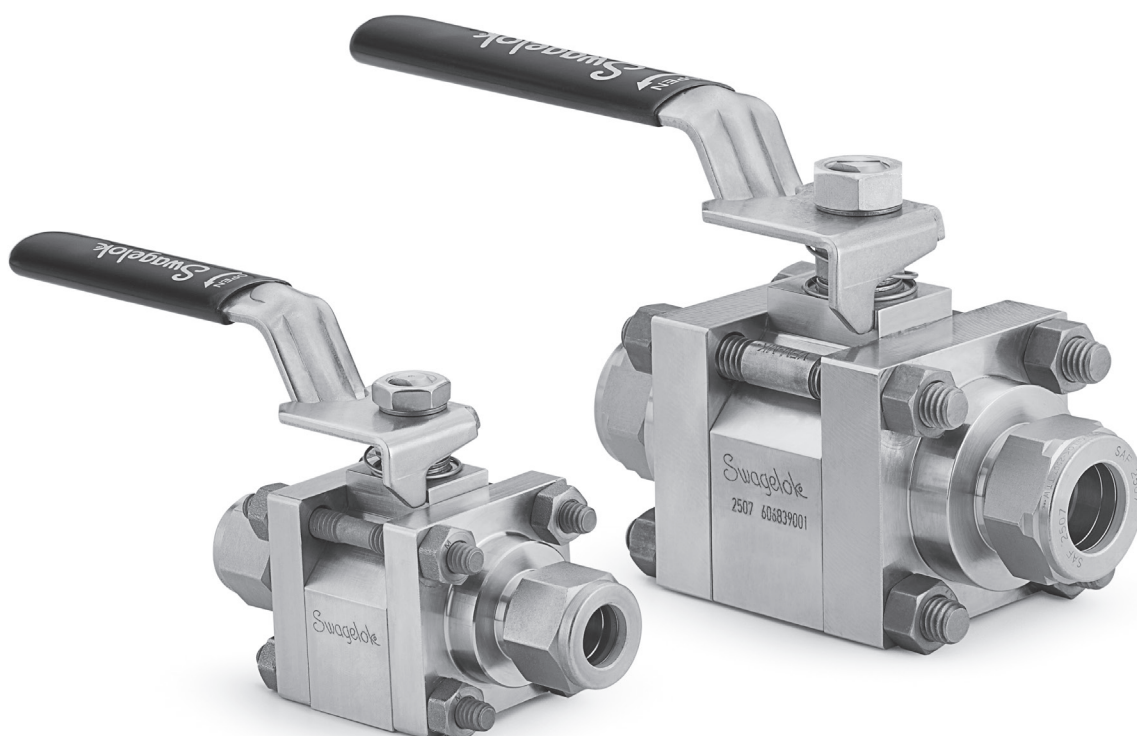


Special Alloy Ball Valves



60 Series

- 3/8 to 1 in. sizes
- Alloy 625, alloy 825, alloy 2507 super duplex stainless steel, and 6-moly materials
- On-off (2-way) valves
- Compensating seat design
- Live-loaded, two-piece stem packing

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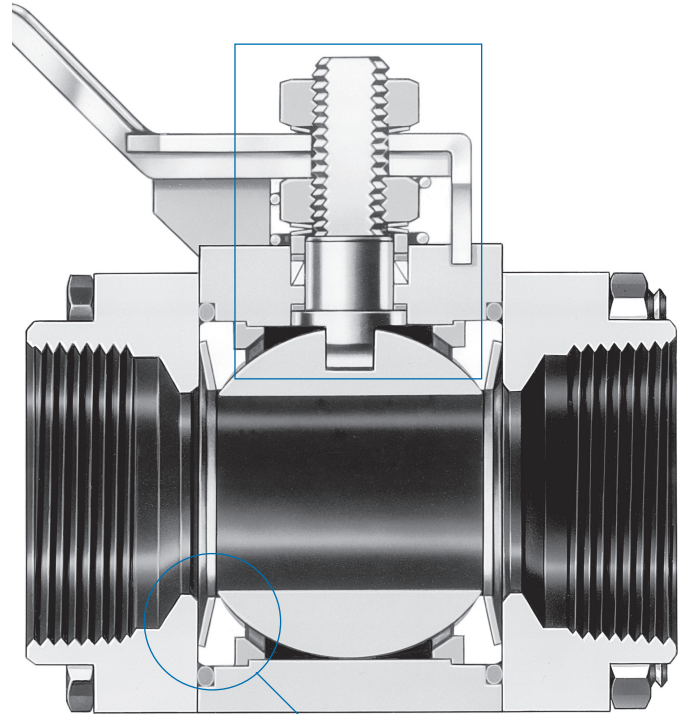
Important Information About Swagelok Process Ball Valves

- ⚠ Swagelok ball valves are designed to be operated in a fully open or fully closed position.
- ⚠ Packing adjustment may be required during the valve's service life.

Features

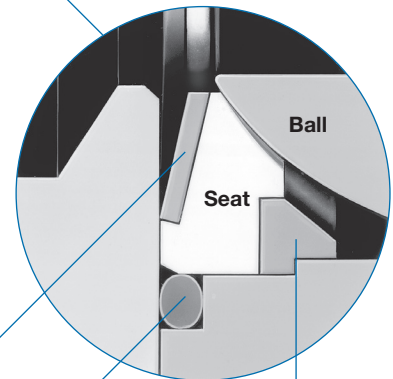
- Quarter-turn actuation
- Alloy 625, alloy 825, alloy 2507 super duplex stainless steel, and 6-moly
- Reinforced PTFE seat materials; other materials available
- Variety of end connections in 3/8 to 1 in. sizes
- Pneumatic and electric actuators
- Optional vent porting

On-Off (2-Way) Valve



Unique coned-disc spring-loaded seat

- compensates for seat wear, pressure, and temperature changes
- reduces seat wear from pressure surges
- seals regardless of flow direction



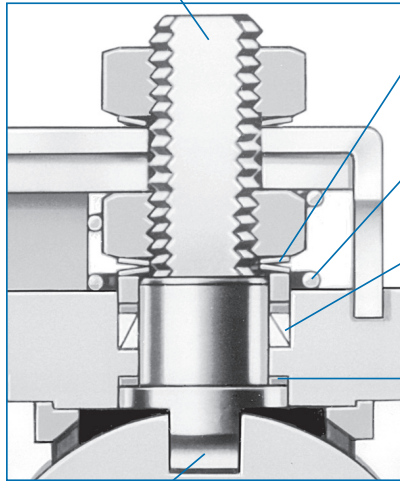
Coned-disc spring

Flange seal
provides leak-tight seal between flange and center body

Support ring
contains the seat and protects against seat bulge, premature wear, and deformation

Features

Directional stem flats
show open or closed position



Stem springs
compensate for changes in pressure and temperature, and wear

Grounding spring
grounds stem to provide continuity for antistatic protection

Live-loaded, 2-piece chevron stem packing

- requires less operating torque
- improves performance
- compensates for stem wear

High-strength stem bearing

- provides smooth actuation
- eliminates galling between valve stem and body
- resists wear

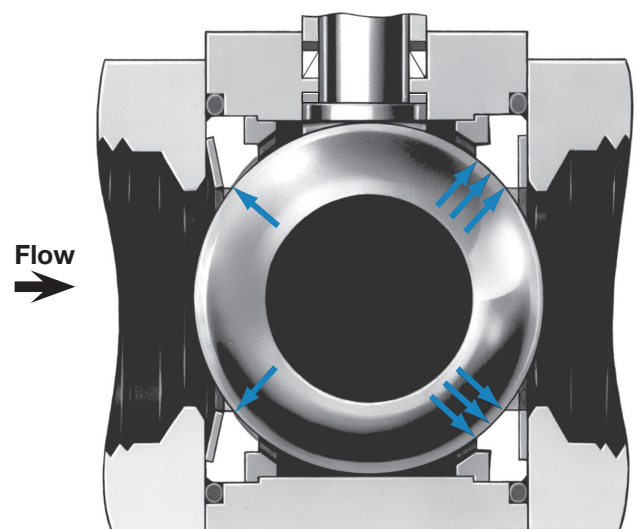
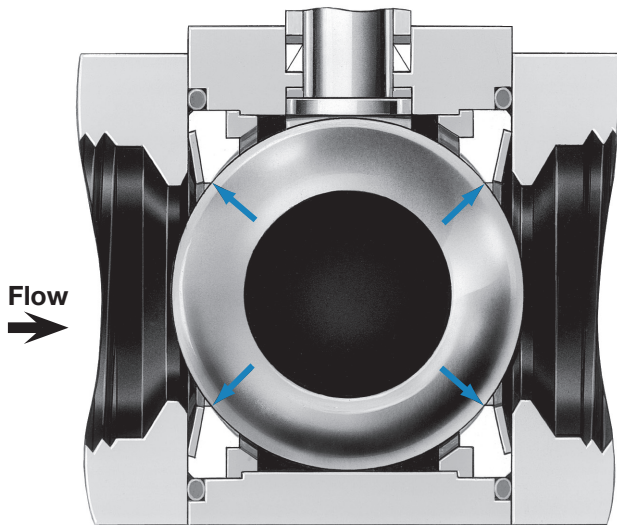
Bottom-loaded stem

- prevents stem blowout
- enhances system safety

Flexing seat design ensures leak-tight seal in both low- and high-pressure systems

Under low pressure, seals are created by the coned-disc spring-loaded seats pushing against the ball. Pressure is not required to create a seal.

Under high pressure, the ball is forced downstream, flexing the downstream seat and creating a seal. The upstream seat also flexes with the ball movement and maintains a seal.



Pressure-Temperature Ratings

Pressure-temperature ratings for special alloy 60 series valves are based on standard materials of construction as listed in the table to right and in the table notes below.

Reinforced PTFE Seats (60T)

| Material | Alloy 625, Alloy 825, Alloy 2507, 6-Moly |
|-----------------------|--|
| Temperature, °F (°C) | Working Pressure psig (bar) |
| -20 (-28) to 100 (37) | 2200 (151) |
| 150 (65) | 1850 (127) |
| 200 (93) | 1500 (103) |
| 250 (121) | 1150 (79.2) |
| 300 (148) | 800 (55.1) |
| 350 (176) | 560 (38.5) |
| 400 (204) | 330 (22.7) |
| 450 (232) | 100 (6.8) |

Ratings based on reinforced PTFE seats and packings, alloy X-750 stem bearings, and fluorocarbon FKM O-rings.

Virgin PTFE Seats (60V Series)

| Material | Alloy 625, Alloy 825, Alloy 2507, 6-Moly |
|-----------------------|--|
| Temperature, °F (°C) | Working Pressure psig (bar) |
| -20 (-28) to 100 (37) | 1500 (103) |
| 150 (65) | 1500 (103) |
| 200 (93) | 1500 (103) |
| 250 (121) | 1150 (79.2) |
| 300 (148) | 800 (55.1) |
| 350 (176) | 560 (38.5) |
| 400 (204) | 330 (22.7) |
| 450 (232) | 100 (6.8) |

Ratings based on virgin PTFE seats and packings, alloy X-750 stem bearings, and fluorocarbon FKM O-rings.

Polyethylene Seats (60E Series)

| Material | Alloy 625, Alloy 825, Alloy 2507, 6-Moly |
|-----------------------|--|
| Temperature, °F (°C) | Working Pressure psig (bar) |
| -20 (-28) to 100 (37) | 2500 (172) |
| 150 (65) | 2030 (139) |
| 200 (93) | 1160 (79.9) |
| 250 (121) | 250 (17.2) |

Ratings based on UHMWPE seats and packings, PEEK stem bearings, and ethylene propylene O-rings.

Materials of Construction

| Component | Valve Body Materials | | | |
|-----------------------------------|---|--------------------|---------------------|-----------------|
| | Alloy 625 | Alloy 825 | Alloy 2507 | 6-Moly |
| Material Grade/ASTM Specification | | | | |
| 1 Stem nut | 316 SS | | | |
| 2 Stem spring | Strain-hardened 316 SS/A240 | | | |
| 3 Stop plate | 304 SS/A240 or 316 SS/A240 | | | |
| 4 Handle | | | | |
| 5 Handle sleeve | Vinyl | | | |
| 6 Grounding spring | 302 SS/A313 | | | |
| 7 Stem nut | Alloy 400 | | | |
| 8 Stem springs (2) | Strain-hardened 316 SS/A240 | | | |
| 9 Gland | PTFE-coated 316 SS/B783 | | | |
| 10 Packing support | PEEK | | | |
| 11 Top packing | Reinforced PTFE | | | |
| 12 Bottom packing | | | | |
| 13 Body | Alloy 625/ B446 | Alloy 825/ B425 | Alloy 2507/ A479 | 6-moly/ B691 |
| 14 Stem bearing(s) | Alloy X-750/AMS 5542 | | | |
| 15 Stem | Alloy 625/ B446 | | | |
| 16 Ball | | | | |
| 17 Support rings (2) | Alloy 625/ B446 | Alloy 825/ B425 | Alloy 2507/ A479 | 6-moly/ B691 |
| 18 Seats (2) | Reinforced PTFE | | | |
| 19 Coned-disc springs (2) | Alloy X-750/AMS 5542 | | | |
| 20 Flange seals (2) | Fluorocarbon FKM | | | |
| 21 Flanges (2) | Alloy 625/ B446 | Alloy 825/ B425 | Alloy 2507/ A479 | 6-moly/ B691 |
| 22 Body fasteners (4) | Alloy K-500/FED SPEC QQ-N-286 | | | |
| 23 Body hex nuts (8) | Alloy 400/B164 | | | |
| Lubricants | Silicone-based and PTFE-based; other lubricants available | | | |

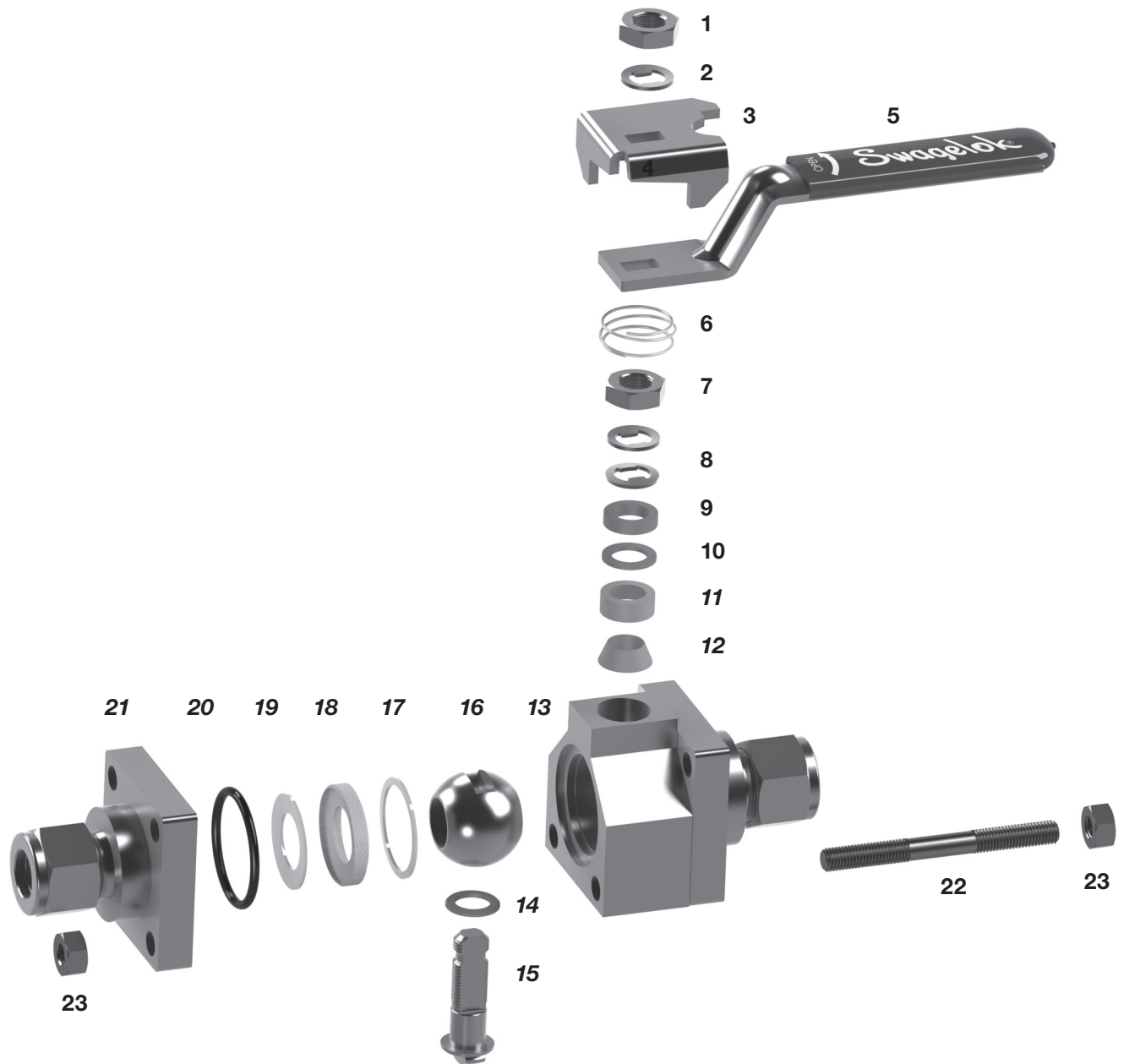
Wetted components listed in *italics*.

Additional Seat Materials

| Valves with Seats of... | Also Contain... | And These Lubricants |
|-------------------------|--|--------------------------------------|
| UHMWPE | UHMWPE packing, PEEK stem bearing, ^① ethylene propylene O-rings, and uncoated packing gland | Hydrocarbon-based and silicone-based |
| Virgin PTFE | Virgin PTFE packing | Silicone-based and PTFE-based |

① Molybdenum disulfide coated.

Materials of Construction



Testing

Every special alloy 60 series ball valve is factory tested with nitrogen at 1000 psig (69 bar) or its maximum working pressure if less than 1000 psig (69 bar). Seats have a maximum allowable leak rate of 0.1 std cm³/min, lower than allowable in FCI 70-2 Specification Class VI.

Shell testing with nitrogen at 1000 psig (69 bar) or the maximum rated pressure if less than 1000 psig (69 bar) is performed to a requirement of no detectable leakage with a liquid leak detector.

Positive Material Identification (PMI) testing is performed on 100% of the products designated as “exotic” materials that are classified as pressure containing or wetted.

Cleaning and Packaging

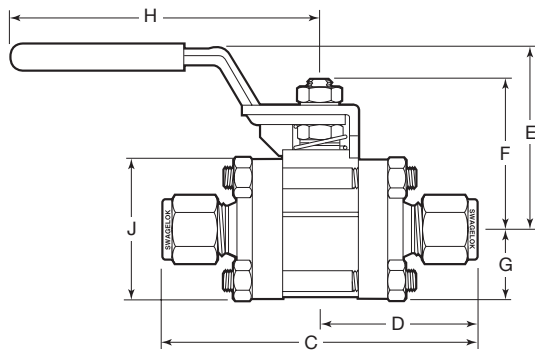
Every special alloy 60 series ball valve is cleaned in accordance with Swagelok *Standard Cleaning and Packaging (SC-10)* catalog, [MS-06-62](#).

Dimensions

Dimensions, in inches (millimeters), are for reference only and are subject to change.

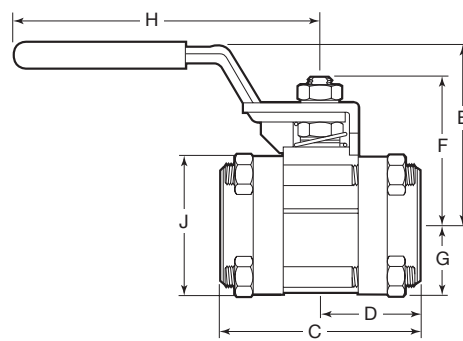
Swagelok Tube Fitting End Connections

Dimensions shown with Swagelok nuts finger-tight. See **Ordering Information** below.



Female Pipe Thread End Connections

Female NPT pipe thread dimensions conform to ASME B1.20.1. See **Ordering Information** below.



| Size | Ordering Number | Orifice in. (mm) | C _v | Dimensions, in. (mm) | | | | | | |
|------------------------------|----------------------|---------------------|----------------|----------------------|-------------|-------------|-------------|-------------|------------|-------------|
| | | | | C | D | E | F | G | H | J |
| Swagelok Tube Fitting | | | | | | | | | | |
| 1/2 in. | -63TS8 | 0.406 (10.3) | 7.5 | 4.04 (103) | 2.02 (51.3) | 2.35 (59.7) | 1.79 (45.5) | 0.89 (22.6) | 4.50 (114) | 1.78 (45.2) |
| 3/4 in. | -63TS12 ^① | 0.516 (13.1) | 13.6 | 4.04 (103) | 2.02 (51.3) | 2.35 (59.7) | 1.79 (45.5) | 0.89 (22.6) | 4.50 (114) | 1.78 (45.2) |
| 1 in. | -65TS16 ^① | 0.875 (22.2) | 40 | 5.36 (136) | 2.68 (68.1) | 2.94 (74.7) | 2.52 (64.0) | 1.25 (31.8) | 6.00 (152) | 2.50 (63.5) |
| Female NPT | | | | | | | | | | |
| 3/8 in. | -63TF6 | 0.516 (13.1) | 12 | 2.70 (68.6) | 1.35 (34.3) | 2.35 (59.7) | 1.79 (45.5) | 0.89 (22.6) | 4.50 (114) | 1.78 (45.2) |
| 1/2 in. | -63TF8 | 0.516 (13.1) | 12 | 2.70 (68.6) | 1.35 (34.3) | 2.35 (59.7) | 1.79 (45.5) | 0.89 (22.6) | 4.50 (114) | 1.78 (45.2) |
| 3/4 in. | -65TF12 | 0.875 (22.2) | 31 | 3.59 (91.2) | 1.80 (45.7) | 2.94 (74.7) | 2.52 (64.0) | 1.25 (31.8) | 6.00 (152) | 2.50 (63.5) |
| 1 in. | -65TF16 | 0.875 (22.2) | 38 | 3.59 (91.2) | 1.80 (45.7) | 2.94 (74.7) | 2.52 (64.0) | 1.25 (31.8) | 6.00 (152) | 2.50 (63.5) |

^① For materials available in end connection sizes refer to Swagelok *Tubing Data* catalog, [MS-01-107](#), for additional information.

Ordering Information

Select a basic ordering number from the **Dimensions** table. Add the valve body material designator from the table below to the basic ordering number.

Examples: **825-63TS8**, **6MO-65TF16**

| Valve Body Material | Designator |
|---------------------|------------|
| 625 | 625 |
| 825 | 825 |
| Alloy 2507 | 2507 |
| 6-Moly | 6MO |

Additional Seat Materials

Standard valve ordering numbers specify reinforced PTFE seat material. For other seat materials, replace **T** with the desired designator. Not all seat material and flange seal combinations are available. Contact your authorized Swagelok representative.

Examples: 2507-63**CS**8, 6MO-65**EF**12

| Seat Material | Designator |
|---------------|------------|
| Virgin PTFE | V |
| UHMWPE | E |

Additional Flange Seal Materials

Fluorocarbon FKM is standard flange seal material. For other materials, add a flange seal material designator to the valve ordering number. Not all flange seal and seat material combinations are available. Contact your authorized Swagelok representative.

Examples: 625-63TS8-**B**, 6MO-63TF6-**IN**

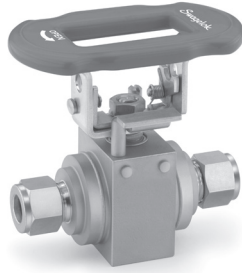
| Flange Seal Material | Designator | Temperature Range °F (°C) |
|-----------------------------|------------|------------------------------|
| Alloy X-750, PTFE coated | IN | -65 to 450 (-53 to 232) |
| Buna N | B | -20 to 250 (-28 to 121) |
| Buna C | BC | -65 to 250 (-53 to 121) |
| Ethylene propylene | E | -20 to 250 (-28 to 121) |
| Neoprene | N | -20 to 250 (-28 to 121) |
| PTFE | T | 50 to 150 (10 to 65) |

Options and Accessories

Handles



Locking Lever Bracket Handle



Oval Handle

A variety of handle options is available for use with 60 series ball valves. To order a locking lever bracket handle, add **-JL** to the ordering number. To order an oval handle, add **-JK** to the ordering number. For additional information and dimensions, refer to Swagelok *Ball Valve Actuation Options* catalog, [MS-02-343](#).

Low Dead Space Inserts



- Reduce fluid entrapment around the ball, stem, and seats while the valve is in the open or closed position.

To order, add **-LD** to the valve ordering number.

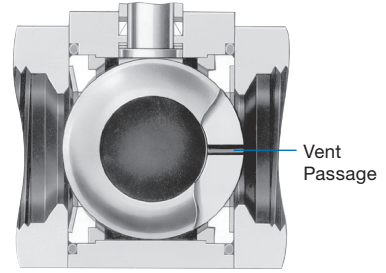
Examples: 625-63TS8-**LD**

Kits for Field Assembly

Select an ordering number.

| Valve Series | Kit Ordering Numbers |
|--------------|----------------------|
| 63 | TGC-91K-63-LD |
| 65 | TGC-91K-65-LD |

Vented Valves



Internal Vent Option

On-off (2-way) ball valves are available with an internal vent. These vents are available for either upstream or downstream service. To order a valve with an internal vent, insert **NDV** for downstream vent or **NUV** for upstream vent into the valve ordering number.

Example: 625-63T**NDV**S8

Panel Mount Kits



- Allow vertical or horizontal mounting.
- Can be installed on panels up to 1/4 in. (6.4 mm) thick.
- Fit oval and lever handle.
- Provide template for drilling holes.

Ordering Information

Select an ordering number.

Kits include self-cinching nut, cover plate, cap screws, panel mount brackets, and instructions.

| Valve Series | Kit Ordering Number |
|--------------|---------------------|
| 63 | MS-PMK-S63 |
| 65 | MS-PMK-S65 |

Maintenance Kits

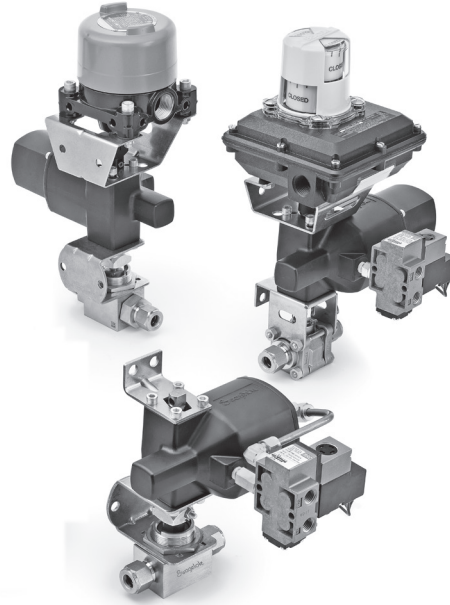
Each kit contains seal, flange seal, lubricant, and fasteners. Contact your Swagelok representative for more information.

Pneumatic Actuators

Swagelok rack and pinion pneumatic actuators are available for the special alloy, 60 series ball valves. See the Swagelok *General Purpose and Special Application Ball Valves—60 Series* catalog, [MS-01-146](#).

Options for Pneumatic Actuators

Swagelok can provide factory assemblies with pneumatic actuators, solenoid valves, limit switches, and position sensors, as well as kits for field assembly. For more information, see the *Swagelok Ball Valve Actuation Options* catalog, [MS-02-343](#).



Oxygen Service Hazards

For more information about hazards and risks of oxygen-enriched systems, refer to Swagelok *Oxygen System Safety* technical report, [MS-06-13](#).

Safe Product Selection

When selecting a product, the total system design must be considered to ensure safe, trouble-free performance. Function, material compatibility, adequate ratings, proper installation, operation, and maintenance are the responsibilities of the system designer and user.

⚠ WARNING

Do not mix/interchange Swagelok products or components not governed by industrial design standards, including Swagelok tube fitting end connections, with those of other manufacturers.

Warranty Information

Swagelok products are backed by The Swagelok Limited Lifetime Warranty. For a copy, visit [swagelok.com](#) or contact your authorized Swagelok representative.