Conval INC.

# World Class Camseal Ball Valves

- *Metal Seat*
- *Zero Leakage*
- *Top Entry*
- *In-Line Servicing*

# Conval Camseal Ball Valves are designed for the world's most demanding high-pressure, high-temperature applications.

### *STANDARD SIZES*
1/2" through 4" Top Entry
SW, BW and FNPT Ends

### *PRESSURE RATING*
ASME Class 900 through 4500

### *STANDARD MATERIALS*
Carbon Steel WCB, WC9, and C12A
Stainless Steel Cast 316/316L
Other materials available upon request

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

## DESIGN FEATURES

### *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.

### *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 temperature 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*

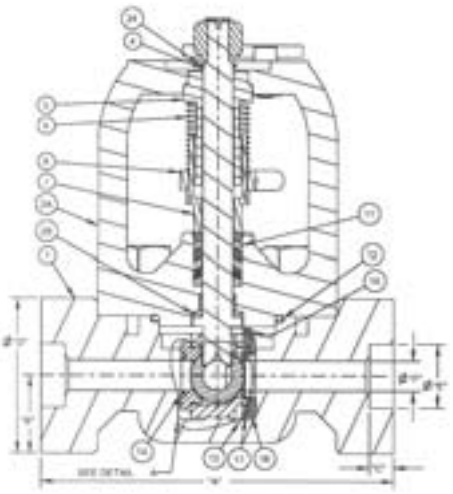
An ISO-5211 integral mounting pad facilitates error-free, air, motor and gear operator actuation due to superior rigidity, precise alignment and a fully-guided stem bearing system. Lockout capability is standard.

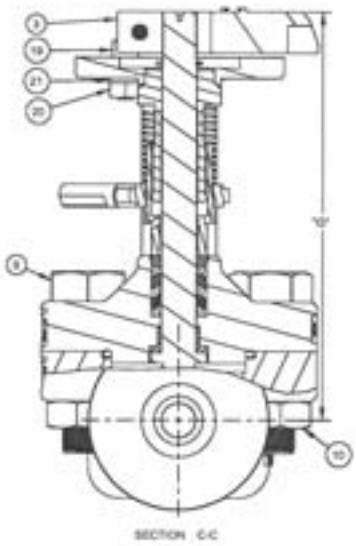
### *Two-Year Warranty*

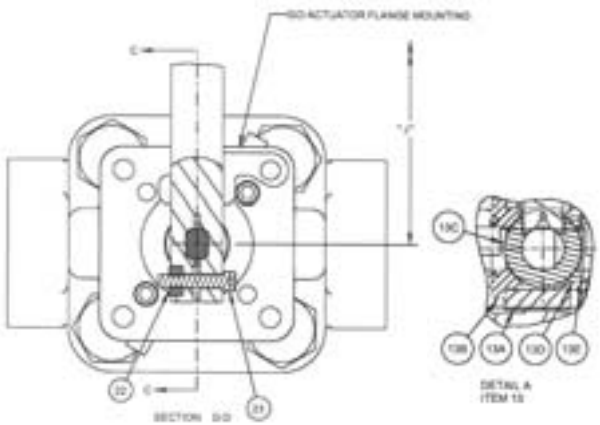
Conval is committed to unsurpassed quality. We are so confident of the quality of our product, that we offer a two-year warranty.

United States Patent No. 7,267,323

# CAMSEAL BALL VALVE LIST OF MATERIALS







| NO. | NAME | QTY | MATERIAL | MATERIAL | MATERIAL | MATERIAL |
|---|---|---|---|---|---|---|
| 1 | BODY | 1 | ASME-SA-216 Gr. WCB | ASME-SA-217 Gr. WC9 | ASME-SA-217 Gr. C12A | ASME-SA-351-CF3M/CF8M |
| 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/CF8M |
| 2B | BONNET STEM BEARING | 1 | ASME-SA479 TYPE 410 | ASME SA479 TYPE 410 | ASME SA479 TYPE 410 | AMS 5387 |
| 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 | ASTM A582 TYPE 416 | ASTM A582 TYPE 416 | ASME SA479 TYPE XM-19H |
| 5 | BUSHING GLAND | 1 | ASME SB150 | ASME SB150 | ASME SB150 | ASME SB150 |
| 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 | AMS 5360, AMS 5370 | AMS 5360, AMS 5370 | AMS 5360, AMS 5370 | AMS 5360, AMS 5370 |
| 9 | BODY BOLT | 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 | 2 | GARLOCK QUICK SET 9001 PACKING | | | |
| 12 | C-RING BONNET/BODY | 1 | ASTM B670 | ASTM B670 | ASTM B670 | ASTM B670 |
| 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 SA479 TYPE 410 | ASME SA479 TYPE 410 | ASME SA479 TYPE 410 | ASME 5B637 |
| 13C | COATED BALL | 1 | ASME SA479 TYPE 410 | ASME SA479 TYPE 410 | ASME SA479 TYPE 410 | ASME 5B637 |
| 13D | UPSTREAM SEAT | 1 | ASME SA479 TYPE 410 | ASME SA479 TYPE 410 | ASME SA479 TYPE 410 | ASME SA479 TYPE 316 |
| 13E | UPSTREAM SEAT BELLEVILLE | | ASTM B670, AMS 5596 | ASTM B670, AMS 5596 | ASTM B670, AMS 5596 | ASTM B670, AMS 5596 |
| 14 | C-RING SEAT TO BODY | 1 | ASTM B670 | ASTM B670 | ASTM B670 | ASTM B670 |
| 15 | CAM | 2 | ASME SA479 TYPE 410 | ASME SA479 TYPE 410 | ASME SA479 TYPE 410 | ASME SA479 TYPE XM-19H |
| 16 | CAM LOCK | 1 | ASME SA240 TYPE 316 | ASME SA240 TYPE 316 | ASME SA240 TYPE 316 | ASME SA240 TYPE 316 |
| 17 | SPACER | 1 | ASME 5B637 | ASME 5B637 | ASME 5B637 | ASME 5B637 |
| 18 | CAM BELLEVILLE | 1 | ASTM B670, AMS 5596 | ASTM B670, AMS 5596 | ASTM B670, AMS 5596 | ASTM B670, AMS 5596 |
| 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 | ALLOY STEEL | ALLOY STEEL | ALLOY STEEL | ALLOY STEEL |
| 23 | HANDLE BOLT | 1 | ALLOY STEEL | ALLOY STEEL | ALLOY STEEL | ALLOY STEEL |
| 24 | SNAP RING STEM RETAINER | 1 | MFR STD | MFR STD | MFR STD | MFR STD |

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

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

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

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

# CAMSEAL BALL VALVE PRESSURE/TEMPERATURE CHARTS

### *Cast WCB*
### *B16.34-2004 Standard Class (Table 2-1.1A)*

| TEMP F | WORKING PRESSURES BY CLASSES PSIG 1700 | 3100 | 4500 |
|---|---|---|---|
| 100 | 4198 | 7652 | 11110 |
| 200 | 3847 | 7014 | 10185 |
| 300 | 3706 | 6760 | 9815 |
| 400 | 3592 | 6548 | 9505 |
| 500 | 3417 | 6230 | 9040 |
| 600 | 3218 | 5866 | 8515 |
| 650 | 3111 | 5675 | 8240 |
| 700 | 3017 | 5486 | 7960 |
| 750 | 2874 | 5244 | 7610 |
| 800 | 2330 | 4252 | 6170 |

### *Cast WCB*
### *B16.34-2004 Special Class (Table 2-1.1B)*

| TEMP F | WORKING PRESSURES BY CLASSES PSIG 1700 | 3100 | 4500 |
|---|---|---|---|
| 100 | 4250 | 7750 | 11250 |
| 200 | 4250 | 7750 | 11250 |
| 300 | 4194 | 7651 | 11105 |
| 400 | 4153 | 7572 | 10995 |
| 500 | 4153 | 7572 | 10995 |
| 600 | 4153 | 7572 | 10995 |
| 650 | 4052 | 7391 | 10730 |
| 700 | 3916 | 7142 | 10365 |
| 750 | 3593 | 6554 | 9515 |
| 800 | 2913 | 5314 | 7715 |

### *Cast WCB*
### *B16.34-2004 Limited Class per Annex V-2.1.3*

| TEMP F | WORKING PRESSURES BY CLASSES PSIG 1700 | 3100 | 4500 |
|---|---|---|---|
| 100 | 4250 | 7750 | 11250 |
| 200 | 4250 | 7750 | 11250 |
| 300 | 4194 | 7651 | 11105 |
| 400 | 4153 | 7572 | 10995 |
| 500 | 4153 | 7572 | 10995 |
| 600 | 4153 | 7572 | 10995 |
| 650 | 4052 | 7391 | 10730 |
| 700 | 3916 | 7142 | 10365 |
| 750 | 3593 | 6554 | 9515 |
| 800 | 2913 | 5314 | 7715 |

### *Cast WC9*
### *B16.34-2004 Standard Class (Table 2-1.10A)*

| TEMP F | WORKING PRESSURES BY CLASSES PSIG 1700 | 3100 | 4500 |
|---|---|---|---|
| 100 | 4250 | 7652 | 11110 |
| 200 | 4250 | 7014 | 10185 |
| 300 | 4126 | 6760 | 9815 |
| 400 | 4000 | 6548 | 9505 |
| 500 | 3768 | 6230 | 9040 |
| 600 | 3428 | 5866 | 8515 |
| 650 | 3333 | 5675 | 8240 |
| 700 | 3218 | 5486 | 7960 |
| 750 | 3014 | 5244 | 7610 |
| 800 | 2878 | 4252 | 6170 |
| 850 | 2760 | 5034 | 7305 |
| 900 | 2545 | 4644 | 6740 |
| 950 | 2188 | 3993 | 5795 |
| 1000 | 1514 | 2764 | 4010 |
| 1050 | 991 | 1806 | 2625 |
| 1100 | 623 | 1134 | 1645 |

### *Cast WC9*
### *B16.34-2004 Special Class (Table 2-1.10B)*

| TEMP F | WORKING PRESSURES BY CLASSES PSIG 1700 | 3100 | 4500 |
|---|---|---|---|
| 100 | 4250 | 7750 | 11250 |
| 200 | 4250 | 7750 | 11250 |
| 300 | 4188 | 7639 | 11090 |
| 400 | 4125 | 7520 | 10915 |
| 500 | 4103 | 7484 | 10865 |
| 600 | 4086 | 7452 | 10815 |
| 650 | 4057 | 7396 | 10735 |
| 700 | 4007 | 7308 | 10605 |
| 750 | 4007 | 7308 | 10605 |
| 800 | 4007 | 7308 | 10605 |
| 850 | 3837 | 7000 | 10160 |
| 900 | 3400 | 6200 | 9000 |
| 950 | 2674 | 4872 | 7070 |
| 1000 | 1893 | 3454 | 5015 |
| 1050 | 1240 | 2258 | 3280 |
| 1100 | 777 | 1418 | 2055 |

### *Cast WC9*
### *B16.34-2004 Limited Class per Annex V-2.1.3*

| TEMP F | WORKING PRESSURES BY CLASSES PSIG 1700 | 3100 | 4500 |
|---|---|---|---|
| 100 | 4250 | 7750 | 11250 |
| 200 | 4250 | 7750 | 11250 |
| 300 | 4116 | 7639 | 11090 |
| 400 | 4125 | 7520 | 10915 |
| 500 | 4103 | 7484 | 10865 |
| 600 | 4086 | 7452 | 10815 |
| 650 | 4057 | 7396 | 10735 |
| 700 | 4007 | 7308 | 10605 |
| 750 | 4007 | 7308 | 10605 |
| 800 | 4007 | 7308 | 10605 |
| 850 | 3837 | 7000 | 10160 |
| 900 | 3400 | 6200 | 9000 |
| 950 | 2744 | 5120 | 7556 |
| 1000 | 2052 | 4047 | 6213 |
| 1050 | 1344 | 2646 | 4064 |
| 1100 | 842 | 1661 | 2546 |

### *Cast C12A*
### *B16.34-2004 Standard Class (Table 2-1.15A)*

| TEMP F | WORKING PRESSURES BY CLASSES PSIG 1700 | 3100 | 4500 |
|---|---|---|---|
| 100 | 4250 | 7750 | 11250 |
| 200 | 4250 | 7750 | 11250 |
| 300 | 4126 | 7527 | 10925 |
| 400 | 4000 | 7292 | 10585 |
| 500 | 3768 | 6868 | 9965 |
| 600 | 3428 | 6249 | 9070 |
| 650 | 3333 | 6018 | 8825 |
| 700 | 3218 | 5866 | 8515 |
| 750 | 3014 | 5492 | 7970 |
| 800 | 2878 | 5244 | 7610 |
| 850 | 2760 | 5034 | 7305 |
| 900 | 2545 | 4644 | 6740 |
| 950 | 2188 | 3993 | 5795 |
| 1000 | 2062 | 3756 | 5450 |
| 1050 | 2040 | 3720 | 5400 |
| 1100 | 1711 | 3118 | 4525 |
| 1150 | 1263 | 2302 | 3345 |
| 1200 | 816 | 1488 | 2160 |

### *Cast C12A*
### *B16.34-2004 Special Class (Table 2-1.15B)*

| TEMP F | WORKING PRESSURES BY CLASSES PSIG 1700 | 3100 | 4500 |
|---|---|---|---|
| 100 | 4250 | 7750 | 11250 |
| 200 | 4250 | 7750 | 11250 |
| 300 | 4250 | 7750 | 11250 |
| 400 | 4250 | 7750 | 11250 |
| 500 | 4250 | 7750 | 11250 |
| 600 | 4250 | 7750 | 11250 |
| 650 | 4250 | 7750 | 11250 |
| 700 | 4154 | 7576 | 10995 |
| 750 | 4130 | 7528 | 10930 |
| 800 | 4080 | 7440 | 10800 |
| 850 | 3837 | 7000 | 10160 |
| 900 | 3400 | 6200 | 9000 |
| 950 | 2674 | 4872 | 7070 |
| 1000 | 2385 | 4347 | 6310 |
| 1050 | 2385 | 4347 | 6310 |
| 1100 | 2137 | 3898 | 5655 |
| 1150 | 1580 | 2878 | 4180 |
| 1200 | 1020 | 1860 | 2700 |

### *Cast C12A*
### *B16.34-2004 Limited Class per Annex V-2.1.3*

| TEMP F | WORKING PRESSURES BY CLASSES PSIG 1700 | 3100 | 4500 |
|---|---|---|---|
| 100 | 4250 | 7750 | 11250 |
| 200 | 4250 | 7750 | 11250 |
| 300 | 4250 | 7750 | 10925 |
| 400 | 4250 | 7750 | 11250 |
| 500 | 4250 | 7750 | 11250 |
| 600 | 4250 | 7750 | 11250 |
| 650 | 4250 | 7750 | 11250 |
| 700 | 4154 | 7576 | 10995 |
| 750 | 4130 | 7528 | 10930 |
| 800 | 4080 | 7440 | 10800 |
| 850 | 3837 | 7000 | 10160 |
| 900 | 3400 | 6200 | 9000 |
| 950 | 2744 | 5120 | 7556 |
| 1000 | 2585 | 5015 | 7556 |
| 1050 | 2585 | 5015 | 7556 |
| 1100 | 2316 | 4568 | 7006 |
| 1150 | 1712 | 3373 | 5179 |
| 1200 | 1105 | 2180 | 3345 |

### *Cast CF3M/CF8M Dual Rated*
### *B16.34-2004 Standard Class (Table 2-2.2A)*

| TEMP F | WORKING PRESSURES BY CLASSES PSIG 1700 | 3100 | 4500 |
|---|---|---|---|
| 100 | 4080 | 7440 | 10800 |
| 200 | 3508 | 6399 | 9290 |
| 300 | 3168 | 5779 | 8390 |
| 400 | 2912 | 5308 | 7705 |
| 500 | 2708 | 4936 | 7165 |
| 600 | 2556 | 4663 | 6770 |
| 650 | 2504 | 4564 | 6625 |
| 700 | 2460 | 4489 | 6515 |
| 750 | 2420 | 4415 | 6410 |
| 800 | 2392 | 4365 | 6335 |
| 850 | 2368 | 4316 | 6265 |
| 900 | 2352 | 4291 | 6230 |
| 950 | 2188 | 3993 | 5795 |
| 1000 | 2062 | 3756 | 5450 |

### *Cast CF3M/CF8M Dual Rated*
### *B16.34-2004 Standard Class (Table 2-2.2B)*

| TEMP F | WORKING PRESSURES BY CLASSES PSIG 1700 | 3100 | 4500 |
|---|---|---|---|
| 100 | 4250 | 7750 | 11250 |
| 200 | 3916 | 7142 | 10365 |
| 300 | 3536 | 6448 | 9360 |
| 400 | 3247 | 5923 | 8600 |
| 500 | 3020 | 5507 | 7995 |
| 600 | 2855 | 5203 | 7555 |
| 650 | 2793 | 5092 | 7395 |
| 700 | 2748 | 5009 | 7270 |
| 750 | 2703 | 4928 | 7150 |
| 800 | 2670 | 4872 | 7070 |
| 850 | 2641 | 4817 | 6990 |
| 900 | 2624 | 4787 | 6950 |
| 950 | 2595 | 4732 | 6870 |
| 1000 | 2385 | 4347 | 6310 |

### *Cast CF3M/CF8M Dual Rated*
### *B16.34-2004 Limited Class per Annex V-2.1.3*

| TEMP F | WORKING PRESSURES BY CLASSES PSIG 1700 | 3100 | 4500 |
|---|---|---|---|
| 100 | 4250 | 7750 | 11250 |
| 200 | 3914 | 7135 | 10365 |
| 300 | 3536 | 6448 | 9360 |
| 400 | 3247 | 5923 | 8600 |
| 500 | 3020 | 5507 | 7995 |
| 600 | 2855 | 5203 | 7555 |
| 650 | 2793 | 5092 | 7395 |
| 700 | 2748 | 5009 | 7270 |
| 750 | 2703 | 4928 | 7150 |
| 800 | 2670 | 4872 | 7070 |
| 850 | 2641 | 4817 | 6990 |
| 900 | 2624 | 4787 | 6950 |
| 950 | 2595 | 4732 | 6870 |
| 1000 | 2385 | 4347 | 6310 |

Note: Flanged and threaded end valve ratings terminate at 1000°F and at 2500 Class. Flanged end valves may only be standard rated, not immediate rated.
Special Class ratings not applicable to flanged end valves. Threaded end valve ratings terminate at 1000°F and at 2500 Class.
Limited class ratings not applicable to flanged end valves. Threaded end valve ratings terminate at 1000°F and at 2500 Class.

# CAMSEAL BALL VALVES
# DESIGN VALIDATION AND COMPARISON TESTING

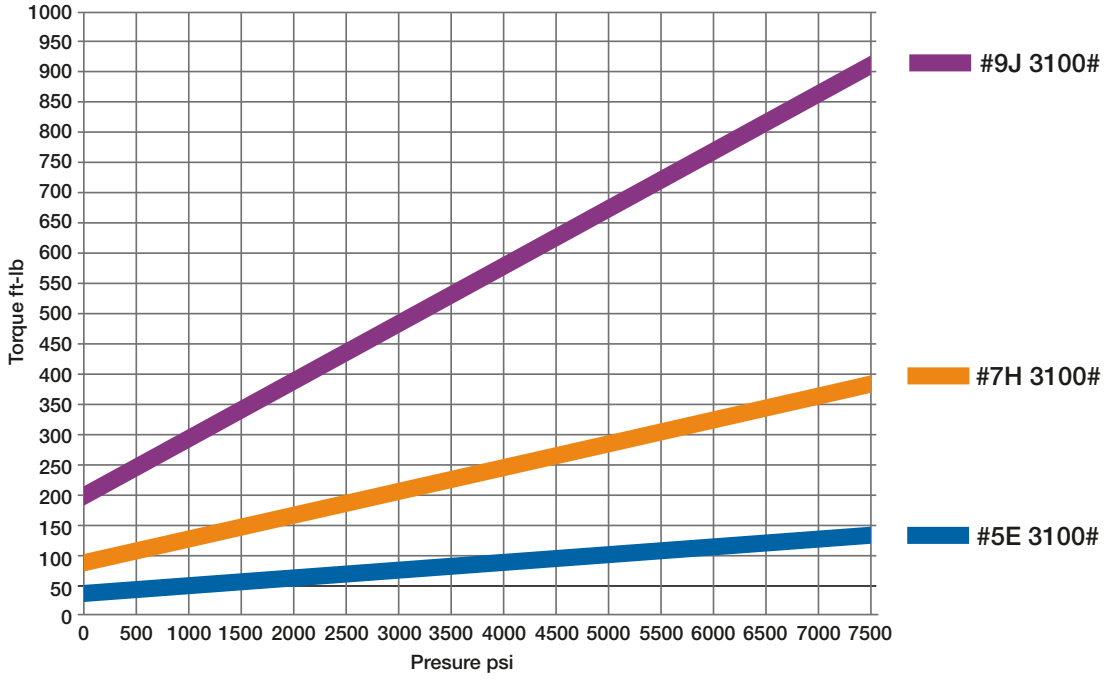
The Camseal Ball Valve has been subjected to extremely rigorous computer-aided analysis, laboratory and field testing during its development. Not only were benchmarks established against which performance was measured, but evaluation valves manufactured by competitors were also tested alongside the Camseal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



## 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.

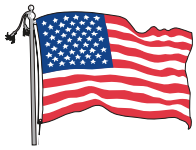
The first CLAMPSEAL® valves were introduced to the market by Hamilton Standard in 1964. However, in the mid-1960's, growing demand for the firm's popular aerospace products forced Hamilton Standard to make the decision to abandon its industrial products projects. The rights to the CLAMPSEAL valve reverted 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 celebrated its 40th anniversary in 2007 with the launch of the new Camseal Ball Valve. 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.**

N NPT

***1967-2007***
***Celebrating 40+ years of excellence!***
***Thank you for your business.***



MADE IN USA

***ISO 9001 certified since***
***September 11, 1992***

Conval INC.

World Headquarters: 265 Field Road P.O. Box 1049, Somers, CT 06071-1049 USA
Phone (860) 749-0761 Fax (860) 763-3557
e-mail: sales@Conval.com www.Conval.com



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