	NFA	$\frac{1}{8}$ "	$4\frac{3}{4}$ "	2"	—	1"	$2\frac{7}{16}$ "	$\frac{1}{2}$ "	$1\frac{3}{8}$ "	$\frac{7}{32}$ "	1"
$\frac{1}{4}$ " NPT	10-12NFB	10,000	NFB	$\frac{1}{8}$ "	$4\frac{3}{4}$ "	2"	—	1"	$2\frac{7}{16}$ "	$\frac{1}{2}$ "	$1\frac{3}{8}$ "	$\frac{7}{32}$ "	1"
$\frac{3}{8}$ " NPT	10-12NFC	10,000	NFC	$\frac{1}{8}$ "	$4\frac{3}{4}$ "	2"	—	1"	$2\frac{7}{16}$ "	$\frac{1}{2}$ "	$1\frac{3}{8}$ "	$\frac{7}{32}$ "	1"
$\frac{1}{2}$ " NPT	10-12NFD	10,000	NFD	$\frac{5}{16}$ "	$5\frac{3}{4}$ "	$2\frac{5}{8}$ "	—	$1\frac{1}{2}$ "	$3\frac{1}{4}$ "	$\frac{1}{2}$ "	$1\frac{5}{8}$ "	$\frac{5}{16}$ "	$1\frac{1}{2}$ "

\* For valves requiring high temperature Grafoil packing in the  $\frac{1}{8}$ " NPT, or  $\frac{1}{4}$ " NPT or  $\frac{3}{8}$ " NPT sizes, add suffix "-W" to catalog number. (Example 10-11NFB-W.)



## High Pressure Equipment

### Female NPT/10,000 and 15,000 psi Pipe Connection Valves

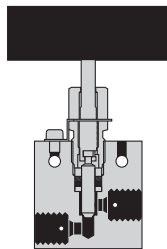
**1/8" • 1/4" • 3/8" • 1/2" NPT • 3/4" NPT • 1" NPT**

**Non-rotating tip stems** are standard for on-off service and insure long life on valve seats. Regulating tip stems are available for all valves at no additional cost.

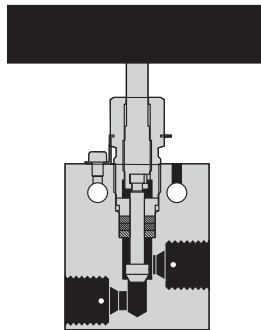
**Materials** include high tensile Type 316 stainless steel for valve bodies, and hardened 17-4PH stainless steel for lower section stems.

**Packing** is Teflon (450°F) standard with optional Viton (350°F), BUNA-N (200°F) and Grafoil (650°F) available at no additional cost.

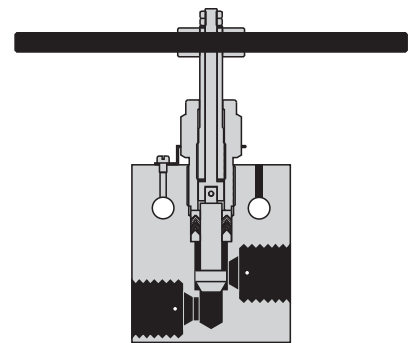
**Air operators** for remote control operation are available for all valves. (See Air Operator section of catalog).



NFA (1/8") and NFB (1/4")

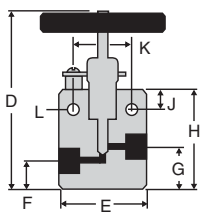


NFC (3/8") and NFD (1/2")



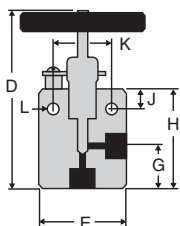
NFF (3/4") and NFH (1")

### Two Way Straight Valves



Pipe Size	Catalog No.*	psi	Connection	Orifice	D	E	F	G	H	J	K	L	Thickness
1/8" NPT	15F-11NFA	15,000	NFA	.203	4 <sup>3</sup> / <sub>8</sub> "	2"	3/8"	1 <sup>3</sup> / <sub>16</sub> "	2"	3/8"	1 <sup>1</sup> / <sub>4</sub> "	7/32"	3/4"
1/4" NPT	15F-11NFB	15,000	NFB	.203	4 <sup>3</sup> / <sub>8</sub> "	2"	3/8"	1 <sup>3</sup> / <sub>16</sub> "	2"	3/8"	1 <sup>1</sup> / <sub>4</sub> "	7/32"	3/4"
3/8" NPT	15F-11NFC	15,000	NFC	.312	6 <sup>1</sup> / <sub>8</sub> "	2 <sup>1</sup> / <sub>2</sub> "	1/2"	1 <sup>1</sup> / <sub>8</sub> "	2 <sup>7</sup> / <sub>8</sub> "	1/2"	1 <sup>3</sup> / <sub>8</sub> "	1 <sup>1</sup> / <sub>32</sub> "	1"
1/2" NPT	15F-11NFD	15,000	NFD	.312	6 <sup>1</sup> / <sub>8</sub> "	2 <sup>5</sup> / <sub>8</sub> "	3/4"	1 <sup>3</sup> / <sub>8</sub> "	3 <sup>1</sup> / <sub>8</sub> "	1/2"	1 <sup>3</sup> / <sub>8</sub> "	1 <sup>1</sup> / <sub>32</sub> "	1 <sup>1</sup> / <sub>2</sub> "
3/4" NPT	10F-11NFF	10,000	NFF	.687	8 <sup>1</sup> / <sub>2</sub> "	4 <sup>1</sup> / <sub>8</sub> "	7/8"	1 <sup>13</sup> / <sub>16</sub> "	4 <sup>5</sup> / <sub>8</sub> "	1 <sup>1</sup> / <sub>8</sub> "	2 <sup>1</sup> / <sub>2</sub> "	9/16"	1 <sup>3</sup> / <sub>4</sub> "
1" NPT	10F-11NFH	10,000	NFH	.687	8 <sup>1</sup> / <sub>2</sub> "	4 <sup>1</sup> / <sub>8</sub> "	7/8"	1 <sup>13</sup> / <sub>16</sub> "	4 <sup>5</sup> / <sub>8</sub> "	1 <sup>1</sup> / <sub>8</sub> "	2 <sup>1</sup> / <sub>2</sub> "	9/16"	1 <sup>3</sup> / <sub>4</sub> "

### Two Way Angle Valves



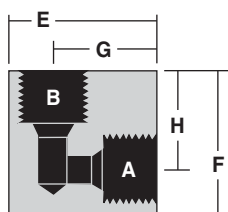
Pipe Size	Catalog No.*	psi	Connection	Orifice	D	E	F	G	H	J	K	L	Thickness
1/8" NPT	15F-12NFA	15,000	NFA	.203	4 <sup>13</sup> / <sub>16</sub> "	2"	—	1 <sup>1</sup> / <sub>4</sub> "	2 <sup>7</sup> / <sub>16</sub> "	3/8"	1 <sup>1</sup> / <sub>4</sub> "	7/32"	3/4"
1/4" NPT	15F-12NFB	15,000	NFB	.203	4 <sup>13</sup> / <sub>16</sub> "	2"	—	1 <sup>1</sup> / <sub>4</sub> "	2 <sup>7</sup> / <sub>16</sub> "	3/8"	1 <sup>1</sup> / <sub>4</sub> "	7/32"	3/4"
3/8" NPT	15F-12NFC	15,000	NFC	.312	6 <sup>1</sup> / <sub>2</sub> "	2 <sup>1</sup> / <sub>2</sub> "	—	1 <sup>1</sup> / <sub>2</sub> "	3 <sup>1</sup> / <sub>4</sub> "	1/2"	1 <sup>3</sup> / <sub>8</sub> "	1 <sup>1</sup> / <sub>32</sub> "	1"
1/2" NPT	15F-12NFD	15,000	NFD	.312	6 <sup>1</sup> / <sub>2</sub> "	2 <sup>5</sup> / <sub>8</sub> "	—	1 <sup>1</sup> / <sub>2</sub> "	3 <sup>1</sup> / <sub>4</sub> "	1/2"	1 <sup>3</sup> / <sub>8</sub> "	1 <sup>1</sup> / <sub>32</sub> "	1 <sup>1</sup> / <sub>2</sub> "
3/4" NPT	10F-12NFF	10,000	NFF	.687	9"	4 <sup>1</sup> / <sub>8</sub> "	—	2 <sup>5</sup> / <sub>16</sub> "	5 <sup>1</sup> / <sub>8</sub> "	1 <sup>1</sup> / <sub>8</sub> "	2 <sup>1</sup> / <sub>2</sub> "	9/16"	1 <sup>3</sup> / <sub>4</sub> "
1" NPT	10F-12NFH	10,000	NFH	.687	9"	4 <sup>1</sup> / <sub>8</sub> "	—	2 <sup>5</sup> / <sub>16</sub> "	5 <sup>1</sup> / <sub>8</sub> "	1 <sup>1</sup> / <sub>8</sub> "	2 <sup>1</sup> / <sub>2</sub> "	9/16"	1 <sup>3</sup> / <sub>4</sub> "

\* For valves requiring high temperature Grafoil packing in the 1/8" NPT, or 1/4" NPT or 3/8" NPT sizes, add suffix "-W" to catalog number. (Example 10-11NFB-W.)

## Elbows/Tees/Crosses

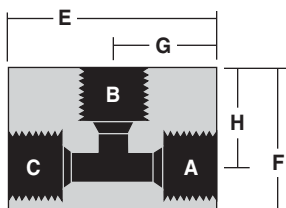
A complete range of elbows, tees, and crosses is available for all of the tubing connection sizes. Material is high tensile 316 stainless steel.

### NPT Elbows



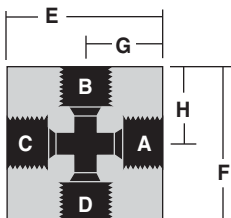
Catalog No.	Pressure Rating psi	Connections	A-B	E	F	G	H	Thickness
15-22NFA	15,000	1/8" FNPT	NFA	1 1/2"	1 1/2"	1"	1"	3/4"
15-22NFB	15,000	1/4" FNPT	NFB	1 1/2"	1 1/2"	1"	1"	1"
15-22NFC	15,000	3/8" FNPT	NFC	1 1/2"	1 1/2"	1"	1"	1"
15-22NFD	15,000	1/2" FNPT	NFD	2 5/8"	1 7/8"	1 7/8"	1 1/8"	1 1/2"
10-22NFF	10,000	3/4" FNPT	NFF	2 5/8"	2 5/16"	1 5/16"	1 3/8"	1 1/2"
10-22NFH	10,000	1" FNPT	NFH	3"	3"	2 1/16"	2 1/16"	1 3/4"

### NPT Tees



Catalog No.	Pressure Rating psi	Connections	A-B	E	F	G	H	Thickness
15-23NFA	15,000	1/8" FNPT	NFA	1 1/2"	1 1/4"	3/4"	3/4"	3/4"
15-23NFB	15,000	1/4" FNPT	NFB	2"	1 1/2"	1"	1"	1"
15-23NFC	15,000	3/8" FNPT	NFC	2"	1 1/2"	1"	1"	1"
15-23NFD	15,000	1/2" FNPT	NFD	2 5/8"	2 1/8"	1 5/16"	1 3/8"	1 1/2"
10-23NFF	10,000	3/4" FNPT	NFF	2 5/8"	2 1/8"	1 5/16"	1 3/8"	1 1/2"
10-23NFH	10,000	1" FNPT	NFH	4 1/8"	3"	2 1/16"	2 1/16"	1 3/4"

### NPT Crosses



Catalog No.	Pressure Rating psi	Connections	A-B	E	F	G	H	Thickness
15-24NFA	15,000	1/8" FNPT	NFA	1 1/2"	1 1/2"	3/4"	3/4"	3/4"
15-24NFB	15,000	1/4" FNPT	NFB	2"	2"	1"	1"	1"
15-24NFC	15,000	3/8" FNPT	NFC	2"	2"	1"	1"	1"
15-24NFD	15,000	1/2" FNPT	NFD	2 5/8"	2 3/4"	1 5/16"	1 3/8"	1 1/2"
10-24NFF	10,000	3/4" FNPT	NFF	2 5/8"	2 3/4"	1 5/16"	1 3/8"	1 1/2"
10-24NFH	10,000	1" FNPT	NFH	4 1/8"	4 1/8"	2 1/16"	2 1/16"	1 3/4"



## High Pressure Equipment

### NPT Straight Couplings

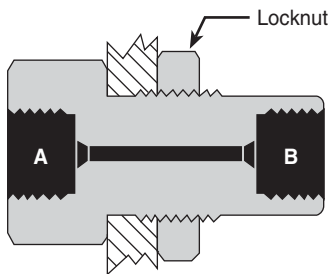
Standard material is high tensile 316 stainless steel.



Catalog No.	Pressure Rating psi	Connections	A-B	Length	Hex
15-21NFA	15,000	1/8" FNPT	NFA	1 1/4"	3/4"
15-21NFB	15,000	1/4" FNPT	NFB	1 3/4"	1"
15-21NFC	15,000	3/8" FNPT	NFC	1 3/8"	1"
15-21NFD	15,000	1/2" FNPT	NFD	1 7/8"	1 3/8"
10-21NFF	10,000	3/4" FNPT	NFF	2 1/2"	1 3/8"
10-21NFH	10,000	1" FNPT	NFH	2 1/2"	1 3/4"

### NPT Bulkhead Couplings

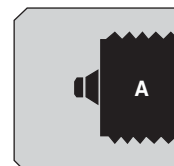
Bulkhead couplings are designed specifically for passing a tubing connection through a panel or steel barricade. These couplings include a locknut as shown. Material is high tensile 316 stainless steel.



Catalog No.	Pressure Rating psi	Connections	A-B	Length	Hex	Hole Diameter
15-21NFA-B	15,000	1/8" FNPT	NFA	2 1/8"	1"	7/8" - 14
15-21NFB-B	15,000	1/4" FNPT	NFB	2 1/8"	1"	7/8" - 14
15-21NFC-B	15,000	3/8" FNPT	NFC	2 3/8"	1 3/8"	1 1/16" - 12
15-21NFD-B	15,000	1/2" FNPT	NFD	2 3/8"	1 1/2"	1 3/8" - 12
10-21NFF-B	10,000	3/4" FNPT	NFF	2 5/8"	1 7/8"	1 5/8" - 12
10-21NFH-B	10,000	1" FNPT	NFH	3 1/2"	2 1/8"	1 7/8" - 12

### NPT Caps

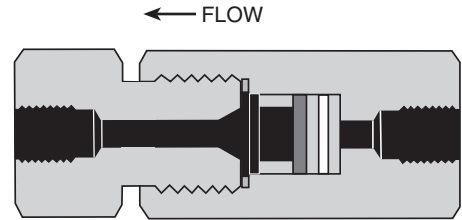
Tubing end caps are offered for use in sealing off tubing ends either for temporary use or permanent use such as on small volume reservoirs. Standard material is high tensile 316 stainless steel.



Catalog No.	Pressure Rating psi	Connections	A-B	Length	Hex
15-21NFA-C	15,000	1/8" FNPT	NFA	3/4"	3/4"
15-21NFB-C	15,000	1/4" FNPT	NFB	1"	1"
15-21NFC-C	15,000	3/8" FNPT	NFC	1 1/4"	1"
15-21NFD-C	15,000	1/2" FNPT	NFD	1 1/2"	1 3/8"
10-21NFF-C	10,000	3/4" FNPT	NFF	1 3/4"	1 3/8"
10-21NFH-C	10,000	1" FNPT	NFH	1 3/4"	1 3/4"

## NPT Line Filters

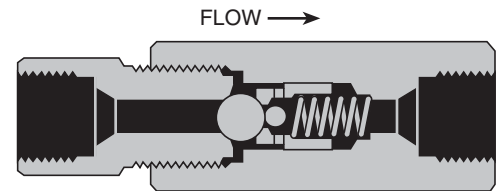
The line filters as shown utilize sintered stainless steel filter discs 3 pc./set. Porosities are available as per the chart to the right. If not otherwise specified, 100 micron filter discs are supplied. (One micron = 0.001 millimeters). Material of body, caps and cover is high tensile 316 stainless steel.



Catalog No.	Pressure Rating psi	Connections	A-B	Length	Hex	Micron Size Filter Available					
						0.5	2	5	10	40	100
15-51NFA	15,000	1/8" FNPT	NFA	3 3/16"	1 3/8"	●	●	●	●	●	●
15-51NFB	15,000	1/4" FNPT	NFB	4 3/16"	1 3/8"	●	●	●	●	●	●
15-51NFC	15,000	3/8" FNPT	NFC	4 3/16"	1 3/8"	●	●	●	●	●	●
15-51NFD	15,000	1/2" FNPT	NFD	4 3/16"	1 3/8"	●	●	●	●	●	●

## NPT Ball Check Valves

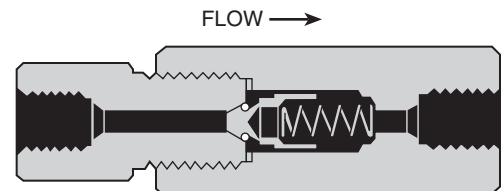
Ball type check valves insure flow in one direction only. Material for body, caps and cover is high tensile 316 stainless steel.



Catalog No.	Pressure Rating psi	Connections	A-B	Length	Hex
15-41NFA	15,000	1/8" FNPT	NFA	4 5/32"	1"
15-41NFB	15,000	1/4" FNPT	NFB	4 5/32"	1"
15-41NFC	15,000	3/8" FNPT	NFC	4 5/32"	1"
15-41NFD	15,000	1/2" FNPT	NFD	4 9/16"	1 3/8"
10-41NFF	10,000	3/4" FNPT	NFF	5 5/16"	1 3/8"
10-41NFH	10,000	1" FNPT	NFH	7 1/8"	2 1/2"

## NPT Softseat Check Valves

Soft seat check valves insure flow in one direction only and can be mounted in any position. These are highly reliable for both gas and liquid service. Standard O-ring (soft seat) material for the sealing surface is Buna-N (nitrile) with other materials including Teflon and Viton available on request. Temperature is limited by the choice of O-ring material. Material of all other parts is high tensile 316 stainless steel.

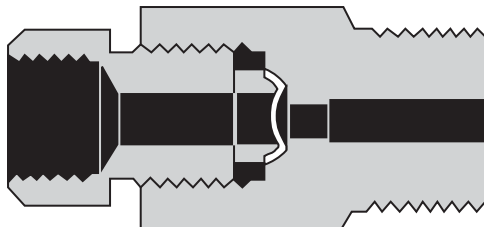


Catalog No.	Pressure Rating psi	Connections	A-B	Length	Hex
15-41NFA-T	15,000	1/8" FNPT	NFA	4 5/32"	1"
15-41NFB-T	15,000	1/4" FNPT	NFB	4 5/32"	1"
15-41NFC-T	15,000	3/8" FNPT	NFC	4 5/32"	1"
15-41NFD-T	15,000	1/2" FNPT	NFD	4 9/16"	1 3/8"
10-41NFF-T	10,000	3/4" FNPT	NFF	5 5/16"	1 3/8"
10-41NFH-T	10,000	1" FNPT	NFH	7 1/8"	2 1/2"



## High Pressure Equipment

### NPT Safety Heads



The male inlet design can be inserted directly into the tubing connections of valves and various fittings such as tees and crosses, or located in pressure vessels.

Outlet connections are  $\frac{3}{8}$ " pipe (NPT). This outlet may be connected to a suitable discharge line to vent pressure to a safe location in the event of bursting of the rupture disc. Torque required for sealing rupture discs will range from 40 to 90 foot pounds, depending upon pressure and media being used.

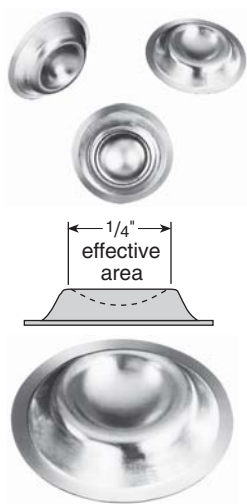
Material of body and hold down nut is high tensile 316 stainless steel.

**Note:** Rupture discs are **not** included and must be ordered as a separate item.

Catalog No.	psi	Connections	Length	Hex
15-61NMA	15,000	$\frac{1}{8}$ " MNPT	2"	1"
15-61NMB	15,000	$\frac{1}{4}$ " MNPT	2"	1"
15-61NMC	15,000	$\frac{3}{8}$ " MNPT	2"	1"
15-61NMD	15,000	$\frac{1}{2}$ " MNPT	2"	1"

### Rupture Discs

#### $\frac{1}{4}$ " Angled Seat



**SPECIAL DISCS** are available on special order for pressure ranges not shown above and in numerous materials and coatings. Consult factory for price and delivery.

Standard rupture discs are available from stock in burst pressures as listed in the chart below. All pressures through 15,000 psi are shaded. These discs are 316 stainless steel (except for 1,000 psi which are inconel) and may be used with any of the safety heads shown. Note that these rupture discs are supplied with a tolerance of plus 6% and minus 3% of specified burst pressure. Samples of each batch are tested and the actual average burst pressure is stamped on an accompanying metal tag. Factors influencing rupture disc life include corrosion, metal fatigue, and cyclic effects. Periodic replacement is recommended to prevent premature failure.

#### Standard Burst Pressures (in psi at 72°F)

1,000	3,000	5,000	7,000	9,000	11,000	17,500	25,000	37,500	55,000
1,500	3,500	5,500	7,500	9,500	11,500	18,000	27,000	40,000	60,000
2,000	4,000	6,000	8,000	10,000	12,500	20,000	30,000	45,000	65,000
2,500	4,500	6,500	8,500	10,500	15,000	22,500	35,000	50,000	