



Globe Valve

Regulating Service

Forbes Marshall is a leader in the area of process efficiency and energy conservation for the process industry. We have sixty years of experience building steam engineering and control instrumentation solutions with focussed investments in manufacturing and research and development. We deliver quality solutions in 18 countries. Forbes Marshall is unique in having extensive expertise in both steam and control instrumentation. This dual expertise has allowed us to engineer industry specific systems that focus on energy efficiency, environment and process efficiency for diverse sectors.

Our teams are peopled by some of the finest engineers in the land. These highly trained professionals have developed innovative solutions and saved millions of rupees in process costs for our clients. Our business practices and processes have combined into a singular philosophy of being trusted partners who provide innovative solutions. It's a philosophy we are proud to live up to.

We have long standing partnerships with some of the best names in the control instrumentation industry such as Arca, Codel, Krohne and Shinkawa, to develop, design and supply innovative solutions for measurement and monitoring of process parameters. With a combination of specialist knowledge and the latest technology, we provide products and solutions to achieve optimum efficiency. Our products are a unique combination of hardware and software that make them reliable and accurate.

Globe Valves

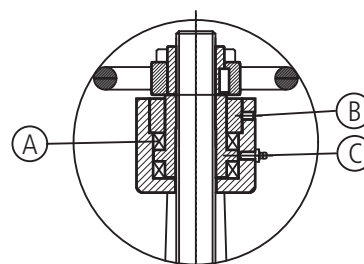
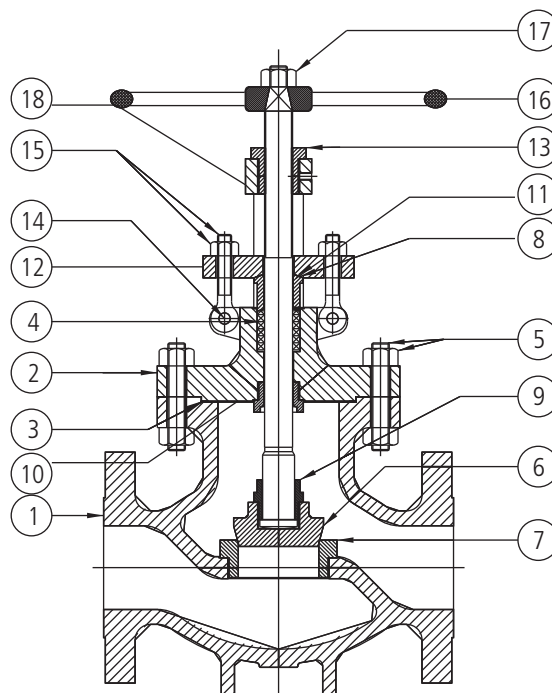
'FM' Globe Valves are used in applications requiring throttling and frequent operations.

'FM' Parabolic, Vee-type regulating, Swivel and guided plug and stem, Soft seat are offered for different applications as required.

Cast Steel Bolted Bonnet

Features

- Outside screw and yoke construction.
- Angle and Y-type design available on request.
- Flanged end, buttwelding end or socket weld end.
- Valves provided with back seating arrangement.
- Regulating, guided and soft seated plugs are available.
- Specially designed die formed graphite packings, controlled clearances between stem, gland and bonnet bushing for guaranteed low emissions meet 100 ppm maximum fugitive emission levels.
- Renewable, seal welded seat ring or integral seat (cast S.S. only) available.
- Deep stuffing box with lantern ring optional.
- Self aligning two piece gland.
- Anti-friction ball thrust bearing for higher sizes and classes.
- Locking arrangement optional.
- Optional gear, electric or pneumatic actuator available.
- Meets design requirement of ASME B16.34 / BS 1873 / ISO 15761 / IBR and testing requirement of BS EN 12266-1 / API 598.
- Flanged end dimensions conform to ASME B16.5 / API 605 / BS 3293
- Ring joint facings available in higher classes.
- Buttwelding end dimensions conform to ASME B16.25.
- Face to face dimension conform to ASME B 16.10 / BS 2080.
- Meets requirement of NACE MR-01-75.



- A Anti-friction ball thrust bearing :**
Reduces friction between mating parts to ensure smooth operation
- B Grub Screw :**
Secures yoke nut in the bonnet
- C Grease Nipple :**
Supplies lubricant to the mating parts

Materials

	Part Name	Material
18	Grub Screw	Carbon Steel
17	Hand Wheel Nut	Carbon Steel
16	Hand Wheel	Malleable Iron / Cast Steel / Ductile Iron / Fabricated Steel
15	Eye Bolt and Nut	Forged Carbon Steel
14	Cross Bolt and Nut	Forged Carbon Steel
13	Yoke Sleeve	A 439-D2 / Al. Bronze, BS 1400, AB2C
12	Gland Flange	Carbon Steel / Equivalent to Body Material
11	Gland Bush	Stainless Steel
10	Back Seat	See Page 6
09	Plug Nut	See Page 6
08	Spindle	See Page 6
07	Seat Ring	See Page 6
06	Plug	See Page 6

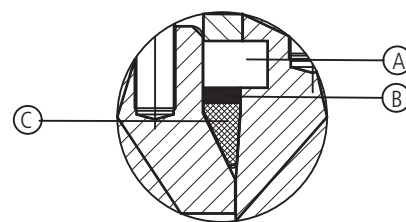
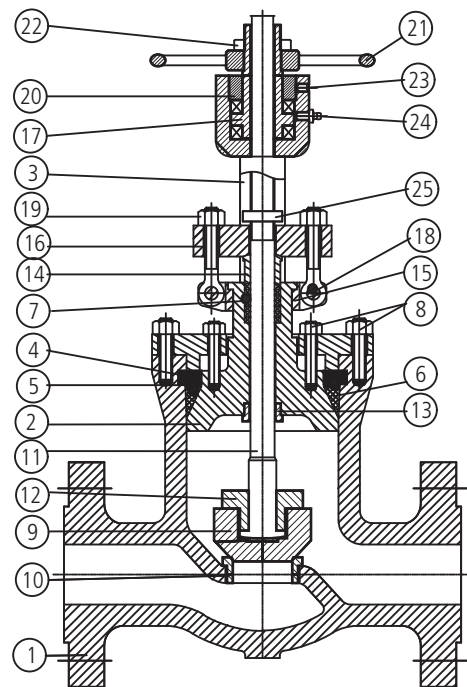
	Part Name	WCB	LCB	WC6	WC9
05	Stud and Nut	A193 Gr B7 / A194 Gr 2H	A320 Gr L7 / A194 Gr 4	A193 Gr B16 / A194 Gr 4/7	A193 Gr B16 / A194 Gr 4/7
04	Gland Packing	GRAFOIL	GRAFOIL	GRAFOIL	GRAFOIL
03	Gasket	Spiral Wound / Soft Iron	Spiral Wound / Soft Iron	Spiral Wound / SS304	Spiral Wound / SS304
02	Bonnet	A216 Gr WCB	A352 Gr LCB	A217 Gr WC6	A217 Gr WC9
01	Body	A216 Gr WCB	A352 Gr LCB	A217 Gr WC6	A217 Gr WC9

	Part name	C5	C12	CF8	CF8M
05	Stud and Nut	A193 Gr B16 / A194 Gr 4/7	A193 Gr B16 / A194 Gr 4/7	A193 Gr B7 / A194 Gr 2H	A193 Gr B7 / A194 Gr 2H
04	Gland Packing	GRAFOIL	GRAFOIL	GRAFOIL	GRAFOIL
03	Gasket	Spiral Wound / Soft Iron	Spiral Wound / Soft Iron	Spiral Wound / SS304	Spiral Wound / SS316
02	Bonnet	A217 Gr C5	A217 Gr C12	A351 Gr CF8	A351 Gr CF8M
01	Body	A217 Gr C5	A217 Gr C12	A351 Gr CF8	A351 Gr CF8M

Cast Steel Pressure Seal Bonnet

Features

- Outside screw and yoke construction.
- Flanged end or buttwelding end.
- Valves provided with back seating arrangement.
- Specially designed die formed graphite packings, controlled clearances between stem, gland and bonnet bushing for guaranteed low emissions. 100 ppm maximum fugitive emission levels can be met.
- Regulating, guided and soft seated plugs are available.
- Renewable, seal welded seat ring or integral seat (cast S.S. only) available.
- Deep stuffing box - with lantern ring optional.
- Self aligning two piece gland.
- Anti-friction ball thrust bearing yoke sleeve for higher sizes and classes.
- Locking arrangement optional.
- Optional gear, electric or pneumatic actuator available.
- Gasket design ensures self sealing under pressure
- Meets design requirement of ASME B16.34 / BS 1873 / ISO 15761 / IBR and testing requirement of BS EN 12266 1, API 598
- Flanged end dimensions conform to ASME B16.5 / API 605 / BS 3293.
- Ring joint facings available in higher classes.
- Buttwelding end dimensions conform to ASME B16.25.
- Face to Face dimensions conform to ASME B16.10 / BS 2080.
- Meets requirement of NACE MR-01-75



- A Back Up ring :**
Absorbs thrust applied by internal pressure
- B Thrust ring :**
Protects the soft metallic gasket from deformation
- C Gasket :**
Unique angular design provides superior sealing

Materials

Part Name	Material
25 Anti-rotation Device	Carbon Steel
24 Grease Nipple	Carbon Steel
23 Grub Screw	Carbon Steel
22 Hand Wheel Nut	Carbon Steel
21 Hand Wheel	Malleable Iron / Cast Steel / Ductile Iron
20 Yoke Nut	Carbon Steel
19 Eye Bolt and Nut	Forged carbon Steel / Alloy Steel
18 Cross Bolt and Nut	Forged carbon Steel / Alloy Steel
17 Yoke Sleeve	A 439-D2 / Al. Bronze, BS 1400, AB2C
16 Gland Flange	Carbon Steel
15 Clamp	Carbon Steel
14 Gland Bush	See page 6
13 Back Seat	See page 6
12 Plug Nut	See page 6
11 Spindle	See page 6
10 Seat Ring	See page 6
09 Plug	See page 6

Part Name	WCB	LCB	WC6	WC9
08 Stud and Nut	A193 Gr B7 / A194 Gr 2H	A320 Gr L7 / A194 Gr 4	A193 Gr B16 / A194 Gr 4/7	A193 Gr B16 / A194 Gr 4/7
07 Gland Packing	GRAFOIL	GRAFOIL	GRAFOIL	GRAFOIL
06 Gasket	Soft Iron	Soft Iron	SS304	SS304
05 Thrust Ring	A217 Gr CA15	A351 Gr CF8	A217 Gr CA15	A217 Gr CA15
04 Back Up Ring	A217 Gr CA15	A351 Gr CF8	A217 Gr CA15	A217 Gr CA15
03 Yoke	A216 Gr WCB	A352 Gr LCB	A217 Gr WC6	A217 Gr WC9
02 Bonnet	A216 Gr WCB	A352 Gr LCB	A217 Gr WC6	A217 Gr WC9
01 Body	A216 Gr WCB	A352 Gr LCB	A217 Gr WC6	A217 Gr WC9

Part name	C5	C12	CF8	CF8M
08 Stud and Nut	A193 Gr B16 / A194 Gr 4/7	A193 Gr B16 / A194 Gr 4/7	A193 Gr B7 / A194 Gr 2H	A193 Gr B7 / A194 Gr 2H
07 Gland Packing	GRAFOIL	GRAFOIL	GRAFOIL	GRAFOIL
06 Gasket	SS304	SS304	SS304	SS316
05 Thrust Ring	A217 Gr CA15	A217 Gr CA15	A351 Gr CF8	A351 Gr CF8M
04 Back Up Ring	A217 Gr CA15	A217 Gr CA15	A351 Gr CF8	A351 Gr CF8M
03 Yoke	A217 Gr C5	A217 Gr C12	A351 Gr CF8	A351 Gr CF8M
02 Bonnet	A217 Gr C5	A217 Gr C12	A351 Gr CF8	A351 Gr CF8M
01 Body	A217 Gr C5	A217 Gr C12	A351 Gr CF8	A351 Gr CF8M

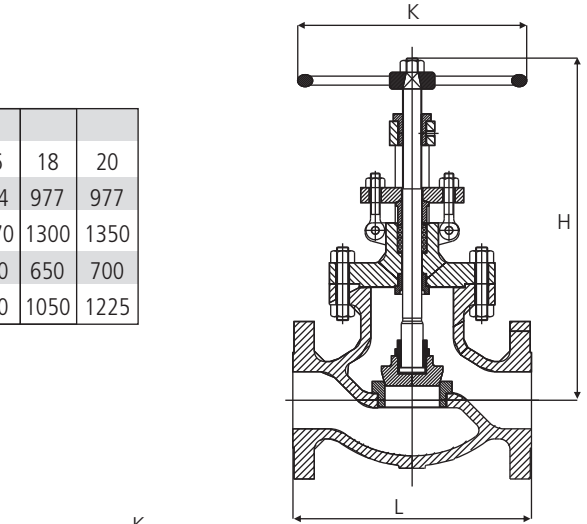
Dimensions

Cast Steel Bolted Bonnet

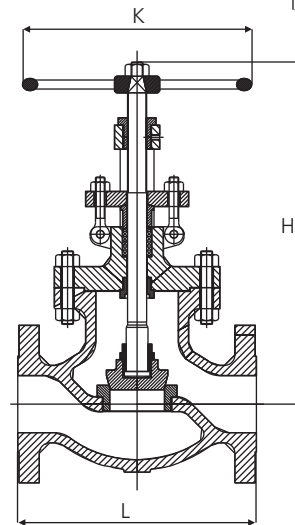
Class 150														
Size	inch	2	2 1/2	3	4	5	6	8	10	12	14	16	18	20
L, L1-RF, BW	mm	203	216	241	292	356	406	495	622	699	787	914	977	977
H	mm	330	390	410	475	540	585	725	825	940	1200	1270	1300	1350
K	mm	200	250	250	300	350	350	450	500	600	600	650	650	700
Wt. (approx)	kg	23	29	40	59	95	115	178	268	385	540	760	1050	1225

Class 300												
Size	inch	2	2 1/2	3	4	5	6	8	10	12	14	16
L, L1-RF, BW	mm	267	292	318	355	400	444	558	622	711	838	863
H	mm	350	425	485	520	565	655	825	920	1155	1250	1295
K	mm	200	250	300	300	350	350	500	600	700	700	450*
Wt. (approx)	kg	30	45	60	83	135	162	265	375	525	765	1100

Class 600										
Size	inch	2	2 1/2	3	4	5	6	8	10	12
L, L1-RF, BW	mm	292	330	355	431	508	558	660	787	838
H	mm	420	490	550	590	620	700	950	1140	1320
K	mm	250	300	300	350	500	500	600	600	400*
Wt. (approx)	kg	39	61	76	122	210	245	447	692	975



Class 150



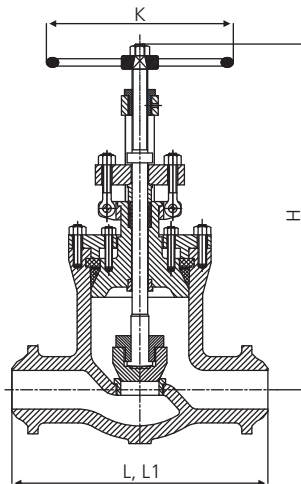
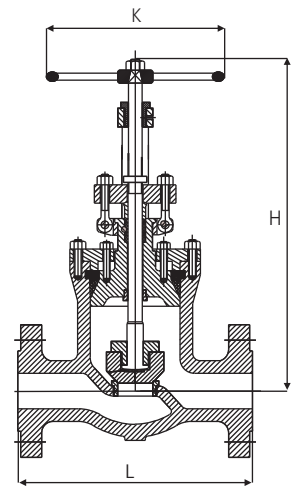
Class 300 & 600

Cast Steel Pressure Seal Bonnet

Class 900											
Size	inch	2	2 1/2	3	4	5	6	8	10	12	
L, L1-RF, BW	mm	368	419	381	457	559	609	736	838	965	
H	mm	550	580	675	750	815	1085	1300	1420	1825	
K	mm	300	350	350	500	500	350*	350*	400*	450*	
Wt. (approx)	kg	70	85	105	130	255	315	670	925	1200	

Class 1500									
Size	inch	2	2 1/2	3	4	5	6	8	10
L, L1-RF, BW	mm	368	419	470	546	673	705	832	991
H	mm	565	580	680	800	825	1130	1450	1535
K	mm	300	350	400	450	500	600	450*	500*
Wt. (approx)	kg	80	90	115	160	300	410	650	1150

Class 2500									
Size	inch	2	2 1/2	3	4	5	6	8	10
L, L1-RF, BW	mm	451	509	578	673	794	914	1022	1270
H	mm	575	605	725	835	875	1200	1510	1720
K	mm	350	350	350*	400*	400*	400*	450*	550*
Wt. (approx)	kg	95	110	125	210	565	615	1050	1525



Class 900, 1500 & 2500

• RF - Flanged • BW - Butt Weld
* Gear Operation suggested.

Nominal Seating Surface Materials

Trim No.	Nominal Trim	Seat Surface Hardness (HB, A Minimum)	Material Type	Cast	Typical Specification (Grade)	
					Forged	Welded
1	F6	C	13Cr	ASTM A217 (CA15)	ASTM A105 (F6a)	AWS A5.9 ER410
2	304	D	18Cr-8Ni	ASTM A351 (CF8)	ASTM A182 (F304)	AWS A5.9 ER308
3	F310	D	25Cr-20Ni		ASTM A182 (F310)	AWS A5.9 ER310
4	Hard F6	750 (E)	Hard 13Cr		F	
5	Hardfaced	350 (E)	Co-Cr A (G)			AWS A5.13 E or R CoCr-A
5A	Hardfaced	350 (E)	Ni-Cr			H
6	F6 and Cu-Ni	250 (I) and 175 (I)	13Cr and Cu-Ni	ASTM A217 (CA15)	ASTM A182 (F6a) J	AWS A5.9 ER410
7	F6 and Hard F6	250 (I) and 750 (I)	13Cr and Hard 13Cr	ASTM A217 (CA15)	ASTM A182 (F6a) F	AWS A5.9 ER410
8	F6 and Hardfaced	250 (I) and 350 (I)	13Cr and Co-Cr A (G)	ASTM A217 (CA15)	ASTM A182 (F6a)	AWS A5.9 ER410 / AWS A5.13 E or R CoCr-A
8A	F6 and Hardened	250 (I) and 350 (I)	13Cr and Ni-Cr	ASTM A217 (CA15)	ASTM A182 (F6a)	AWS A5.9 ER410 H
9	Monel	D	Ni-Cu Alloy		MFG Standard	
10	316	D	18Cr-8Ni	ASTM A351 (CF8M)	ASTM A182 (F316)	AWS A5.9 ER316
11	Monel and Hardfaced	D and 350 (I)	Ni-Cu alloy and Trim 5 or 5A		MFG Standard	See Trim 5 or 5A
12	316 and Hardfaced	D and 350 (I)	18Cr-8Ni-Mo Trim 5 and 5A	ASTM A351 (CF8M)	ASTM A182 (F316)	AWS A5.9 ER316 See Trim 5 or 5A
13	Alloy 20	D	19Cr-29Ni	ASTM A351 (CN7M)	ASTM B 473	AWS A15.9 ER320
14	Alloy 20 and Hardfaced	D and 350 (I)	19Cr-29Ni and Trim 5 and 5A	ASTM A351 (CN7M)	ASTM B 473	AWS A5.9 ER320 / See Trim 5 or 5A

Cr = Chromium, Ni = Nickel, Co = Cobalt, Cu = Copper

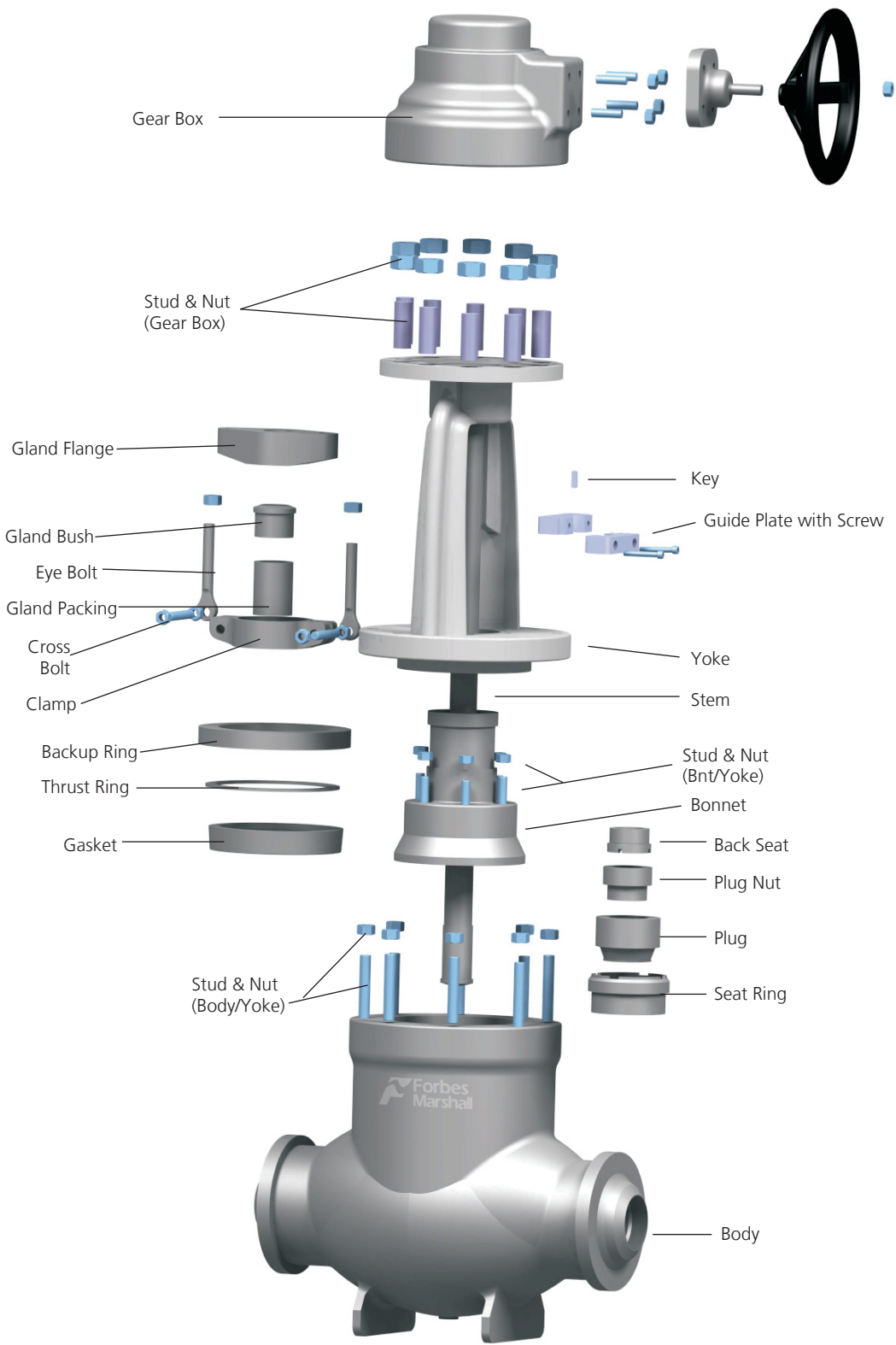
- (A) HB (formerly BHN) is the symbol for Brinell hardness number as per ASMTM E 10.
- (B) Free machining grade of 13Cr are prohibited
- (C) Body and gate seat surfaces should be 250 HB minimum with a 50 HB minimum differential between the body and gate seat surfaces.
- (D) Manufacturers standard hardness.
- (E) Differential hardness between the body and gate seat surface is not required.

- (F) Case hardened by Nitriding to a thickness of 0.13 mm (0.005 inch) minimum.
- (G) This classification includes such trademarked material as Stellite 6 TM, Colmonoy TM, Stoodly 6T TM and Wallex 6 TM.
- (H) Manufacturers Standard hardfacing with a maximum iron content of 2.5 percent.
- (I) Hardness differential between the body and gate seat surface shall be the Manufacturers standard.
- (J) Manufacturers standard with 30 Ni minimum.

Range of Shell Material and Recommended Trim Material

Material Type	ASTM / BS	Service Condition and Temperature	Recommended Trim	
			Low Pressure	High Pressure
Carbon Steel	A216 Gr. WCB	Non corrosive water, oil and gas 30°C to 430°C (86°F to 806°F)		
Low Temperature Service Carbon Steel		Cryogenic Service Low Temperature		
	A352 Gr. LCB	-46°C to 343°C (-50.8°F to 649.4°F)	2 / 12	12 / 5
	A352 Gr. LC2	-73°C to 343°C (-99.4°F to 649.4°F)		
	A352 Gr. LC3	-101°C to 343°C (-149.8°F to 649.4°F)		
Alloy Steel	A217 Gr. WC1	Non corrosive water, oil and gas and steam (-29°C to 425°C) (-20°F to 797°F)		
1 1/4% Cr - 1/2% Mo	A217 Gr. WC6	Non corrosive water, oil and gas	1 / 5	5
2 1/4% Cr - 1% Mo	A217 Gr. WC9	-10° to 593°C (14°F to 1099.4°F)		
5% Cr - 1/2% Mo	A217 Gr. C5	Corrosive water, oil and gas	8 / 5	5
9% Cr - 1% Mo	A217 Gr. C12	-10° to 649°C (14°F tp 1200.2°F)		
Cast Stainless Steel		Corrosive high temperature service	10 / 12	5
18% Cr - 8% Ni	A351 Gr. CF8	-10° to 816°C (14°F to 1500.8°F)		
17% Cr - 8% Ni	A351 Gr. CF3	-10° to 427°C (14°F to 800.6°F)		
18% Cr - 9% Ni - 2% Mo	A351 Gr. CF8M	-10° to 649°C (14°F to 1200.2°F)		
17% Cr - 9% Ni - 2% Mo	A351 Gr. CF3M	-10° to 454°C (14°F to 849.2°F)		
18% Cr - 9% Ni-cb	A351 Gr. CF8C	-10° to 816°C (14°F to 1500.8°F)		
25% Cr - 5Ni - Mo - Cu (Duplex 1A)	A890 CD4MCu	-80° to 300°C (-112°F to 572°F)	Duplex 1A	Duplex 1A
24% Cr - 10Ni - Mo - N (Duplex 2A)	A890 CE8MN	-80° to 300°C (-112°F to 572°F)	Duplex 2A	Duplex 2A
25% Cr - 5Ni - Mo - N (Duplex 3A)	A890 CD6MN	-80° to 300°C (-112°F to 572°F)	Duplex 3A	Duplex 3A
22% Cr - 5Ni - Mo - N (Duplex 4A)	A890 CD3MN	-80° to 300°C (-112°F to 572°F)	Duplex 4A	Duplex 4A
25% Cr - 7Ni - Mo - N (Duplex 5A)	A890 CE3MN	-80° to 300°C (-112°F to 572°F)	Duplex 5A	Duplex 5A
25% Cr - 7Ni - Mo - N (Duplex 6A)	A890 CD3MWCuN	-80° to 300°C (-112°F to 572°F)	Duplex 6A	Duplex 6A
INCONEL 625	A494 CW6MC	-157° to 982°C (-250.6°F to 1799.6°F)	INCONEL 625	INCONEL 625
INCOLOY 825	A494 CU5MCuC	-253° to 540°C (-423.4°F to 1004°F)	INCOLOY 825	INCOLOY 825

Exploded view





Industry Spectrum

- Refineries
- Petrochemicals
- Power
- Sugar
- Paper
- Chemical
- Nuclear
- Oil and Gas
- Steel

and many more....



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