

 **Newmans**[®]

The Reliable Source

1300 Gazin St. • Houston, TX 77020 • www.NewcoValves.com
Toll Free: 1.800.231.3505 • Fax: 713.675.1589

COOPER[®]

Three (3) Piece Ball Valves

**High Quality Alloy
Ball Valves**

- Self Adjusting Packing
- Blowout-proof Stem
- 3-piece Construction
- Standard and Full Port
- Reinforced TFE Seats
- Sizes from ¼" - 3"



***Stainless Steel and
Exotic Alloy Industrial Valves***

Exactly What You'd Expect From The Specialist!

COMPLETE ALLOY COVERAGE

Common alloys shown—others available on special order

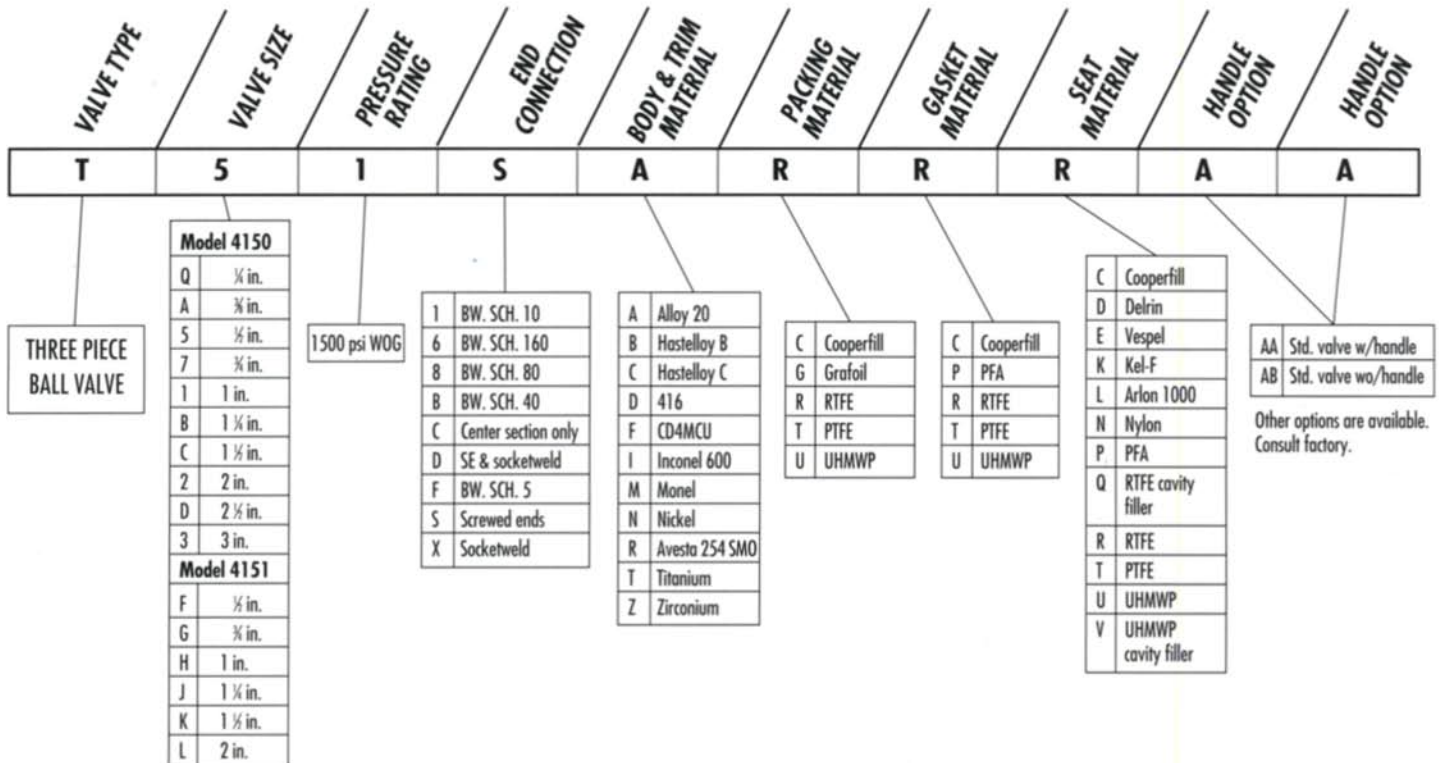
304	347	Incoloy
304L	Alloy 20	Hastelloy B
316	Monel	Hastelloy C
316L	Nickel	Titanium
317	Inconel	Zirconium
AVESTA 254 SMO*		CD4MCU

*AVESTA is a registered trademark of Avesta Jernverks AB

SPECIAL ADVANTAGES:

- Reinforced TFE seats and seals
- Secondary metal-to-metal seat
- Self-adjusting packing
- Blowout-proof stem
- ¼"-3" standard and full port—all alloys
- Cooperfill™ 133 thrust bearing—exceptionally long life
- All valves hydrostatically tested to applicable ANSI, MSS or API specifications
- All valves serialized — full traceability of materials
- Flexible manufacturing facility — widest choice of special applications in the industry

HOW TO ORDER MODELS 4150 & 4151

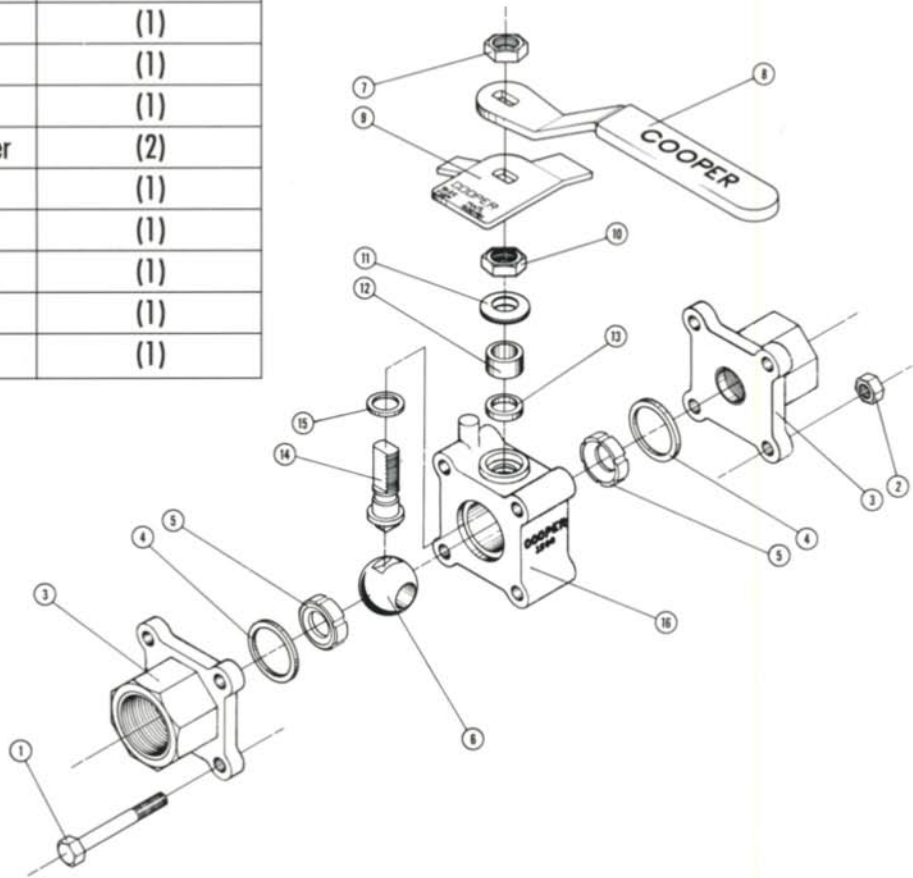


COOPER®

Valve Accessories

Parts illustrated & listed in disassembly sequence

Item Number	Part Name	Qty. Required
1	Body bolt	(4)
2	Body nut	(4)
3	End piece	(2)
4	Body seal	(2)
5	Seat	(2)
6	Ball	(1)
7	Handle Nut	(1)
8	Handle	(1)
9	Stop plate	(1)
10	Stem nut	(1)
11	Belleville washer	(2)
12	Stem bushing	(1)
13	Stem seal	(1)
14	Stem	(1)
15	Thrust bearing	(1)
16	Body	(1)

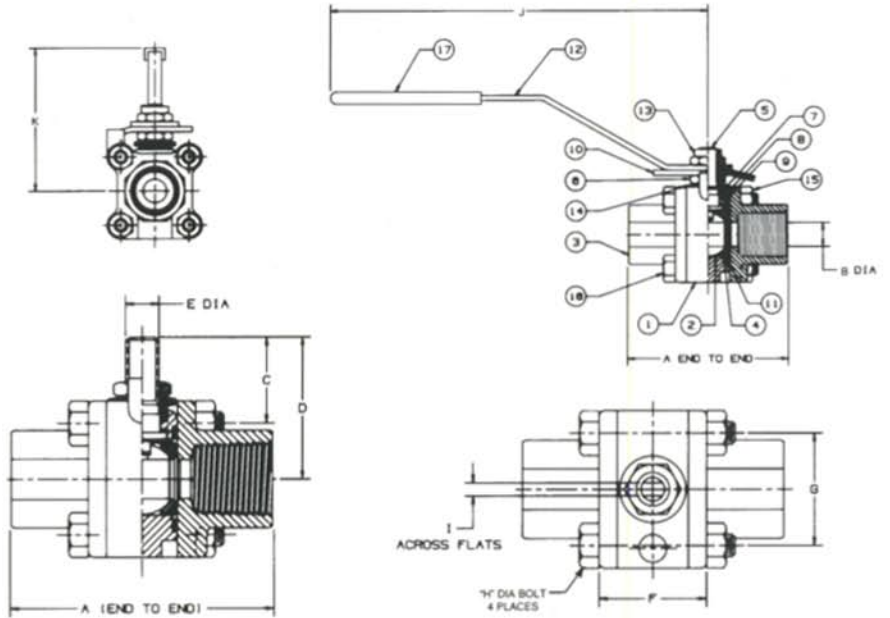


COOPER®

Standard Port

Model Number

- 4150SE.....Threaded
- 4150X.....Socketweld
- 4150X-SE...Socketweld by screwed
- 4150BW.....Buttweld
- 4150TE.....Tube end



Bill of Materials

Item	Description
1	Body
2	Ball
3	End piece
4	Seat
5	Stem
6	Stem nut
7	Stem bushing
8	Stem seal
9	Thrust bearing
10	Stop plate
11	Body seal
12	Handle
13	Handle nut
14	Belleville washer
15	Body nut
16	Body bolt

Specifications

Size	A	B	C	D	E	F	G	H	I	J	K	Wt.(Lbs.)
1/4"	2 ²⁹ / ₃₂	7/16	1 1/16	1 19/32	.374/.367	1 3/16	1/4	1/4	.215/.213	4 3/4	1 15/16	2
3/8"	2 ²⁹ / ₃₂	7/16	1 1/16	1 19/32	.374/.367	1 3/16	1/4	1/4	.215/.213	4 3/4	1 15/16	2
1/2"	2 ²⁹ / ₃₂	7/16	1 1/16	1 19/32	.374/.367	1 3/16	1/4	1/4	.215/.213	4 3/4	1 15/16	2
3/4"	3 ³ / ₃₂	9/16	1 1/32	1 11/16	.374/.367	1 7/16	1 1/2	1/4	.215/.213	4 3/4	2	2 1/2
1"	3 3/4	1 3/16	1 5/16	2 3/16	.436/.428	1 7/8	1 3/4	5/16	.295/.292	5 7/8	2 1/4	3 1/2
1 1/4"	4 5/32	1	1 3/8	2 3/8	.436/.428	2 13/32	2	5/16	.295/.292	5 7/8	2 1/2	5
1 1/2"	4 17/32	1 1/4	1 3/4	2 7/8	.561/.552	2 11/16	2 1/4	3/8	.340/.338	7 5/8	3	7
2"	5	1 1/2	1 25/32	3 3/32	.561/.552	3 1/8	2 5/8	3/8	.340/.338	7 5/8	3 1/4	10
2 1/2"	5 15/16	2	2 3/32	3 3/4	.623/.615	3 7/8	3 5/16	5/8	.345/.342	9 1/2	4	17
3"	7 1/4	2 1/2	2 13/16	4 15/16	.874/.872	5	4 7/32	3/4	.500/.497	9 1/2	6	35

Features:

- Three (3) piece design
- Full port
- TFE seals
- Secondary metal seat
- Pressures: to 1500 PSI
- Ends: threaded, socketweld, buttweld & sanitary
- Standard Materials: cast stainless steel
- Standard port
- Blowout-proof stem
- Sizes: 1/4" thru 3"

Options:

- Exotic alloys
- Firesafe
- Vacuum service
- Cryogenics
- Cavity filled seats
- Chlorine service

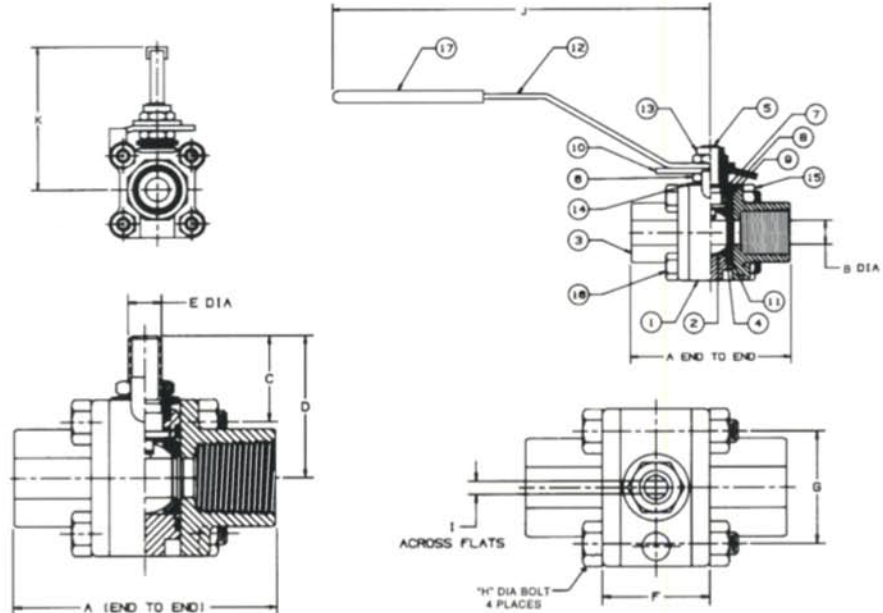


COOPER®

Full Port

Model Number

- 4151SE.....Threaded
- 4151X.....Socketweld
- 4151X-SE....Socketweld by screwed
- 4151BW.....Buttweld
- 4151TE.....Tube end



Bill of Materials

Item	Description
1	Body
2	Ball
3	End piece
4	Seat
5	Stem
6	Stem nut
7	Stem bushing
8	Stem seal
9	Thrust bearing
10	Stop plate
11	Body seal
12	Handle
13	Handle nut
14	Belleville washer
15	Body nut
16	Body bolt

Specifications

Size	A	B	C	D	E	F	G	H	I	J	K	Wt.(lbs.)
1/4"	2 ²⁹ / ₃₂	7/16	1 1/16	1 19/32	.374/.367	1 3/16	1 1/4	1/4	.215/.213	4 3/4	1 15/16	2
3/8"	2 ²⁹ / ₃₂	7/16	1 1/16	1 19/32	.374/.367	1 3/16	1 1/4	1/4	.215/.213	4 3/4	1 15/16	2
1/2"	3 ³ / ₃₂	1/2	1 1/32	1 11/16	.374/.367	1 7/16	1 1/2	1/4	.215/.213	4 3/4	2	2
3/4"	3 3/4	3/4	1 5/16	2 3/16	.436/.428	1 7/8	1 3/4	5/16	.295/.292	5 7/8	2 1/4	3
1"	4 5/32	1	1 3/8	2 3/8	.436/.428	2 13/32	2	5/16	.295/.292	5 7/8	2 1/2	5
1 1/4"	4 17/32	1 1/4	1 3/4	2 7/8	.561/.552	2 11/16	2 1/4	3/8	.340/.338	7 5/8	3	6 1/2
1 1/2"	5	1 1/2	1 25/32	3 3/32	.561/.552	3 1/8	2 5/8	3/8	.340/.338	7 5/8	3 1/4	8
2"	5 15/16	2	2 3/32	3 3/4	.623/.615	3 7/8	3 5/16	5/8	.345/.342	9 1/2	4	16 1/2
3"	7 1/4	3	4 1/16	6 7/8	.874/.872	5 1/2	4 27/32	7/8	.874/.872	10	7	40

Features:

- Three (3) piece design
- Full port
- TFE seals
- Secondary metal seat
- Pressures: to 1500 PSI
- Ends: threaded, socketweld, buttweld & sanitary
- Standard Materials: cast stainless steel
- Standard port
- Blowout-proof stem
- Sizes: 1/4" thru 3"

Options:

- Exotic alloys
- Firesafe
- Vacuum service
- Cryogenics
- Cavity filled seats
- Chlorine service

COOPER®

Engineering Data

Flow Data

Standard Port	
Valve Size (inches)	Approximate C_v
1/8 & 1/4	9
1/2	9
3/4	17
1	35
1 1/4	55
1 1/2	95
2	140
2 1/2	220
3	360
Full Port	
Valve Size (inches)	Approximate C_v
1/8 & 1/4	10
1/2	19
3/4	35
1	60
1 1/4	95
1 1/2	140
2	230
2 1/2	360
3	590

Maximum Expected Breakaway Torque (Running torques approximately 1/3 value shown)

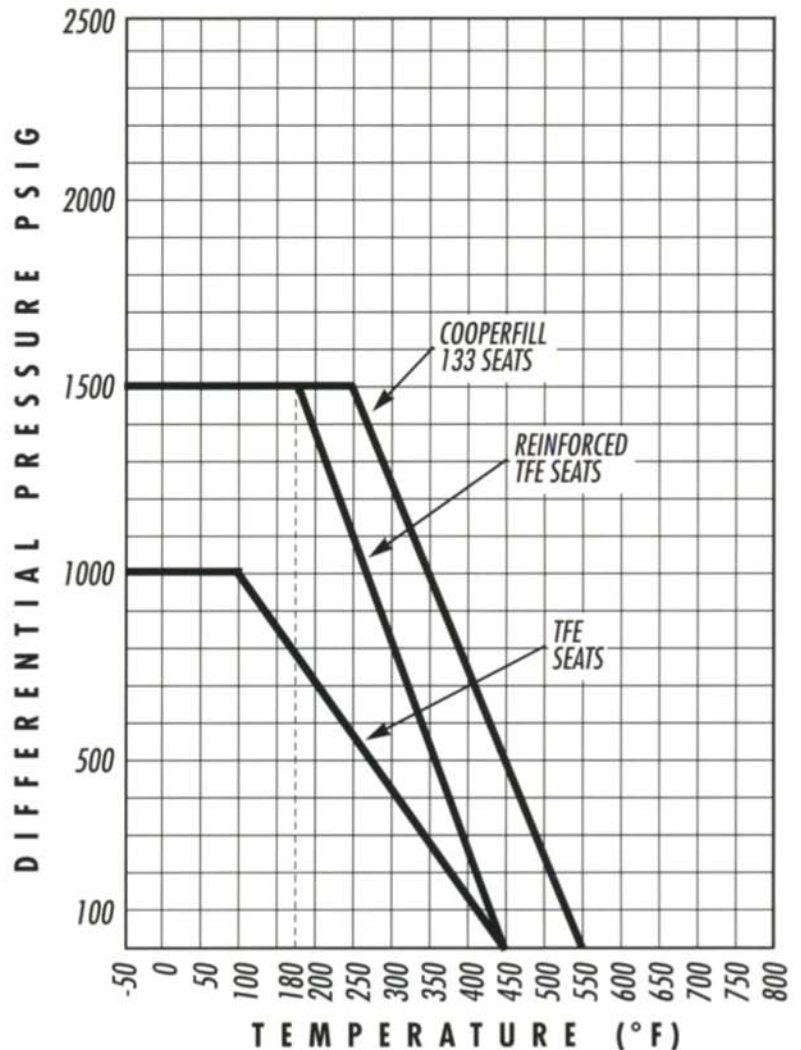
Standard Port	
Valve Size (inches)	Torque (inch pounds)
1/4	30
3/8	30
1/2	30
3/4	40
1	90
1 1/4	190
1 1/2	280
2	390
2 1/2	600
3	800

Full Port	
Valve Size (inches)	Torque (inch pounds)
1/4	30
3/8	30
1/2	40
3/4	90
1	190
1 1/4	280
1 1/2	390
2	600
2 1/2	800
3	1100

Note: Torque values shown are based on clean fluids. For other applications consult factory.

Pressure Vs. Temperature

- Note:
1. Pressure and temperature curves shown are for standard stock valves. For other seat/seal combinations consult factory.
 2. Reinforced TFE may be used to 150 PSIG steam maximum. Cooperfill 133 may be used to 300 PSIG steam.
 3. Maximum temperature for TFE and reinforced TFE seals is 450°F. Maximum temperature for flex gaskets is 550°F. Consult factory for higher temperatures.
 4. Pressure and temperature curves shown apply to 1/8" - 3" valves.



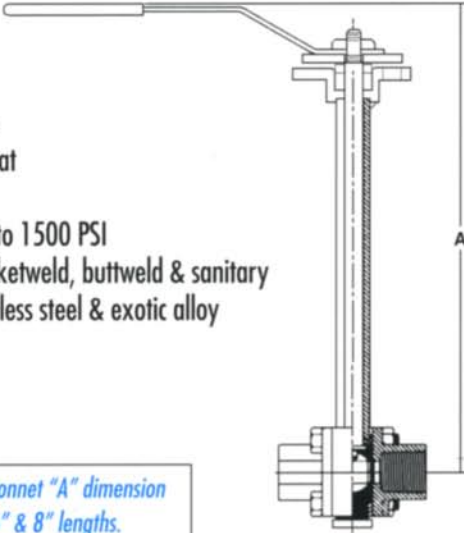
COOPER®

Special Application Ball Valves

Cryogenic Ball Valve

Features:

- Three (3) piece design
- Full port
- Standard port
- TFE seals
- Blowout-proof stem
- Secondary metal seat
- Sizes: 1/4" thru 3"
- Pressures: vacuum to 1500 PSI
- Ends: threaded, socketweld, buttweld & sanitary
- Materials: cast stainless steel & exotic alloy

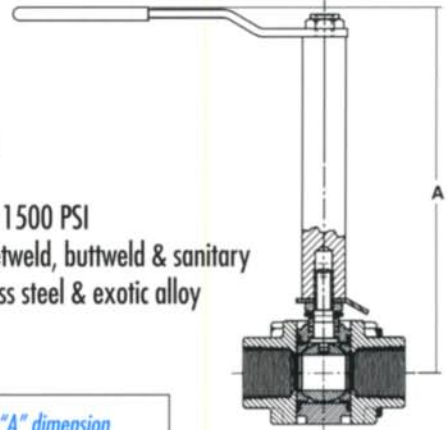


Standard extended bonnet "A" dimension available in 3", 4", 6" & 8" lengths. Other lengths available on request.

Ball Valve Extended Stem

Features:

- Three (3) piece design
- Full port
- Standard port
- TFE seals
- Blowout-proof stem
- Secondary metal seat
- Sizes: 1/4" thru 3"
- Pressures: vacuum to 1500 PSI
- Ends: threaded, socketweld, buttweld & sanitary
- Materials: cast stainless steel & exotic alloy

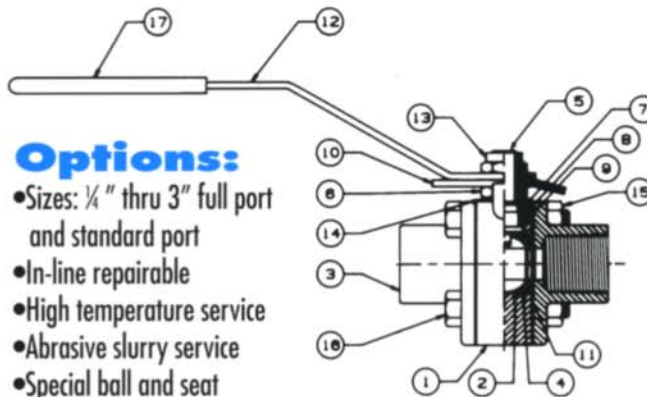


Standard extended stem "A" dimension available in 3", 4", 6" & 8" lengths. Other lengths available on request.

Metal Seated Three (3) Piece Design Bar Stock Ball Valve

Bill of Material—Titanium

Item	Name	Material
1	Body	ASTM B367 GR.C-3
2	Ball	Titanium
3	End piece	ASTM B3647 GR.C-3
4	Seat	Titanium
5	Stem	Titanium
6	Stem nut	304 SS
7	Stem bushing	Titanium
8	Stem seal	Grafoil
9	Thrust bearing	Arlon 1555
10	Stop plate	304 SS
11	Body seal	Mylar reinforced grafoil
12	Handle	304 SS
13	Handle nut	18-8 SS
14	Belleville washer	17-7 Ph SS
15	Body nut	ASTM A449 GR.5 NP.
16	Body bolt	ASTM A449 GR.5 NP.



Options:

- Sizes: 1/4" thru 3" full port and standard port
- In-line repairable
- High temperature service
- Abrasive slurry service
- Special ball and seat coatings
- Available in a variety of exotic alloys

*Consult factory for other options



Model 4150 or 4151

- SEScrewed end
- SWSocketweld end
- BWButtweld end
- X-SESocketweld by screwed
- TETube end

COOPER®

Seat Materials

Ball Valve Seat Materials

Cooper ball valves are available with a wide choice of seat materials from Teflon to metal seats. Soft seated valves such as Teflon or other polymeric provide a tight positive shutoff. Cooper polymeric seated ball valves are factory tested per API 598 for bubble tight shutoff. Metal seated ball valves, while not providing a positive shutoff will provide closure with very low leakage rates.

TFE (Teflon)*

A tough and fairly rigid tetrafluoroethylene polymer, TFE has excellent temperature chemical and anti-friction properties. Being completely inert to chemical attack TFE is especially suited for ball valve seats and stem packings in a wide range of flow media and temperatures (-90 to +450°F). It is only affected by such substances as liquid alkali metals, fluorine and radiation. TFE's slick, wax-like surface displays one of the lowest coefficients of friction of any non-solid material and easily the lowest static friction. Under high stress TFE is susceptible to cold-flow, and it should be avoided for seal or gasket applications where sealing is dependent on the resiliency and memory of the material, unless it is totally encapsulated.

Reinforced TFE

The already highly satisfactory physical performance of TFE can be improved by the addition of "fillers" or reinforcing agents. The effect of these materials is to modify the properties such that a higher resistance to cold-flow is obtained without appreciable degradation of the coefficient of friction. Thus, reinforced TFE has a larger application range dependent upon the reinforcing agent. The most commonly used "filler" is 15% by weight of controlled length fibrous glass. Since this glass itself is virtually chemically inert, the application range of this filled material is very wide. The percentage of glass reinforcement can vary from 2% to 25% by weight, depending upon application requirements. Much empirical data is being derived for many reinforcing agents as alternatives to glass. Examples are graphites and high temperature plastics.

CTFE (Kel-F)**

A polymer of trifluorochloroethylene, it is colorless, nonflammable, and exceptionally stable and chemically inert. It possesses high impact strength at both high and low temperatures, resistance to thermal shock, and zero moisture absorption, but is "notch sensitive." Its high compressive strength is indicative of its unusually low cold-flow characteristics. An excellent bearing material, it is well suited for ball valve seats, but is not recommended for O-ring seats. In specially designed ball valves, amorphous CTFE has been used for ball seats with success, for cryogenic services down to -350° F.

PFA

Teflon PFA is a class of perfluoropolymers that offers the processing ease of conventional thermoplastics with added features that substantially extend its temperature limits. It is a copolymer that combines the carbon-fluorine backbone of fluorocarbons with a perfluoroalkoxy side chain. These perfluoroalkoxy branches lead to the general symbol, PFA. PFA, a true thermoplastic, is melt processible, and can be molded to extremely difficult shapes. It is processed at 700°F.

PFA resin has a branched polymer chain that provides good mechanical properties at low melt viscosities. The unique branch of PFA is longer and more flexible, leading to improvements in high temperature properties, higher melting point and greater thermal stability. The strength and stiffness of PFA at high operating temperatures are at least equivalent to those of PTFE and creep resistance is better than PTFE over a wide temperature range. PFA flex life is excellent.

PFA possesses features that make it extremely desirable as a liner for corrosive fluid flow applications; it is chemically inert; it is heat, weather, and stress cracking resistant; it has negligible moisture absorption; it has anti-stick characteristics; it has a low coefficient of friction. PFA has been found to be superior for handling certain chemicals-monomers such as butadiene.

PFA permits the use of some lined products on a wider range of applications to temperatures as high as 500°F under certain conditions.

Ultra High Molecular Weight Polyethylene (UHMWP)

This thermoplastic polymer has a molecular weight of approximately four million, resulting in an exceptionally high notched impact strength, resistance to stress cracking, and outstanding resistance to abrasion. Additionally, the material offers excellent resistance to most chemicals and has superior self-lubricating properties. It is not recommended for strong acids and organic solvents. Although temperature is limited, depending upon application, between 75° and 160°F, the material is well suited to ball valve seats, especially in pressure ranges greater than those that can be handled by TFE. It is normally used in low to medium level radiation service, and in applications where fluorocarbons cannot be tolerated.

PFA (Perfluoroalkoxy)

PFA is a true thermoplastic, molded TFE, which is melt processible, and can be processed into extremely difficult shapes. It exhibits slightly higher thermal operating temperatures than PTFE, less creep resistance, and has an excellent flex life. It is chemically inert, and is heat, weather and stress cracking resistant. It has negligible moisture absorption, and a low coefficient of friction.

Vespel (SP-21)

Vespel is a tough, highly heat resistant polyimide resin which has a larger operating range than most other plastics. Vespel does not soften or melt when exposed to high temperatures. Reduction of mechanical properties does occur, but after prolonged exposure and generally in a predictable manner. Its characteristics can also be enhanced by the addition of certain percentages of fillers such as graphite, molybdenum disulfide, fiberglass, etc. It has a continuous temperature rating of 550° to 600°F and may be used at temperatures down to -250°F. It should not be used for water, steam, or aqueous solutions above 212°F, caustic, or strong acids. It works well in organic solvents, petroleum oils, mineral oils, and Dowtherm; and exhibits unusual resistance to radiation.

Delrin

Delrin can be used in applications involving organic solvents, inorganic salt solutions, and detergents, where temperatures are between -250° to 150°F. It should not be used for acids, strong alkalis, oxidizing agents, O₂, or hydraulic service.

Peek (Polyetheretherketone)

See attached. High temperature aromatic polymer.

Grafoil***

Recently, increasing numbers of applications have been solved by the use of this laminar graphite material which is formed into seats or packing. The material's exceptionally low coefficient of friction and astonishing resistance to elevated temperatures (6000°F max.), combined with its compressive strength of 24,000 PSIG, permits its use as a ball valve seat and seal material in extreme conditions where low wear is anticipated. The performance of grafoil as a stem packing is unsurpassed. Additionally, it has remarkable resistance to radiation.

Physical properties and pressure-temperature ratings PFA (Perfluoroalkoxy)

Property	ASTM method	Value
Melting point	-	575-590°F
Tensile strength, 73°F	D178	4300 psi
Elongation, 73°F	D1708	300%
Flexural modulus, 73°F	D790	100,000 psi
Impact strength, 73°F	D256	No break
Coefficient of linear thermal expansion per °F (70° to 2126°F)	D696	6.7 x 10
Flammability	D635	Nonflammable
Weather and chemical resistance	-	Excellent

* Registered Trade Mark of E.I. DuPont Co.

** Registered Trade Mark of 3M Co.

*** Registered Trade Mark of Union Carbide Corporation

COOPER THREE (3) PIECE BALL VALVE

Firesafe Design

Minimum leakage under fire conditions—full swing out capabilities.

Cryogenic Service

Available ¼"-3", standard and full port for service to -400°F.

Chlorine Service

Cooper ball valves are available in special designs for the most exacting chlorine applications.

Vacuum Service

Standard Cooper ball valves are suitable for service down to 20 microns. With special preparation, they may be used to 10-8 mm mg.

Steam Service

Rated to 300 PSIG saturated steam with Cooper's exclusive Cooperfill 133 seats and special seals.

Oxygen Service

All ball valves are available specially cleaned and prepared for oxygen service.

Features:

- Three (3) piece design
- Standard port
- Blowout-proof stem
- Sizes: ¼" thru 3"
- Ends: threaded, socketweld, buttweld & sanitary
- Materials: cast stainless steel
- Full port
- TFE seals
- Secondary metal seat
- Pressures: vacuum to 1500 PSI

Options:

- Exotic alloys
- Firesafe
- Vacuum service
- Cryogenics
- Cavity filled seats
- Chlorine service

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