

FORCE[®]

CRYOGENIC BALL VALVE

API 6D

FORCE branded ball valves for cryogenic service have been developed to meet the most advanced and demanding technological standards. We offer stainless steel cryogenic trunnion and floating ball valves for processing, storage, shipment and distribution of ethylene, LPG, LNG, and other low temperature cryogenic fluids down to -196°C (-320°F). All valves are compliant with API 6D, ASME B16.34 and NACE MR 0175.



Specifications

- Trunnion Mounted Valve Offering:
 - ASME CL 150 to 900, Sizes 2" - 8"
 - ASME CL 1500, Size 2"
 - Seat designs available:
 - DBB (self relieving x self relieving)
 - DIB2 (self relieving x double piston effect)
- Floating Valve Offering:
 - ASME CL 150, Sizes 2" - 4"
- End Connections: RF and RTJ
- Full port
- Blowout proof stem
- Anti-static design
- Fire safe design

Standards

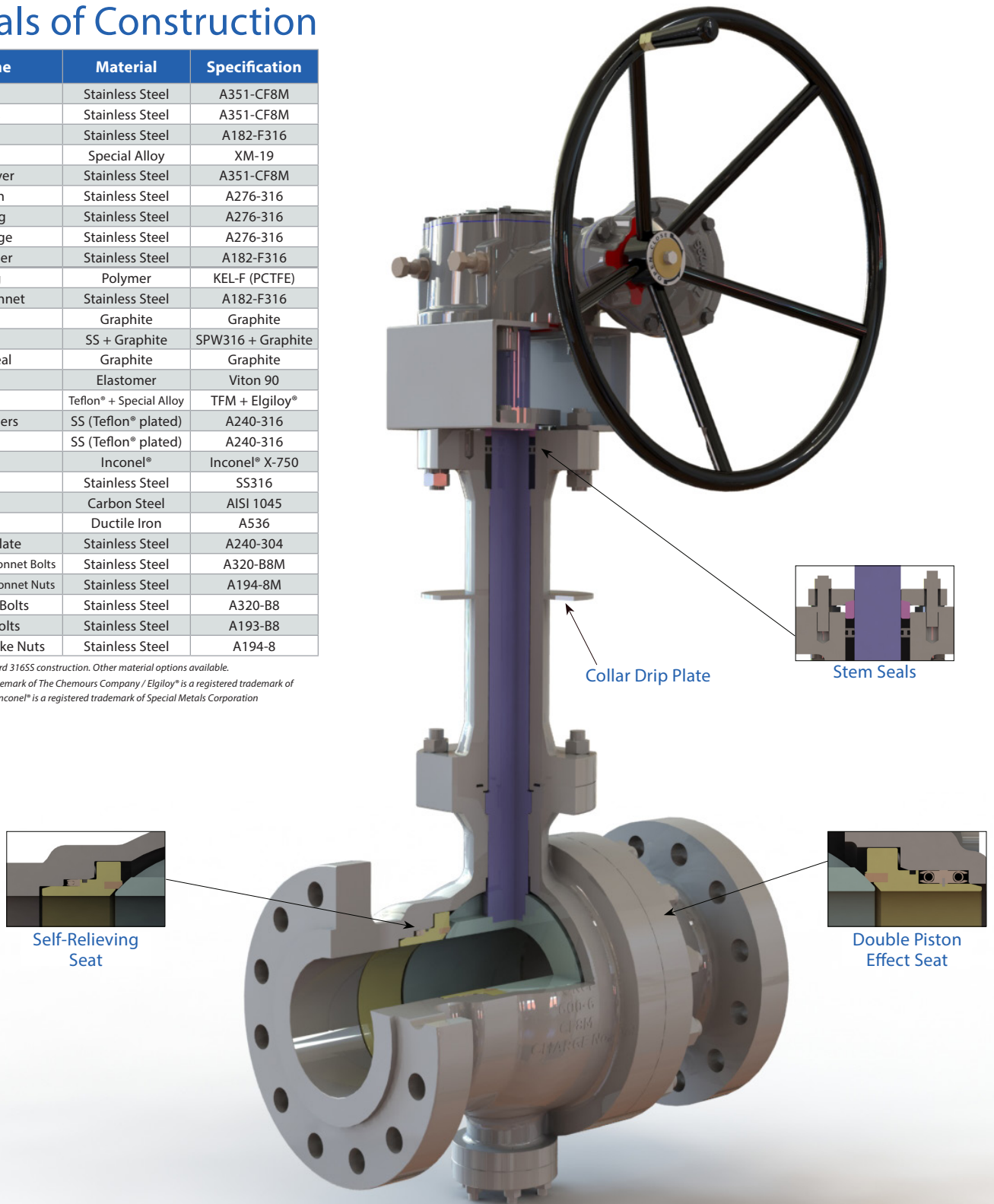
- Design/Material: API 6D / ASME B16.34
- Inspection & Testing: API 6D / MSS SP134
- End to End: ASME B16.10
- Flanged End: ASME B16.5
- Mounting: ISO 5211
- NACE MR 0175/ISO 15156-1 Compliant (non-exposed bolting)
- Design Temp: -320°F to 212°F (-196°C to 100°C)

Materials of Construction

Part Name	Material	Specification
Body	Stainless Steel	A351-CF8M
End Caps	Stainless Steel	A351-CF8M
Ball	Stainless Steel	A182-F316
Stem	Special Alloy	XM-19
Bottom Cover	Stainless Steel	A351-CF8M
Stem Bush	Stainless Steel	A276-316
Gland Ring	Stainless Steel	A276-316
Gland Flange	Stainless Steel	A276-316
Seat Retainer	Stainless Steel	A182-F316
Seat Ring	Polymer	KEL-F (PCTFE)
Extended Bonnet	Stainless Steel	A182-F316
Packing	Graphite	Graphite
Gaskets	SS + Graphite	SPW316 + Graphite
Retainer Seal	Graphite	Graphite
O-Rings	Elastomer	Viton 90
Lip-Seal	Teflon [®] + Special Alloy	TFM + Elgiloy [®]
Thrust Washers	SS (Teflon [®] plated)	A240-316
Bearings	SS (Teflon [®] plated)	A240-316
Springs	Inconel [®]	Inconel [®] X-750
Yoke	Stainless Steel	SS316
Key	Carbon Steel	AISI 1045
Gear Box	Ductile Iron	A536
Collar Drip Plate	Stainless Steel	A240-304
Cap/Bottom Cover/Bonnet Bolts	Stainless Steel	A320-B8M
Cap/Bottom Cover/Bonnet Nuts	Stainless Steel	A194-8M
Gland Flange Bolts	Stainless Steel	A320-B8
Yoke/Gear Bolts	Stainless Steel	A193-B8
Gland Flange/Yoke Nuts	Stainless Steel	A194-8

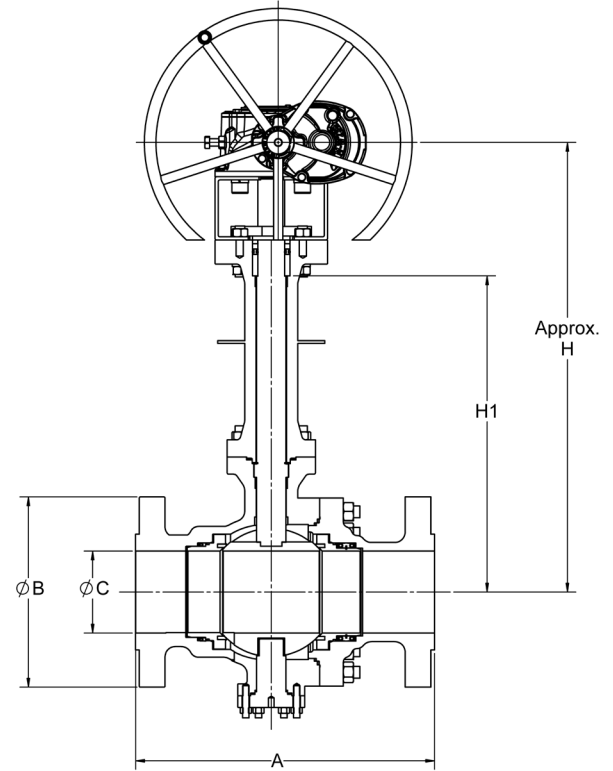
* Above BOM reflects standard 316SS construction. Other material options available.

** Teflon[®] is a registered trademark of The Chemours Company / Elgiloy[®] is a registered trademark of Elgiloy Specialty Metals / Inconel[®] is a registered trademark of Special Metals Corporation



Trunnion Mounted - Weights and Dimensions

Nominal Pipe Size	ASME Pressure Class	A		ØB	ØC	H	H1	Approx. Weight (lbs)
		RF	RTJ					
2"	CL 150	7.0"	7.5"	5.9"	2.0"	24.4"	17.3"	82
	CL 300	8.5"	9.1"	6.5"	2.0"	24.4"	17.3"	117
	CL 600	11.5"	11.6"	6.5"	2.0"	24.0"	17.6"	132
	CL 900	14.5"	14.6"	8.5"	2.0"	23.6"	17.7"	198
	CL 1500	14.5"	14.6"	8.5"	2.0"	23.6"	17.7"	198
3"	CL 150	8.0"	8.5"	7.5"	3.0"	25.3"	19.8"	101
	CL 300	11.1"	11.8"	8.3"	3.0"	25.3"	19.8"	172
	CL 600	14.0"	14.1"	8.3"	3.0"	27.2"	19.2"	192
	CL 900	15.0"	15.1"	9.4"	3.0"	27.4"	19.4"	287
4"	CL 150	9.0"	9.5"	9.1"	4.0"	27.2"	21.1"	654
	CL 300	12.0"	12.6"	10.0"	4.0"	27.2"	21.1"	231
	CL 600	17.0"	17.1"	10.8"	4.0"	27.9"	19.5"	304
6"	CL 150	18.0"	18.1"	11.4"	4.0"	27.3"	18.9"	637
	CL 300	15.5"	16.0"	11.0"	6.0"	32.3"	22.5"	331
	CL 600	15.9"	16.5"	12.6"	6.0"	32.3"	22.5"	390
8"	CL 150	22.0"	22.1"	14.0"	6.0"	33.0"	23.2"	556
	CL 300	24.0"	24.1"	15.0"	6.0"	33.3"	23.5"	904
	CL 600	18.0"	18.5"	13.6"	8.0"	30.9"	22.6"	496
8"	CL 300	19.8"	20.4"	15.0"	8.0"	30.9"	22.6"	584
	CL 600	26.0"	26.1"	16.5"	8.0"	34.9"	25.0"	922
	CL 900	29.0"	29.1"	18.5"	8.0"	36.7"	26.8"	1,530



Floating - Weights and Dimensions

Nominal Pipe Size	ASME Pressure Class	A		ØB	ØC	H	H1	Approx. Weight (lbs)
		RF	RTJ					
2"	CL 150	7.0"	7.5"	5.9"	2.0"	23.6"	19.3"	21
3"	CL 150	8.0"	8.5"	7.5"	3.0"	25.6"	21.2"	39
4"	CL 150	9.0"	9.5"	9.1"	4.0"	28.8"	22.8"	55

