

Typical Forex Cast Steel Bolted Bonnet Gate Valve Expanded View

1. Body: Forex cast steel bodies provide low resistance flow and optimum strength and performance.

2. Yoke & Bonnet: Forex bonnet assemblies are built to the same standards as the bodies. Larger size gate valves utilize a multi-piece bonnet design.

3. Grease Fitting: The grease fitting allows for easy stem lubrication.

4. Stem: The stem is precision machined and inserts into the horizontal channel in the disc.

5. Wedge: Forex 1-piece fex wedge is machined to the tightest tolerances to ensure trouble free shutoff and cycling.

6. Back Seat Bushing: The back seat, when engaged with the stem head, provides a stable shutoff to the stuffing box which isolates the packing from flow exposure.

7. Gland: Compresses the packing to create a stem seal above the back seat, between the bonnet and stem.

8. Gland Flange: Applies pressure to the gland for accurate packing adjustments.

9. & 10. Gland Bolts & Nuts: The gland bolt and nut allows for easy adjustments for packing compression.

11. Gland Bolt Pin: The gland bolt pin secures the gland bolts to the yoke & bonnet.

12. Packing: The packing creates a seal above the back seat, between the bonnet and stem.

13. Stuffing Box: The stuffing box contains the packing.

14. Stem Nut: The stem nut provides a precision guide for proper stem alignment.

15. Yoke Bushing: The retaining nut secures the stem nut to the bonnet assembly.

16. Handwheel: The handwheel cycles the valve.

17. Handwheel Nut: The handwheel nut secures the handwheel to the bonnet assembly.

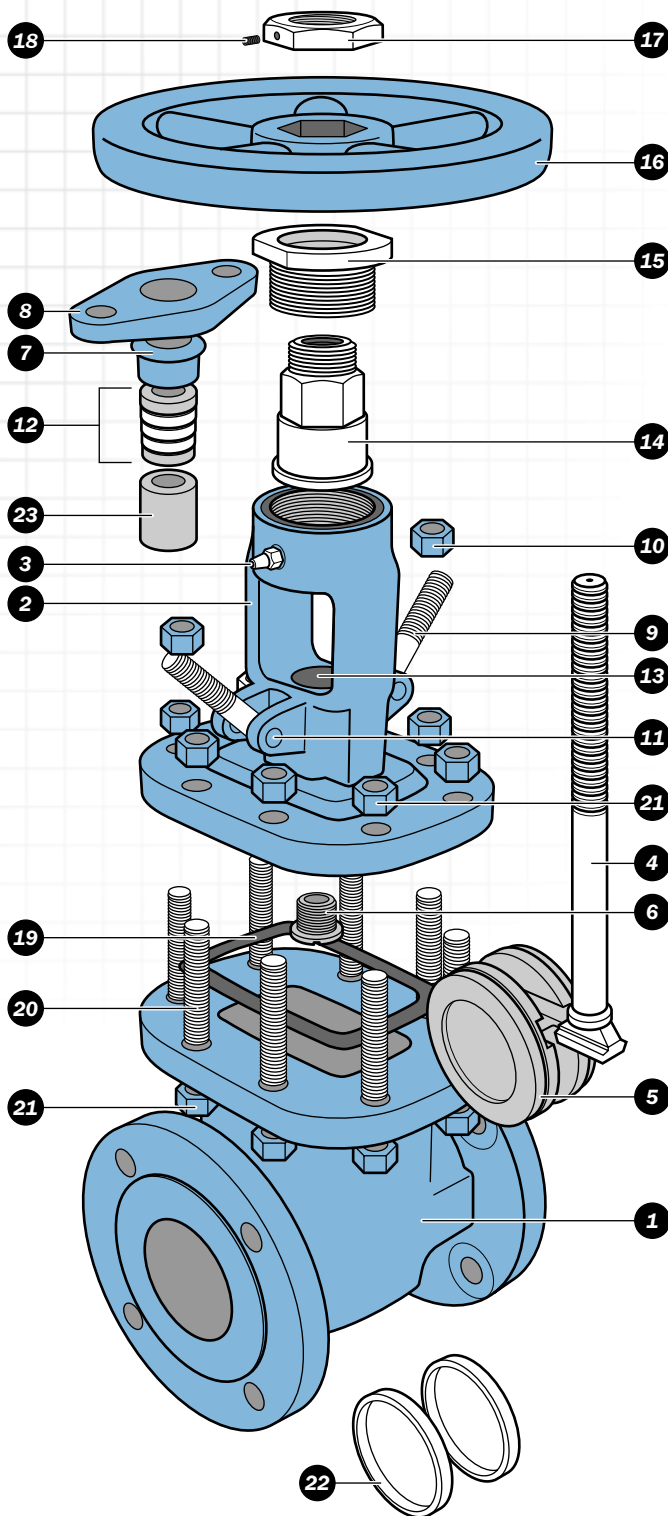
18. Set Screw: The set screw prevents handwheel nut loosening.

19. Bonnet Gasket: The bonnet gasket creates a leakproof seal between the bonnet and body.

20. & 21. Bonnet Studs & Nuts: The bonnet studs and nuts secure the bonnet to the body.

22. Seat Rings: To ensure a stable shutoff, seat rings are aligned and seal-welded into the valve, then precision ground for optimal seating.

23. Spacer Ring: Assists the packing rings in creating a seal above the back seat, between the bonnet and stem.





Cast Steel Bolted Bonnet Gates

Styles: CB2, CB3, & CB4/2

Class 150 - Sizes: 2" thru 48"

Pressure Class Range: 150 thru 1500

Design and Manufacturing Standards

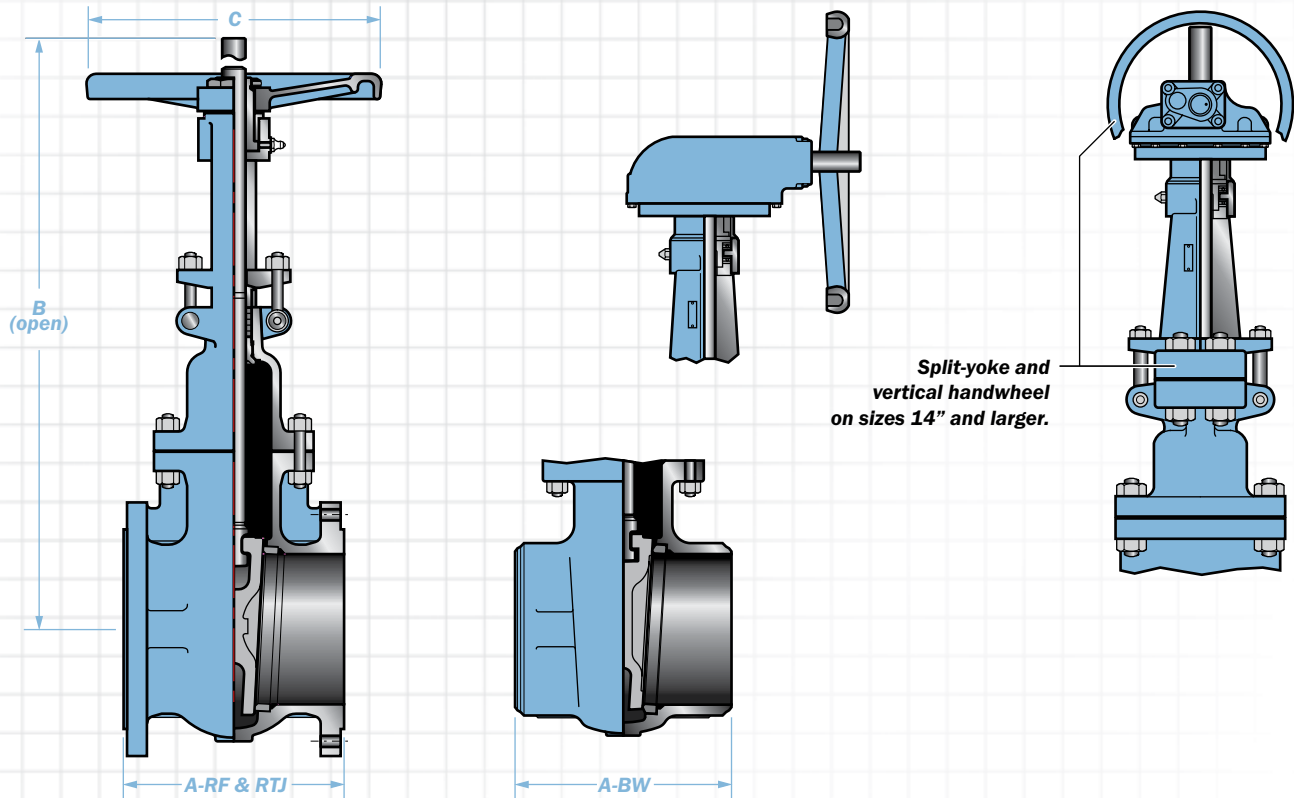
Valve Design: ASME B16.34/API 600

Flange Dimensions: ASME B16.5, B16.47 (Series A)

Face-to-Face Dimensions: ASME B16.10

Tested in Accordance with: API 598

Recommended Spare Parts*



Typical Bill of Materials

Component	CB2	CB3	CB4/2	Component	CB2	CB3	CB4/2
Body	ASTM A216-WCB			Gland Flange	ASTM A216-WCB		
Seat Rings	ASTM A105/HF			Gland Bolt Pins	ASTM A36		
Wedge 2" - 3"	ASTM A276-410	ASTM A216-WCB/HF	ASTM A351-CF8M/A276-316	Gland Bolts	ASTM A307-B		
Wedge 4" & larger	ASTM A216-WCB w/13% Chrome		ASTM A276-316	Gland Nuts	ASTM A194-2H		
				Nameplate	Stainless Steel 304		
Stem	ASTM A182-F6a		ASTM A182-316	Nameplate Rivets	Stainless Steel - Commercial		
Yoke & Bonnet	ASTM A182-WCB			Grease Fitting	Carbon Steel - Commercial		
*Bonnet Gasket	ASTM A439-D2			Stem Nut	ASTM A439-D2		
Bonnet Nuts	ASTM A194-2H			Yoke Bushing	ASTM A536 (65-45-12)		
Bonnet Studs	ASTM A194-2HM		ASTM A536 (65-45-12)	Handwheel	ASTM A536 (65-45-12)		
Bonnet Studs	ASTM A193-B7		ASTM A193-B7M	Handwheel Nut	ASTM A536 (65-45-12)		
Back Seat Bushing	ASTM A276-410		ASTM A276-316	Set Screw	ASTM A193-B6		
*Packing	Graphite w/Braided Carbon Fiber End Rings			Spacer Ring	N/A		
Gland	ASTM A276-410		ASTM A276-316	-	-		

Class 150

Size	nps	2	2.5	3	4	5	6	8	10	12	14	16	18	20	24	30	36	42	48
	dn	50	65	80	100	125	150	200	250	300	350	400	450	500	600	750	900	1050	1200
A-RF	in	7.0	7.5	8.0	9.0	10.0	10.5	11.5	13.0	14.0	15.0	16.0	17.0	18.0	20.0	24.0	28.0	31.0	34.0
	mm	178	191	203	229	254	267	292	330	356	381	406	432	457	508	610	711	813	864
A-BW	in	8.5	9.5	11.1	12.0	15.0	15.9	16.5	18.0	19.8	22.5	24.0	26.0	28.0	32.0	24.0	28.0	43.0	46.0
	mm	216	241	282	305	381	404	419	457	503	572	610	660	711	813	610	711	1092	1168
B	in	14.8	17.1	18.2	22.6	28.1	33.2	38.9	46.4	54.6	63.5	72.4	79.2	86.0	100.8	125.1	153.2	174.4	217.5
	mm	376	434	462	574	714	843	988	1179	1387	1613	1839	2012	2184	2560	3178	3891	4430	5525
C	in	8.0	8.0	8.0	10.0	13.0	14.0	16.0	18.0	20.0	18.1	18.1	18.1	18.1	21.3	24.0	31.8	31.5	35.4
	mm	203	203	203	254	330	357	406	457	508	460	460	460	460	541	610	808	800	900
RF Wt.	lbs	46	56	71	111	163	196	289	449	639	860	1190	1389	1786	2602	4466	4850	10134	15677
	kg	21	25	32	50	74	89	131	204	290	391	541	631	812	1183	2030	1193	4600	8500
BW Wt.	lbs	40	46	58	91	152	180	259	425	584	811	1146	1349	1720	2534	4037	4385	10198	15545
	kg	18	21	26	41	69	82	118	193	265	369	521	613	782	1152	1835	1993	4625	8550

Note: Dimensions: Inches/Millimeters - Weights: Pounds/Kilograms. Larger sizes available on request. Dimensions are subject to change without notice.

Cast Steel Bolted Bonnet Gates

Styles: CB2, CB3, & CB4/2

Class 300 - Sizes: 2" thru 36"

Pressure Class Range: 150 thru 1500

Design and Manufacturing Standards

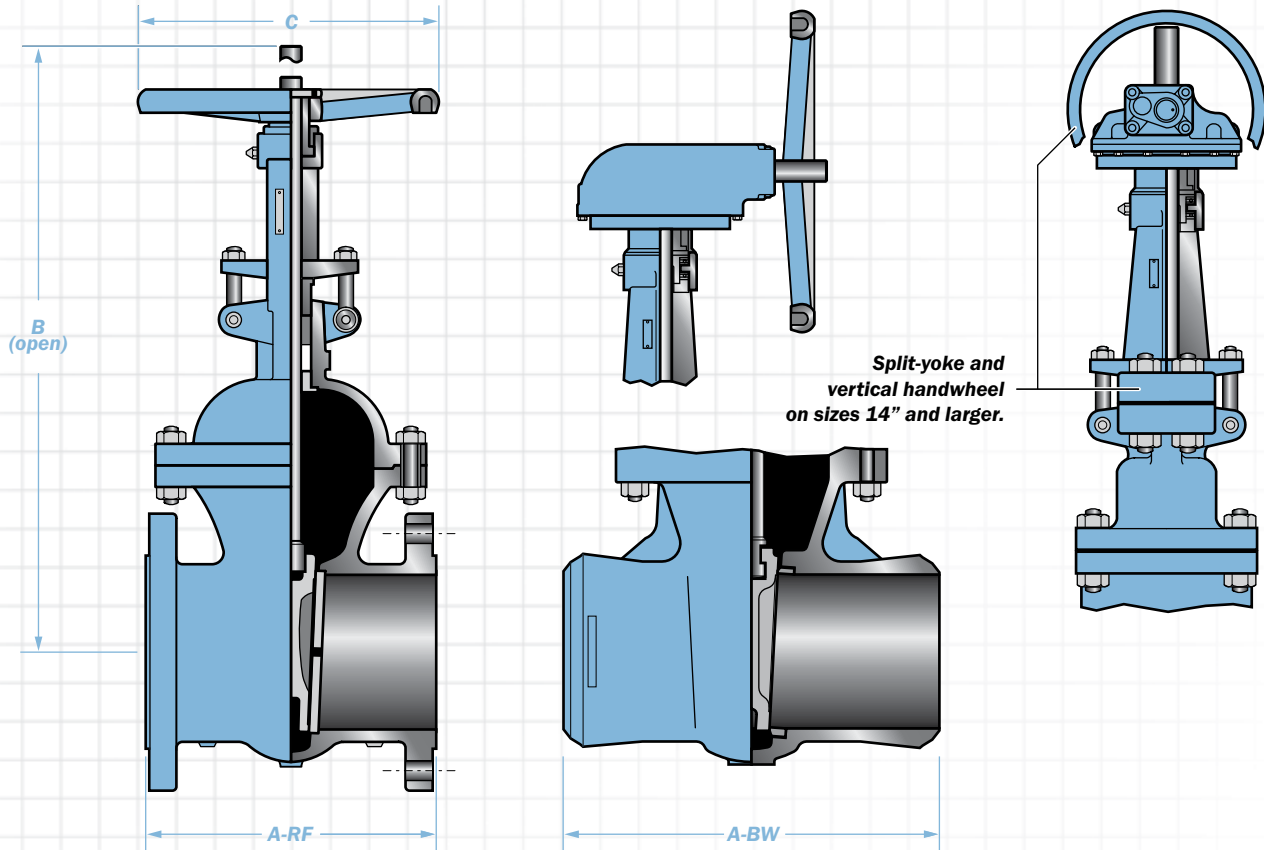
Valve Design: ASME B16.34/API 600

Flange Dimensions: ASME B16.5, B16.47 (Series A)

Face-to-Face Dimensions: ASME B16.10

Tested in Accordance with: API 598

Recommended Spare Parts*



Typical Bill of Materials

Component	CB2	CB3	CB4/2	Component	CB2	CB3	CB4/2
Body	ASTM A216-WCB			Gland Flange	ASTM A216-WCB		
Seat Rings	ASTM A105/HF			Gland Bolt Pins	ASTM A36		
Wedge 2" - 3"	ASTM A276-410	ASTM A216-WCB/HF	ASTM A351-CF8M/A276-316	Gland Bolts	ASTM A307-B		
Wedge 4" & larger	ASTM A216-WCB w/13% Chrome	ASTM A216-WCB/HF	ASTM A276-316	Gland Nuts	ASTM A194-2H		
Stem	ASTM A182-F6a			Nameplate	Stainless Steel 304		
Yoke & Bonnet	ASTM A216-WCB			Nameplate Rivets	Stainless Steel - Commercial		
*Bonnet Gasket	Spiral Wound 316 Stainless Steel/Graphite			Grease Fitting	Carbon Steel - Commercial		
Bonnet Nuts	ASTM A194-2H		ASTM A194-2HM	Stem Nut	ASTM A439-D2		
Bonnet Studs	ASTM A193-B7		ASTM A193-B7M	Yoke Bushing	ASTM A536 (65-45-12)		
Back Seat Bushing	ASTM A276-410		ASTM A276-316	Handwheel	ASTM A536 (65-45-12)		
*Packing	Graphite w/Braided Carbon Fiber End Rings			Handwheel Nut	ASTM A536 (65-45-12)		
Gland	ASTM A276-410		ASTM A276-316	Set Screw	ASTM A193-B6		
				Spacer Ring	ASTM A276-410		
				-	-		

Class 300

Size	nps	2	2.5	3	4	5	6	8	10	12	14	16	18	20	24	30	36
	dn	50	65	80	100	125	150	200	250	300	350	400	450	500	600	750	900
A-RF	in	8.5	9.5	11.1	12.0	15.0	15.9	16.5	18.0	19.75	30.0	33.0	36.0	39.0	45.0	55.0	68.0
	mm	216	241	282	305	381	404	419	457	502	762	838	914	991	1143	1397	1727
A-BW	in	8.5	9.5	11.1	12.0	15.0	15.9	16.5	18.0	19.75	30.0	33.0	36.0	39.0	45.0	55.0	68.0
	mm	216	241	282	305	381	404	419	457	502	762	838	914	991	1143	1397	1727
B	in	17.2	19.1	20.0	24.0	29.6	33.0	41.1	49.3	57.0	67.0	73.1	82.2	95.5	104.7	136.3	169.8
	mm	437	485	508	610	752	838	1044	1252	1448	1702	1857	2088	2426	2659	3462	4312
C	in	8.0	10.0	10.0	12.0	15.0	16.0	18.0	20.0	22.0	18.1	18.1	21.3	21.3	24.0	31.9	30.0
	mm	203	254	254	305	381	406	457	508	559	460	460	451	541	610	810	760
RF	lbs	64	88	112	175	258	340	542	816	1072	1764	2183	2867	3682	5645	9702	15104
	kg	29	40	51	80	117	155	246	371	487	802	992	1303	1674	2566	4410	6850
BW	lbs	51	68	86	154	207	269	430	620	871	1323	1830	2381	3109	4873	8350	11003
	kg	23	31	39	70	94	122	195	282	396	601	832	1082	1413	2215	3795	4990

Note: Dimensions: Inches/Millimeters - Weights: Pounds/Kilograms. Larger sizes available on request. Dimensions are subject to change without notice.

Class 600															
Size	nps	2	2.5	3	4	5	6	8	10	12	14	16	18	20	24
	dn	50	65	80	100	125	150	200	250	300	350	400	450	500	600
A-RF	in	11.5	13.0	14.0	17.0	20.0	22.0	26.0	31.0	33.0	35.0	39.0	43.0	47.0	55.0
	mm	292	330	356	432	508	559	660	787	838	889	991	1092	1194	1397
A-BW	in	11.5	13.0	14.0	17.0	20.0	22.0	26.0	31.0	33.0	35.0	39.0	43.0	47.0	55.0
	mm	292	330	356	432	508	559	660	787	838	889	991	1092	1194	1397
A-RTJ	in	11.62	13.12	14.12	17.12		22.12	26.12	31.12	33.12	35.12	39.12	43.12	47.25	55.38
	mm	295	333	359	435		562	664	791	841	892	994	1095	1200	1406
B	in	18.3	19.9	21.7	26.9	31.6	36.5	44.0	52.8	61.4	64.8	71.7	79.3	104.8	116.9
	mm	465	505	551	683	803	927	1118	1341	1560	1646	1821	2014	2662	2970
C	in	10.0	10.0	12.0	15.0	18.0	20.0	24.0	27.0	27.0	30.0	35.0	43.0	43.0	31.9
	mm	254	254	305	381	457	508	610	686	686	762	889	1092	1092	**810
RFRTJ	lbs	97	132	176	320	520	680	1150	1715	2440	3150	4415	5010	6853	10337
Wt.	kg	44	60	80	145	236	309	523	780	1109	1432	2007	2277	3108	4688
BW	lbs	79	120	152	270	430	580	1020	1430	1950	2695	3800	5010	5640	8595
Wt.	kg	36	55	69	123	195	264	464	650	886	1225	1727	2277	2558	3898

Class 900									
Size	nps	2	2.5	3	4	6	8	10	12
	dn	50	65	75	100	150	200	250	300
A-RF	in	14.5	16.5	15.0	18.0	24.0	29.0	33.0	38.0
	mm	368	419	381	457	610	737	838	965
A-BW	in	14.5	16.5	15.0	18.0	24.0	29.0	33.0	38.0
	mm	368	419	381	457	610	737	838	965
A-RTJ	in	14.62	16.62	15.12	18.12	24.12	29.12	33.12	38.12
	mm	371	422	384	460	612	740	841	968
B	in	21.7	26.0	23.7	27.6	38.4	45.5	52.6	59.8
	mm	551	660	602	701	975	1156	1336	1519
C	in	9.8	9.8	13.8	13.8	22.0	25.2	30.0	30.0
	mm	250	250	350	350	560	640	760	760
RF	lbs	135	175	255	453	913	1705	2387	3600
Wt.	kg	61	385	116	206	415	775	1085	1636
BW	lbs	125	155	213	396	807	1465	1724	2790
Wt.	kg	57	70	97	180	367	665	784	1268

Class 1500									
Size	nps	2	2.5	3	4	6	8	10	12
	dn	50	65	75	100	150	200	250	300
A-RF	in	14.5	16.5	18.5	21.5	27.8	32.75	39.0	44.5
	mm	368	419	470	546	706	832	991	1130
A-BW	in	14.5	16.5	18.5	21.5	27.8	32.75	39.0	44.5
	mm	368	419	470	546	706	832	991	1130
A-RTJ	in	14.62	16.62	18.62	21.62	28.0	33.13	39.38	45.12
	mm	371	422	473	549	711	841	1000	1146
B	in	21.7	26.0	28.5	32.6	39.3	48.1	66.5	82.3
	mm	551	660	724	828	998	1223	1688	2090
C	in	11.8	11.8	15.75	19.6	23.6	30.0	30.0	35.0
	mm	300	300	400	500	600	760	760	889
RF	lbs	128	163	209	423	978	1625	4412	8414
Wt.	kg	58	74	95	192	445	739	2001	3816
BW	lbs	106	137	174	352	870	1650	3541	7080
Wt.	kg	48	62	79	160	395	750	1606	3211

Pressure Temperature Ratings - ASME B16.34 - 2004

Class 150							
Temperature °F	WCB*	LCC	WC6	WC9	C5	C12	C12A
-20 to 100	285	290	290	290	290	290	290
200	260	260	260	260	260	260	260
300	230	230	230	230	230	230	230
400	200	200	200	200	200	200	200
500	170	170	170	170	170	170	170
600	140	140	140	140	140	140	140
650	125	125	125	125	125	125	125
700	110	-	110	110	110	110	110
750	95	-	95	95	95	95	95
800	80	-	80	80	80	80	80
850	65	-	65	65	65	65	65
900	50	-	50	50	50	50	50
950	35	-	35	35	35	35	35
1000	20	-	20	20	20	20	20
1050	-	-	20**	20**	20**	20**	20
1100	-	-	20**	20**	20**	20**	20
1150	-	-	-	-	20**	20**	20
1200	-	-	-	-	20**	20**	20

Class 300							
Temperature °F	WCB*	LCC	WC6	WC9	C5	C12	C12A
-20 to 100	740	750	750	750	750	750	750
200	680	750	750	750	750	750	750
300	655	730	720	730	730	730	730
400	635	705	695	705	705	705	705
500	605	665	665	665	665	665	665
600	570	605	605	605	605	605	605
650	550	590	590	590	590	590	590
700	530	-	570	570	570	570	570
750	505	-	530	530	530	530	530
800	410	-	510	500	510	510	510
850	320	-	485	485	485	485	485
900	230	-	450	450	375	450	450
950	135	-	320	385	275	375	385
1000	85	-	215	265	200	255	365
1050	-	-	145	175	145	170	360
1100	-	-	95	110	100	115	300
1150	-	-	65	70	60	75	225
1200	-	-	40	40	35	50	145

Class 600							
Temperature °F	WCB*	LCC	WC6	WC9	C5	C12	C12A
-20 to 100	1480	1500	1500	1500	1500	1500	1500
200	1360	1500	1500	1500	1500	1500	1500
300	1310	1455	1445	1455	1455	1455	1455
400	1265	1405	1385	1410	1410	1410	1410
500	1205	1330	1330	1330	1330	1330	1330
600	1135	1210	1210	1210	1210	1210	1210
650	1100	1175	1175	1175	1175	1175	1175
700	1060	-	1135	1135	1135	1135	1135
750	1015	-	1065	1065	1065	1065	1065
800	825	-	1015	1015	1015	1015	1015
850	640	-	975	975	975	975	975
900	460	-	900	900	745	900	900
950	275	-	640	755	550	755	775
1000	170	-	430	535	400	505	725
1050	-	-	290	350	290	345	720
1100	-	-	190	220	200	225	605
1150	-	-	130	135	125	150	445
1200	-	-	80	80	70	105	290

Class 900							
Temperature °F	WCB*	LCC	WC6	WC9	C5	C12	C12A
-20 to 100	2220	2250	2250	2250	2250	2250	2250
200	2035	2250	2250	2250	2250	2250	2250
300	1965	2185	2165	2185	2185	2185	2185
400	1900	2110	2080	2115	2115	2115	2115
500	1810	1995	1995	1995	1995	1995	1995
600	1705	1815	1815	1815	1815	1815	1815
650	1650	1765	1765	1765	1765	1765	1765
700	1590	-	1705	1705	1705	1705	1705
750	1520	-	1595	1595	1595	1595	1595
800	1235	-	1525	1525	1525	1525	1525
850	955	-	1460	1460	1460	1460	1460
900	690	-	1350	1350	1120	1350	1350
950	410	-	955	1160	825	1130	1160
1000	255	-	650	805	595	760	1090
1050	-	-	430	525	430	515	1080
1100	-	-	290	330	300	340	905
1150	-	-	195	205	185	225	670
1200	-	-	125	125	105	155	430

Class 1500							
Temperature °F	WCB*	LCC	WC6	WC9	C5	C12	C12A
-20 to 100	3705	3750	3750	3750	3750	3750	3750
200	3395	3750	3750	3750	3750	3750	3750
300	3270	3640	3610	3640	3640	3640	3640
400	3170	3520	3465	3530	3530	3530	3530
500	3015	3325	3325	3325	3325	3325	3325
600	2840	3025	3025	3025	3025	3025	3025
650	2745	2940	2940	2940	2940	2940	2940
700	2665	-	2840	2840	2840	2840	2840
750	2535	-	2660	2660	2660	2660	2660
800	2055	-	2540	2540	2540	2540	2540
850	1595	-	2435	2435	2435	2435	2435
900	1150	-	2245	2245	1870	2245	2245
950	685	-	1595	1930	1370	1885	1930
1000	430	-	1080	1335	995	1270	1820
1050	-	-	720	875	720	855	1800
1100	-	-	480	550	495	565	1510
1150	-	-	325	345	310	375	1115
1200	-	-	205	205	170	255	720

Class 2500							
Temperature °F	WCB*	LCC	WC6	WC9	C5	C12	C12A
-20 to 100	6170	6250	6250	6250	6250	6250	6250
200	5655	6250	6250	6250	6250	6250	6250
300	5450	6070	6015	6070	6070	6070	6070
400	5280	5865	5775	5880	5880	5880	5880
500	5025	5540	5540	5540	5540	5540	5540
600	4730	5040	5040	5040	5040	5040	5040
650	4575	4905	4905	4905	4905	4905	4905
700	4425	-	4730	4730	4730	4730	4730
750	4230	-	4430	4430	4430	4430	4430
800	3430	-	4230	4230	4230	4230	4230
850	2655	-	4060	4060	4060	4060	4060
900	1915	-	3745	3745	3115	3745	3745
950	1145	-	2655	3220	2285	3145	3220
1000	715	-	1800	2230	1655	2115	3030
1050	-	-	1200	1455	1200	1430	3000
1100	-	-	800	915	830	945	2515
1150	-	-	545	570	515	630	1855
1200	-	-	345	345	285	430	1200

* Not recommended for prolonged use above 800° F. ** For weld end valves only. Flanged end ratings terminate at 1000° F. **Note:** Packing, gasket, or bolting may limit temperature. Please advise service temperature if above 1000° F. Ratings from ASME B16.34 standard class valves. Special class weld end valves to ASME B16.34 are available on special order.