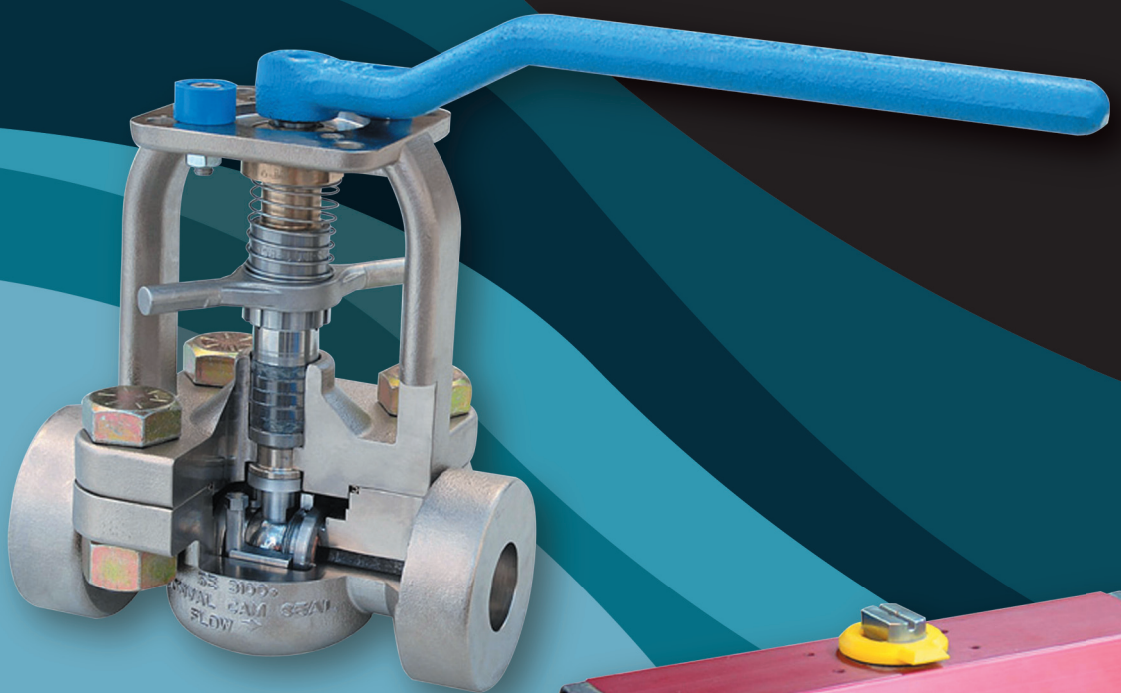
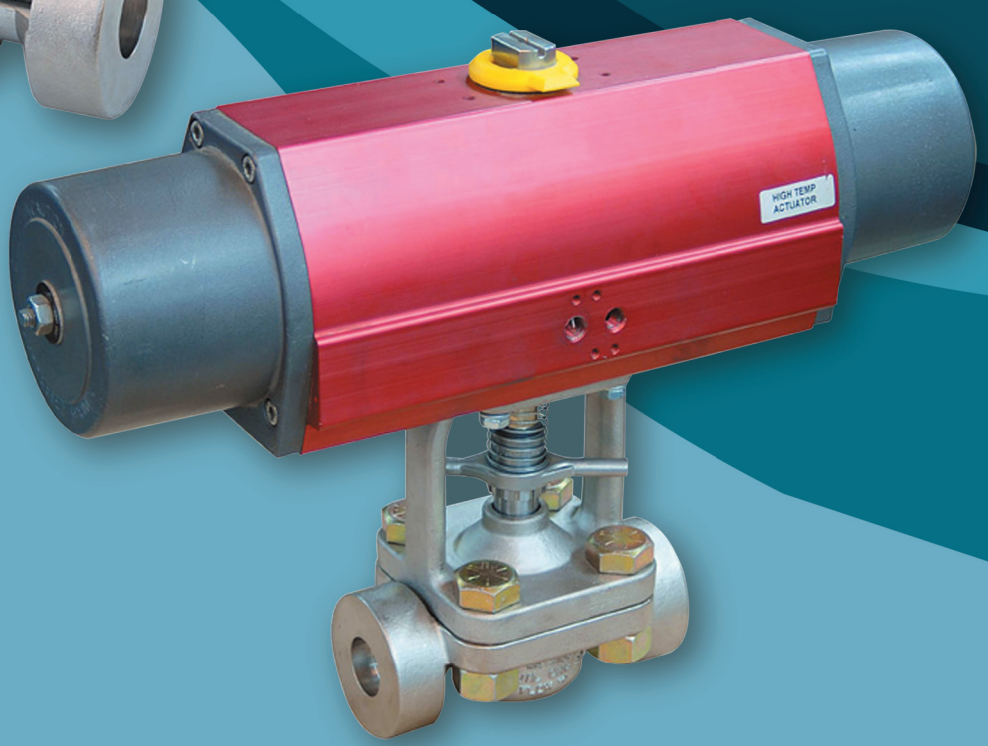
Conval INC.

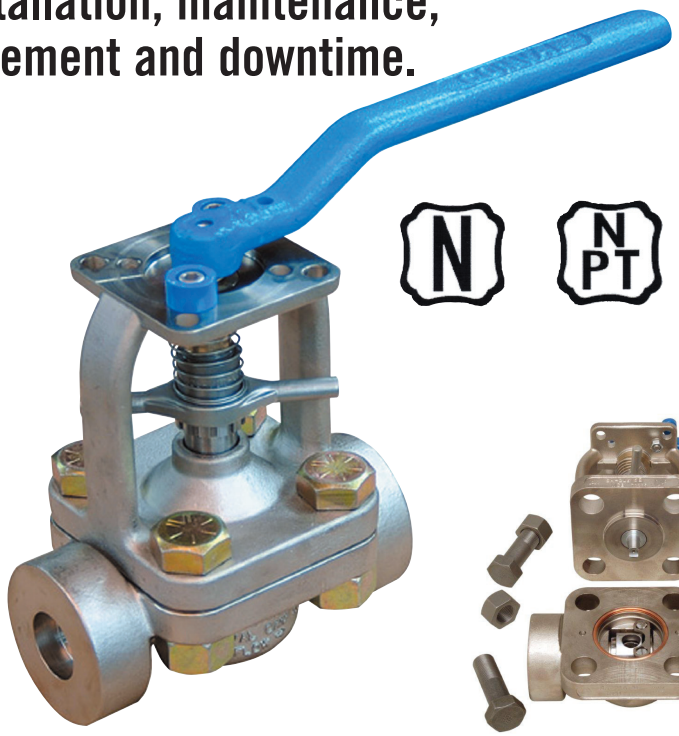
World Class Camseal® Ball Valves

- *Unique Zero Leakage Design*
- *Top Quality Manufacturing*
- *Long, Reliable Life Cycle*
- *In-Line, Top Entry Maintenance & Repair*
- *Enormous Savings in Labor, Materials & Downtime*





Camseal® Cartridge-style, Top Entry Zero Leakage Ball Valves save significant time and money on installation, maintenance, replacement and downtime.



STANDARD SIZES
1/2" through 4" Top Entry
SW, BW, FNPT and a variety of ends

PRESSURE RATING
ASME Class 900 through 4500

STANDARD MATERIALS
Carbon Steel SA-105
Stainless Steel SA-182-F316/F316L
Alloy SA-182-F22 Cl.3, SA-182-F91
Other materials available upon request

STANDARD ACCESSORIES
ISO-5211 Integral Mounting Pad
Actuators - Electric, Pneumatic or Hydraulic

DESIGN FEATURES

Conval Camseal Ball Valve Provides Zero Leakage

Zero Body Leakage: The body/bonnet joint is not subject to pipeline stresses. There is no in-line body bolting to loosen and fatigue, so the body remains leak-free.

Zero Seat Leakage: All valves are capable of meeting zero bubbles for 4 minutes @ 50 psi and 1,000 psi Nitrogen at final factory hydrotest, after field in-line welding, following post-weld heat treat, during and after process thermal excursions including thermal shocks. Modular internals isolate critical seal surfaces from thermal effects..

Zero Stem Seal Leakage: Conval's exclusive Integral Gland Wrench concentrically loads the stem packing without tools, eliminating stem leaks and extending packing life. Live loading is available as an option.

Cartridge-style Top Entry

With top entry access, maintenance and replacement of the cartridge internals are very convenient, with no effect on existing piping and welds. A window in the top of the bushing shows the position of the ball when an actuator is being mounted.

Robust Stem-Ball Engagement

Reliable, accurate ball alignment is achieved due to the robust engagement between the one-piece stem and the ball.

Superior Bearing Support

Superior bearing support of the blowout-proof stem ensures proper axial alignment and Zero Seat Leakage even on actuated valves.

Chrome Carbide Coating System

Conval's highly-engineered flame spray Chrome Carbide coating system has superior bond strength and coating density to provide long-life, leak-free performance even in high pressure drop applications.

In-line Servicing

In-line renewability can be accomplished in 30 minutes and restores Zero Leakage performance in the event of process application abuse.

Integral Mounting Pad

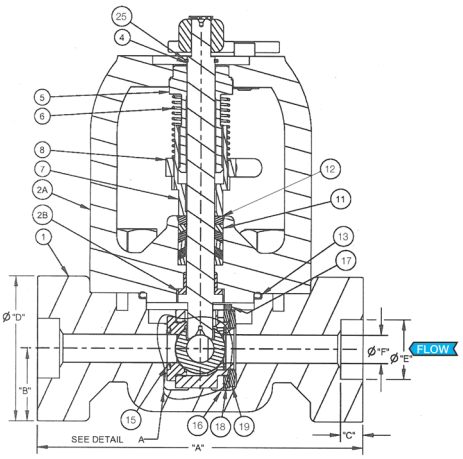
An ISO-5211 integral mounting pad facilitates error-free, air, motor and gear operator actuation due to superior rigidity, precise alignment and a fully-guided stem bearing system. Lockout capability is standard.

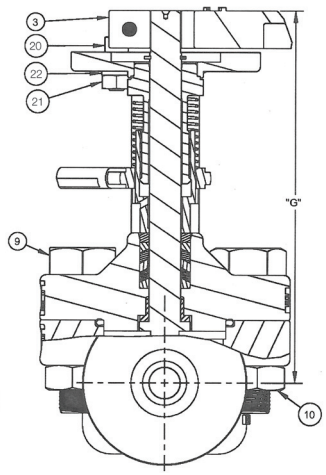
Two-Year Warranty

Conval is committed to unsurpassed quality. We are so confident of the quality of our product, that we offer a two-year warranty.

United States Patent No. 7,267,323

CAMSEAL® BALL VALVE LIST OF MATERIALS





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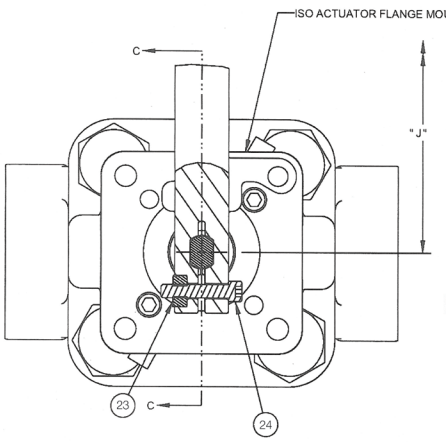
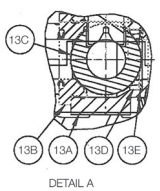




DETAIL A
ITEM 13

LIST OF MATERIALS FOR 1700# AND 3100# VALVES

NO.	NAME	QTY	MATERIAL			
1	BODY	1	ASME-SA-105	ASME-SA-182-F22 Cl.3	ASME-SA-182-F91	ASME-SA-182-F316/F316L
2	BONNET ASSEMBLY	1				
2A	BONNET	1	ASME-SA-216 Gr. WCB	ASME-SA-217 Gr. WC9	ASME-SA-217 Gr. C12A	ASME-SA-351-CF3M
2B	BONNET STEM BEARING	1	ASME-SA479 TYPE 410	ASME SA479 TYPE 410	ASME SA479 TYPE 410	AMS 5387 STBL #6
3	HANDLE	1	ASME-SA-216 Gr. WCB	ASME-SA-216 Gr. WCB	ASME-SA-216 Gr. WCB	ASME-SA-216 Gr. WCB
4	STEM	1	ASTM A582 TYPE 416	ASME SB637 UNS N07718	ASME SB637 UNS N07718	ASME SB637 UNS N07718
5	BUSHING GLAND	1	ASME SB150 AL-BR2	ASME SB150 AL-BR2	ASME SB150 AL-BR2	ASME SB150 AL-BR2
6	IGW SPRING	1	MFR STD STAINLESS	MFR STD STAINLESS	MFR STD STAINLESS	MFR STD STAINLESS
7	GLAND	1	ASTM A582 TYPE 416	ASTM A582 TYPE 416	ASTM A582 TYPE 416	ASME SA479 TYPE 316
8	IGW	1	MFR STD STAINLESS	MFR STD STAINLESS	MFR STD STAINLESS	MFR STD STAINLESS
9	BODY STUD	SD	ASME SA193 B16	ASME SA193 B16	ASME SA193 B16	ASME SA193 B8M
10	BODY FLANGE NUT	SD	ASME SA194 GR 4	ASME SA194 GR 4	ASME SA194 GR 4	ASME SA194 GR 8M
11	PACKING SET	1				
11A	PACKING	1	FLEXIBLE GRAPHITE			
11B	PACKING SPACER	1	ASME SA479 UNS S21800 (NIT 60)			
12	C-RING BONNET/BODY	1	ASTM B670 PLTD	ASTM B670 PLTD	ASTM B670 PLTD	ASTM B670 PLTD
13	CARTRIDGE ASSY	1				
13A	CARTRIDGE	1	ASME SA479 TYPE 410	ASME SA479 TYPE 410	ASME SA479 TYPE 410	ASME SA479 TYPE 316
13B	COATED SEAT	1	ASME SB637 UNS N07718	ASME SB637 UNS N07718	ASME SB637 UNS N07718	ASME SB637 UNS N07718
13C	COATED BALL	1	ASME SB637 UNS N07718	ASME SB637 UNS N07718	ASME SB637 UNS N07718	ASME SB637 UNS N07718
13D	UPSTREAM SEAT	1	ASME SA479 TYPE 410	ASME SA479 TYPE 410	ASME SA479 TYPE 410	AMS 5387 STELLITE 6
13E	UPSTREAM SEAT BELLEVILLE	1	ASME SB637 UNS N07718			
14	C-RING SEAT TO BODY	1	ASTM B670 PLTD	ASTM B670 PLTD	ASTM B670 PLTD	ASTM B670 PLTD
15	CAM	2	ASME SA479 TYPE 410	ASME SA479 TYPE 410	ASME SA479 TYPE 410	ASME SA479 UNS S20910
16	CAM CLIP	1	ASME SB637 N07750	ASME SB637 N07750	ASME SB637 N07750	ASME SB637 N07750
17	SPACER	1	ASME SB637 UNS N07718			
18	CAM BELLEVILLE	SD				
19	STOP BOLT	2	MFR STD STAINLESS	MFR STD STAINLESS	MFR STD STAINLESS	MFR STD STAINLESS
20	STOP NUT	2	MFR STD STAINLESS	MFR STD STAINLESS	MFR STD STAINLESS	MFR STD STAINLESS
21	STOP LOCK WASHER	2	MFR STD STAINLESS	MFR STD STAINLESS	MFR STD STAINLESS	MFR STD STAINLESS
22	HANDLE NUT	1	MFR STD CARBON STL	MFR STD CARBON STL	MFR STD CARBON STL	MFR STD CARBON STL
23	HANDLE BOLT	1	MFR STD ALLOY CS	MFR STD ALLOY CS	MFR STD ALLOY CS	MFR STD ALLOY CS
24	SNAP RING STEM RETAINER	1	MFR STD	MFR STD	MFR STD	MFR STD

Note: Stainless Steel Item 23 – key material not shown (Nitronic 50) supplied for Inconel 718 stems. Key material not shown (Nitronic 60) supplied for Nitronic 50 stems.
SD= Size Dependent

LIST OF MATERIALS FOR 4500# VALVES

NO.	NAME	QTY	MATERIAL			
1	BODY	1	ASME-SA-105	ASME-SA-217 GR. WC9	ASME-SA-217 GR. C12A	ASME-SA-351-CF8M/3M
EXCEPT FOR THE FOLLOWING COMPONENTS MATERIALS ARE THE SAME AS 1700# AND 3100# VALVES						
4	STEM	1	ASTM B-637, UNS N07718			
13B	COATED SEAT	1	ASTM B-637, UNS N07718			
13C	COATED BALL	1	ASTM B-637, UNS N07718			

PIPE SIZE	CODE	ASME CLASS	INCHES A	B	C	D	E	F	G	J	LBS. WEIGHT	CV
1/2 THRU 1 1/2	5E	1700# 3100#	7 1/4	1 5/8		3 1/4	-	5/8	7 3/8	15 3/16	30 1/4	14-42*
1/2 THRU 1 1/4	7E	4500#	9 1/4	2		4	-	5/8	10 5/32	24 3/16	60	
2 THRU 2 1/2	7H	1700# 3100#	9 1/4	2		4	-	1 1/16	10 5/32	24 3/16	62	37-71*
1 1/2 THRU 4	9H	4500#	11	2 11/32	-	4 11/16	-	1 1/16	11 1/2	32	100	20-97
3 THRU 4 (BW ONLY)	9J	1700# 3100#	11	2 11/32		4 11/16		1 1/2	11 1/2	32	112	69-107*

PIPE SIZE	CODE	ASME CLASS	MILLIMETERS A	B	C	D	E	F	G	J	KG WEIGHT	CV
1/2 THRU 1 1/2	5E	1700# 3100#	184	41	- -	83	-	16	187	386	13.7	14-42*
1/2 THRU 1 1/4	7E	4500#	235	51	-	102	-	16	258	614	27.2	
2 THRU 2 1/2	7H	1700# 3100#	235	51	-	102	-	27	258	614	28.1	37-71*
1 1/2 THRU 4	9H	4500#	279	60	-	119	-	27	292	813	45.4	20-97
3 THRU 4 (BW ONLY)	9J	1700# 3100#	279	60	-	119	-	38	292	813	50.8	69-107*

*The first number represents the Practical Cv based on pipe ID, the second number represents the Max Cv of the valve.

CAMSEAL® BALL VALVES
DESIGN VALIDATION AND COMPARISON TESTING

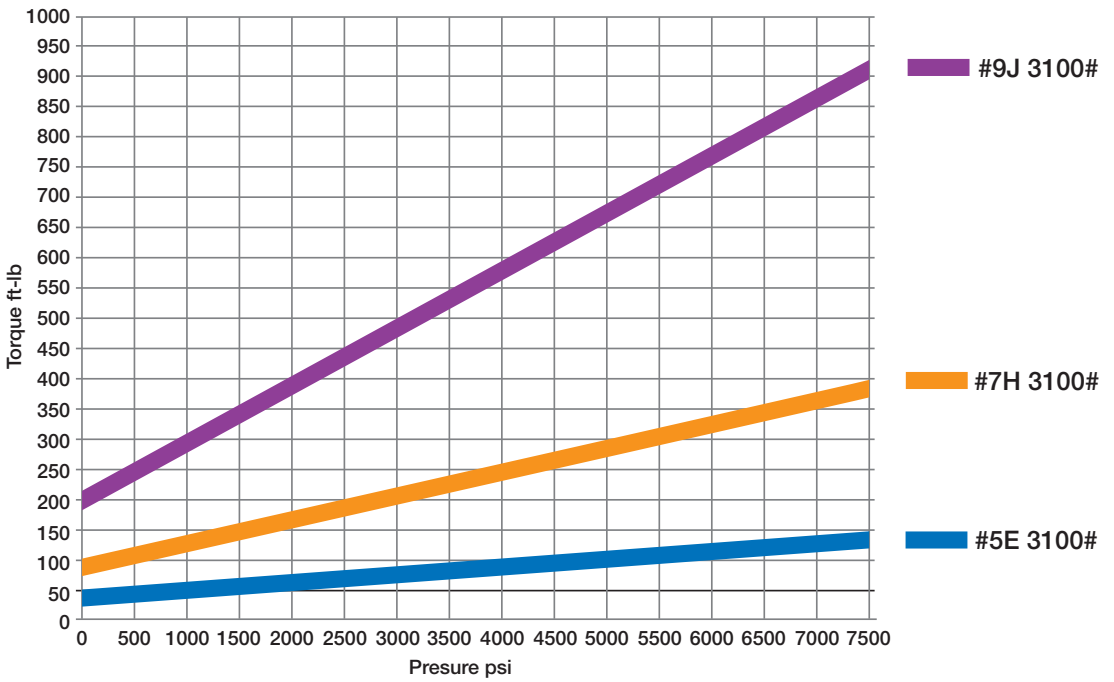
The Camseal Ball Valve has been subjected to extremely rigorous computer-aided analysis, laboratory and field testing during its development. Not only were benchmarks established against which performance was measured, but evaluation valves manufactured by competitors were also tested alongside the Camseal Ball Valve. A summary of the design validation and comparison testing is given below.

- CAD 3D-Finite Element Analysis was used to evaluate all strains and stresses associated with the Camseal Ball Valve. Though the design meets ASME B16.34, Conval's rigorous approach verified pressure boundary integrity, including all body and bonnet sections that are not directly defined by the code.
- CAD 3D-Thermal Modeling facilitated the design process by pictorially displaying thermal parameters and heat transfer to the ISO-5211 Mounting Pad. Subsequent lab and field testing validated the design and the model.
- CAD 3D-Flow Modeling software was used to streamline internal waterway sections and maximize Cv and flow efficiency.
- Sophisticated Thermal Spray coating, grinding and lapping techniques were proven through Nitrogen leak testing. The Camseal Ball Valve exhibits Zero Leakage from final inspection through pipeline welding and post weld heat treat. Zero bubble leak performance was subsequently verified during numerous positive and negative thermal gradients and at elevated temperatures above 1100° F and again at 70° F.
- Competitive valves subjected to the same rigorous thermal cycling leaked badly and continued to leak badly once back at room temperature.
- In addition to in-house lab and field testing, steam blow-down tests at a high-pressure steam laboratory were performed. In total, over 100 thermal cycles, 100 blow-down cycles and several hundred operational cycles were logged without degradation to the original Zero-Leakage integrity.

After manufacture, every valve undergoes pressure testing per ASME B 16.34 in addition to special, zero-bubble Nitrogen ball to seat leak tests.

All valves are manufactured under a sophisticated Quality Management System covered by one of the following Certifications: ISO-9000-2000, 10CFR50, Appendix B nuclear, ASME N- and NPT-Stamp nuclear; and CE marking per the European Pressure Equipment Directive (PED).

3100# CAMSEAL BALL VALVE TORQUE CHART



CAMSEAL® BALL VALVE WORKING PRESSURE BY CLASS, PSIG

SA 182-F22 Cl.3 FORGINGS, AND SA 217-WC9 CASTINGS

	STANDARD CLASS			SPECIAL CLASS[1]			LIMITED CLASS		
TEMP °F	1700	3100	4500	1700	3100	4500	1700	3100	4500
-20 TO 100	4250	7750	11250	4250	7750	11250	4250	7750	11250
200	4250	7750	11250	4250	7750	11250	4250	7750	11250
300	4126	7527	10925	4188	7639	11090	4188	7639	11090
400	4000	7292	10585	4125	7520	10915	4125	7520	10915
500	3768	6868	9965	4103	7484	10865	4103	7484	10865
600	3428	6249	9070	4086	7452	10815	4086	7452	10815
650	3333	6081	8825	4057	7396	10735	4057	7396	10735
700	3218	5866	8515	4007	7308	10605	4007	7308	10605
750	3014	5492	7970	4007	7308	10605	4007	7308	10605
800	2878	5244	7610	4007	7308	10605	4007	7308	10605
850	2760	5034	7305	3837	7000	10160	3837	7000	10160
900	2545	4644	6740	3400	6200	9000	3400	6200	9000
950	2188	3993	5795	2674	4872	7070	2744	5120	7556
1000	1514	2764	4010	1893	3454	5015	2052	4047	6213
1050	991	1806	2625	1240	2258	3280	1344	2646	4064
1100	623	1134	1645	777	1418	2055	842	1661	2546
1200	233	426	615	290	532	770	314	613	956

SA 182-F91 FORGINGS, AND SA 217-C12A CASTINGS

	STANDARD CLASS			SPECIAL CLASS[1]			LIMITED CLASS		
TEMP °F	1700	3100	4500	1700	3100	4500	1700	3100	4500
-20 TO 100	4250	7750	11250	4250	7750	11250	4250	7750	11250
200	4250	7750	11250	4250	7750	11250	4250	7750	11250
300	4126	7527	10925	4250	7750	11250	4250	7750	11250
400	4000	7292	10585	4250	7750	11250	4250	7750	11250
500	3768	6868	9965	4250	7750	11250	4250	7750	11250
600	3428	6249	9070	4250	7750	11250	4250	7750	11250
650	3333	6081	8825	4250	7750	11250	4250	7750	11250
700	3218	5866	8515	4154	7576	10995	4154	7576	10995
750	3014	5492	7970	4130	7528	10930	4130	7528	10930
800	2878	5244	7610	4080	7440	10800	4080	7440	10800
850	2760	5034	7305	3837	7000	10160	3837	7000	10160
900	2545	4644	6740	3400	6200	9000	3400	6200	9000
950	2188	3993	5795	2674	4872	7070	2744	5120	7556
1000	2062	3756	5450	2385	4347	6310	2585	5015	7556
1050	2040	3720	5400	2385	4347	6310	2585	5015	7556
1100	1711	3118	4525	2137	3898	5655	2316	4568	7006
1150	1263	2302	3345	1580	2878	4180	1712	3373	5179
1200	816	1488	2160	1020	1860	2700	1105	2180	3345

SA 105 FORGINGS, AND SA 216-WCB CASTINGS

	STANDARD CLASS			SPECIAL CLASS[1]			LIMITED CLASS		
TEMP °F	1700	3100	4500	1700	3100	4500	1700	3100	4500
-20 TO 100	4198	7652	11110	4250	7750	11250	4250	7750	11250
200	3847	7014	10185	4250	7750	11250	4250	7750	11250
300	3706	6760	9815	4194	7651	11105	4194	7651	11105
400	3592	6548	9505	4153	7572	10995	4153	7572	10995
500	3417	6230	9040	4153	7572	10995	4153	7572	10995
600	3218	5866	8515	4153	7572	10995	4153	7572	10995
650	3111	5675	8240	4052	7391	10730	4052	7391	10730
700	3017	5486	7960	3916	7142	10365	3916	7142	10365
750	2874	5244	7610	3593	6554	9515	3593	6554	9515
800	2330	4252	6170	2913	5314	7715	2913	5314	7715

SA 182-F316 FORGINGS, AND SA 351-CF8M CASTINGS

	STANDARD CLASS			SPECIAL CLASS[1]			LIMITED CLASS		
TEMP °F	1700	3100	4500	1700	3100	4500	1700	3100	4500
-20 TO 100	4080	7440	10800	4250	7750	11250	4250	7750	11250
200	3508	6399	9290	3916	7142	10365	3916	7142	10365
300	3168	5779	8390	3536	6448	9360	3536	6448	9360
400	2912	5308	7705	3247	5923	8600	3247	5923	8600
500	2708	4936	7165	3020	5507	7995	3020	5507	7995
600	2556	4663	6770	2855	5203	7555	2855	5203	7555
650	2504	4564	6625	2793	5092	7395	2793	5092	7395
700	2460	4489	6515	2748	5009	7270	2748	5009	7270
750	2420	4415	6410	2703	4928	7150	2703	4928	7150
800	2392	4365	6335	2670	4872	7070	2670	4872	7070
850	2368	4316	6265	2641	4817	6990	2641	4817	6990
900	2352	4291	6230	2624	4787	6950	2624	4787	6950
950	2188	3993	5795	2595	4732	6870	2595	4732	6870
1000	2062	3756	5450	2385	4347	6310	2385	4347	6310

Flanged and threaded end valve ratings terminate at 2500 class, and 1000 °F.
Flanged end valves may only be Standard Class, and Nominal Ratings.

[1] NDE is required for Special Class ratings.

CAMSEAL® BALL VALVE WORKING PRESSURE BY CLASS, BARS

SA 182-F22 Cl.3 FORGINGS, AND SA 217-WC9 CASTINGS

	STANDARD CLASS			SPECIAL CLASS[1]			LIMITED CLASS		
TEMP °C	PN292	PN522	PN760	PN292	PN522	PN760	PN292	PN522	PN760
-29 TO 38	293	534	776	293	534	776	293	534	776
93	293	534	776	293	534	776	293	534	776
149	284	519	753	289	527	765	289	527	765
204	276	503	730	284	518	753	284	518	753
260	260	473	687	283	516	749	283	516	749
316	236	431	625	282	514	746	282	514	746
343	230	419	608	280	510	740	280	510	740
371	222	404	587	276	504	731	276	504	731
399	208	379	550	276	504	731	276	504	731
427	198	362	525	276	504	731	276	504	731
454	190	347	504	265	483	701	265	483	701
482	175	320	465	234	427	621	234	427	621
510	151	275	400	184	336	487	189	353	521
538	104	191	276	131	238	346	141	279	428
566	68	125	181	85	156	226	93	182	280
593	43	78	113	54	98	142	58	115	176
649	16	29	42	20	37	53	22	42	66

SA 182-F91 FORGINGS, AND SA 217-C12A CASTINGS

	STANDARD CLASS			SPECIAL CLASS[1]			LIMITED CLASS		
TEMP °C	PN292	PN522	PN760	PN292	PN522	PN760	PN292	PN522	PN760
-29 TO 38	293	534	776	293	534	776	293	534	776
93	293	534	776	293	534	776	293	534	776
149	284	519	753	293	534	776	293	534	776
204	276	503	730	293	534	776	293	534	776
260	260	473	687	293	534	776	293	534	776
316	236	431	625	293	534	776	293	534	776
343	230	419	608	293	534	776	293	534	776
371	222	404	587	286	522	758	286	522	758
399	208	379	550	285	519	754	285	519	754
427	198	362	525	281	513	745	281	513	745
454	190	347	504	265	483	701	265	483	701
482	175	320	465	234	427	621	234	427	621
510	151	275	400	184	336	487	189	353	521
538	142	259	376	164	300	435	178	346	521
566	141	256	372	164	300	435	178	346	521
593	118	215	312	147	269	390	160	315	483
621	87	159	231	109	198	288	118	233	357
649	56	103	149	70	128	186	76	150	231

SA 105 FORGINGS, AND SA 216-WCB CASTINGS

	STANDARD CLASS			SPECIAL CLASS[1]			LIMITED CLASS		
TEMP °C	PN292	PN522	PN760	PN292	PN522	PN760	PN292	PN522	PN760
-29 TO 38	289	528	766	293	534	776	293	534	776
93	265	484	702	293	534	776	293	534	776
149	256	466	677	289	527	766	289	527	766
204	248	451	655	286	522	758	286	522	758
260	236	430	623	286	522	758	286	522	758
316	222	404	587	286	522	758	286	522	758
343	214	391	568	279	510	740	279	510	740
371	208	378	549	270	492	715	270	492	715
399	198	362	525	248	452	656	248	452	656
427	161	293	425	201	366	532	201	366	532

SA 182-F316 FORGINGS, AND SA 351-CF8M CASTINGS

	STANDARD CLASS			SPECIAL CLASS[1]			LIMITED CLASS		
TEMP °C	PN292	PN522	PN760	PN292	PN522	PN760	PN292	PN522	PN760
-29 TO 38	281	513	745	293	534	776	293	534	776
93	242	441	641	270	492	715	270	492	715
149	218	398	578	244	445	645	244	445	645
204	201	366	531	224	408	593	224	408	593
260	187	340	494	208	380	551	208	380	551
316	176	322	467	197	359	521	197	359	521
343	173	315	457	193	351	510	193	351	510
371	170	309	449	189	345	501	189	345	501
399	167	304	442	186	340	493	186	340	493
427	165	301	437	184	336	487	184	336	487
454	163	298	432	182	332	482	182	332	482
482	162	296	430	181	330	479	181	330	479
510	151	275	400	179	326	474	179	326	474
538	142	259	376	164	300	435	164	300	435

Flanged and threaded end valve ratings terminate at 2500 class, and 1000 °F.
Flanged end valves may only be Standard Class, and Nominal Ratings.

[1] NDE is required for Special Class ratings.

CAMSEAL® BALL VALVE OPERATING TORQUES

WATER
STEM TORQUE VS. LINE PRESSURE FOR WATER

PRESSURE (PSI)	5E TORQUE (FT-LB)	7E TORQUE (FT-LB)	7H TORQUE (FT-LB)	9H TORQUE (FT-LB)	9J TORQUE (FT-LB)
0	31	31	80	80	195
500	38	38	100	100	242
1000	44	44	120	120	289
1500	50	50	139	139	336
2000	57	57	159	159	383
2500	63	63	179	179	430
3000	69	69	198	198	477
3500	76	76	218	218	525
4000	82	82	238	238	572
4500	88	88	257	257	619
5000	95	95	277	277	666
5500	101	101	296	296	713
6000	107	107	324	316	760
6500	114	114	336	336	807
7000	120	120	355	355	854
7500	126	126	375	375	902
8000	-	133	-	395	-
8500	-	139	-	414	-
9000	-	145	-	434	-
9500	-	152	-	454	-
10000	-	158	-	473	-
10500	-	164	-	493	-
11000	-	171	-	513	-
11500	-	177	-	532	-

STEAM
STEM TORQUE VS. LINE PRESSURE FOR STEAM

PRESSURE (PSI)	5E TORQUE (FT-LB)	7E TORQUE (FT-LB)	7H TORQUE (FT-LB)	9H TORQUE (FT-LB)	9J TORQUE (FT-LB)
0	31	31	79	79	193
500	37	37	97	97	236
1000	42	42	115	115	278
1500	48	48	133	133	321
2000	54	54	151	151	363
2500	60	60	168	168	406
3000	66	66	186	186	448
3500	71	71	204	204	491
4000	77	77	222	222	533
4500	83	83	240	240	576
5000	89	89	257	257	618
5500	94	94	275	275	661
6000	100	100	300	293	704
6500	106	106	311	311	746
7000	112	112	329	329	789
7500	118	118	346	346	831
8000	-	123	-	364	-
8500	-	129	-	382	-
9000	-	135	-	400	-
9500	-	141	-	418	-
10000	-	146	-	435	-
10500	-	152	-	453	-
11000	-	158	-	471	-
11500	-	164	-	489	-

WATER
STEM TORQUE VS. LINE PRESSURE FOR WATER (METRIC)

PRESSURE (BARS)	5E TORQUE (N-M)	7E TORQUE (N-M)	7H TORQUE (N-M)	9H TORQUE (N-M)	9J TORQUE (N-M)
0	42	42	109	109	264
42	51	51	135	135	328
69	60	60	162	162	392
103	68	68	189	189	456
138	77	77	215	215	519
172	85	85	242	242	583
207	94	94	269	269	647
241	102	102	295	295	711
276	111	111	322	322	775
310	120	120	349	349	839
345	128	128	375	375	903
379	137	137	402	402	967
414	145	145	439	429	1031
448	154	154	455	455	1095
483	163	163	482	482	1158
517	171	171	509	509	1222
552	-	180	-	535	-
586	-	188	-	562	-
621	-	197	-	588	-
655	-	206	-	615	-
689	-	214	-	642	-
724	-	223	-	668	-
758	-	231	-	695	-
793	-	240	-	722	-

STEAM
STEM TORQUE VS. LINE PRESSURE FOR STEAM (METRIC)

PRESSURE (BARS)	5E TORQUE (N-M)	7E TORQUE (N-M)	7H TORQUE (N-M)	9H TORQUE (N-M)	9J TORQUE (N-M)
0	42	42	108	108	262
34	50	50	132	132	319
69	57	57	156	156	377
103	65	65	180	180	435
138	73	73	204	204	492
172	81	81	228	228	550
207	89	89	252	252	608
241	97	97	276	276	665
276	104	104	301	301	723
310	112	112	325	325	781
345	120	120	349	349	838
379	128	128	373	373	896
414	136	136	407	397	954
448	144	144	421	421	1012
483	151	151	445	445	1069
517	159	159	470	470	1127
552	-	167	-	494	-
586	-	175	-	518	-
621	-	183	-	542	-
655	-	191	-	566	-
689	-	198	-	590	-
724	-	206	-	614	-
758	-	214	-	638	-
793	-	222	-	663	-

The Conval Story

In 1962, Mr. Chester Siver completed designs for a revolutionary line of high-pressure, forged steel valves. Hamilton Standard (now Hamilton Sunstrand), a division of United Technologies Corporation, was asked to use their then-new Electron Beam Welding technology for joining of parts into valves for subassemblies. Hamilton Standard became intrigued with the valve as an ideal application of the Electron Beam Welding technique, and negotiated a contract for the rights to manufacture and sell the valve. Mr. Siver served as manager of the valve project.

The first CLAMPSEAL® valves were introduced to the market by Hamilton Standard in 1964. However, in the mid-1960's, growing demand for the firm's popular aerospace products forced Hamilton Standard to make the decision to abandon its industrial products projects. The rights to the CLAMPSEAL valve reverted back to Mr. Siver. Since CLAMPSEAL valves were born in Connecticut, Mr. Siver founded "Conval" (short for Connecticut Valve) in 1967. Today, the valves are still manufactured in Connecticut, a state with a longstanding reputation for technological innovation and manufacturing excellence.

Conval has grown into a leader in valves for the world's most demanding applications. We have a global team of experts to help to meet your most challenging needs. We invite you to contact us today.

High-pressure, high-temperature ball, bellows, bonnetless, check, gate, globe, throttling, and urea service valves for the world's most demanding applications.

Thank you for your business!

ISO 9001 certified since September 11, 1992

PED certified since 2003

MADE IN USA

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