

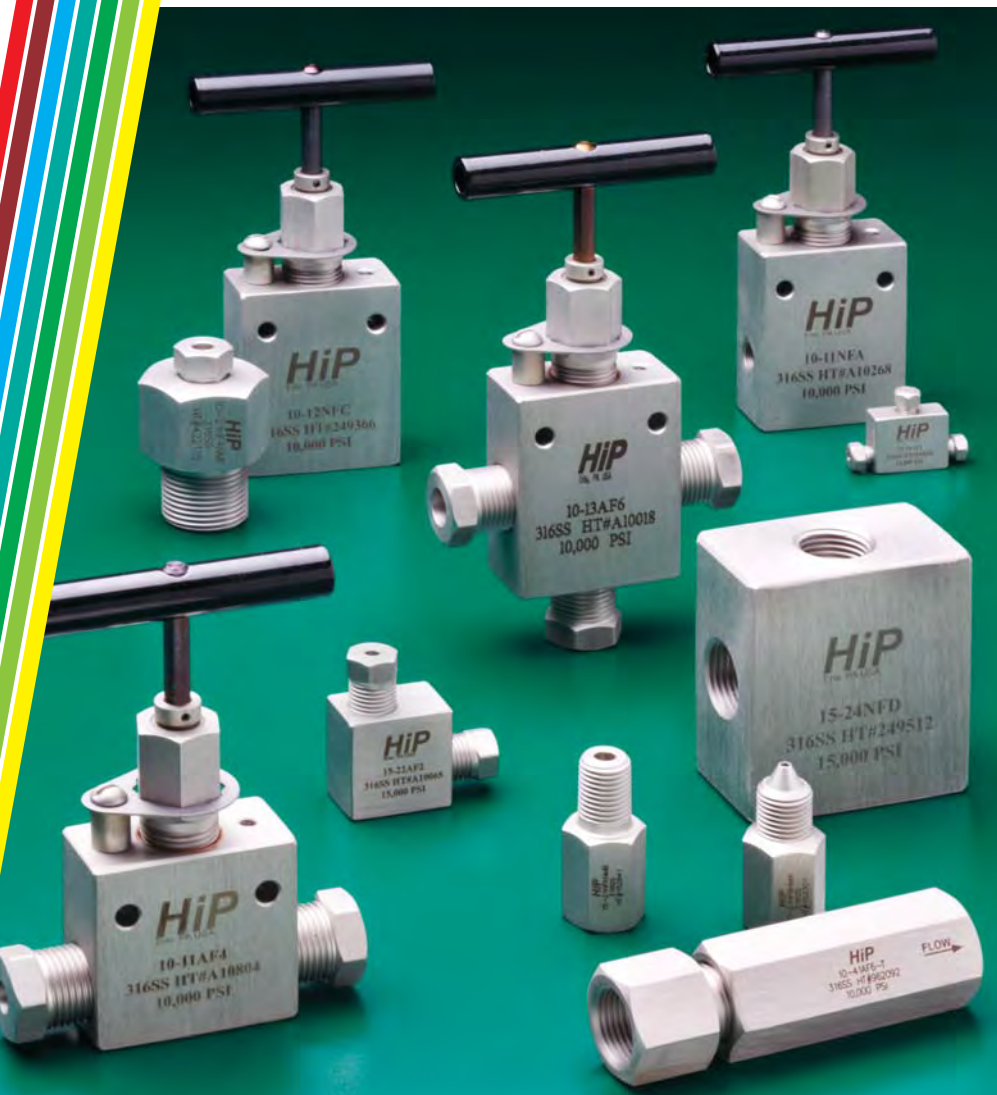


## High Pressure Equipment

### Low Pressure Valves, Fittings and Tubing

**Taper Seal and NPT -10,000 and 15,000 psi service**

High Pressure Equipment Company has developed the Taper Seal and NPT lines of products to assure safe and easy plumbing through 15,000 psi. These needle valves, fittings, line filters, check valves, safety heads, rupture discs and tubing are engineered and manufactured to the highest standards of repeatable quality. The reliable performance of these products has made HiP one of the world's leading suppliers of elevated pressure components.



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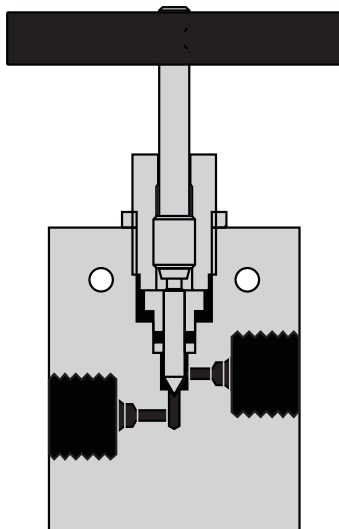
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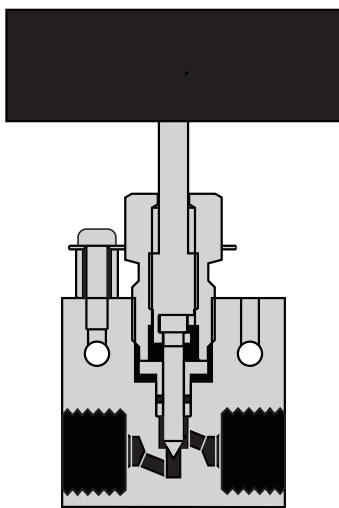


## High Pressure Equipment

### Taper Seal Needle Valves 10,000 and 15,000 psi service



AF1 ( $\frac{1}{16}$ " ) and AF2 ( $\frac{1}{8}$ " )  
15,000 psi



AF4 ( $\frac{1}{4}$ " ) and AF6 ( $\frac{3}{8}$ " )  
10,000 psi

**Compression type tubing connections** for  $\frac{1}{16}$ " ,  $\frac{1}{8}$ " ,  $\frac{1}{4}$ " , and  $\frac{3}{8}$ " O.D. tubing. Requires no special tooling for tubing preparation (simply cut off, deburr, and insert tubing into connection). Connection details are shown on page 2.A.

**Non-rotating tip stems** are standard for on-off service and ensure long life on valve seats. Regulating tip stems are available at no additional cost, add - REG to the catalog number.

**Glands and sleeves** are supplied with each valve unless otherwise requested (glands and sleeves shown on pages 2.4 and 2.A).

**Materials** include high tensile type 316 stainless steel for the valve body and hardened 17-4PH stainless steel lower section stem.

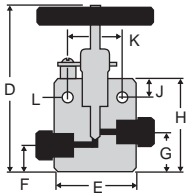
**Packing** is Teflon (450°F) standard, with optional Viton (350°F), BUNA-N (200°F) or Grafoil (650°F) available at no additional cost.

**Air operators** for remote control operation are available for all valves. (Refer to Air Operator section of catalog for additional data).

#### Valve Features

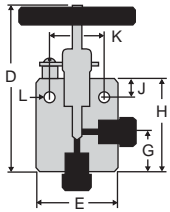
- Non-rotating stem tips
- Packing below stem threads
- Type 316 ss high tensile bodies
- Positive gland lock device
- No stem adjustment needed
- Black T-handles or choice of 4 colors
- Tube sizes  $\frac{1}{16}$ " through  $\frac{3}{8}$ "

# Taper Seal Valves



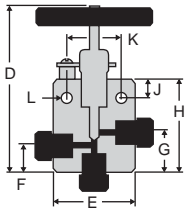
## Two Way Straight Valves

Tubing	Catalog No.	psi	Connection	Orifice	D	E	F	G	H	J	K	L	Thickness
1/16" O.D.	15-11AF1	15,000	AF1	0.052"	2 1/2"	1 1/8"	1/4"	13/32"	1 1/8"	5/16"	3/4"	9/64"	1/2"
1/8" O.D.	15-11AF2	15,000	AF2	1/16"	3 1/8"	1 1/2"	11/16"	15/16"	1 13/16"	5/16"	7/8"	9/64"	3/4"
1/4" O.D.	10-11AF4	10,000	AF4	1/8"	4 5/8"	2"	1/2"	1/2"	1 7/8"	1/2"	1 3/8"	7/32"	1"
3/8" O.D.	10-11AF6	10,000	AF6	1/8"	4 5/8"	2"	1/2"	1/2"	1 7/8"	1/2"	1 3/8"	7/32"	1"



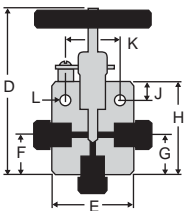
## Two Way Angle Valves

Tubing	Catalog No.	psi	Connection	Orifice	D	E	F	G	H	J	K	L	Thickness
1/16" O.D.	15-12AF1	15,000	AF1	0.052"	2 7/8"	1 1/8"	—	21/32"	1 3/8"	5/16"	3/4"	9/64"	1/2"
1/8" O.D.	15-12AF2	15,000	AF2	1/16"	3 1/8"	1 1/2"	—	15/16"	1 13/16"	5/16"	7/8"	9/64"	3/4"
1/4" O.D.	10-12AF4	10,000	AF4	1/8"	5 3/16"	2"	—	1 1/16"	2 7/16"	1/2"	1 3/8"	7/32"	1"
3/8" O.D.	10-12AF6	10,000	AF6	1/8"	5 3/16"	2"	—	1 1/16"	2 7/16"	1/2"	1 3/8"	7/32"	1"



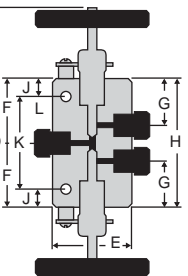
## Three Way Valves / Two Pressure Connections

Tubing	Catalog No.	psi	Connection	Orifice	D	E	F	G	H	J	K	L	Thickness
1/16" O.D.	15-13AF1	15,000	AF1	0.052"	2 3/4"	1 1/8"	1/2"	21/32"	1 3/8"	5/16"	3/4"	9/64"	1/2"
1/8" O.D.	15-13AF2	15,000	AF2	1/16"	3 1/8"	1 1/2"	11/16"	15/16"	1 13/16"	5/16"	7/8"	9/64"	3/4"
1/4" O.D.	10-13AF4	10,000	AF4	1/8"	5 3/16"	2"	1/2"	1 1/16"	2 7/16"	1/2"	1 3/8"	7/32"	1"
3/8" O.D.	10-13AF6	10,000	AF6	1/8"	5 3/16"	2"	1/2"	1 1/16"	2 7/16"	1/2"	1 3/8"	7/32"	1"



## Three Way Valves / One Pressure Connection

Tubing	Catalog No.	psi	Connection	Orifice	D	E	F	G	H	J	K	L	Thickness
1/16" O.D.	15-14AF1	15,000	AF1	0.052"	2 3/4"	1 1/8"	21/32"	21/32"	1 3/8"	5/16"	3/4"	9/64"	1/2"
1/8" O.D.	15-14AF2	15,000	AF2	1/16"	3 1/8"	1 1/2"	15/16"	15/16"	1 13/16"	5/16"	7/8"	9/64"	3/4"
1/4" O.D.	10-14AF4	10,000	AF4	1/8"	5 3/16"	2"	1 1/16"	1 1/16"	2 7/16"	1/2"	1 7/8"	7/32"	1"
3/8" O.D.	10-14AF6	10,000	AF6	1/8"	5 3/16"	2"	1 1/16"	1 1/16"	2 7/16"	1/2"	1 3/8"	7/32"	1"



## Three Way / Two Stem Connection Valves

Tubing	Catalog No.	psi	Connection	Orifice	D	E	F	G	H	J	K	L	Thickness
1/16" O.D.	15-15AF1	15,000	AF1	0.052"	4 3/4"	1 1/8"	1"	23/32"	2"	5/16"	1 3/8"	9/64"	1/2"
1/8" O.D.	15-15AF2	15,000	AF2	1/16"	5"	1 1/2"	1 1/4"	7/8"	2 1/2"	5/16"	1 7/8"	9/64"	3/4"
1/4" O.D.	10-15AF4	10,000	AF4	1/8"	8 7/8"	2"	1 11/16"	1 3/16"	3 3/8"	1/2"	2 3/8"	7/32"	1"
3/8" O.D.	10-15AF6	10,000	AF6	1/8"	8 7/8"	2"	1 11/16"	1 13/16"	3 3/8"	1/2"	2 3/8"	7/32"	1"



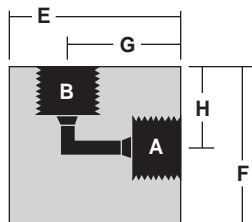
## High Pressure Equipment

### Glands/Sleeves/Plugs 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. Standard tubing glands and sleeves are furnished unless otherwise specified.

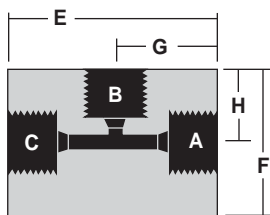
#### Connection Components

Catalog No.	Tube Size	Gland	Catalog No.	Tube Size	Sleeve	Catalog No.	Tube Size	Plug
15-2AM1	1/16"		15-2A1	1/16"		15-7AM1	1/16"	
15-2AM2	1/8"		15-2A2	1/8"		15-7AM2	1/8"	
10-2AM4	1/4"		10-2A4	1/4"		10-7AM4	1/4"	
10-2AM6	3/8"		10-2A6	3/8"		10-7AM6	3/8"	



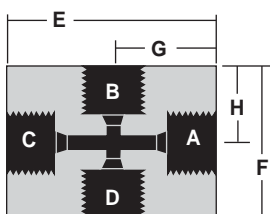
#### Taper Seal Elbows

Catalog No.	Pressure Rating psi	Connections	A-B	E	F	G	H	Thickness
15-22AF1	15,000	1/16" O.D. TUBE	AF1	3/4"	3/4"	9/16"	9/16"	3/8"
15-22AF2	15,000	1/8" O.D. TUBE	AF2	1 1/8"	1 1/8"	3/4"	3/4"	3/4"
10-22AF4	10,000	1/4" O.D. TUBE	AF4	1 1/2"	1 1/2"	1"	1"	1"
10-22AF6	10,000	3/8" O.D. TUBE	AF6	1 1/2"	1 1/2"	1"	1"	1"



#### Taper Seal Tees

Catalog No.	Pressure Rating psi	Connections	A-B-C	E	F	G	H	Thickness
15-23AF1	15,000	1/16" O.D. TUBE	AF1	1"	3/4"	1/2"	9/16"	3/8"
15-23AF2	15,000	1/8" O.D. TUBE	AF2	1 1/2"	1 1/8"	3/4"	3/4"	3/4"
10-23AF4	10,000	1/4" O.D. TUBE	AF4	2"	1 1/2"	1"	1"	1"
10-23AF6	10,000	3/8" O.D. TUBE	AF6	2"	1 1/2"	1"	1"	1"

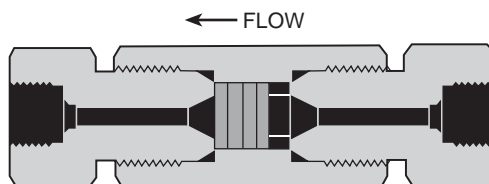


#### Taper Seal Crosses

Catalog No.	Pressure Rating psi	Connections	A-B-C-D	E	F	G	H	Thickness
15-24AF1	15,000	1/16" O.D. TUBE	AF1	1"	1"	1/2"	1/2"	3/8"
15-24AF2	15,000	1/8" O.D. TUBE	AF2	1 1/2"	1 1/2"	3/4"	3/4"	3/4"
10-24AF4	10,000	1/4" O.D. TUBE	AF4	2"	2"	1"	1"	1"
10-24AF6	10,000	3/8" O.D. TUBE	AF6	2"	2"	1"	1"	1"

## Line Filters

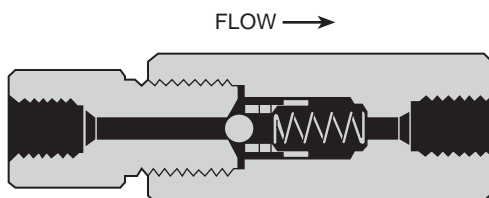
The line filters as shown utilize sintered stainless steel filter discs (AF2 & AF1 – 3 pc./set, AF4 & AF6 – 4 pc./set). Porosities are available as per the chart to the right. If not otherwise specified, 100 micron filter discs are supplied. (One micron = 0.001 millimeters). Material of bodies and end covers is high tensile 316 stainless steel. Standard tubing glands and sleeves are provided unless otherwise specified.



Catalog No.	Pressure Rating psi	Connections	Length	Hex Size	Micron Size Filter Available					
					0.5	2	5	10	40	100
15-51AF1	15,000	1/16" TAPER SEAL	3 1/8"	3/4"	●	●	●	●	●	●
15-51AF2	15,000	1/8" TAPER SEAL	3 1/8"	3/4"	●	●	●	●	●	●
10-51AF4	10,000	1/4" TAPER SEAL	5 1/4"	1 3/8"	●	●	●	●	●	●
10-51AF6	10,000	3/8" TAPER SEAL	5 1/4"	1 3/8"	●	●	●	●	●	●

## Ball Check Valves

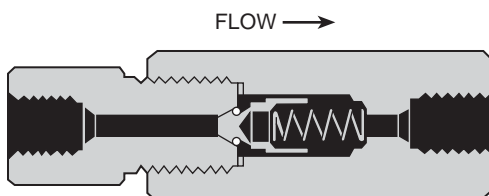
Ball type check valves insure flow in one direction only. Material for bodies, balls, and covers is high tensile 316 stainless steel. Standard tubing glands and sleeves are provided unless otherwise specified.



Catalog No.	psi	Connections	Length	Hex
15-41AF1	15,000	1/16" TAPER SEAL	3 1/8"	1"
15-41AF2	15,000	1/8" TAPER SEAL	3 9/16"	1"
10-41AF4	10,000	1/4" TAPER SEAL	3 7/8"	1"
10-41AF6	10,000	3/8" TAPER SEAL	3 7/8"	1"

## Soft Seat 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. Standard glands and sleeves are provided unless otherwise specified.

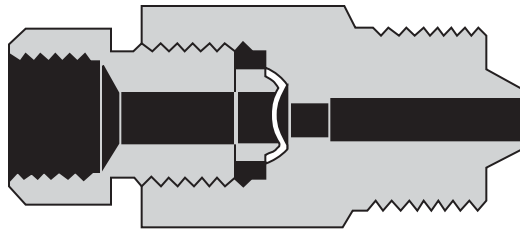


Catalog No.	psi	Connections	Length	Hex
15-41AF1-T	15,000	1/16" TAPER SEAL	3 1/2"	1"
15-41AF2-T	15,000	1/8" TAPER SEAL	3 1/2"	1"
10-41AF4-T	10,000	1/4" TAPER SEAL	3 7/8"	1"
10-41AF6-T	10,000	3/8" TAPER SEAL	3 7/8"	1"



## High Pressure Equipment

### Safety Heads



A choice of three safety head designs is available: male inlet, female inlet (straight), and tee type. 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 on all sizes 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 60 foot pounds, depending upon pressure and media being used.

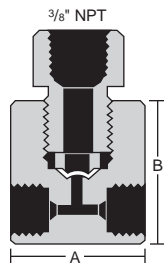
Material of bodies and hold down nuts is high tensile 316 stainless steel. Hold down rings are hardened 17-4PH stainless steel. Standard tubing glands and collars (sleeves) are provided unless otherwise specified.

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



#### Male Inlet Safety Heads

Catalog No.	Pressure Rating psi	Inlet Connection	Length	Hex Size
10-61AM4	10,000	$\frac{1}{4}$ " TAPER SEAL	2 $\frac{1}{8}$ "	1"
10-61AM6	10,000	$\frac{3}{8}$ " TAPER SEAL	2 $\frac{1}{8}$ "	1"



#### Tee Type Safety Heads

Catalog No.	Pressure Rating psi	Inlet Connection	A	B	Thickness
15-63AF1	15,000	$\frac{1}{16}$ " TAPER SEAL	1 $\frac{1}{8}$ " HEX	1 $\frac{3}{8}$ "	1 $\frac{1}{8}$ "
15-63AF2	15,000	$\frac{1}{8}$ " TAPER SEAL	1 $\frac{1}{2}$ "	1 $\frac{1}{2}$ "	1"
10-63AF4	10,000	$\frac{1}{4}$ " TAPER SEAL	2"	1 $\frac{3}{4}$ "	1"
10-63AF6	10,000	$\frac{3}{8}$ " TAPER SEAL	2"	1 $\frac{3}{4}$ "	1"



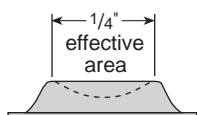
#### Female Inlet (Straight) Safety Heads

Catalog No.	Pressure Rating psi	Inlet Connection	Length	Hex Size
15-61AF1	15,000	$\frac{1}{16}$ " TAPER SEAL	1 $\frac{7}{8}$ "	1"
15-61AF2	15,000	$\frac{1}{8}$ " TAPER SEAL	1 $\frac{7}{8}$ "	1"
10-61AF4	10,000	$\frac{1}{4}$ " TAPER SEAL	1 $\frac{7}{8}$ "	1"
10-61AF6	10,000	$\frac{3}{8}$ " TAPER SEAL	1 $\frac{7}{8}$ "	1"



## Rupture Discs

### 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. Taper seal pressures are shaded. These discs are 316 stainless steel (except for 1000 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 then 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	

## High Pressure Tubing

Tubing is cold drawn, seamless, and is supplied in the 1/8 hard condition (not annealed). Tensile strength is approximately 40 percent higher than that of annealed tubing. All tubing is manufactured in strict accordance with High Pressure Equipment Company specifications to insure tolerances and bore quality. Tubing is stocked in lengths of 18 to 22 feet but may be ordered in shorter lengths with **no additional cutting charge**.

**Note:** The 1/16" and 1/8" O.D. tubing sizes may be coiled for shipment. Larger sizes must be shipped in straight lengths.



	Tubing Size	Working Pressure psi	Type of Connection Used	Material	Catalog Order Number
1/16"	1/16" O.D. x 0.006" I.D.	15,000	1/16" TAPER SEAL (AF1)	316 SS	15-9A1-006
	1/16" O.D. x 0.030" I.D.				15-9A1-030
1/8"	1/8" O.D. x 0.060" I.D.	15,000	1/8" TAPER SEAL (AF2)	316 SS	15-9A2
1/4"	1/4" O.D. x 1/8" I.D.	10,000	1/4" TAPER SEAL (AF4)	316 SS	10-9A4-316
				304 SS	10-9A4-304
3/8"	3/8" O.D. x 1/4" I.D.	10,000	3/8" TAPER SEAL (AF6)	316 SS	10-9A6-316
				304 SS	10-9A6-304



## High Pressure Equipment

### Taper Seal Connections

10,000 and 15,000 psi service

Taper Seal connections are available for  $\frac{1}{16}$ " ,  $\frac{1}{8}$ " ,  $\frac{1}{4}$ " , and  $\frac{3}{8}$ " O.D. tubing. No special tubing preparation is required – simply cut tubing to desired length, deburr and assemble.

The  $\frac{1}{8}$ " ,  $\frac{1}{4}$ " , and  $\frac{3}{8}$ " sizes utilize a two-piece sleeve which is supplied partially assembled. When the connection is assembled, the outer sleeve portion is permanently compressed over the inner portion to rigidly lock the sleeve onto the tubing. Note that the sleeve is not forced to bite into the tubing, but rather is clamped onto the tubing much like a machine collet.

#### Pressure ratings.

The  $\frac{1}{16}$ " and  $\frac{1}{8}$ " O.D. tubing size connections are rated to 15,000 psi working pressure.

The  $\frac{1}{4}$ " and  $\frac{3}{8}$ " O.D. sizes are rated to 10,000 psi working pressure.

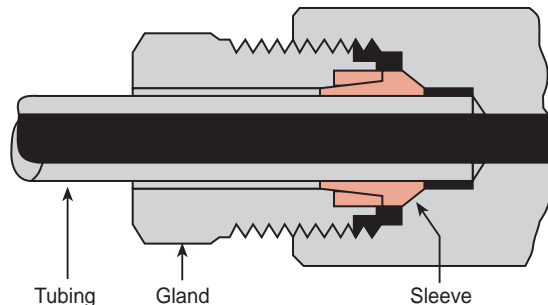
#### Easy make-up connections.

One of the popular benefits of taper seal connections is that it is very easy to determine when the connection is "tight enough" during initial assembly. Simply rotate the tubing gland into the connection until you feel a "bottoming out" or "dead stop" of the wrench. This signals that the connection has been properly made.

A commercial thread lubricant is highly recommended to facilitate initial makeup of the connection, but such lubrication may be removed afterwards if desired. The Taper Seal connection can be disassembled and then reassembled an indefinite number of times.

**Standard material** for the gland is Type 316 stainless steel. The inner portion of the two-piece sleeve is Type 316 stainless steel. The non-wetted outer sleeve portion is zinc plated alloy steel. (Note that the  $\frac{1}{16}$ " O.D. size is a one-piece sleeve design) in Type 316 stainless steel.

**Tubing glands and sleeves** are provided with all valves and fittings unless otherwise requested. (See chart at right for size details and catalog numbers).



	15,000 psi		10,000 psi	
	<b>AF1</b> <i>1/16" O.D. Tubing</i>	<b>AF2</b> <i>1/8" O.D. Tubing</i>	<b>AF4</b> <i>1/4" O.D. Tubing</i>	<b>AF6</b> <i>3/8" O.D. Tubing</i>
<b>Female Opening Detail</b>				
<b>Gland</b>				
<b>Sleeve</b>				
<b>Plug</b>				



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

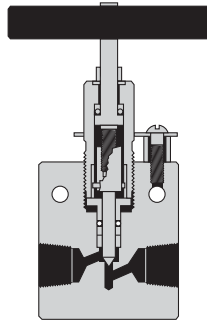
**1/8" • 1/4" • 3/8" • 1/2" NPT**

**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.

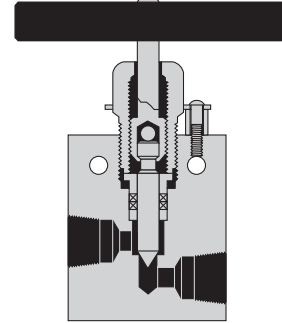
**Materials** include high tensile Type 316 stainless steel for valve bodies, and hardened 17-4PH stainless steel for lower section stems.

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

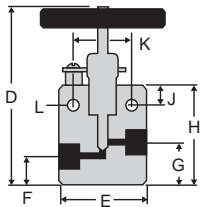
**Air operators** for remote control operation are available for all valves. (See Air Operator section of catalog).



NFA (1/8"), NFB (1/4") and NFC (3/8")

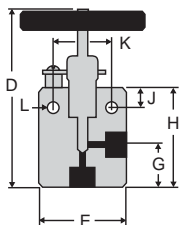


NFD (1/2")



### Two Way Straight Valves

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



### Two Way Angle Valves

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

\* 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.)



## High Pressure Equipment

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

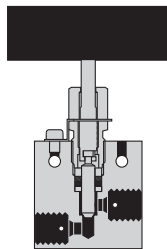
**1/8" • 1/4" • 3/8" • 1/2" NPT • 3/4" NPT • 1" NPT**

**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.

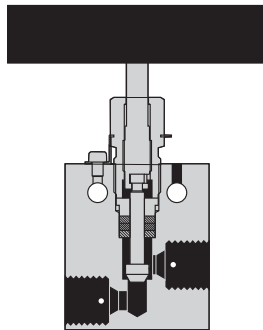
**Materials** include high tensile Type 316 stainless steel for valve bodies, and hardened 17-4PH stainless steel for lower section stems.

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

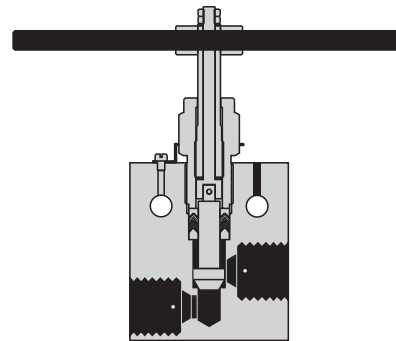
**Air operators** for remote control operation are available for all valves. (See Air Operator section of catalog).



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

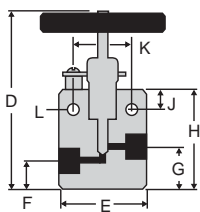


NFC (3/8") and NFD (1/2")



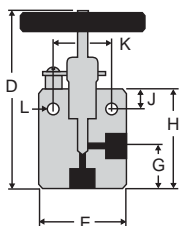
NFF (3/4") and NFH (1")

### 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 3/8"	2"	3/8"	13/16"	2"	3/8"	1 1/4"	7/32"	3/4"
1/4" NPT	15F-11NFB	15,000	NFB	.203	4 3/8"	2"	3/8"	13/16"	2"	3/8"	1 1/4"	7/32"	3/4"
3/8" NPT	15F-11NFC	15,000	NFC	.312	6 1/8"	2 1/2"	1/2"	1 1/8"	2 7/8"	1/2"	1 3/8"	1 1/32"	1"
1/2" NPT	15F-11NFD	15,000	NFD	.312	6 1/8"	2 5/8"	3/4"	1 3/8"	3 1/8"	1/2"	1 3/8"	1 1/32"	1 1/2"
3/4" NPT	10F-11NFF	10,000	NFF	.687	8 1/2"	4 1/8"	7/8"	1 13/16"	4 5/8"	1 1/8"	2 1/2"	9/16"	1 3/4"
1" NPT	10F-11NFH	10,000	NFH	.687	8 1/2"	4 1/8"	7/8"	1 13/16"	4 5/8"	1 1/8"	2 1/2"	9/16"	1 3/4"

### Two Way Angle Valves



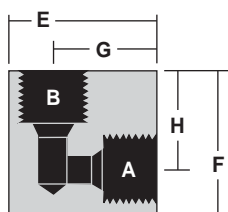
Pipe Size	Catalog No.*	psi	Connection	Orifice	D	E	F	G	H	J	K	L	Thickness
1/8" NPT	15F-12NFA	15,000	NFA	.203	4 13/16"	2"	—	1 1/4"	2 7/16"	3/8"	1 1/4"	7/32"	3/4"
1/4" NPT	15F-12NFB	15,000	NFB	.203	4 13/16"	2"	—	1 1/4"	2 7/16"	3/8"	1 1/4"	7/32"	3/4"
3/8" NPT	15F-12NFC	15,000	NFC	.312	6 1/2"	2 1/2"	—	1 1/2"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

\* 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

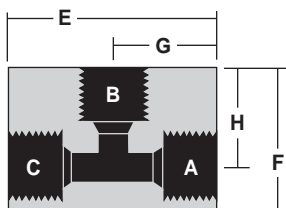
A complete range of elbows, tees, and crosses is available for all of the tubing connection sizes. Material is high tensile 316 stainless steel.

### NPT Elbows



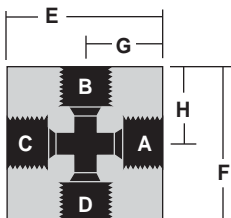
Catalog No.	Pressure Rating psi	Connections	A-B	E	F	G	H	Thickness
15-22NFA	15,000	1/8" FNPT	NFA	1 1/2"	1 1/2"	1"	1"	3/4"
15-22NFB	15,000	1/4" FNPT	NFB	1 1/2"	1 1/2"	1"	1"	1"
15-22NFC	15,000	3/8" FNPT	NFC	1 1/2"	1 1/2"	1"	1"	1"
15-22NFD	15,000	1/2" FNPT	NFD	2 5/8"	1 7/8"	1 7/8"	1 1/8"	1 1/2"
10-22NFF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

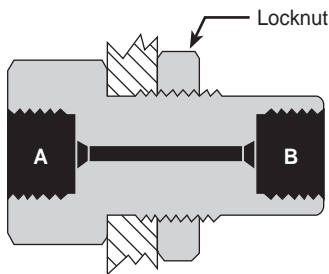
Standard material is high tensile 316 stainless steel.



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

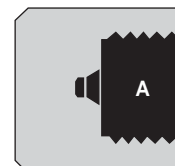
Bulkhead couplings are designed specifically for passing a tubing connection through a panel or steel barricade. These couplings include a locknut as shown. Material is high tensile 316 stainless steel.



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

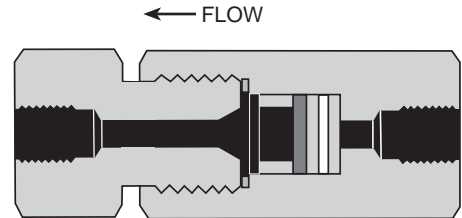
Tubing end caps are offered for use in sealing off tubing ends either for temporary use or permanent use such as on small volume reservoirs. Standard material is high tensile 316 stainless steel.



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

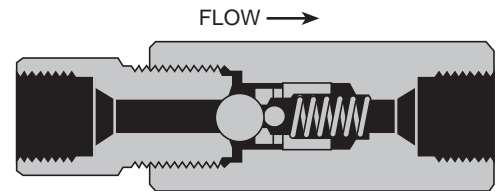
The line filters as shown utilize sintered stainless steel filter discs 3 pc./set. Porosities are available as per the chart to the right. If not otherwise specified, 100 micron filter discs are supplied. (One micron = 0.001 millimeters). Material of body, caps and cover is high tensile 316 stainless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

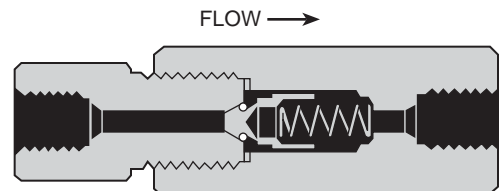
Ball type check valves insure flow in one direction only. Material for body, caps and cover is high tensile 316 stainless steel.



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.

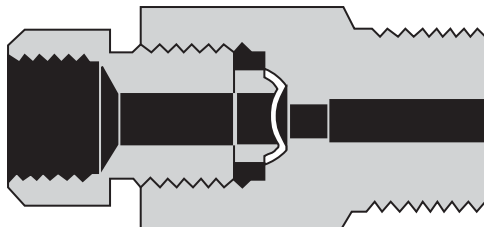


Catalog No.	Pressure Rating psi	Connections	A-B	Length	Hex
15-41NFA-T	15,000	1/8" FNPT	NFA	4 5/32"	1"
15-41NFB-T	15,000	1/4" FNPT	NFB	4 5/32"	1"
15-41NFC-T	15,000	3/8" FNPT	NFC	4 5/32"	1"
15-41NFD-T	15,000	1/2" FNPT	NFD	4 9/16"	1 3/8"
10-41NFF-T	10,000	3/4" FNPT	NFF	5 5/16"	1 3/8"
10-41NFH-T	10,000	1"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

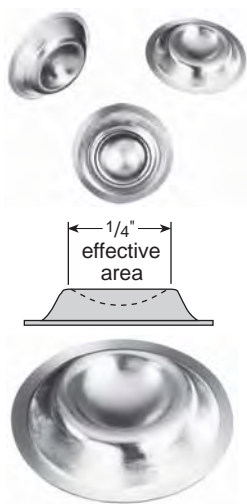
Material of body and hold down nut is high tensile 316 stainless steel.

**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	