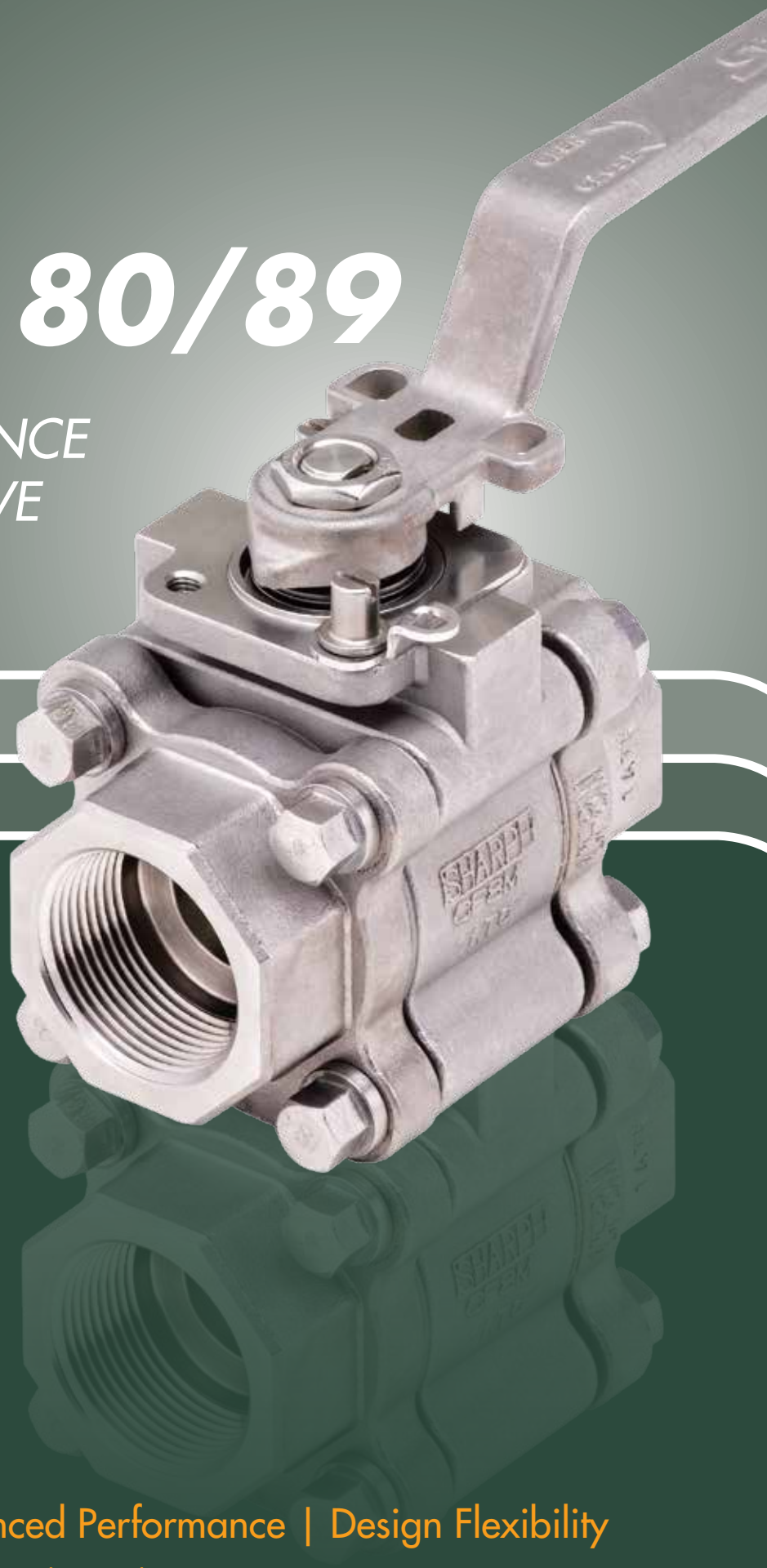
SHARPE®

Valves, Automation & Controls

SERIES 80/89

HIGH PERFORMANCE 3-PIECE BALL VALVE



Fully Compliant
API 608
Class 800

For petroleum refining, chemical & petrochemical processing

Added Features | Enhanced Performance | Design Flexibility

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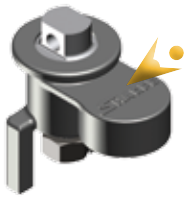
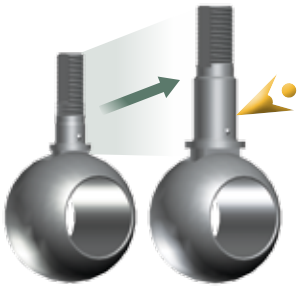
OVERVIEW:

A wider range of applications, functionality and control features

Unique cast stainless steel "SharpeGrip" handle for added strength and safe handling



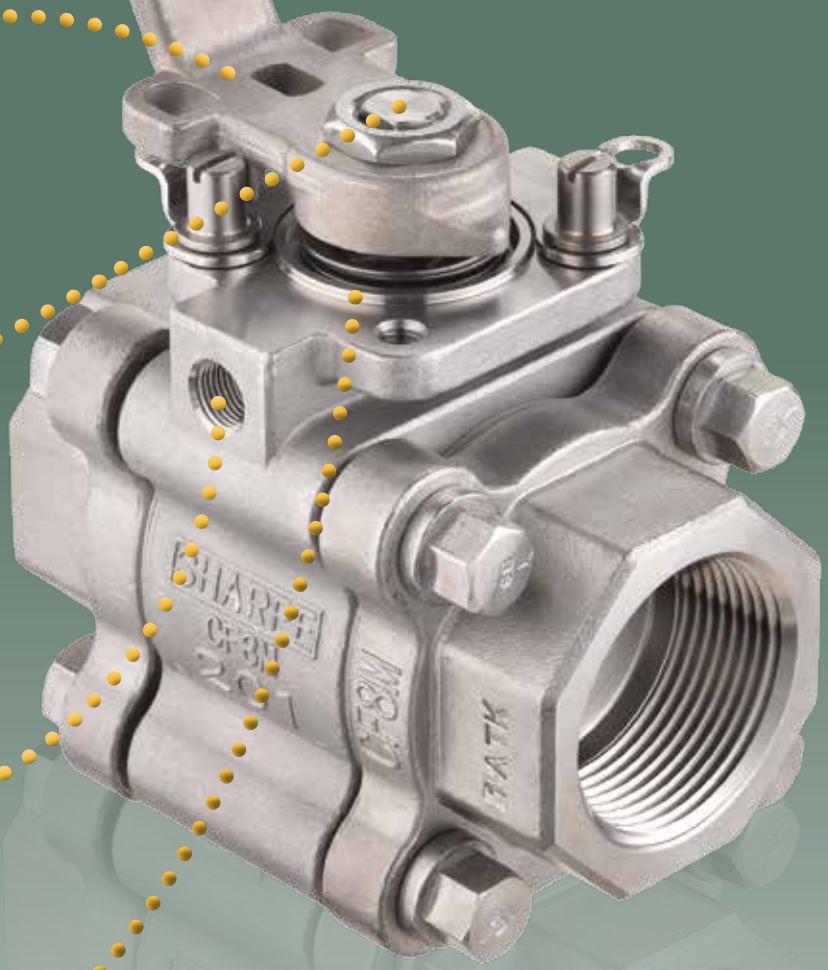
Optional tamper proof locking device



Enlarged, heavy duty stem shaft for API 608 class 800

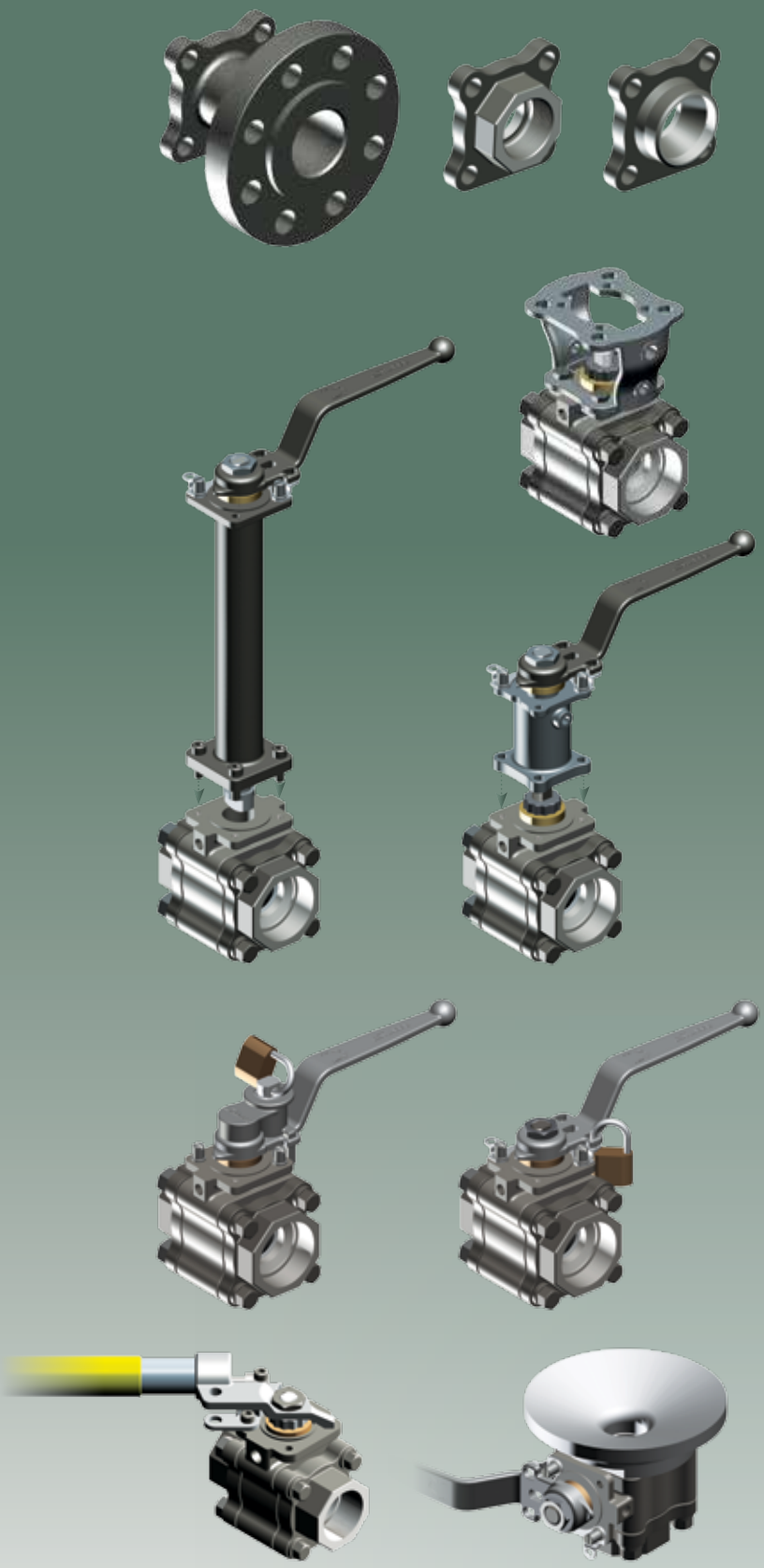
Integral fugitive emission ports for monitoring system and control (patent pending)

Superior stem seal configuration for leakage protection and improved environmental performance



The new series 80 standard port and series 89 full port 3-piece ball valves are designed for high performance, long cycle life and exceptional durability. The valves are fully compliant to API 608 class 800 for sizes ¼" to 2½" and class 300 for sizes 3" to 4".

ACCESSORIES:
Extensions, brackets and auxiliary options



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End connection combinations

- A wide selection of optional end connections are available, including, but not limited to: threaded, socket weld, butt weld, extended butt weld and flanged ends to class 150, 300 and 600.

Cast mounting brackets

- Cast brackets all in stainless steel material with hole patterns conforming to ISO 5211 on top and bottom planes for actuation mounting.
- Optional safety locking holes for securing valves during maintenance.
- Wide tool clearance for installation, aesthetic design and open visibility.

Extension bonnets

- Extensions - an option to move the valve top interface away from the pipe line for insulation and reduction of heat transfer.
- Emission bonnets - an added stem sealing system for valves without integral emission ports.
- Cryogenic bonnets - valves for cryogenic service are converted to accept a cryogenic extension bonnet with an extended stem, to distance the stem sealing area away from low temperatures.

Additional options

- Steam jackets - enables the valves to be kept at a controlled temperature.
- Diverters - valves that are converted for diverting or mixing applications that usually require two valves.
- Tank bottom valves - valves with special end caps welded directly to tanks or pipes, to eliminate the dead volume that is common with standard fittings.
- Locking device - Sharpe exclusive, tamper-proof locking device is spring loaded, and ensures lock is always activated.
- Spring return handles - ensures that the valve cannot be left open (or closed).Can be retrofitted on-site without valve disassembly.

FEATURES:

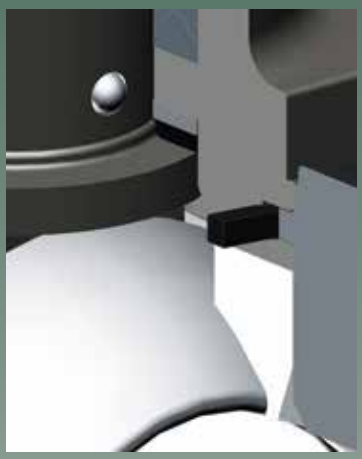
Important construction components

Rugged body and end caps

- Rugged body with higher and deeper stem packing area to allow for more seals.
- Two-cast bosses for optional fugitive emission ports *(patent pending)*
- Larger ISO bolt pattern for handling higher valve torques.
- End caps with extra thick flanges to comply with class 800.

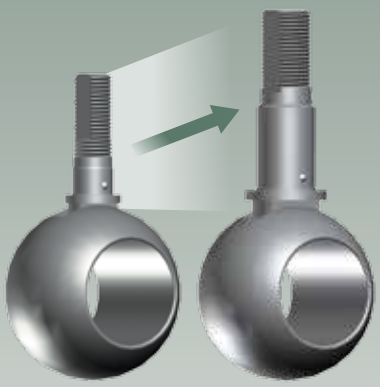
Tongue and groove design

- Fully encapsulated body seals, allowing ends to be welded in-line, without time consuming and labor intensive disassembly.
- In the event of fire, this design will compensate for bolt expansion and reduce the chance of external leakage.
- Helps prevent seal ruptures in high pressure, cryogenic or steam applications.



Heavy duty stem design

- Stem diameters have been increased to meet the higher torque requirements of the most demanding applications.
- Stem-to-ball contact area is wider and larger, allowing the valve to be used for higher torque applications.
- Design allows for the use of stainless steel stem material rather than 17-4PH, and offers superior corrosion resistance.
- All stems have a Double-D configuration to indicate ball position.



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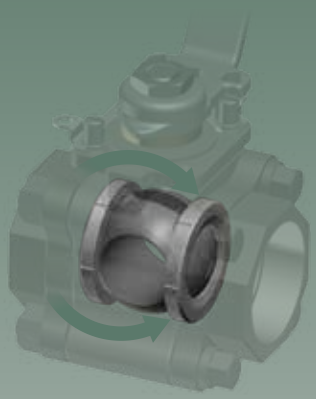


Body bolt design

- Larger diameter body bolts to comply with class 800.
- Encapsulated body bolts for added protection and wash down applications.
- Optional bolts and nuts to comply with NACE MR0175/ ISO 15156.

ISO 5211 top-works compatibility

- The top-works offer compatibility for mounting a wider range of accessories.
- Actuators and Sharpe accessories may be retrofitted on existing valves without disruption of line integrity.

Floating ball design

- Solid stainless steel ball with wide selection of configurations for a variety of applications for diverting, mixing, controlling, flushing, purging and more.
- Floating ball seals on the downstream seat, reducing torque and guarantees bubble-tight shutoff.

Unique “SharpeGrip” handle

- The "SharpeGrip" is a unique cast, stainless steel handle with special design to accommodate locking devices.
- The handle length is according to API 608 requirements and withstands higher valve operating torque.
- A comfortable, ergonomic hand-grip design.

VALVE TRIM

Operational flexibility and process compatibility of stem assemblies

Stem assemblies

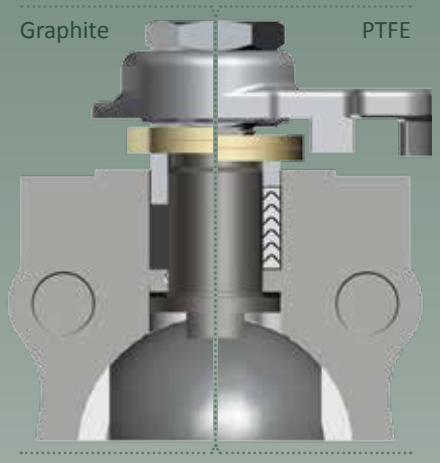
Various stem assemblies are available based on application requirements.

- STANDARD - a multiple pack of chevron "V" shaped stem seals for better sealing in PTFE, TFM® or Nova materials.
- FIRE SAFE - double pack of flexible graphite seals for sealing under fire conditions.
- FUGITIVE EMISSION - 2-pack stem seals in PTFE or graphite, with lantern ring to allow leak detection through the emission ports.
- HIGH-CYCLE - unique designs for demanding high-cycle applications that consist of multi-system sealing devices in the stem bonnet.

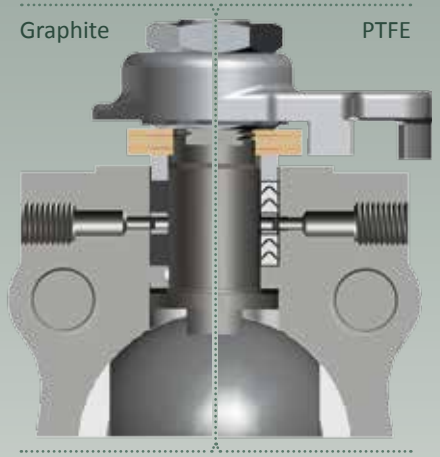
Stem sealing

- INTEGRATED FUGITIVE EMISSION BODY *(patent pending)*
  Double containment stem packing with threaded ports to connect sensors.
- INCREASED STEM SEALING AREA
  Allows for a range of sealing combinations for severe applications and other stringent design demands.
- LIVE-LOADED STEM
  - Two pairs of concave and opposing spring washers provide additional compensation for seal wear.
  - Self-adjusts with pressure and temperature fluctuations.
- SAFE DESIGN
  Blowout proof stem design with anti-static device ensures the stem cannot be blown out by accidental medium pressure rise or cause ignition.
- EXTENDED VALVE CYCLE LIFE
  PEEK and Nova thrust bearings and stem seals extend valve life-cycle, and are the perfect choice for actuation applications.

Standard Stem Assembly



Fugitive Emission Assembly



High Cycle Assembly

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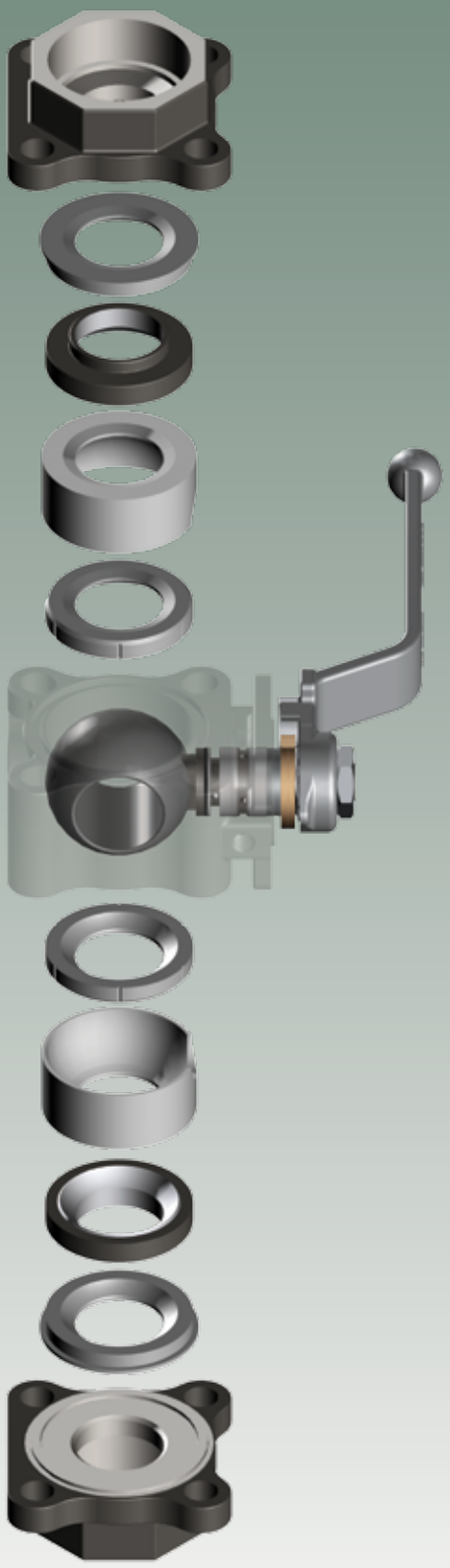
Seat and seal options for demanding design solutions



Seats and seals

A wide range of seat and seal materials are readily available to meet the most demanding applications including:

Buna, Delrin®, Nova, PEEK, EPDM, Viton®, PTFE, RTFE, TFM®, Grafoil, UHMWPE.

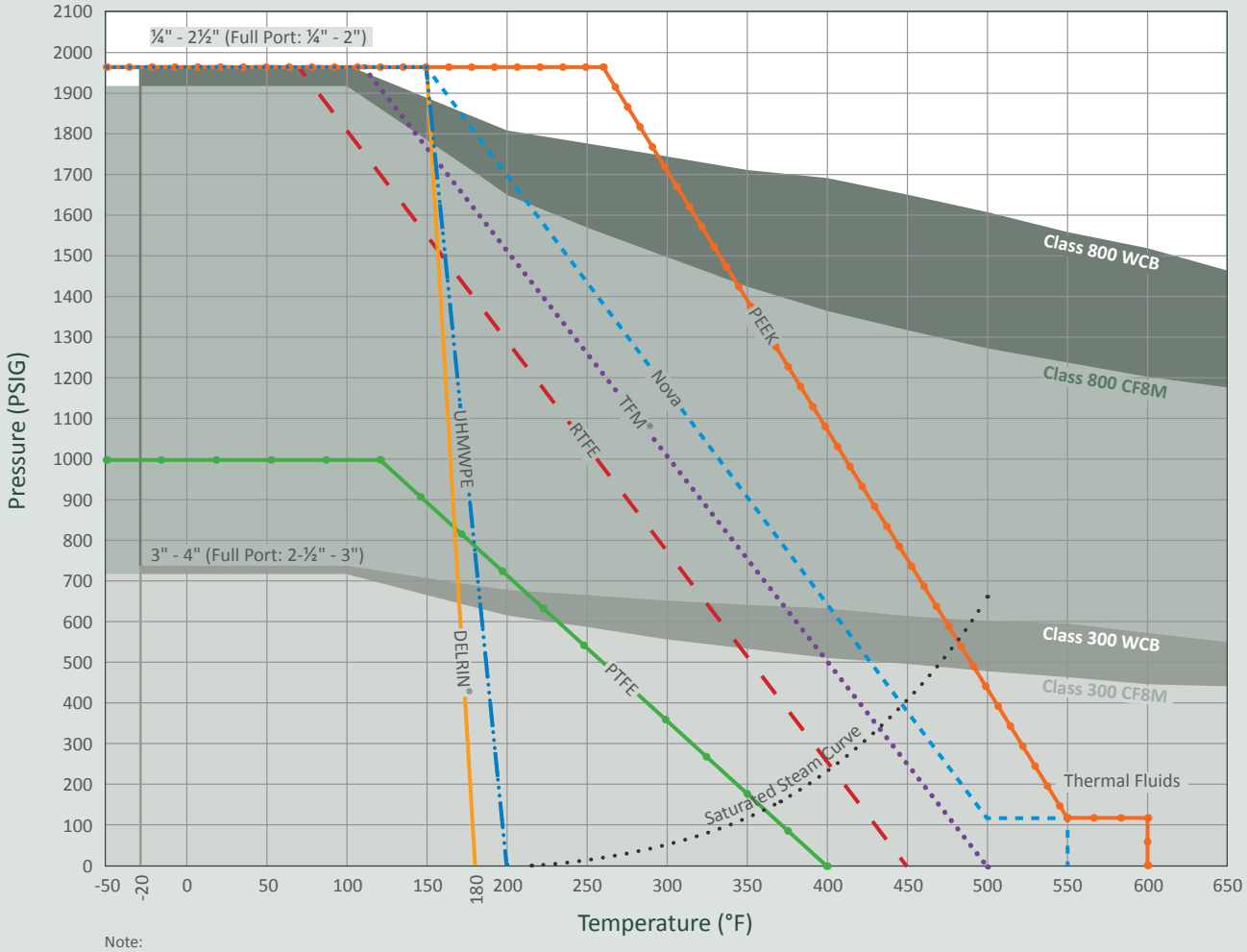
Seat designs

All the seats are designed with circumferential relief slots to equalize body pressure, reduce torque and assure leak-tight sealing.
Aside from standard seats, Sharpe also supplies numerous seats designated for specific applications, including, but not limited to:

- CAVITY FILLER SEATS
  Seats that eliminate the voids in the valve body cavity to minimize solidification of the media.
- DIVERTER SEATS
  Seats used in diverting or mixing applications where the flow plan governs seat type.
- METAL SEATS
  Metal seats are the only option where high temperatures, severe abrasion and corrosive fluids are involved.
- CAVITY PRESSURE RELIEF SEATS
  Seats designed to relieve pressure build-up in the body cavity.
- DOUBLE BLOCK & BLEED SEATS
  Seats with O-rings to enable shutoff on upstream and downstream.

VALVE SEATS

Pressure/Temperature Rating



Note:
The maximum pressure/temperature ratings of the valve assemblies are limited to lowest of the body or seat material fitted.
The valve body ratings are based on ASME B16.34 rating for materials.
The graphs are based on laboratory testing and our experience in field.
The seat ratings depend on the material, design, application and function.
For higher pressure rating above 2000 psig, please consult with Sharpe Valves.

Sharpe Seat Materials

PTFE
T - Virgin PTFE
Polytetrafluoroethylene is a Fluorocarbon-based polymer. This seating material has excellent chemical resistance and low coefficient of friction. Its temperature range is -100°F to 400°F (-73°C to 232°C). Color - white.

TFM
M - TFM® PTFE
Dyneon® TFM PTFE is a second generation PTFE with improved chemical and heat resistant properties over first generation PTFE and exhibits better stress recovery. Its temperature range is -100°F to 500°F (-73°C to 260°C) Color - white.

RTFE
R - Reinforced Polytetrafluoroethylene (RTFE 15% Glass Filled). PTFE's mechanical properties are enhanced by adding percentage of filler material to provide improved strength, stability and wear resistance. Its temperature range is from -320°F to 450°F (-196°C to 232°C). Color-off-white.

NOVA
N - Nova
This is a Teflon base filled with glass amorphous carbon powder and graphite. It has a lower thermal contraction-expansion than PTFE, and is ideal for steam or thermal fluid applications. Its temperature range is from -50°F to 550°F (-45°C to 288°C). Color - black.

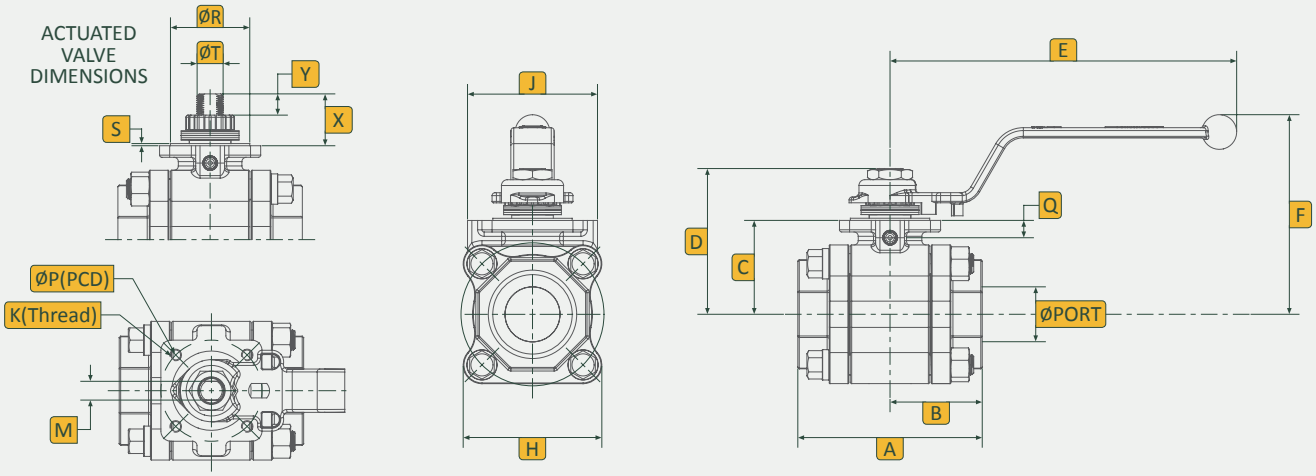
PEEK
P - PEEK (Unfilled) Polyetheretherketone
PEEK Polymer offers a unique combination of chemical, mechanical and thermal properties. Excellent for water and steam applications. Its temperature range is from -60°F to 600°F (-40°C to 315°C). Color - beige.

UHMWPE
U - Ultra High Molecular Weight Polyethylene (UHMWPE)
Also known as High Modulus Polyethylene (HMPE) or High Performance Polyethylene (HPPE).Very tough material.
It is highly resistant to corrosive chemicals, with the exception of oxidizing acids and organic solvents. This is rated to 2000 PSIG at temperatures from -70°F to 200°F (-57°C to 90°C). Color - white.

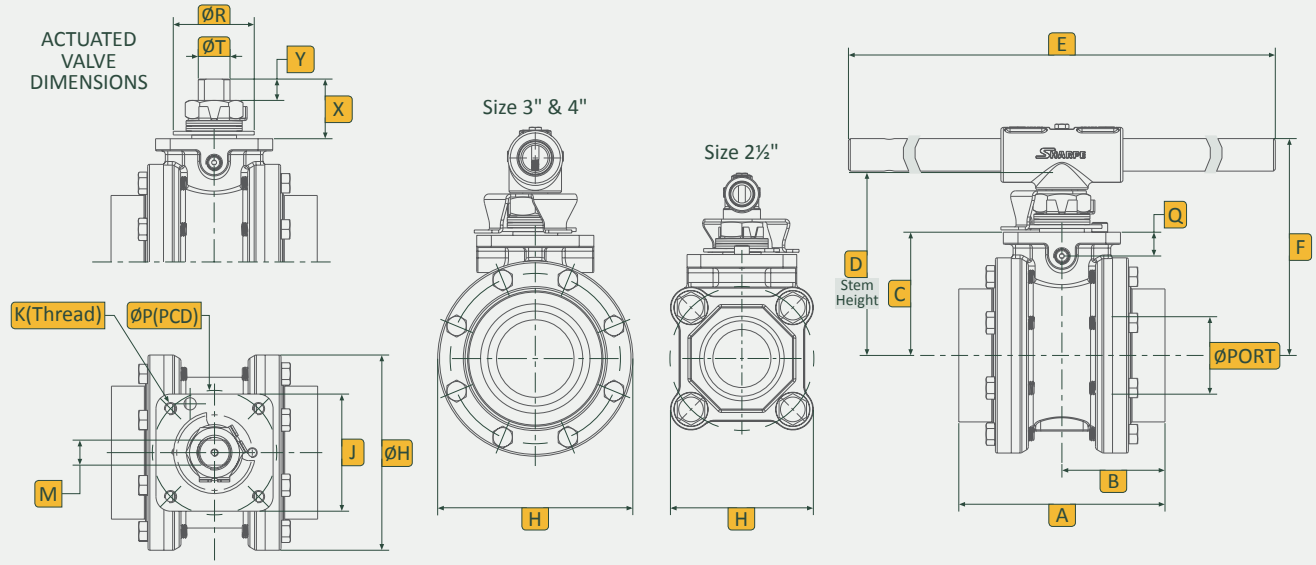
DELRIN
D - Delrin®
This material is very rigid and does not undergo cold flow.
It has a combination of strength, stiffness, hardness, dimensional stability, toughness, fatigue resistance, abrasion resistance, low wear and low friction. It can withstand pressure up to 6000 PSIG depending on valve size and class rating. Has a temperature range of -70°F to 180°F (-57°C to 82°C).

OTHER
Other seat materials
Other seat material are available according to the application, such as very high temperature or cryogenic conditions.

¼" - 2" Dimensions



2½" - 4" Dimensions



Dimensions (Metric)

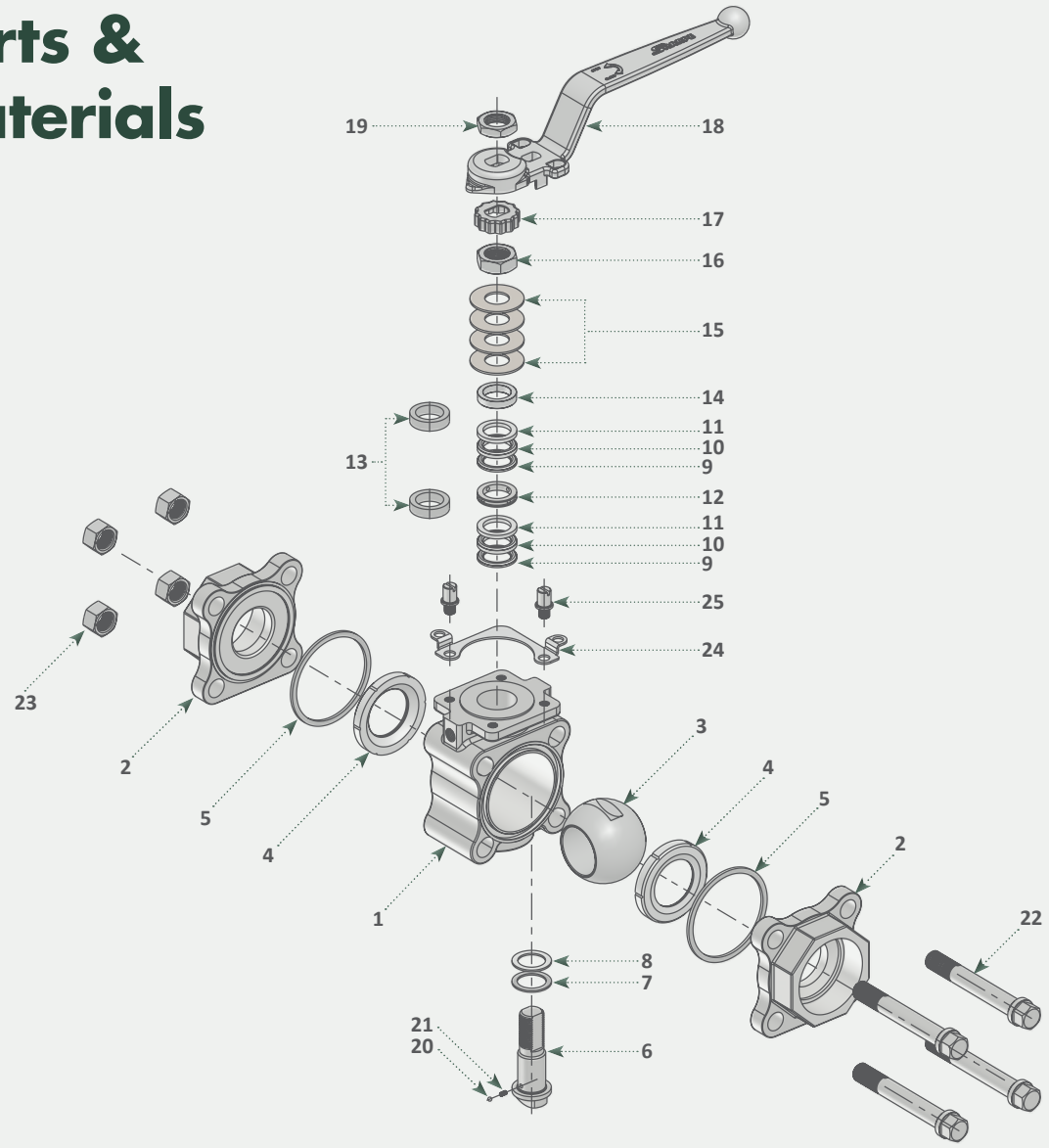
Standard Port	Full Port	ØPORT	A	B	C	D	E	F	H	J	K (Thread)	M	ØP (PCD)	Q	ØR	S	ØT	X	Y
80	89																		
¾"	¼", ⅜", ½"	14.3	78	39	36	55	163	90	49.5	49	M5-P0.8	6.7	42	6.9	30	1.3	10	18.7	8.3
1"	¾"	20.7	94.4	47.2	44.3	65.3	185	97.4	60.6	56	M6-P1.0	8.7	50	9.8	35	1.5	12	21	9.9
1¼"	1"	25.4	108	54	48.5	69.5	185	101.6	72.5	70	M6-P1.0	8.7	50	9.5	35	1.5	12	21	9.9
1½"	1¼"	31.5	116	58	61	97	240	134	80	70	M8-P1.25	13	70	12	55	1.5	18	35.9	14.7
2"	1½"	38	128	64	65	101	240	138	96	90	M8-P1.25	13	70	12	55	1.5	18	35.9	14.7
2½"	2"	50.8	161	80.5	91	134	400	161	125	96	M10-P1.5	16	102	19.3	NA	NA	22.5	43.1	13.4
3"	2½"	63.5	169	84.5	101	149	600	190	160	96	M10-P1.5	20.5	102	19.5	NA	NA	26	48.9	16
4"	3"	82.6	214	107	116.5	165	600	205	203	96	M10-P1.5	20.5	102	19.5	NA	NA	26	48.9	16

Dimensions (Inches)

Standard Port	Full Port	ØPORT	A	B	C	D	E	F	H	J	K (Thread)	M	ØP (PCD)	Q	ØR	S	ØT	X	Y
80	89																		
¾"	¼", ⅜", ½"	0.56	3.07	1.54	1.42	2.17	6.42	3.54	1.95	1.93	M5-P0.8	0.264	1.65	0.27	1.18	0.051	0.394	0.736	0.327
1"	¾"	0.81	3.72	1.86	1.74	2.57	7.28	3.83	2.39	2.20	M6-P1.0	0.343	1.97	0.39	1.38	0.059	0.472	0.827	0.390
1¼"	1"	1.00	4.25	2.13	1.91	2.74	7.28	4.00	2.85	2.76	M6-P1.0	0.343	1.97	0.37	1.38	0.059	0.472	0.827	0.390
1½"	1¼"	1.24	4.57	2.28	2.40	3.82	9.45	5.28	3.15	2.76	M8-P1.25	0.512	2.76	0.47	2.17	0.059	0.709	1.413	0.579
2"	1½"	1.50	5.04	2.52	2.56	3.98	9.45	5.43	3.78	3.54	M8-P1.25	0.512	2.76	0.47	2.17	0.059	0.709	1.413	0.579
2½"	2"	2.00	6.34	3.17	3.58	5.28	15.75	6.34	4.92	3.78	M10-P1.5	0.630	4.02	0.76	NA	NA	0.886	1.697	0.528
3"	2½"	2.50	6.65	3.33	3.98	5.87	23.62	7.48	6.30	3.78	M10-P1.5	0.807	4.02	0.77	NA	NA	1.024	1.925	0.630
4"	3"	3.25	8.43	4.21	4.59	6.50	23.62	8.07	7.99	3.78	M10-P1.5	0.807	4.02	0.77	NA	NA	1.024	1.925	0.630

The dimensions above are for information only. Please refer to Sharpe Valves if you need dimensions for construction.

Parts & Materials



Sizes ½" - 2" (¼" - 1½" Full Port)

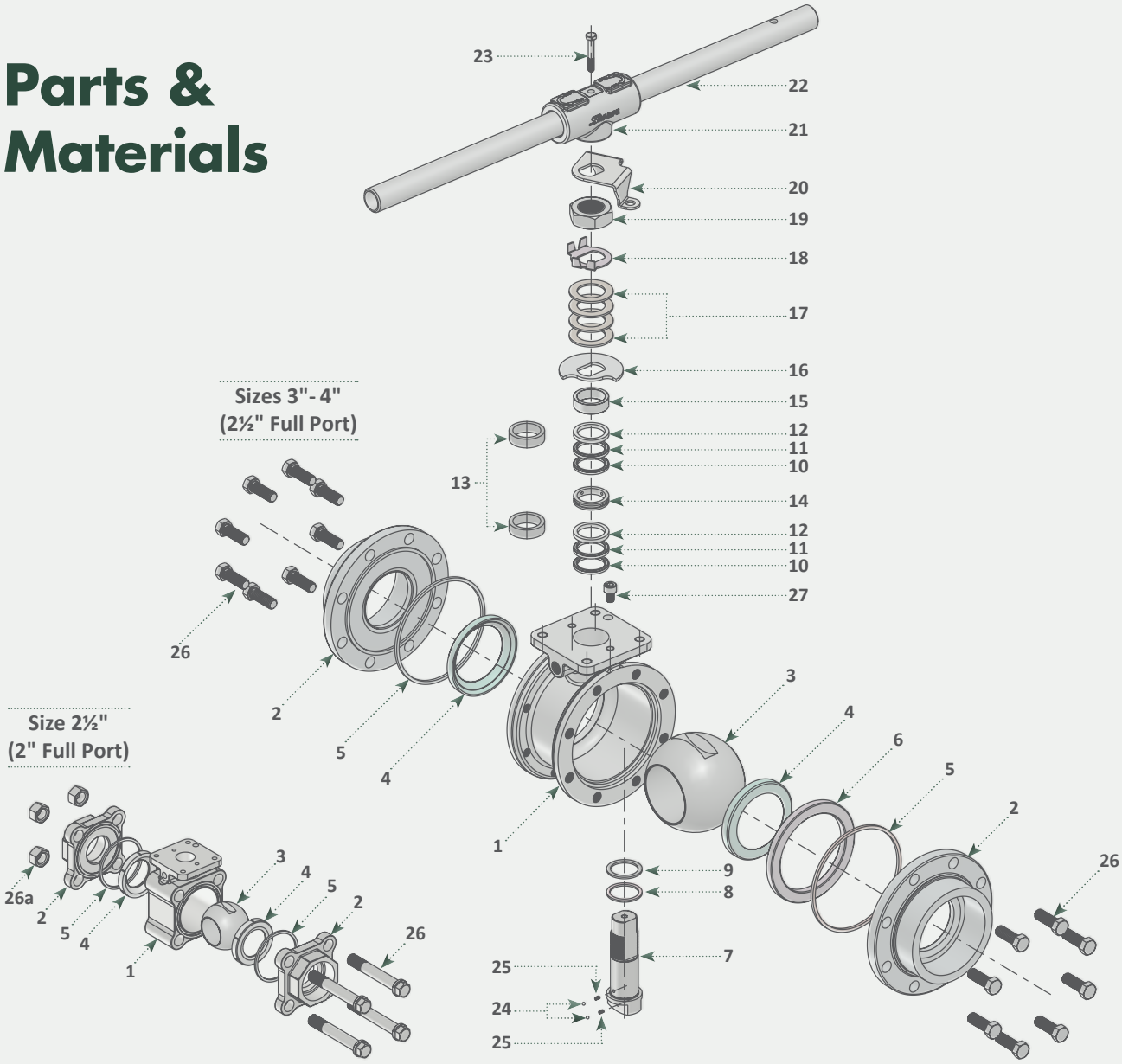
ITEM	DESCRIPTION	MATERIAL	QTY
1	Body	Stainless Steel ASTM A351 CF8M Carbon Steel ASTM A216 WCB SMO ASTM A351 CK3MCuN Alloy 20 ASTM A351 CN7M Hastelloy C ASTM A494 TYPE CW-12MW Monel ASTM A494 GR M35-1	1
2	End Cap	Stainless Steel ASTM A351 CF8M/CF3M Carbon Steel ASTM A216 WCB SMO ASTM A351 CK3MCuN Alloy 20 ASTM A351 CN7M Hastelloy C ASTM A494 TYPE CW-12MW Monel ASTM A494 GR M35-1	2
3	Ball	316 Stainless Steel Carbon Steeel Alloy 20 SMO 254® Hastelloy C Monel	1
4*	Seat	PTFE, RTFE, TFM®, Nova, PEEK, DELRIN®, UHMWPE	2
5*	Body Seal	PTFE, RTFE, Graphite, Viton®	2
6	Stem	316 Stainless Steel SMO 254® Alloy 20 17-4PH Hastelloy C Monel Inconel	1

ITEM	DESCRIPTION	MATERIAL	QTY
7*	Thrust Bearing - Bottom	PEEK, UHMWPE, NYLATRON	1
8*	Thrust Bearing - Top	Nova, PEEK, UHMWPE, NYLATRON	1
9*	Stem Packing - Bottom	PTFE, TFM®, Nova	2
10*,**	Stem Packing - Middle	PTFE, TFM®, Nova	2
11*	Stem Packing - Top	PTFE, TFM®, Nova	2
12*	Lantern Ring	Stainless Steel	1
13*	Stem Packing	Graphite (Firesafe or high temperature)	2
14	Gland	Stainless Steel	1
15	Belleville Washer	S.ST 17-7	4
16	Packing Nut	Stainless Steel	1
17	Lock Tab	Stainless Steel	1
18	Handle	ASTM A351 CF8	1
19	Handle Nut	Stainless Steel	1
20	Anti - Static Ball	Stainless Steel	1
21	Anti - Static Spring	Hard Drawn	1
22	Body Bolt	A193 Gr. B8M or B8	4
23	Body Nut	A194 Gr. 8	4
24	Lock Plate	Stainless Steel	1
25	Stop Pin	Stainless Steel	2

The quantities listed in the stem arrangement are for fugitive emission assemblies. Standard stem assemblies carry more seals and no lantern rings.

*** these parts are used in repair kits. ** middle stem packing is only used from size 1-1/2" and above.**

Parts & Materials



Sizes 2½" - 4" (2" - 3" Full Port)

ITEM	DESCRIPTION	MATERIAL	QTY
1	Body	Stainless Steel ASTM A351 CF8M Carbon Steel ASTM A216 WCB SMO ASTM A351 CK3MCuN Alloy 20 ASTM A351 CN7M Hastelloy C ASTM A494 TYPE CW-12MW Monel ASTM A494 GR M35-1	1
2	End Cap	Stainless Steel ASTM A351 CF8M/CF3M Carbon Steel ASTM A216 WCB SMO ASTM A351 CK3MCuN Alloy 20 ASTM A351 CN7M Hastelloy C ASTM A494 TYPE CW-12MW Monel ASTM A494 GR M35-1	2
3	Ball	Stainless Steel Carbon Steeel Alloy 20 SMO 254® Hastelloy C Monel	1
4*	Seat	PTFE, RTFE, TFM®, Nova, PEEK, DELRIN®, UHMWPE	2
5*	Body Seal	PTFE, RTFE, Graphite, Viton®	2
6	Seat Ring	ASTM A351 CF8M / CF3M ASTM A216 WCB	1
7	Stem	316 Stainless Steel SMO 254® Alloy 20 17-4PH Hastelloy C Monel Inconel	1

ITEM	DESCRIPTION	MATERIAL	QTY
8*	Thrust Bearing - Bottom	PEEK, UHMWPE, NYLATRON	1
9*	Thrust Bearing - Top	Nova, PEEK, UHMWPE, NYLATRON	1
10*	Stem Packing - Bottom	PTFE, TFM®, Nova	2
11*	Stem Packing - Middle	PTFE, TFM®, Nova	2
12*	Stem Packing - Top	PTFE, TFM®, Nova	2
13*	Stem Packing	Graphite (Firesafe or high temperature)	2
14	Lantern Ring	Stainless Steel	1
15	Gland	Stainless Steel	1
16	Stop Plate	Stainless Steel	1
17	Belleville Washer	S.ST 17-7	4
18	Lock Tab	Stainless Steel	1
19	Packing Nut	Stainless Steel	1
20	Lock	Stainless Steel	1
21	Wrench Block	Stainless Steel ASTM A351 CF8	1
22	Handle Pipe	Stainless Steel	1
23	Wrench Bolt	Stainless Steel	1
24	Anti-Static Ball	Stainless Steel	2
25	Anti-Static Spring	Hard Drawn	2
26/26a	Body Bolt / Body Nut	A193 Gr. B8M / A194 Gr. 8	4/16
27	Stop Pin	Stainless Steel	1

The quantities listed in the stem arrangement are for fugitive emission assemblies. Standard stem assemblies carry more seals and no lantern rings.
*** these parts are used in repair kits.**

How To Order Series 80/89

1"	FS80	-	4	4	6	6	R	G	G	-	SW/TE	-	W	-	OH
Size	Series		Body	Ends	Ball	Stem	Seat	Seal	Stem Packing		Ends		Service		Options

Size

¼"
⅜"
½"
¾"
1"
1¼"
1½"
2"
2½"
3"
4"

Series

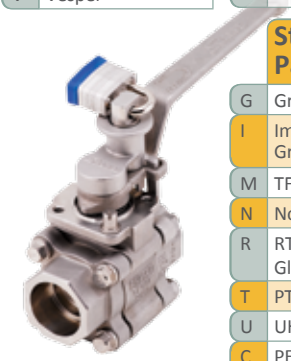
80	Standard Port
89	Full Port
FS80	Fire Safe
FS89	Fire Safe
CF80	Cavity Filler
CF89	Cavity Filler
V80	Control
V89	Control

Body/Ends Ball/Stem

1	Brass
2	Alloy 20
3	Monel
4	Carbon Steel
5	Hastelloy C
6	316 Stainless Steel
7	17-4 PH
8	316L Stainless Steel
9	Carbon Steel LCB
B	Bronze
D	Duplex
E	304 Stainless Steel
F	304L Stainless Steel
I	Inconel
K	Super Duplex
S	SMO 254®
T	Titanium Gr2
W	Hastelloy C22
X	AL6XN
Z	Inconel 718

Seat

B	TFM® Carbon Filled
C	PEEK Carbon Filled
D	Delrin®
K	PCTFE (KEL-F)
M	TFM®
N	Nova
P	Virgin PEEK
R	RTFE 15% Glass Filled
T	PTFE
U	UHMWPE
V	Vespel®



Body Seal

A	Buna Sh90
B	Buna
E	EPDM
G	Graphite
I	Impregnated Graphite
M	TFM®
O	Neoprene
T	PTFE
U	UHMWPE
V	Viton®
Z	Kalrez®

Stem Packing

G	Graphite
I	Impregnated Graphite
M	TFM®
N	Nova
R	RTFE 15% Glass Filled
T	PTFE
U	UHMWPE
C	PEEK Carbon Filled

Ends

TE	Threaded / NPT
TEB	Threaded / BSPT
BW5	Buttweld SCH 5
BW10	Buttweld SCH 10
BW40	Buttweld SCH 40
BW80	Buttweld SCH 80
SW	Socketweld
FB	Flush Bottom
1	150# Flanged RF
3	300# Flanged RF
6	600# Flanged RF
EBW	Extended BW
ESW	Extended SW

Service

X	Oxygen Service
U	Vacuum
MN	Ammonia Service
CL	Chlorine
W	Thermal Oil/Steam

Options

OH	Oval Handle
F1	1 Emission Port
F2	2 Emission Port
L	Lockable Ext Stem
GO	Gear Operator
A	NACE
VB	Vented Ball
NS	Anti-Static
SJ	Steam Jacket
SJ3	Steam Jacket With 3 Outlets
DBB	Double Block & Bleed
TP	Tamper Proof Locking Device
DMH	Spring Return Handle
HC	High Cycle Stem
AP4	API 608 Gland (4" Only)
V15	V-Ball V15
V30	V-Ball V30
V60	V-Ball V60

When placing an order or requesting a quotation, please provide as many details on the application as possible such as media type, temperature, pressure, pipe size, etc.

Example: **2" FS80-4467NGG-SW/TE-A-TP**
Size 2", fire safe, series 80, carbon steel body and ends, stainless steel ball, 17-4PH stem, Nova seats, graphite body seals, graphite stem seals, threaded ends, NACE, tamper proof locking device.

Technical Information

VALVE SIZE	FLOW COEFF. Cv	FLOW COEFF. Kv	EQUIV. LENGTH. PIPE (feet)	EQUIV. LENGTH. PIPE (meters)	APPROX. WEIGHT (lbs.)
¼", ⅜", ½"	12	10.3	1.9	0.58	2.0
¾"	12	10.3	5.0	1.52	2.0
1"	32	27.6	3.1	0.94	4.0
1¼"	46	39.7	3.4	1.04	6.0
1½"	80	69.0	4.3	1.31	9.0
2"	120	103	7.5	2.29	12.0
2½"	240	207	5.0	1.52	27.0
3"	350	302	8.3	2.53	32.0
4"	720	621	10.4	3.17	53.0

Applicable Standards

Body Wall Thickness	ASME B16.34
SW & Threaded Ends	ASME B16.11
Butt-Weld Ends	ASME B16.25
Flange Dimensions	ASME B16.5
Basic Design	ASME B16.34, API 608 4th Ed
Fire Safe	API 607 6th Ed
Pressure Test	API 598, MSS-SP 72
Mounting Dimensions	ISO 5211
NACE	MR0175/ISO 15156
Marking	MSS-SP 25

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