

Special-Alloy Fluid System Components



Special-Alloy Products

- Select fittings, valves, filters, and hoses
- Alloy C-276, alloy 20, alloy 400/R-405, alloy 600, alloy 825, and titanium materials

Special Alloys

Select fittings, valves, filters, and hoses are available in special-alloy body materials. **For technical data, including materials of construction, dimensions, and other necessary product information, see the appropriate Swagelok® product catalog.**

Special-Alloy Designators

| Alloy C-276 | Alloy 20 | Alloy 400/ R-405 | Alloy 600 | Alloy 825 | Titanium Grade 4 |
|-------------|----------|---------------------|-----------|-----------|------------------|
| HC | C20 | M | INC | 825 | TI |

Tube Fittings and Adapter Fittings

Male Connectors



| Tube OD in. | Pipe Size in. | Basic Ordering Number |
|-------------|---------------|-----------------------|
| 1/4 | 1/8 | -400-1-2 |
| 1/4 | 1/4 | -400-1-4 |
| 3/8 | 1/4 | -600-1-4 |
| 3/8 | 1/2 | -600-1-8 |
| 1/2 | 1/4 | -810-1-4 |
| 1/2 | 1/2 | -810-1-8 |

Union Elbows



| Tube OD in. | Basic Ordering Number |
|-------------|-----------------------|
| 1/4 | -400-9 |
| 3/8 | -600-9 |
| 1/2 | -810-9 |

Female Adapters Tube to Pipe



| Tube OD in. | Pipe Size in. | Basic Ordering Number |
|-------------|---------------|-----------------------|
| 1/4 | 1/8 | -4-TA-7-2 |
| 1/4 | 1/4 | -4-TA-7-4 |
| 1/4 | 1/2 | -4-TA-7-8 |
| 3/8 | 1/4 | -6-TA-7-4 |
| 3/8 | 1/2 | -6-TA-7-8 |
| 1/2 | 1/4 | -8-TA-7-4 |
| 1/2 | 1/2 | -8-TA-7-8 |

Caps



| Tube OD in. | Basic Ordering Number |
|-------------|-----------------------|
| 1/4 | -400-C |
| 3/8 | -600-C |
| 1/2 | -810-C |

Male Elbows



| Tube OD in. | Pipe Size in. | Basic Ordering Number |
|-------------|---------------|-----------------------|
| 1/4 | 1/4 | -400-2-4 |
| 3/8 | 1/4 | -600-2-4 |
| 1/2 | 1/2 | -810-2-8 |

Union Tees



| Tube OD in. | Basic Ordering Number |
|-------------|-----------------------|
| 1/4 | -400-3 |
| 3/8 | -600-3 |
| 1/2 | -810-3 |

Male Adapters Tube to Pipe



| Tube OD in. | Pipe Size in. | Basic Ordering Number |
|-------------|---------------|-----------------------|
| 1/4 | 1/8 | -4-TA-1-2 |
| 1/4 | 1/4 | -4-TA-1-4 |
| 1/4 | 1/2 | -4-TA-1-8 |
| 3/8 | 1/4 | -6-TA-1-4 |
| 3/8 | 1/2 | -6-TA-1-8 |
| 1/2 | 1/4 | -8-TA-1-4 |
| 1/2 | 1/2 | -8-TA-1-8 |

Plugs



| Tube OD in. | Basic Ordering Number |
|-------------|-----------------------|
| 1/4 | -400-P |
| 3/8 | -600-P |
| 1/2 | -810-P |

Nuts



| Tube OD in. | Basic Ordering Number |
|-------------|-----------------------|
| 1/4 | -402-1 |
| 3/8 | -602-1 |
| 1/2 | -812-1 |

Unions



| Tube OD in. | Basic Ordering Number |
|-------------|-----------------------|
| 1/4 | -400-6 |
| 3/8 | -600-6 |
| 1/2 | -810-6 |

Bulkhead Unions



| Tube OD in. | Basic Ordering Number |
|-------------|-----------------------|
| 1/4 | -400-61 |
| 3/8 | -600-61 |
| 1/2 | -810-61 |

Reducers



| Tube OD, in. | | Basic Ordering Number |
|--------------|-----|-----------------------|
| T | Tx | |
| 3/8 | 1/4 | -600-R-4 |
| 1/2 | 3/8 | -810-R-6 |

Back Ferrules



| Tube OD in. | Basic Ordering Number |
|-------------|-----------------------|
| 1/4 | -404-1 |
| 3/8 | -604-1 |
| 1/2 | -814-1 |

Front Ferrules



| Tube OD in. | Basic Ordering Number |
|-------------|-----------------------|
| 1/4 | -403-1 |
| 3/8 | -603-1 |
| 1/2 | -813-1 |

See the Swagelok *Gageable Tube Fittings and Adapter Fittings* catalog, MS-01-140. See *Swagelok Tubing Data*, MS-01-107, for pressure-temperature ratings.

SAF 2507™ Super Duplex Material

SAF 2507 super duplex stainless steel tube fittings and weld fittings are available for use with SAF 2507 tubing. See the Swagelok *Gageable SAF 2507 Super Duplex Tube Fittings* catalog, MS-01-174, and Swagelok *SAF 2507 Super Duplex Weld Fittings* catalog, MS-01-173.

Process and Instrument 3-Piece Ball Valves (60 Series)

- Special-alloy body and flange materials available in 62, 63, and 65 series valves
- 1/4, 1/2, 3/4, and 1 in. female NPT end connections
- 1/4, 3/8, 1/2, and 1 in. Swagelok tube fitting end connections
- Working pressure at 100°F (37°C)—1500 psig (103 bar)^①
- Temperature rating—50 to 150°F (10 to 65°C)

^① Contact your authorized Swagelok sales and service representative for higher-temperature applications and pressure ratings at elevated temperatures.

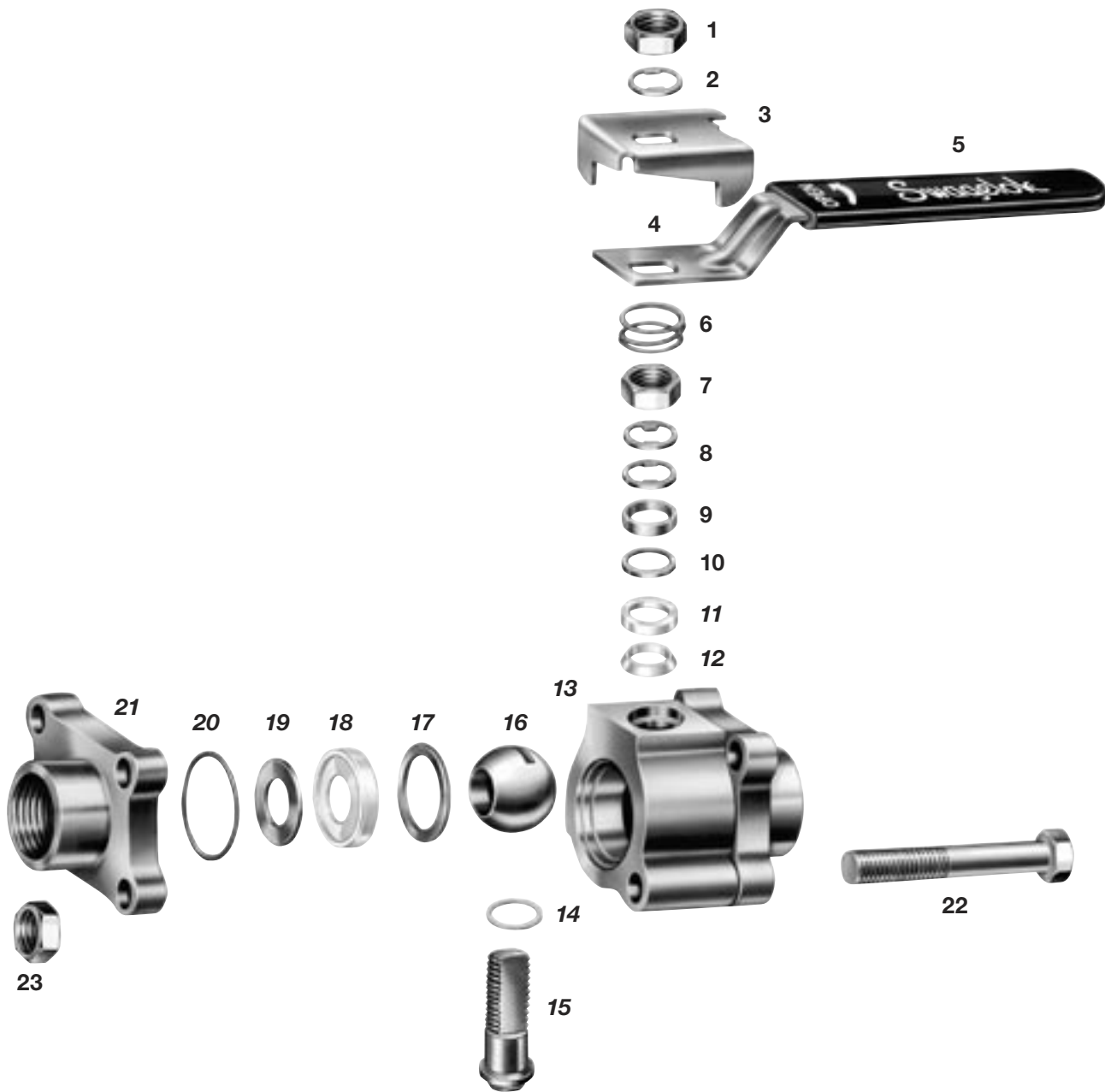


Materials of Construction

| Component | Valve Body Materials | | | | |
|----------------------------|--|---|---|--|-----------------------------|
| | Alloy C-276 | Alloy 20 | Alloy 400/R-405 | Alloy 600 | Titanium |
| | Material Grade/ASTM Specification | | | | |
| 1 Stem nut | 316 SS/A240 | | | | |
| 2 Stem spring ^① | Strain-hardened 316 SS/A240 | | | | |
| 3 Stop plate ^① | 304 SS/A240 or 316 SS/A240 | | | | |
| 4 Handle | | | | | |
| 5 Handle sleeve | Vinyl | | | | |
| 6 Grounding spring | 302 SS/A313 | | | | |
| 7 Stem nut | Alloy 400/R-405 | | | | |
| 8 Stem springs (2) | Strain-hardened 316 SS/A240 | | | | |
| 9 Gland | PTFE-coated 316 SS/B783 | | | | |
| 10 Packing support | PEEK | | | | |
| 11 Top packing | Virgin PTFE | | | | |
| 12 Bottom packing | | | | | |
| 13 Body | <i>Alloy C-276/ B574, B575 or CW-12MW/A494</i> | <i>Alloy 20/ B473, B463 or CN-7M/A351</i> | <i>Alloy R-405/ B164, B127 or M-35-1/A494</i> | <i>Alloy 600/ B166, B168 or CY-40/A494</i> | <i>Ti grade 4/ B348</i> |
| 14 Stem bearing | ECTFE | | | | |
| 15 Stem | <i>Alloy C-276/ B574, B575</i> | <i>Alloy 20/ B473, B463</i> | <i>Alloy R-405/ B164</i> | <i>Alloy 600/ B166, B168</i> | <i>Ti grade 4/ B348</i> |
| 16 Ball | | | <i>Alloy R-405/B164 or alloy 400/B127</i> | | |
| 17 Support rings (2) | Virgin PTFE | | | | |
| 18 Seats (2) | Virgin PTFE | | | | |
| 19 Coned-disc springs (2) | <i>Alloy C-276/ B574, B575</i> | <i>Alloy X-750/ AMS 5542</i> | <i>K-500/Federal spec QQ-N-286</i> | <i>Alloy X-750 / AMS 5542</i> | |
| 20 Flange seals (2) | Virgin PTFE | | | | |
| 21 Flanges (2) | <i>Alloy C-276/ B574, B575 or CW-12MW/A494</i> | <i>Alloy 20/ B473, B463 or CN-7M/A351</i> | <i>Alloy 400/ B164, B127 or M-35-1/A494</i> | <i>Alloy 600/ B166, B168 or CY-40/A494</i> | <i>Ti grade 4/ B348</i> |
| 22 Body fasteners (4) | Alloy 400/R-405 | | | | |
| 23 Body hex nuts (8 or 4) | | | | | |
| Lubricant | <i>Silicone-based and PTFE-based; other lubricants available</i> | | | | |

Wetted components listed in *italics*.

^① 62 series—no upper stem spring and stop plate integral with handle.



Ordering Information

To order, add a special-alloy designator to a basic ordering number.

Example: HC-62VS4

See the Swagelok Ball Valves, General Purpose and Special Application—60 Series catalog, MS-01-146.

| End Connections | | Basic Ordering Number | Orifice in. (mm) | Flow Coefficient (C _v) |
|------------------------|---------|-----------------------|------------------|------------------------------------|
| Type | Size | | | |
| Swagelok tube fittings | 1/4 in. | -62VS4 | 0.188 (4.78) | 1.2 |
| | 3/8 in. | -62VS6 | 0.281 (7.14) | 3.8 |
| | 1/2 in. | -63VS8 | 0.406 (10.3) | 7.5 |
| | 1 in. | -65VS16 | 0.875 (22.2) | 40 |
| Female NPT | 1/4 in. | -62VF4 | 0.281 (7.14) | 3.8 |
| | 1/2 in. | -63VF8 | 0.516 (13.1) | 12 |
| | 3/4 in. | -65VF12 | 0.875 (22.2) | 31 |
| | 1 in. | -65VF16 | | 38 |

Severe-Service Union-Bonnet Needle Valves (N Series)

- Ball tip, regulating, and soft-seat regulating stem designs
- Alloy 400, alloy 20, alloy C-276, 440C SS, cobalt-base alloy, and titanium ball stem tip materials
- 1/4, 3/8, and 1/2 in. female NPT and Swagelok tube fitting end connections
- Pneumatic actuation available, except for 1/2 in. female NPT-ended valves

See the Swagelok *Severe-Service Union-Bonnet Needle Valves—N and HN Series* catalog, MS-01-168.



Poppet Check Valves (C Series)

- Special-alloy materials available in 4C, 8C, and 12C series valves
- 1/4, 1/2, and 3/4 in. female NPT and Swagelok tube fitting end connections
- 1, 10, and 25 psi (0.068, 0.68, and 1.7 bar) nominal cracking pressures
- Springs—alloy C-276 in all valves (optional PTFE coating available)
- Gaskets—alloy C-276 in all 12C valves. All other gaskets same material as body.



Working Pressure at 70°F (20°C)

| Valve Series | Alloy C-276 | Alloy 20 | Alloy 400/ R-405 | Alloy 600 | Titanium |
|--------------|------------------------------|------------|---------------------|------------|-------------|
| | Working Pressure, psig (bar) | | | | |
| 4C, 8C | 3000 (206) | 2500 (172) | 2500 (172) | 3000 (206) | 1785 (122) |
| 12C | 2000 (137) | 1660 (114) | 1660 (114) | 1990 (137) | 1185 (81.6) |

Contact your authorized Swagelok representative for pressure ratings at elevated temperatures.

To order, replace **SS** in a C series valve ordering number from the Swagelok *Check Valves—C, CA, CH, CP, and CPA Series* catalog with a special-alloy designator and add the nominal cracking pressure in psi.

Example: **HC-4C-1**

See the Swagelok *Check Valves—C, CA, CH, CP, and CPA Series* catalog, MS-01-176.

In-Line Particulate Filters (F Series)

- Alloy C-276 material available for filter with 1/4 in. female NPT end connections
- All metal components are alloy C-276
- 2, 7, 15, 60, and 90 μm nominal pore size sintered elements
- Working pressure at 100°F (37°C)—3000 psig (206 bar) for 2F and 4F series; 2500 psig (172 bar) for 6F and 8F series^①



- 1000 psi (68.9 bar) maximum differential pressure
- Temperature rating—800°F (426°C) maximum

To order, add the nominal pore size to basic ordering number **HC-4F4-**.

Example: **HC-4F4-2**

See the Swagelok *Filters—FW, F, and TF Series* catalog, MS-01-92.

^① Contact your authorized Swagelok representative for pressure ratings at elevated temperatures.

PTFE-Lined, Stainless Steel Braided Hose (TH, TC, and TL Series)

- Tube adapter end connections—special alloy
- Core tube—smooth virgin PTFE
- Hose braid—304 stainless steel
- Carbon black filled hose (TC series) and hose with alloy 400/R-405 overbraid (TL series) also available.



See the Swagelok *Hose—Hose Assemblies, Bulk Hose, and End Connections* catalog, MS-01-167.

Tubing

See Swagelok *Tubing Data*, MS-01-107, for information about selecting special-alloy tubing for use with Swagelok tube fittings.

Purchase specifications should include:

- Fully annealed seamless (or welded and drawn, where permitted) alloy tubing to the ASTM specification shown.
- Tubing to be free of scratches, suitable for bending and flaring.

| Tubing Material | ASTM Specification | Tubing Type |
|-----------------|--------------------|------------------------------|
| Alloy C-276 | B622 | Seamless only |
| Alloy 20 | B729 B468 | Seamless or welded and drawn |
| Alloy 400 | B165 | Seamless only |
| Alloy 600 | B167 | |
| Titanium | B338 | Seamless or welded and drawn |

SAF 2507 Super Duplex Material

Tubing of SAF 2507 super duplex stainless steel is also available. See the Swagelok *SAF 2507 Super Duplex Seamless Tubing—Fractional Sizes* catalog, MS-02-151.

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.

Caution: Do not mix or interchange parts 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.

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