

# Conval INC.

## High Performance Valves for the World's Most Demanding Applications

- High Pressure
- High Temperature
- Ball
- Bellows
- Check
- Gate
- Globe
- Throttling
- Urea Service



# WELCOME TO *Gonval* INC.

Conval has designed and manufactured high-pressure, high-temperature forged steel valves for the world's most *demanding* applications for over 50 years. One of Conval's guiding principles is selecting, cultivating, and serving the needs of our markets with innovative and technologically-advanced products. In order to achieve this high degree of excellence, we have set up a Quality System that ensures compliance to requirements. Conval was ISO 9001 Certified on Sept. 11, 1992. We also comply to Appendix B of 10 CFR 50, the Crosby Quality program, N-stamp certifications, the European PED, IBR and many other standards.

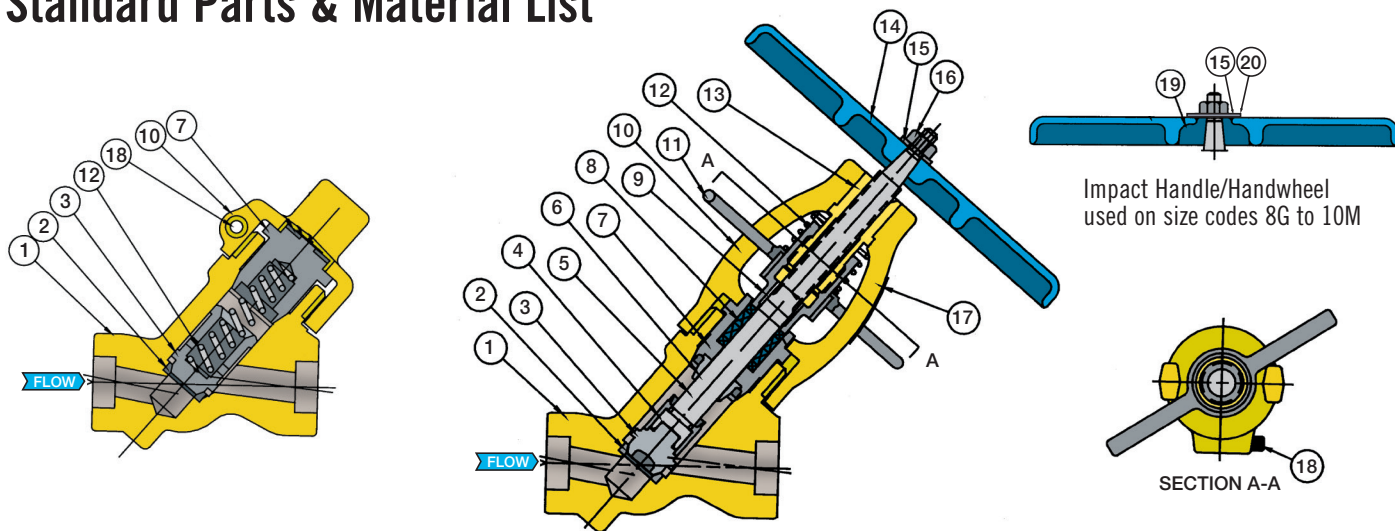
Conval valves and accessories are in service with customers around the world. That's why Conval has stocking representatives on every continent. For your convenience, there is a complete, up-to-date list of representatives and regional managers on our website, Conval.com. We look forward to being of service to you soon.



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## Standard Parts & Material List



### Globe Valve

NO.	NAME	Carbon Steel	Low Alloy	Stainless
1	Body	SA-105	SA-182 F22 or SA-182 F91	SA-182 F316
2	Seat	Cobalt Alloy-AMS 5387	Cobalt Alloy-AMS 5387	ASTM A732 GR21
3	Disc	Cobalt Alloy-AMS 5387	Cobalt Alloy-AMS 5387	Cobalt Alloy-AMS 538
4	Retainer	ASTM A 582 416	ASTM A 582 416	SA-479 316
5	Stern	ASTM A 582 416	ASTM A 582 416	SA479-UNS S20910
6	Stem Guide	ASTM A 732 GR21	ASTM- A732-GR21	ASTM A732 GR21
7	Bonnet/Chamber	SA479-410	SA479-410	SA479-TYPE 316
8	Packing Set	Flexible Graphite	Flexible Graphite	Flexible Graphite
		Die Formed Packing Rings	Die Formed Packing Rings	Die Formed Packing Rings
		Braided Carbon Yarn Wiper Rings	Braided Carbon Yarn Wiper Rings	Braided Carbon Yarn Wiper Rings
9	Gland	ASTM A 582 416	ASTM A 582 416	ASME SA-479 316
10	Yoke	SA-105	SA-182 F22	SA-182 F316
11	I.G.W.1	AMS 5370	AMS 5370	AMS 5370
12	Spring	Stainless	Stainless	Stainless
13	Bushing	ASME SB-150-C64200	ASME SB-150-C64200	ASME SB-150-C64200
14	Handle/Handwheel	Malleable Iron	Malleable Iron	Malleable Iron
15	Washer <sup>2</sup>	Steel	Steel	Stainless
16	Locknut	Steel	Steel	Steel
17	ID Plate	Stainless Steel	Stainless Steel	Stainless Steel
18	Clampbolt	Stainless	Stainless	Stainless
19	Impact Adaptor	Malleable Iron	Malleable Iron	Malleable Iron
20	Retainer Washer	Steel	Steel	Steel

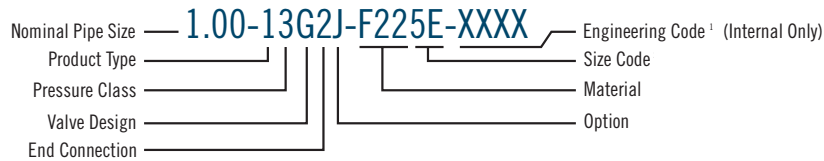
<sup>1</sup> Integral Gland Wrench

<sup>2</sup> Retainer Washer required with sizes 8, 9 and 10

### Check Valve

NO.	NAME	Carbon Steel	Low Alloy	Stainless
1 1	Body	SA-105	SA-182 F22, SA-182 F91	SA-182 F316
2	Seat	Cobalt Alloy-AMS 5387	Cobalt Alloy-AMS 5387	ASTM A732 GR21
3	Piston	Cobalt Alloy-AMS 5387	Cobalt Alloy-AMS 5387	Cobalt Alloy-AMS 538
4	Spring	Inconel X No. 1 Temper	Inconel X No. 1 Temper	Inconel X No. 1 Temper
5	Clampbolt	Stainless	Stainless	Stainless
6	Yoke	SA-105	SA-182 F22	SA-182 F316
7	Bonnet	SA479-UNS S20910	SA479-UNS S20910	SA479-316/ASTM A732 GR21
8	ID Plate	Stainless Steel	Stainless Steel	Stainless Steel

# Clampseal Figure Number Description



<sup>1</sup> Engineering Code assigned by Conval is a key to Engineering Bill of Material and will appear on all packing lists and invoices. This code need not be supplied when ordering unless a specific configuration is being reordered.

## PRODUCT TYPE

1	Globe Valve
2	Whisperjet
3	Y-Body - Extended Body
4	Desuperheater
5	Gate

## ASME PRESSURE CLASS

Nominal		Intermediate
0	Under 900	
1	900	1195
2	1500	2155
3	2500	3045
4	3500	4095
8	4500	

## VALVE DESIGN

A	Angle Pattern Stop
B	Tandem Blowdown: 2 Angle Bodies
C	Y-Pattern Check
D	Angle Pattern Check
E	T-Pattern Check
F	Gate
G	Y-Pattern Stop
H	Bellows Seal
J	Cryogenic
K	Tandem Blowdown: 1 Angle Body, 1 Y-Pattern
L	Leak Off
N	Continuous Blowdown
P	T-Pattern Stop

R	Y-Pattern Stop Check
S	Angle Pattern Stop Check
T	T-Pattern Stop Check
U	Throttling
V	Tandem Blowdown: 2 Y-Pattern Bodies
W	Strainer W/Blowoff Valve
X	Strainer W/Blowoff Fitting
Y	Strainer
Z	3-Way
2	Tandem Blowdown: 1- Ball Valve 1-Throttling Valve

## END CONNECTIONS

1	Threaded
2	Socket Weld Full Port
3	Socket Weld Reduced Port
4	Butt Weld Full Port
5	Butt Weld Reduced Port
6	Butt Weld Double Reduced Port
7	Clamp Connector
8	Flanged - Standard
9	Flanged - Special
0	Other

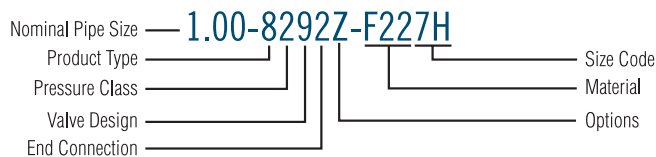
## OPTIONS

A	AUMA Actuator	J	I.G.W.	S	Single Limitswitch
B	EIM Actuator	K	Drain Connection	T	Ball Check
C	Handwheel	L	Locking Handle	U	Double Limitswitch
D	Fisher Actuator	M	Stem Shroud	V	Valtek Actuator
E	Orifice Port	N	Copes Actuator	W	Needle Disc
F	Micrometer Dial	P	Limiterque Actuator	X	Chain Wheel
G	Bendix Actuator	Q	L.L.G. W/I.G.W.	Y	Conval Actuator
H	Spinner Handle	R	Rotork Actuator	Z	Other

## MATERIAL

Carbon	Alloy	Stainless
105 Standard	F22 Standard	316 Standard
A05 Stainless Steel	F91 Standard	B16 Ductile Iron Bushing
Internals	A22 Stainless Steel	D16 316 Body Only
B05 Ductile Iron Bushing	Internals	E16 Monel Trim
C05 17-4 PH Stem	B22 Ductile Iron Bushing	L16 316L Body
E05 Monel Trim	C22 F22 Body /A105 Yoke	N16 Navy Special
N05 Navy Special	E22 Monel Trim	S16 Cobalt Free
S05 Cobalt Free	N22 Navy Special	P16 Polymer Trim
P05 Polymer Trim	S22 Cobalt Free	R16 N60 Bushing
R05 N60 Bushing	P22 Polymer Trim	D73 316L Urea Grade
	R22 N60 Bushing	D81 25-22-2
		D5R Ferralium Trim

# Camseal Figure Number System



## PRODUCT TYPE

8	Ball
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## ASME PRESSURE CLASS

2	1700
3	3100
4	4500

## VALVE DESIGN

9	Camseal
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## END CONNECTIONS

1	Threaded	6	Butt Weld Double Reduced Port
2	Socket Weld Full Port	7	Clamp Connector
3	Socket Weld Reduced Port	8	Flanged - Standard
4	Butt Weld Full Port	9	Flanged - Special
5	Butt Weld Reduced Port	0	Other

## OPTIONS

A	AUMA Actuator
B	EIM Actuator
P	Limiterque Actuator
R	Rotork Actuator
Z	Other

## MATERIAL

Carbon	Stainless
SA-105	SA-182-F316/F316L
Alloy	
SA-182-F22 Cl.3	
SA-182-F91	

# Working Pressure by Class, PSIG

NOMINAL	STANDARD CLASS					SPECIAL CLASS <sup>1</sup>					LIMITED CLASS				
	1/2" - 4" Socket Weld, Butt Weld <sup>1,2</sup>					1/2" - 4" Socket Weld, Butt Weld <sup>1,2</sup>					1/2" - 2 1/2" Socket Weld, Butt Weld <sup>1,2</sup>				
INTERMEDIATE	900	1500	2500	3500	4500	900	1500	2500	3500	4500	900	1500	2500	3500	4500
SA182-F22 Cl.3 FORGINGS, AND SA 217-WC9 CASTINGS															
TEMP °F															
-20 TO 100	2988	5388	7613	10238	11250	2988	5388	7613	10238	11250	2988	5388	7613	10238	11250
200	2988	5388	7613	10238	11250	2988	5388	7613	10238	11250	2988	5388	7613	10238	11250
300	2900	5232	7393	9942	10925	2945	5310	7503	10092	11090	2945	5310	7503	10092	11090
400	2811	5069	7162	9632	10585	2900	5228	7387	9933	10915	2900	5228	7387	9933	10915
500	2649	4776	6746	9069	9965	2885	5202	7351	9887	10865	2885	5202	7351	9887	10865
600	2410	4345	6138	8254	9070	2873	5180	7319	9842	10815	2873	5180	7319	9842	10815
650	2343	4227	5973	8031	8825	2851	5142	7265	9769	10735	2851	5142	7265	9769	10735
700	2263	4078	5761	7749	8515	2816	5081	7178	9651	10605	2816	5081	7178	9651	10605
750	2119	3819	5395	7253	7970	2816	5081	7178	9651	10605	2816	5081	7178	9651	10605
800	2024	3647	5151	6926	7610	2816	5081	7178	9651	10605	2816	5081	7178	9651	10605
850	1939	3499	4944	6648	7305	2696	4865	6875	9246	10160	2696	4865	6875	9246	10160
900	1790	3228	4561	6134	6740	2390	4310	6090	8190	9000	2390	4310	6090	8190	9000
950	1539	2775	3922	5274	5795	1880	3388	4786	6434	7070	1914	3502	5024	6851	7556
1000	1063	1921	2715	3650	4010	1332	2400	3393	4563	5015	1409	2659	3962	5587	6213
1050	697	1255	1774	2388	2625	871	1570	2218	2984	3280	922	1739	2590	3654	4064
1100	438	789	1114	1497	1645	545	986	1393	1871	2055	577	1093	1627	2290	2546
1150	274	492	695	937	1030	341	617	870	1170	1285	361	683	1016	1432	1592
1200	164	297	419	560	615	204	370	523	701	770	216	409	610	858	954

F22 NOT RECOMMENDED FOR PROLONGED USE ABOVE 1100 °F.

WC9; NORMALIZED AND TEMPERED MATERIAL ONLY, NOT TO BE USED OVER 1100 °F.

NOMINAL	STANDARD CLASS					SPECIAL CLASS <sup>1</sup>					LIMITED CLASS				
	1/2" - 4" Socket Weld, Butt Weld <sup>1,2</sup>					1/2" - 4" Socket Weld, Butt Weld <sup>1,2</sup>					1/2" - 2 1/2" Socket Weld, Butt Weld <sup>1,2</sup>				
INTERMEDIATE	900	1500	2500	3500	4500	900	1500	2500	3500	4500	900	1500	2500	3500	4500
SA105 FORGINGS, AND SA 216-WCB CASTINGS															
TEMP °F															
-20 TO 100	2950	5320	7516	10110	11110	2988	5388	7613	10238	11250	2988	5388	7613	10238	11250
200	2704	4875	6889	9268	10185	2988	5388	7613	10238	11250	2988	5388	7613	10238	11250
300	2607	4698	6639	8931	9815	2948	5318	7515	10106	11105	2948	5318	7515	10106	11105
400	2524	4552	6431	8649	9505	2920	5263	7438	10005	10995	2920	5263	7438	10005	10995
500	2402	4332	6119	8227	9040	2920	5263	7438	10005	10995	2920	5263	7438	10005	10995
600	2263	4078	5761	7749	8515	2920	5263	7438	10005	10995	2920	5263	7438	10005	10995
650	2188	3944	5574	7498	8240	2848	5137	7260	9764	10730	2848	5137	7260	9764	10730
700	2119	3818	5388	7244	7960	2754	4965	7015	9432	10365	2754	4965	7015	9432	10365
750	2019	3645	5151	6926	7610	2527	4555	6438	8658	9515	2527	4555	6438	8658	9515
800	1638	2956	4177	5615	6170	2049	3693	5220	7020	7715	2049	3693	5220	7020	7715

A105 NOT RECOMMENDED FOR PROLONGED USE ABOVE 800 °F.

NOMINAL	STANDARD CLASS					SPECIAL CLASS <sup>1</sup>					LIMITED CLASS				
	1/2" - 4" Socket Weld, Butt Weld <sup>1,2</sup>					1/2" - 4" Socket Weld, Butt Weld <sup>1,2</sup>					1/2" - 2 1/2" Socket Weld, Butt Weld <sup>1,2</sup>				
INTERMEDIATE	900	1500	2500	3500	4500	900	1500	2500	3500	4500	900	1500	2500	3500	4500
SA182-F316 FORGINGS, AND SA SA351-F8M CASTINGS															
TEMP °F															
-20 TO 100	2868	5172	7308	9828	10800	2988	5388	7613	10238	11250	2988	5388	7613	10238	11250
200	2467	4448	6285	8454	9290	2754	4965	7015	9432	10365	2754	4965	7015	9432	10365
300	2228	4017	5676	7635	8390	2485	4482	6334	8518	9360	2485	4482	6334	8518	9360
400	2046	3690	5213	7011	7705	2283	4116	5817	7825	8600	2283	4116	5817	7825	8600
500	1905	3431	4848	6520	7165	2124	3828	5409	7275	7995	2124	3828	5409	7275	7995
600	1798	3241	4580	6160	6770	2007	3617	5111	6875	7555	2007	3617	5111	6875	7555
650	1760	3173	4483	6029	6625	1964	3539	5002	6729	7395	1964	3539	5002	6729	7395
700	1730	3120	4409	5929	6515	1932	3483	4920	6616	7270	1932	3483	4920	6616	7270
750	1700	3068	4337	5833	6410	1900	3426	4840	6507	7150	1900	3426	4840	6507	7150
800	1680	3034	4287	5765	6335	1877	3387	4786	6434	7070	1877	3387	4786	6434	7070
850	1666	3000	4239	5701	6265	1857	3349	4731	6361	6990	1857	3349	4731	6361	6990
900	1653	2982	4215	5669	6230	1845	3327	4702	6324	6950	1845	3327	4702	6324	6950
950	1539	2775	3922	5274	5795	1825	3289	4647	6251	6870	1825	3289	4647	6251	6870
1000	1449	2613	3689	4960	5450	1675	3022	4269	5742	6310	1675	3022	4269	5742	6310
1050	1434	2586	3654	4914	5400	1675	3022	4269	5742	6310	1675	3022	4269	5742	6310
1100	1215	2193	3098	4164	4575	1519	2740	3872	5206	5720	1547	2832	4065	5543	6113
1150	944	1699	2401	3230	3550	1178	2125	3002	4036	4435	1246	2354	3506	4941	5495
1200	737	1331	1880	2526	2775	921	1663	2350	3158	3470	974	1842	2744	3866	4299

ABOVE 1000 °F, CONSULT FACTORY

FOR SERVICES OVER 1000 °F, 316H REQUIRED (MINIMUM CARBON CONTENT 0.4%).

1 REFER TO CLASS DESCRIPTIONS FOR OTHER APPLICATIONS.

FLANGED, THREADED, AND GATE VALVES ARE NOMINALLY RATED.

2 SOCKET WELD SIZES DO NOT GO OVER 2 1/2"

FLANGED END VALVES MAY ONLY BE STANDARD CLASS, AND NOMINALLY RATED.

3 NDE IS REQUIRED FOR SPECIAL CLASS RATINGS.

THREADED END VALVE RATINGS TERMINATE AT 1000 °F AND AT 2500 CLASS.

BASED ON ASME B16.34-2017 APPENDIX VII TABLES, AND WHERE APPLICABLE V-2.1.3 OF APPENDIX V

# Working Pressure by Class, BARS

NOMINAL	STANDARD CLASS					SPECIAL CLASS <sup>1</sup>					LIMITED CLASS				
	1/2" - 4" Socket Weld, Butt Weld <sup>1,2</sup>					1/2" - 4" Socket Weld, Butt Weld <sup>1,2</sup>					1/2" - 2 1/2" Socket Weld, Butt Weld <sup>1,2</sup>				
	PN150	PN260	PN420	PN590	PN760	PN150	PN260	PN420	PN590	PN760	PN150	PN260	PN420	PN590	PN760
INTERMEDIATE	PN204	PN365	PN513	PN691		PN204	PN365	PN513	PN691		PN204	PN365	PN513	PN691	
SA182-F22 Cl.3 FORGINGS, AND SA 217-WC9 CASTINGS															
TEMP °C															
-29 TO 38	206	372	525	706	776	206	372	525	706	776	206	372	525	706	776
93	206	372	525	706	776	206	372	525	706	776	206	372	525	706	776
149	200	361	510	685	753	203	366	518	696	765	203	366	518	696	765
204	194	350	494	664	730	200	361	510	685	753	200	361	510	685	753
260	183	329	465	625	687	199	359	507	682	749	199	359	507	682	749
316	166	300	423	569	625	198	357	505	678	746	198	357	505	678	746
343	161	292	412	554	608	196	355	501	673	740	196	355	501	673	740
371	156	281	398	534	587	194	351	495	665	731	194	351	495	665	731
399	146	263	372	500	550	194	351	495	665	731	194	351	495	665	731
427	139	252	355	477	525	194	351	495	665	731	194	351	495	665	731
454	134	241	341	458	504	186	336	474	637	701	186	336	474	637	701
482	123	223	315	423	465	165	297	420	565	621	165	297	420	565	621
510	106	191	271	364	400	130	234	330	444	487	132	334	449	501	521
538	73	133	187	252	276	92	166	234	315	346	97	183	273	385	428
566	48	87	122	165	181	60	108	153	206	226	64	120	179	252	280
593	30	54	77	103	113	38	68	96	129	142	40	75	112	158	176
621	19	34	48	65	71	24	43	60	81	89	25	47	70	99	110
649	11	20	29	39	42	14	25	36	48	53	15	28	42	59	66

F22 NOT RECOMMENDED FOR PROLONGED USE ABOVE 593 °C.

WC9; NORMALIZED AND TEMPERED MATERIAL ONLY, NOT TO BE USED OVER 593 °C.

NOMINAL	STANDARD CLASS					SPECIAL CLASS <sup>1</sup>					LIMITED CLASS				
	1/2" - 4" Socket Weld, Butt Weld <sup>1,2</sup>					1/2" - 4" Socket Weld, Butt Weld <sup>1,2</sup>					1/2" - 2 1/2" Socket Weld, Butt Weld <sup>1,2</sup>				
	900	1500	2500	3500	4500	900	1500	2500	3500	4500	900	1500	2500	3500	4500
INTERMEDIATE	1195	2155	3045	4095		1195	2155	3045	4095		1195	2155	3045	4095	
SA105 FORGINGS, AND SA 216-WCB CASTINGS															
TEMP °C															
-29 TO 38	203	367	519	697	766	206	372	525	706	776	206	372	525	706	776
93	186	336	475	639	702	206	372	525	706	776	206	372	525	706	776
149	180	324	458	616	677	203	367	518	697	766	203	367	518	697	766
204	174	314	444	596	655	201	363	513	690	758	201	363	513	690	758
260	166	299	422	567	623	201	363	513	690	758	201	363	513	690	758
316	156	281	398	534	587	201	363	513	690	758	201	363	513	690	758
343	151	272	385	517	568	196	354	501	673	740	196	354	501	673	740
371	146	263	372	499	549	190	343	484	650	715	190	343	484	650	715
399	139	251	355	477	525	174	314	444	597	656	174	314	444	597	656
427	113	204	288	387	425	141	255	360	484	532	141	255	360	484	532

A105 NOT RECOMMENDED FOR PROLONGED USE ABOVE 427 °C.

A105 NOT RECOMMENDED FOR PROLONGED USE ABOVE 800 °F.

NOMINAL	STANDARD CLASS					SPECIAL CLASS <sup>1</sup>					LIMITED CLASS				
	1/2" - 4" Socket Weld, Butt Weld <sup>1,2</sup>					1/2" - 4" Socket Weld, Butt Weld <sup>1,2</sup>					1/2" - 2 1/2" Socket Weld, Butt Weld <sup>1,2</sup>				
	900	1500	2500	3500	4500	900	1500	2500	3500	4500	900	1500	2500	3500	4500
INTERMEDIATE	1195	2155	3045	4095		1195	2155	3045	4095		1195	2155	3045	4095	
SA182-F316 FORGINGS, AND SA SA351-CF8M CASTINGS															
TEMP °C															
-29 TO 38	198	357	504	677	745	206	372	525	706	776	206	372	525	706	776
93	170	307	434	583	641	190	343	484	650	715	190	343	484	650	715
149	154	277	392	526	578	171	309	437	587	645	171	309	437	587	645
204	141	255	360	483	531	157	284	401	539	593	157	284	401	539	593
260	131	237	334	449	494	146	264	373	501	551	146	264	373	501	551
316	124	224	316	425	467	138	250	353	474	521	138	250	353	474	521
343	121	219	309	416	457	135	244	345	464	510	135	244	345	464	510
371	119	215	304	409	449	133	240	339	456	501	133	240	339	456	501
399	117	212	299	402	442	131	236	334	449	493	131	236	334	449	493
427	116	209	296	397	437	129	234	330	444	487	129	234	330	444	487
454	115	207	292	393	432	128	231	326	438	482	128	231	326	438	482
482	114	206	291	391	430	127	230	324	436	479	127	230	324	436	479
510	106	191	271	364	400	126	227	321	431	474	126	227	321	431	474
538	100	180	255	342	376	115	208	295	396	435	115	208	295	396	435
566	99	178	252	339	372	115	208	295	396	435	115	208	295	396	435
593	84	151	214	287	315	105	189	267	359	394	107	195	280	382	421
621	65	117	166	223	245	81	147	207	278	306	86	162	242	341	379
649	51	92	130	174	191	63	115	162	218	239	67	127	189	267	296

ABOVE 538 °C, CONSULT FACTORY

FOR SERVICES OVER 538 °C, 316H REQUIRED (MINIMUM CARBON CONTENT 0.4%).

1 REFER TO CLASS DESCRIPTIONS FOR OTHER APPLICATIONS.

FLANGED, THREADED, AND GATE VALVES ARE NOMINALLY RATED.

2 SOCKET WELD SIZES DO NOT GO OVER 2 1/2"

FLANGED END VALVES MAY ONLY BE STANDARD CLASS, AND NOMINALLY RATED.

3 NDE IS REQUIRED FOR SPECIAL CLASS RATINGS.

THREADED END VALVE RATINGS TERMINATE AT 538 °C AND AT PN420 CLASS.

BASED ON ASME B16.34-2017 APPENDIX VII TABLES, AND WHERE APPLICABLE V-2.1.3 OF APPENDIX V

# Working Pressure by Class, PSIG

NOMINAL	STANDARD CLASS					SPECIAL CLASS <sup>1</sup>					LIMITED CLASS				
	1/2" - 4" Socket Weld, Butt Weld <sup>1,2</sup>					1/2" - 4" Socket Weld, Butt Weld <sup>1,2</sup>					1/2" - 2 1/2" Socket Weld, Butt Weld <sup>1,2</sup>				
INTERMEDIATE	900	1500	2500	3500	4500	900	1500	2500	3500	4500	900	1500	2500	3500	4500
<b>SA182-F91 FORGINGS, AND SA 217-C12A CASTINGS</b>															
TEMP °F															
-20 TO 100	2988	5388	7613	10238	11250	2988	5388	7613	10238	11250	2988	5388	7613	10238	11250
200	2988	5388	7613	10238	11250	2988	5388	7613	10238	11250	2988	5388	7613	10238	11250
250	2944	5310	7503	10090	11088	2988	5388	7613	10238	11250	2988	5388	7613	10238	11250
300	2900	5232	7393	9942	10925	2988	5388	7613	10238	11250	2988	5388	7613	10238	11250
350	2856	5150	7278	9787	10755	2988	5388	7613	10238	11250	2988	5388	7613	10238	11250
400	2811	5069	7162	9632	10585	2988	5388	7613	10238	11250	2988	5388	7613	10238	11250
450	2730	4923	6954	9351	10275	2988	5388	7613	10238	11250	2988	5388	7613	10238	11250
500	2649	4776	6746	9069	9965	2988	5388	7613	10238	11250	2988	5388	7613	10238	11250
550	2529	4560	6442	8661	9518	2988	5388	7613	10238	11250	2988	5388	7613	10238	11250
600	2410	4345	6138	8254	9070	2988	5388	7613	10238	11250	2988	5388	7613	10238	11250
650	2343	4227	5973	8031	8825	2988	5388	7613	10238	11250	2988	5388	7613	10238	11250
675	2303	4153	5867	7890	8670	2954	5327	7527	10122	11123	2954	5327	7527	10122	11123
700	2263	4078	5761	7749	8515	2920	5266	7441	10006	10995	2920	5266	7441	10006	10995
725	2191	3949	5578	7501	8243	2912	5250	7418	9976	10963	2912	5250	7418	9976	10963
750	2119	3819	5395	7253	7970	2903	5233	7394	9946	10930	2903	5233	7394	9946	10930
775	2071	3733	5273	7089	7790	2885	5203	7351	9887	10865	2885	5203	7351	9887	10865
800	2024	3647	5151	6926	7610	2868	5172	7308	9828	10800	2868	5172	7308	9828	10800
825	1982	3573	5048	6787	7458	2782	5019	7092	9537	10480	2782	5019	7092	9537	10480
850	1939	3499	4944	6648	7305	2696	4865	6875	9246	10160	2696	4865	6875	9246	10160
875	1865	3363	4753	6391	7023	2543	4588	6483	8718	9580	2543	4588	6483	8718	9580
900	1790	3228	4561	6134	6740	2390	4310	6090	8190	9000	2390	4310	6090	8190	9000
925	1664	3001	4241	5704	6268	2135	3849	5438	7312	8035	2152	3906	5557	7520	8278
950	1539	2775	3922	5274	5795	1880	3388	4786	6434	7070	1914	3502	5024	6851	7556
975	1494	2694	3806	5117	5623	1778	3205	4528	6088	6690	1843	3424	4969	6836	7556
1000	1449	2613	3689	4960	5450	1675	3022	4269	5742	6310	1772	3347	4915	6821	7556
1025	1441	2599	3672	4937	5425	1675	3022	4269	5742	6310	1772	3347	4915	6821	7556
1050	1434	2586	3654	4914	5400	1675	3022	4269	5742	6310	1772	3347	4915	6821	7556
1075	1318	2377	3358	4516	4963	1588	2866	4049	5444	5983	1680	3175	4693	6561	7281
1100	1202	2168	3063	4118	4525	1501	2710	3829	5147	5655	1588	3002	4472	6301	7006
1125	1046	1884	2662	3581	3935	1306	2356	3328	4475	4918	1381	2609	3887	5478	6092
1150	889	1600	2261	3043	3345	1110	2001	2827	3803	4180	1174	2216	3302	4656	5179
1175	731	1317	1861	2504	2753	914	1647	2327	3130	3440	966	1824	2718	3832	4262
1200	573	1034	1462	1966	2160	717	1293	1827	2457	2700	758	1432	2134	3008	3345
<b>SA182-F92 FORGINGS</b>															
TEMP °F															
-20 TO 100	2988	5388	7613	10238	11250	2988	5388	7613	10238	11250	2988	5388	7613	10238	11250
200	2988	5388	7613	10238	11250	2988	5388	7613	10238	11250	2988	5388	7613	10238	11250
250	2944	5310	7503	10090	11088	2988	5388	7613	10238	11250	2988	5388	7613	10238	11250
300	2900	5232	7393	9942	10925	2988	5388	7613	10238	11250	2988	5388	7613	10238	11250
350	2856	5150	7278	9787	10755	2988	5388	7613	10238	11250	2988	5388	7613	10238	11250
400	2811	5069	7162	9632	10585	2988	5388	7613	10238	11250	2988	5388	7613	10238	11250
450	2730	4923	6954	9351	10275	2988	5388	7613	10238	11250	2988	5388	7613	10238	11250
500	2649	4776	6746	9069	9965	2988	5388	7613	10238	11250	2988	5388	7613	10238	11250
550	2529	4560	6442	8661	9518	2988	5388	7613	10238	11250	2988	5388	7613	10238	11250
600	2410	4345	6138	8254	9070	2988	5388	7613	10238	11250	2988	5388	7613	10238	11250
650	2343	4227	5973	8031	8825	2988	5388	7613	10238	11250	2988	5388	7613	10238	11250
675	2303	4153	5867	7890	8670	2954	5327	7527	10122	11123	2954	5327	7527	10122	11123
700	2263	4078	5761	7749	8515	2920	5266	7441	10006	10995	2920	5266	7441	10006	10995
725	2191	3949	5578	7501	8243	2912	5250	7418	9976	10963	2912	5250	7418	9976	10963
750	2119	3819	5395	7253	7970	2903	5233	7394	9946	10930	2903	5233	7394	9946	10930
775	2071	3733	5273	7089	7790	2885	5203	7351	9887	10865	2948	5247	7351	9887	10865
800	2024	3647	5151	6926	7610	2868	5172	7308	9828	10800	2868	5172	7308	9828	10800
825	1982	3573	5048	6787	7458	2782	5019	7092	9537	10480	2909	5107	7092	9537	10480
850	1939	3499	4944	6648	7305	2696	4865	6875	9246	10160	2696	4865	6875	9246	10160
875	1865	3363	4753	6391	7023	2543	4588	6483	8718	9580	2817	4780	6483	8718	9580
900	1790	3228	4561	6134	6740	2390	4310	6090	8190	9000	2390	4310	6090	8190	9000
925	1664	3001	4241	5704	6268	2135	3849	5438	7312	8035	2666	4266	5557	7520	8278
950	1539	2775	3922	5274	5795	1880	3388	4786	6434	7070	1914	3502	5024	6851	7556
975	1494	2694	3806	5117	5623	1778	3205	4528	6088	6690	2541	3914	4969	6836	7556
1000	1449	2613	3689	4960	5450	1675	3022	4269	5742	6310	1772	3347	4915	6821	7556
1025	1441	2599	3672	4937	5425	1675	3022	4269	5742	6310	2510	3865	4915	6821	7556
1050	1434	2586	3654	4914	5400	1675	3022	4269	5742	6310	1772	3347	4915	6821	7556
1075	1358	2450	3462	4657	5118	1641	2959	4181	5622	6178	2497	3812	4847	6778	7523
1100	1282	2314	3271	4400	4835	1606	2896	4092	5501	6045	1699	3208	4779	6735	7489
1125	1188	2142	3027	4072	4475	1486	2680	3787	5092	5595	2436	3575	4423	6234	6932
1150	1093	1969	2784	3744	4115	1367	2465	3483	4682	5145	1446	2730	4067	5732	6374

1 REFER TO CLASS DESCRIPTIONS FOR OTHER APPLICATIONS.  
 2 SOCKET WELD SIZES DO NOT GO OVER 2 1/2"  
 3 NDE IS REQUIRED FOR SPECIAL CLASS RATINGS.

FLANGED, THREADED, AND GATE VALVES ARE NOMINALLY RATED.  
 FLANGED END VALVES MAY ONLY BE STANDARD CLASS, AND NOMINALLY RATED.  
 THREADED END VALVE RATINGS TERMINATE AT 1000 °F AND AT 2500 CLASS.

BASED ON ASME B16.34-2017 APPENDIX VII TABLES, AND WHERE APPLICABLE V-2.1.3 OF APPENDIX V

# Working Pressure by Class, BARS

NOMINAL	STANDARD CLASS					SPECIAL CLASS <sup>3</sup>					LIMITED CLASS				
	1/2" - 4" Socket Weld, Butt Weld <sup>1,2</sup>					1/2" - 4" Socket Weld, Butt Weld <sup>1,2</sup>					1/2" - 2 1/2" Socket Weld, Butt Weld <sup>1,2</sup>				
	PN150	PN260	PN420	PN590	PN760	PN150	PN260	PN420	PN590	PN760	PN150	PN260	PN420	PN590	PN760
INTERMEDIATE	PN204	PN365	PN513	PN691	PN204	PN365	PN513	PN691		PN204	PN365	PN513	PN691		
<b>SA182-F91 FORGINGS, AND SA 217-C12A CASTINGS</b>															
<b>TEMP °C</b>															
-29 TO 38	206	372	525	706	776	206	372	525	706	776	206	372	525	706	776
93	206	372	525	706	776	206	372	525	706	776	206	372	525	706	776
121	203	366	518	696	764	206	372	525	706	776	206	372	525	706	776
149	200	361	510	685	753	206	372	525	706	776	206	372	525	706	776
177	197	355	502	675	742	206	372	525	706	776	206	372	525	706	776
204	194	350	494	664	730	206	372	525	706	776	206	372	525	706	776
232	188	340	480	645	708	206	372	525	706	776	206	372	525	706	776
260	183	329	465	625	687	206	372	525	706	776	206	372	525	706	776
288	174	315	444	597	656	206	372	525	706	776	206	372	525	706	776
316	166	300	423	569	625	206	372	525	706	776	206	372	525	706	776
343	161	292	412	554	608	206	372	525	706	776	206	372	525	706	776
357	159	286	405	544	598	204	367	519	698	767	204	367	519	698	767
371	156	281	398	534	587	201	363	513	690	758	201	363	513	690	758
385	151	272	385	517	568	201	362	512	688	756	201	362	512	688	756
399	146	263	372	500	550	200	361	510	686	754	200	361	510	686	754
413	143	258	364	489	537	199	359	507	682	749	199	359	507	682	749
427	139	252	355	477	525	198	357	504	677	745	198	357	504	677	745
441	137	247	348	468	514	192	346	489	657	723	192	346	489	657	723
454	134	241	341	458	504	186	336	474	637	701	186	336	474	637	701
468	129	232	328	441	484	175	316	447	601	661	175	316	447	601	661
482	123	223	315	423	465	165	297	420	565	621	165	297	420	565	621
496	115	207	293	393	432	147	266	375	504	554	148	269	383	518	571
510	106	191	271	364	400	130	234	330	444	487	132	242	347	472	521
524	103	186	263	353	388	123	221	312	420	461	127	236	345	478	530
538	100	180	255	342	376	115	208	295	396	435	122	231	344	485	539
552	99	179	253	340	374	115	208	295	396	435	122	231	344	485	539
566	99	178	252	339	372	115	208	295	396	435	122	231	344	485	539
579	91	164	232	311	342	109	198	279	375	412	116	219	326	459	511
593	83	150	211	284	312	103	187	264	355	390	109	207	309	434	483
607	72	130	184	247	271	90	163	230	308	339	95	180	268	378	420
621	61	110	156	210	231	77	138	195	262	288	81	153	228	321	357
635	50	91	128	173	190	63	114	161	216	237	67	126	188	264	294
649	39	71	101	135	149	49	89	126	169	186	52	99	147	207	231
<b>SA182-F92 FORGINGS</b>															
<b>TEMP °F</b>															
-29 TO 38	206	372	525	706	776	206	372	525	706	776	206	372	525	706	776
93	206	372	525	706	776	206	372	525	706	776	206	372	525	706	776
121	203	366	518	696	764	206	372	525	706	776	206	372	525	706	776
149	200	361	510	685	753	206	372	525	706	776	206	372	525	706	776
177	197	355	502	675	742	206	372	525	706	776	206	372	525	706	776
204	194	350	494	664	730	206	372	525	706	776	206	372	525	706	776
232	188	340	480	645	708	206	372	525	706	776	206	372	525	706	776
260	183	329	465	625	687	206	372	525	706	776	206	372	525	706	776
288	174	315	444	597	656	206	372	525	706	776	206	372	525	706	776
316	166	300	423	569	625	206	372	525	706	776	206	372	525	706	776
343	161	292	412	554	608	206	372	525	706	776	206	372	525	706	776
357	159	286	405	544	598	204	367	519	698	767	204	367	519	698	767
371	156	281	398	534	587	201	363	513	690	758	201	363	513	690	758
385	151	272	385	517	568	201	362	512	688	756	201	362	512	688	756
399	146	263	372	500	550	200	361	510	686	754	200	361	510	686	754
413	143	258	364	489	537	199	359	507	682	749	199	359	507	682	749
427	139	252	355	477	525	198	357	504	677	745	198	357	504	677	745
441	137	247	348	468	514	192	346	489	657	723	192	346	489	657	723
454	134	241	341	458	504	186	336	474	637	701	186	336	474	637	701
468	129	232	328	441	484	175	316	447	601	661	175	316	447	601	661
482	123	223	315	423	465	165	297	420	565	621	165	297	420	565	621
496	115	207	293	393	432	147	266	375	504	554	148	269	383	518	571
510	106	191	271	364	400	130	234	330	444	487	132	242	347	472	521
524	103	186	263	353	388	123	221	312	420	461	127	236	345	478	530
538	100	180	255	342	376	115	208	295	396	435	122	231	344	485	539
552	99	179	253	340	374	115	208	295	396	435	122	231	344	485	539
566	99	178	252	339	372	115	208	295	396	435	122	231	344	485	539
579	91	169	239	321	353	113	204	288	388	426	120	226	337	474	528
593	88	160	226	303	333	111	200	282	379	417	117	221	330	464	516
607	82	148	209	281	309	102	185	261	351	386	108	205	305	430	478
621	75	136	192	258	284	94	170	240	323	355	100	188	281	395	439

ABOVE 620 °C IS LIMITED TO MAXIMUM OUTSIDE DIAMETERS OF 88.9MM

1 REFER TO CLASS DESCRIPTIONS FOR OTHER APPLICATIONS.

2 SOCKET WELD SIZES DO NOT GO OVER 2 1/2"

3 NDE IS REQUIRED FOR SPECIAL CLASS RATINGS.

FLANGED, THREADED, AND GATE VALVES ARE NOMINALLY RATED.

FLANGED END VALVES MAY ONLY BE STANDARD CLASS, AND NOMINALLY RATED.

THREADED END VALVE RATINGS TERMINATE AT 538 °C AND AT PN420 CLASS.

BASED ON ASME B16.34-2017 APPENDIX VII TABLES, AND WHERE APPLICABLE V-2.1.3 OF APPENDIX V



## ASME Class and Ratings

ASME B16.34 incorporates socket weld end valves and butt weld end valves with Limited Class ratings. Conval offers the industry's finest forged steel globe valve with the highest ratings available. ASME Limited Class Rating applies to 2 1/2" and smaller valves only and allows use of ASME Special Class Tables without NDE.

### **Standard Class**

Standard class is a general use classification which uses the ASME Standard Class pressure temperature tables from B16.34. No NDE or special analysis is required. Standard Class provides the lowest (most conservative) ratings.

- Application: Socket Weld, Butt Weld, Threaded End & Flanged valves (Flanged and Threaded End ratings terminate at 1000°F).
  - NPS 1/2 to 4"
  - No NDE Required
- Valve Marking: B16.34 STD

### **Limited Class**

Limited class is a rating which allows small (NPS 2 1/2" or smaller) socket weld valves to be rated to the higher ASME Special Class pressure-temperature tables as well as Annex G from B16.34.

No NDE is required but special engineering analysis must be completed prior to assigning this rating (This has been completed for all CLAMPSEAL® valves). Limited Class provides ratings which are much higher than Standard Class, and in some cases above 900°F are slightly higher than Special Class ratings.

- Application: Socket Weld and Butt Weld End Valves
  - NPS 1/2 to 2 1/2"
  - No NDE Required
- Valve Marking: B16.34 LTD

### **Special Class**

Special class ratings using the tables from ASME B16.34 can be applied to any forged steel valve.

- Application: Socket Weld, Butt Weld, and Threaded End valves
  - NPS 1/2 to 4"
- NDE Requirements Body and Bonnet:
  - Volumetric Exam: Radiographic or Ultrasonic Testing
  - Surface Exam: Liquid Penetrant or Magnetic Particle
- Valve Marking: B16.34 SPL

### **Nominal Ratings**

The ASME B16.34 tables list nominal ratings, i.e., 1500, 2500, 4500. The actual class number (1500) leads to a table or graph of pressure-temperature rating pairs.

To meet nominal rating requirements, valves must satisfy certain wall and hub thickness requirements which are derived from the maximum stress allowed in a given material. These requirements have been met for all CLAMPSEAL® valves.

CLAMPSEAL® valves which exceed the wall thickness requirements may use the excess wall thickness to increase their service rating. These enhanced ratings are called intermediate ratings. Interpolating between the wall required for a class 1500 and a class 2500 valve allows Conval to intermediate rate its 1500 nominal valves to 2155.

Example: an F22 ASME 2155 LTD valve is rated for 1086 PSIG at 1100°F but only 550 PSIG for 1500 Standard class.

Standard, Limited, or Special Class valves may be rated to either Nominal or Intermediate Ratings.

Ball valves, Gate Valves and Threaded End Valves are nominal ASME B16.34 rated. Consult factory for other ratings.

Note: Flanged valves may not be intermediate rated. Maximum flanged and threaded valve rating is 2500.

## Applications

- The modular design of the Clampseal valve family allows for easy customization to provide a wide range of special materials, design options and accessories to match your service requirements.
  - Valve configurations are available for many plants and applications including those listed here:
    - Fossil power
    - Nuclear power
    - Refineries
    - Petro chemical plants
    - Chemical plants
    - Gas separation
    - Pulp and paper plants
    - Recovery boilers
    - Marine boilers
    - Cryogenic systems
    - Oil patch steam injection
    - Thin gas service
    - Water treatment
    - Hydraulic systems
  - Conval's QA program ensures that every component receives the same control as our ASME III nuclear equipment.
  - Each order is reviewed by sales engineers to ensure compatibility with your application.
- Main Steam Lines
  - Instrumentation
  - Vents
  - Drains
  - Boiler Drums
  - Superheaters–Steam Header
  - Desuperheaters
  - Turbine Generators
  - Compressors
  - Steam Condensers
  - Chemical Fuel Lines
  - Economizer
  - Gauge Shut-off
  - Blow-down (Continuous)
  - Reheater – Inlet Header Drain
  - Reheater – Outlet Header Drain
  - Auxiliary Steam Main
  - Water Column Shut-off
  - Water Sampling
  - Steam Sampling
  - Steam Gauge Test
  - Test Loop

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## The Conval Story

In 1962, Mr. Chester Siver completed designs for a revolutionary line of high-pressure, forged steel valves. Hamilton Standard (now UTC Aerospace Systems), 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. 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 is a leader in valves for the world's most demanding applications. Our global team of experts can help to meet your most challenging needs. We invite you to contact us today.

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



*Thank you for your business!  
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# **Conval** INC.

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