FLOWSERVE

Durco PlugSeal™ Valve

ASME Class 600 Plug Valves

Serving the Worldwide Desalination Industry

Experience In Motion

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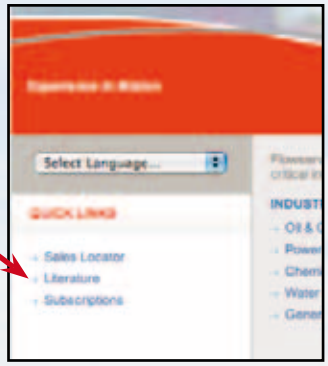

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Other useful information

In addition to the PlugSeal™ valves, information on other valves relevant to the desalination industry is available:

Lined ball valves, check valves and sight glasses..... (document no. ATENTB0010)

High performance butterfly valves. (document no. DVENTB0039)

Worcester ball valves ..... (document no. WCABR1050)

Durco plug valves ..... (document no. DVABR0024)

Finally, a wide variety of metallic and lined rotary valves and actuation equipment is summerized in the document no. DVENBR0001.

To obtain any of these documents, follow the simple steps on the left of this page and enter the document no. in step 3.



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Ordering Preprinted Literature

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History

For 70 years, Flowserve Durco has been a leader in developing and producing non-lubricated plug valves for a wide range of industrial applications.

We are proud to introduce the PlugSeal™ plug valves which leverage our expertise in plug valves and adapt them for usage in the expanding seawater reverse osmosis desalination industry.

Design Parameters

PlugSeal™ valves have been designed with following parameters to suit the SWRO desalination industry:

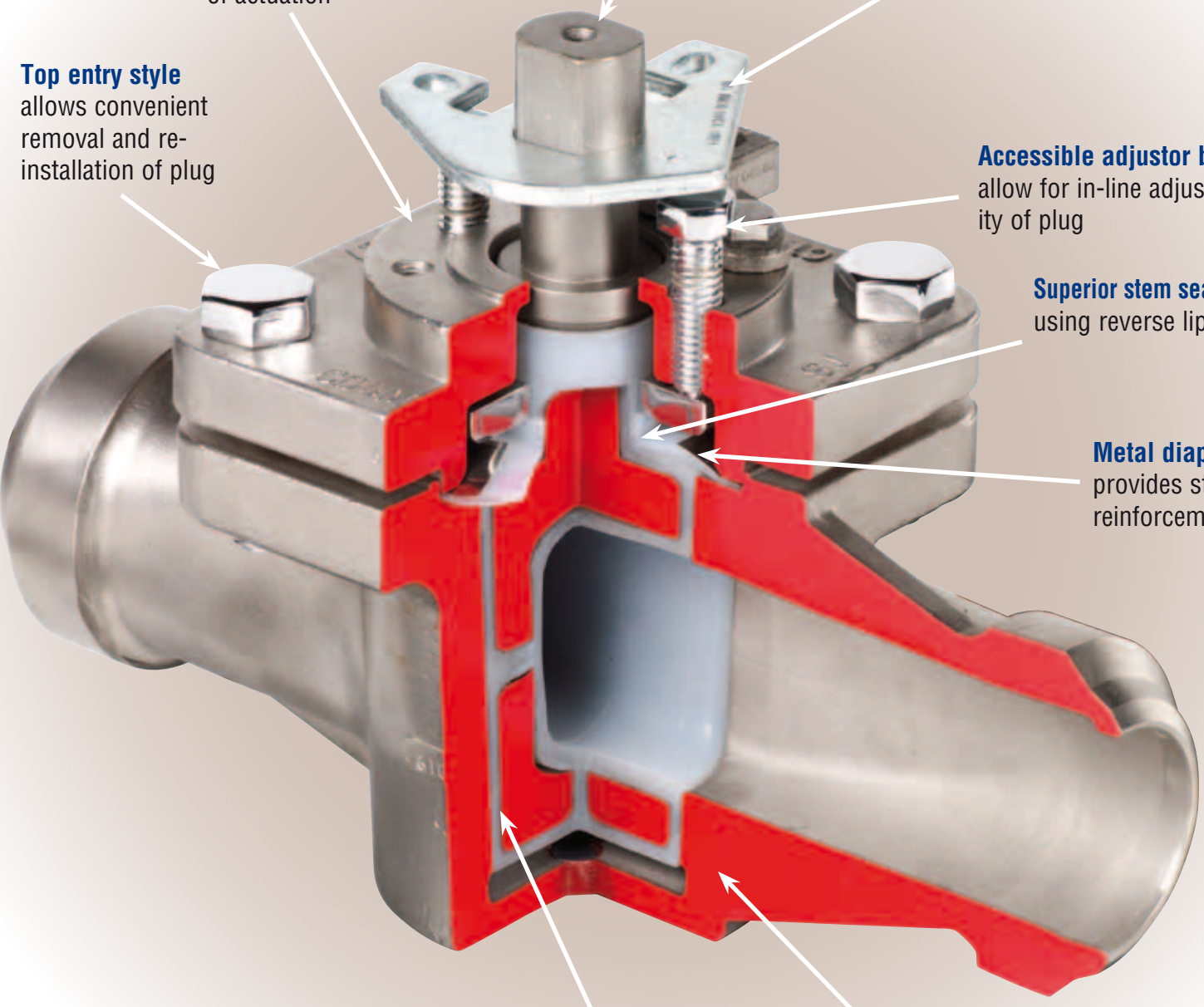
- *Positive Shutoff*
- *Full Rated ASME Cl. 600*
- *Butt Weld or flanged*
- *904L SS or Super Duplex SS (other materials available)*
- *Size capability to 16”*
- *In-line repairability*

Materials

Standard materials include the following:

- Super Duplex Stainless Steel ASTM A995 Gr. 5A
- 904L stainless steel UNS N08904
- 254SMO ASTM A351/A744 Gr. CK3MCuN
- CD4MCuN ASTM A995 Gr 1B

Features



Double-D plug stem
accepts most standard actuation equipment

OSHA lockout mechanism
is standard on wrench operated valves

ISO 5211 mounting pad
allows interchangeability of actuation

Top entry style
allows convenient removal and re-installation of plug

Accessible adjustor bolts
allow for in-line adjustability of plug

Superior stem sealing system
using reverse lip diaphragm

Metal diaphragm
provides stem seal reinforcement

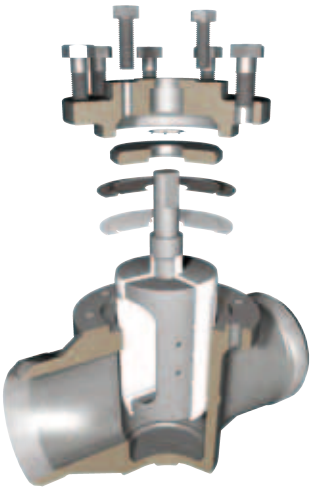
Tapered plug design
allows valve to be re-seated externally after long term wear on the sleeve

Machined body
allows easy turning motion

Lined Plug

- PFA-lined plug exploits Durco's 60 years of experience in designing plastic-lined products.
- Usage of a lined plug eliminates the requirement for a sleeve which is often difficult and expensive to replace.
- After plug is worn it can be economically replaced.
- Plug is standard with substrate of ductile iron with option in CD4M or other materials.

In-Line Repair



- The efficient, simple design of the PlugSeal™ allows for quick, understandable repair without removal of the valve from the process line.
- PlugSeal™ design facilitates buttweld welding process by allowing the internal parts to be removed before valve body is welded into pipeline. After welding, valve can be easily re-assembled. It is understood that the re-assembled valve should be re-tested along with the rest of the system prior to start-up.

Secure Stem Sealing

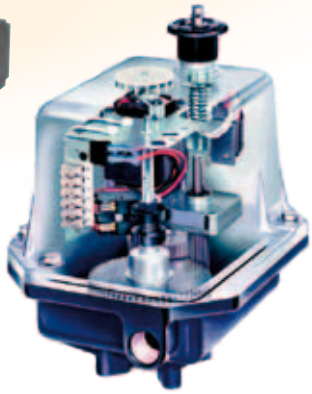
- A dynamic self-adjusting, self energized reverse lip PFA diaphragm seal prevents stem leakage.
- If line pressure forces liquid to the stem seal area, the self-energizing reverse lip PFA diaphragm will be forced against the stem to prevent external leakage.

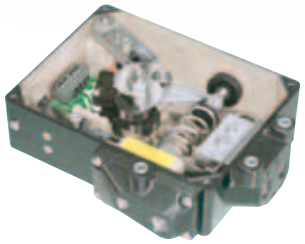
Automated Systems

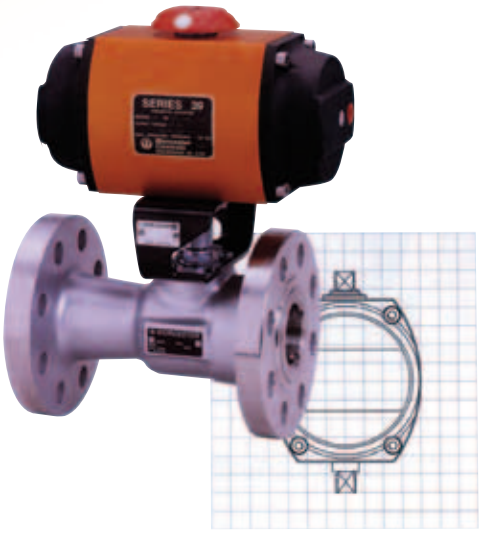
FLOWSERVE offers Automax, Norbro and Worcester Actuators and Instrumentation allowing us to supply complete automated on-off or modulating packages to meet exacting technical requirements.
Durco PlugSeal™ valves are readily adaptable for automatic operation because the torque is relatively constant and lubrication is not required.
Flowserve, a specialist in complete automation systems, produces a broad line of rack and pinion, heavy duty, electric and linear actuators. In addition, a comprehensive line of engineered special control circuits, solenoid valves, limit switches positioners and actuator mounting kits is offered.

Our wide range of electrical and pneumatic instrumentation incorporates:

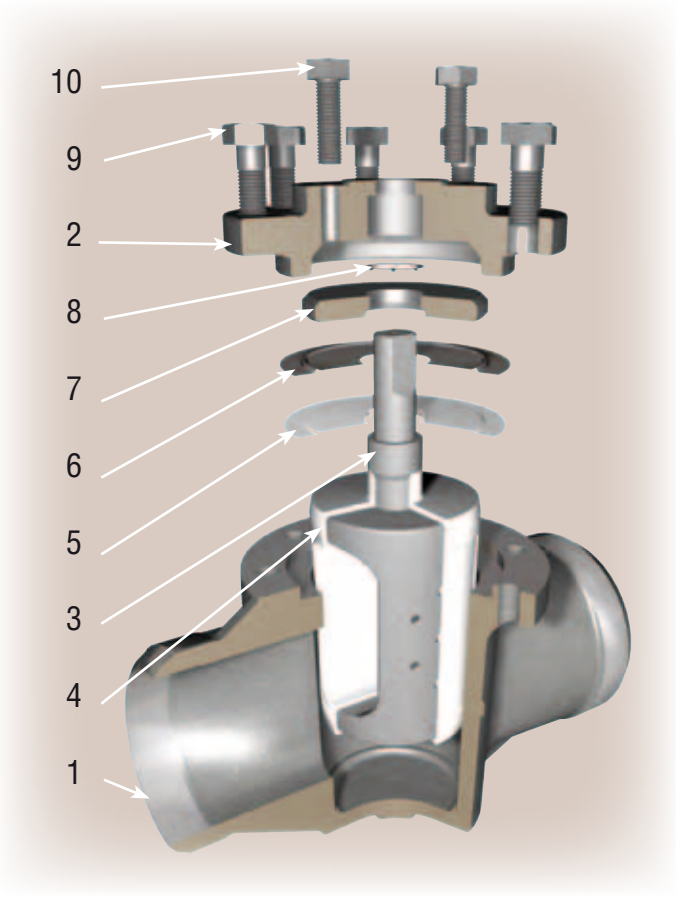
- *Digital network communication*
- *Superior diagnostics*
- *Intelligent valve controllers*
- *Comprehensive user-friendly software*
- *On-line accessible automated drawing system*
- *Control sizing software*
- *Actuator sizing software*







Parts List



Item	Designation	Material
1	Body	See Material list below
2	Top cap	ASTM A 351/995 Grade CD4MCuN (CD4M)
3	Plug insert	ASTM A395 Grade 60-40-18 (DCI)
4	Plug coating	Perfluoroalkoxy (PFA)
5	Primary diaphragm	Perfluoroalkoxy (PFA)
6	Secondary diaphragm	ASTM A666 Type 302 SS (B)
7	Thrust collar	ASTM A666 Type 304 SS (E)
8	Grounding spring	ASTM A666 Type 302 SS (B)
9	Top cap bolting	ASTM A193 Gr. B7 Yellow Zinc Dichromate Plated (B7YC)
10	Thrust collar bolting	ASTM Grade 193 B7 Yellow Zinc Dichromate Plated (B7YC)

Applicable Valve Standards

Specification	Title
ASME B16.34	Steel valves, flanged and buttweld
ASME B16.9	Factory-made wrought buttweld fittings
ASME B16.10	Face-to-face dimensions
ASME B16.25	Buttweld ends
ISO 5211	Actuator attachment
API 598	Valve Inspection and Test
MSS SP-61	Hydrostatic testing

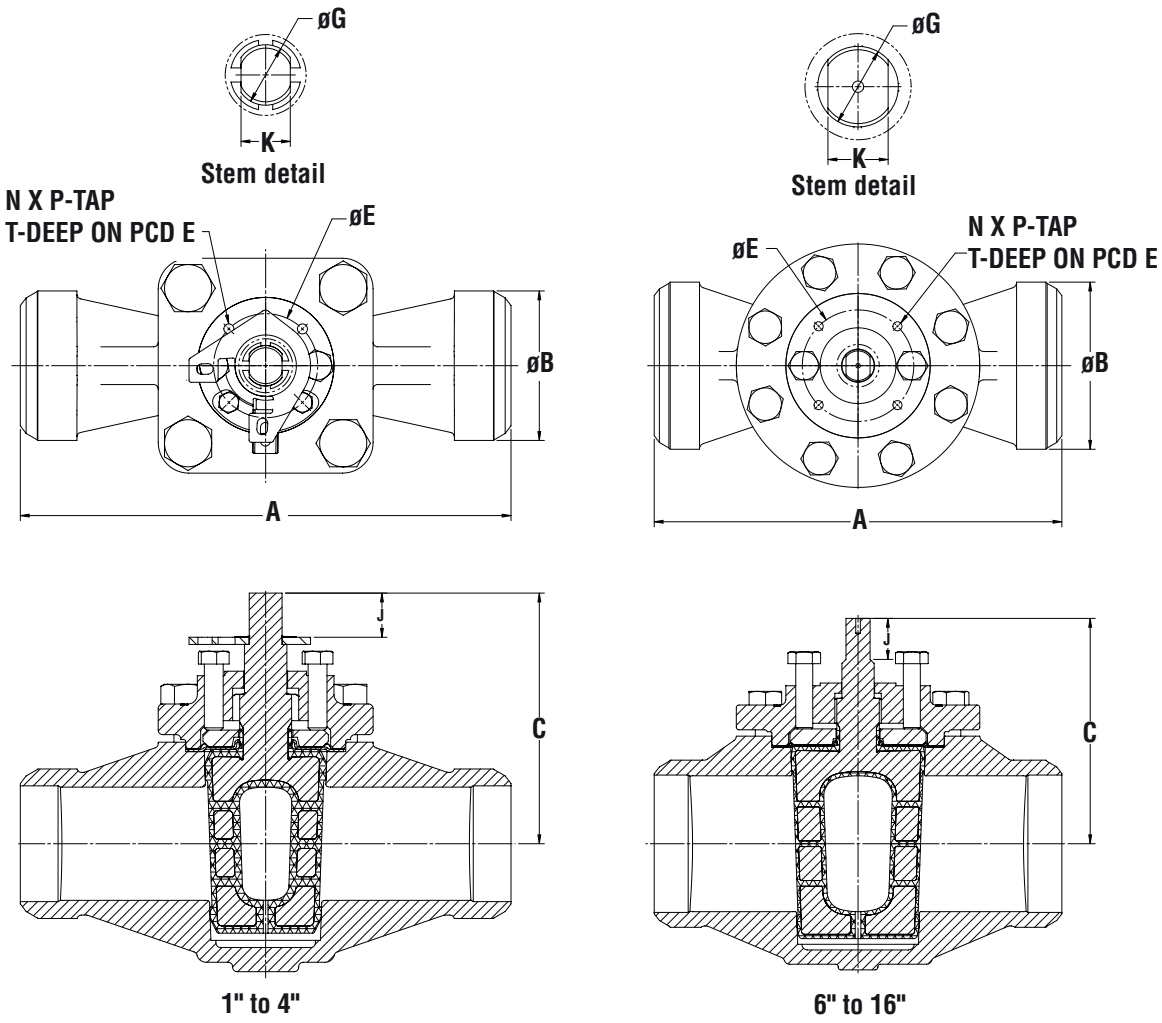
Material Selection Chart*

Super Duplex Stainless Steel ASTM A995 Gr. 5A
904L stainless steel UNS N08904
254SMO ASTM A351/A744 Gr. CK3MCuN
CD4MCuN ASTM A995 Gr 1B**
304 stainless steel ASTM A351/A744 Gr. CF8M
316 stainless steel ASTM A351/A744 CF8
Durimet 20 ASTM A351/A744 Gr.CN-7M**
Monel 400 ASTM A494 Gr.M35-2 and M35-1
Chlorimet 2 ASTM A494 Gr.N-7M**
Chlorimet 3 ASTM A494 Gr. CW-6M**
Inconel 600 ASTM A494 Gr, CY-40

* This list indicates several of our common materials; however any of the wide range of Flowserve materials can be used. Please contact your Flowserve representative for specialized material requirements.

** To facilitate welding and post-weld heat treatment of these materials, pipe stubs are required.

Dimensions inch (mm)



Valve Size in. (mm)	A	ØB	C	ØE	J	ØG	K	Drilling No.	Drilling Size	Depth	Weight lbs.	Weight kg
1 25	8,50 215,9	1,56 39,6	4,28 108,7	1,65 42,0	0,81 20,6	0,78 19,9	0,66 16,7	4	M5X0.8	0,39 10,0	12	6
2 50	11,50 292,1	2,96 75,2	5,70 144,8	2,76 70,0	1,17 29,7	1,07 27,2	0,87 22,1	4	M8X1.25	0,45 11,4	27	12
3 80	13,00 330,2	3,96 100,6	6,64 168,7	2,76 70,0	1,17 29,7	1,07 27,2	0,87 22,1	4	M8X1.25	0,63 16,0	43	20
4 100	14,00 355,6	5,00 127,0	7,66 194,6	4,02 102,1	1,17 29,7	1,07 27,2	0,87 22,1	4	M10X1	0,79 20,0	75	34
6 150	18,00 457,2	7,38 187,5	9,95 252,7	4,92 125,0	1,81 36,2	1,43 36,2	1,06 27,0	4	M12X1.75	0,95 24,0	183	83
8 200	20,50 520,7	9,60 243,8	11,94 303,3	4,92 125,0	1,81 36,2	1,43 36,2	1,06 27,0	4	M12X1.75	0,95 24,0	310	141
10 250	22,00 558,8	11,57 293,8	13,83 351,3	5,51 140,0	2,13 54,0	1,90 48,2	1,42 36,0	4	M16X2	1,00 25,4	481	218
12 300	25,00 635,0	14,13 358,9	15,11 383,8	6,50 165,0	2,13 54,0	2,37 60,2	1,81 46,0	4	M20X1.5	1,13 28,6	739	335
14 350	30,00 762,0	15,46 392,7	15,63 397,0	10,00 254,0	2,50 63,5	2,84 72,2	2,17 55,0	8	M16X2	1,00 25,1	1074	487
16 400	33,00 838,2	17,38 441,5	19,55 496,6	10,00 254,0	2,50 63,5	2,84 72,2	2,17 55,0	8	M16X2	1,26 32,0	1548	702

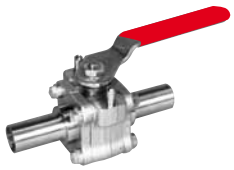
Notes: 1. All top cap fasteners must have a min. yield strength or 40,000 psi
2. Stop collar to be replaced with special pointer when mounting actuator
Dimensions shown are nominal dimensions. For toleranced dimensions, consult the factory. Certain valve features may not be shown pictorially.
Consult the factory if design of attachment is considered.
All weights include lever or gear.

FLOWSERVE offers a wide variety of valves suited to the desalination industry:

- **Atomac lined products**
  are perfect for use on the wide variety of chemicals applications used in the desalination process.

- **Durco Butterfly Valves**
  are ideal for handling large volume flows of seawater. These valves are available in a great variety of metallic and non-metallic materials including several alloys that are resistant to chloride attack.

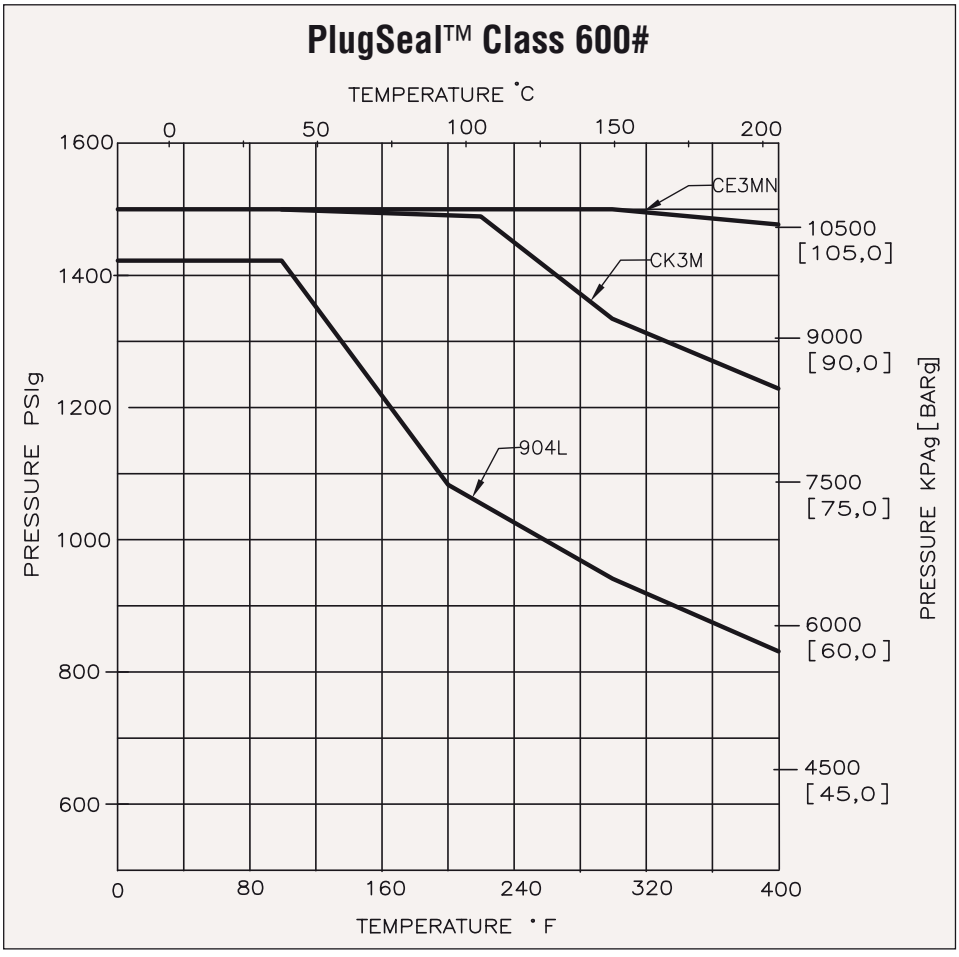
- **Worcester Valves**
  are the world's most respected ball valves. They can be used for a wide variety of general purpose applications in a desalination plant.



- **Durco Plug Valves**
  are rated up to ASME Cl. 600 for high pressure applications in membrane area. Available in Super Duplex SS, 904L SS, 254SMO. In-line repairable styles are perfect for applications where valves are buttwelded into line.

Pressure - Temperature Ratings

Values given are in accordance with ASME B16.34. For materials of other construction than those shown consult the factory.



How to Specify PlugSeal™ Valves

Example: 14-PS-63C-ZUOA-9-N-33W
14" Durco PlugSeal™, ASME Class 600, buttweld, 2-way, body in CE3MN, plug is PFA encapsulated ductile iron, top cap is in CD4M, bare stem, fasteners in B7.

Valve size
01 = 1 in. (25 mm)
02 = 2 in. (50 mm)
03 = 3 in. (80 mm)
04 = 4 in. (100 mm)
06 = 6 in. (150 mm)
08 = 8 in. (200 mm)
10 = 10 in. (250 mm)
12 = 12 in. (300 mm)
14 = 14 in. (350 mm)
16 = 16 in. (400 mm)
18 = 18 in. (450 mm)

Product Family
PS = PlugSeal standard valve

Pressure Class[1]
6 = ASME Cl. 600

End Configuration
3 = Buttweld

Plug Style
C = 2-Way

Body Alloy	Plug Alloy	Top Cap Alloy
0 = CD4M	0 = CD4M	0 = CD4M
1 = 316 SS	1 = 316 SS	D = Ductile iron
2 = Alloy 20	2 = Alloy 20	L = 304L SS
3 = Monel	3 = Monel	2 = Alloy 20
4 = Nickel	4 = Nickel	3 = Monel
5 = Hastelloy B	5 = Hastelloy B	4 = Nickel
6 = Hastelloy C276	6 = Hastelloy C276	5 = Hastelloy B
9 = 304L SS	9 = 304L SS	6 = Hastelloy C276
J = 304 SS	J = 304 SS	N = Inconel
K = 254SMO	K = 254SMO	
L = 316L SS	L = 316L SS	
M= Uranus B6	M= Uranus B6	
N = Inconel	N = Inconel	
R = Hastelloy C22	R = Hastelloy C22	
T = 904L SS	T = 904L SS	
	U = Ductile iron	
Z = CE3MN		

Note: CE3MN is super duplex SS material A995 Gr. 5A

Options
W = Standard

Adjuster fastener
1 = B840
2 = B9
3 = B7
4 = B7MT
5 = C20
6 = HC
7 = 1718
9 = B7M
0 = B7MZ
A = B8MC1
B = B16
C = B8MC2
D = 1625
F = L7M
I = 1828
L = L7
T = B7T
Z = B7YC

Top Cap Fastener
1 = B840
2 = B9
3 = B7
4 = B7MT
5 = C20
6 = HC
7 = 1718
9 = B7M
0 = B7MZ
B = B16
C = B8MC2
D = 1625
F = L7M
I = 1828
L = L7
T = B7T
Z = B7YC

Manufacturers code
M = US casting
N = International casting

Operator
0 = Std. Wrench
1 = Gear Cl
9 = Bare stem

Plug coating
A = PFA

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