

A background image of a warehouse filled with tall metal shelving units. The shelves are stocked with various industrial components, including large blue and silver ball valves. Some shelves have white labels with letters like 'B', 'D', and 'E'. Signs on the shelves read 'NO STORAGE ABOVE TOP OF THIS BEAM'.

# SWI BALL VALVES

High Integrity Floating Ball Valves

**REQUEST A QUOTE**  
[sales@dkamans.com](mailto:sales@dkamans.com)

**SCHEDULE SERVICES**  
562-529-8400

**[WWW.DKAMANS.COM](http://WWW.DKAMANS.COM)**

## ● SWI Global Footprint

Wherever industrial valves are needed in the world, SWI is nearby. We maintain strong partnerships with authorized stocking distributors on every continent. For your nearest authorized stocking distributor or representative, full contact details can be obtained from our web site: [www.swivalve.com](http://www.swivalve.com)



## ● Foreword

SWI Valve Co., Ltd. is a leading industrial valve manufacturing company, specializing in the design and manufacture of Ball, Gate, Globe, Check, Cryogenic and Bellows Seal valves.

Our facilities incorporate all aspects of valve design, development and manufacture ensuring that SWI can offer a degree of flexibility rarely encountered elsewhere.

At SWI, we stand for three values - quality, innovation and service. We know the worlds Oil, Chemical, Petrochemical and Process industries require precision flow control products. We have dedicated ourselves to supplying that need with an extensive range of industrial valves, manufactured in our own factories and designed for environmental sensitivity.

The Quality Policy of SWI Valve Co., Ltd. is to consistently provide product that meets customer and applicable regulatory requirements, with the aim to enhance customer satisfaction by providing exactly what has been agreed contractually, to the required quality and time stated.

The company operates under the Quality Assurance Scheme which is in accordance with ISO 9001 and API Monogram.

We are pleased to introduce our range of High Integrity Floating Ball Valves and trust this catalogue will assist our customers in the selection and application of SWI product.

**Floating Ball Valves for the Chemical, Petrochemical, Oil & Gas and Allied Industries.**



SWI free floating (seat supported) ball valves have been designed to provide cost effective performance for a wide range of applications in the Chemical, Petrochemical, Oil and Gas, Power and Allied Industries.

The design incorporates many technically advanced features which ensures reliable and repeatable operation whilst providing the highest levels of safety and integrity as demanded by these industries.

### KEY FEATURES

- Design, manufacture and materials conform to the essential requirements of ISO 17292, ISO 14313, API 608, API 6D, ASME B16.34, ASME VIII and Directives PED 97/23/EC and ATEX 94/9/EC.
- Certified firesafe in accordance with API 607 6<sup>th</sup> Edition / ISO 10497.
- Anti-static design (10Ω under 12 Volt).
- Positive engagement and alignment of 2 piece bolted body providing 'Gap Free' connection.
- Fully contained body gasket, graphite seal is protected from working fluid by primary elastomeric seal for soft seated.
- Body wall thickness exceeds minimum requirements of ASME B16.34 or ISO 17292.
- Full and reduced bore, soft and metal seated designs available.
- Floating ball design for superior bi-directional shut off across a wide range of pressures.
- Internally assembled blow-out proof stem.
- Superior High Integrity live loaded stem sealing system, double seal before & after fire condition.
- Suitable for high vacuum service and technically Emission Free as standard.
- Self adjusting seat design for effective shut-off across a wide range of pressures minimizing operational torque.
- Bolted construction for ease of on-site maintenance.
- Independent stop plate from hand lever secured to stem even if lever is removed.
- 316 stainless steel corrosion resistant trim as standard for effective service life.
- Cavity pressure relief to high pressure side in the event of thermal expansion of trapped fluid.
- Positive direct pressure relief to upstream side available via vented ball for high volatility duty.
- ISO 5211 / EN 15081 top works as standard for 2" and above.
- Modular design, easily adapted for low temperature & cryogenic service or fugitive emission leak detection.
- Testing and marking to API 598 / API 6D and PED (as required).
- Available with gearbox, pneumatic, hydraulic or electric actuators.

### TECHNICAL SPECIFICATIONS

<b>Size Range</b>	: DN15 (1/2") to DN200 (8")
<b>Pressure Rating</b>	: ANSI Class 150, 300 & 600
<b>Connection</b>	: Flanged to ASME B16.5 or Weld End
<b>Body Materials</b>	: Carbon steel, ITCS, Stainless steel, Duplex, Super Duplex, Inconel 625 and other special alloys.
<b>Top Mounting</b>	: ISO 5211 / EN 15081
<b>Temp. Range</b>	: -196°C + 538°C (-320°F to +1000°F)
<b>Design</b>	: ISO 17292 / ISO 14313 / ASME B16.34 API 608 / API 6D
<b>Face to Face</b>	: ASME B16.10 Long
<b>Fire Testing</b>	: API 607 6 <sup>th</sup> Edition / ISO 10497
<b>Pressure Testing</b>	: API 598 / API 6D / EN 12266-1 / ISO 5208
<b>Certification</b>	: EN 10204 / ISO 10474 / EN 29001 NACE MR 0175 / ISO 15156 / MR 0103 Directives PED 97/23/EC & ATEX 94/9/EC ISO 15848 Part 1 & 2, API 622
<b>Quality Assurance</b>	: ISO 9001 / API Spec Q1 / API Monogram

### Quality Assurance

SWI operate under a Quality Assurance system which is approved by Bureau Veritas to ISO 9001: 2008 / KS Q ISO 9001: 2009 / KEPIC -MN and the company is licensed to use the API Monogram in respect of API 6D ball valves. In line with the companies high reputation for quality of design and manufacture, SWI products have been independently accredited by Bureau Veritas for design, manufacture and materials compliant with the safety requirements of the Directive 97/23/EC (PED).



## DESIGN FEATURES

SWI range of seat supported ball valve designs incorporate some of the most advanced features, including many major Owner & Operating Company specification preferences, whilst fully conforming to the design requirements of ISO 17292, ISO 14313, API 608, API 6D and ASME B16.34 codes.

A two-piece bolted body providing gap free engagement incorporating a solid ball supported via flexing seat rings provides tight shut-off of flow in either direction whilst maintaining the highest level of safety from the high integrity stem sealing system. Potential for atmospheric leakage is minimized via a double live loaded sealing system before or after fire condition. Reliable sealing is enhanced via precise pre-compression of the ball between the two flexing seat rings allowing the ball to float along the valve axis providing bubble tight and bi-directional sealing capability. Bearings and wiper seals incorporated at the top and bottom of the stem guarantees rigid alignment for optimum operation whilst aiding consistent torque combined with longevity of stem sealing and life cycle capability.

All these design features contribute towards the valves capability to provide the highest levels of performance and reliability, whilst ensuring repeatable shut off, positive sealing and a high degree of safety for both plant and personnel.

## THE RANGE

## FULL BORE

SIZE (Ins)	1/2"	3/4"	1"	1½"	2"	3"	4"	6"	8"
ANSI 150									
ANSI 300									
ANSI 600									

## REDUCED BORE

SIZE (Ins)	1/2"	3/4"	1"	1½"	2"	3"	4"	6"	8"
ANSI 150									
ANSI 300									

## SERIES CN - 2 PIECE BOLTED BODY

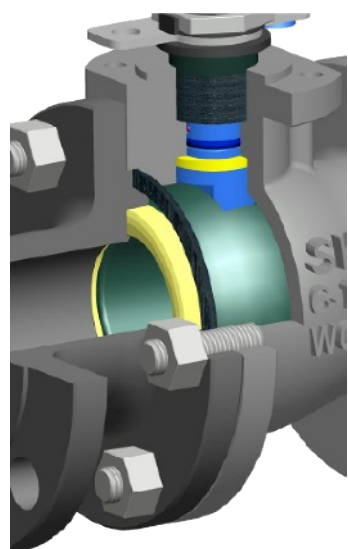
## BOLTED CONSTRUCTION

The 'CN' range of ball valves feature a split body bolted construction to facilitate ease of disassembly for maintenance purposes.

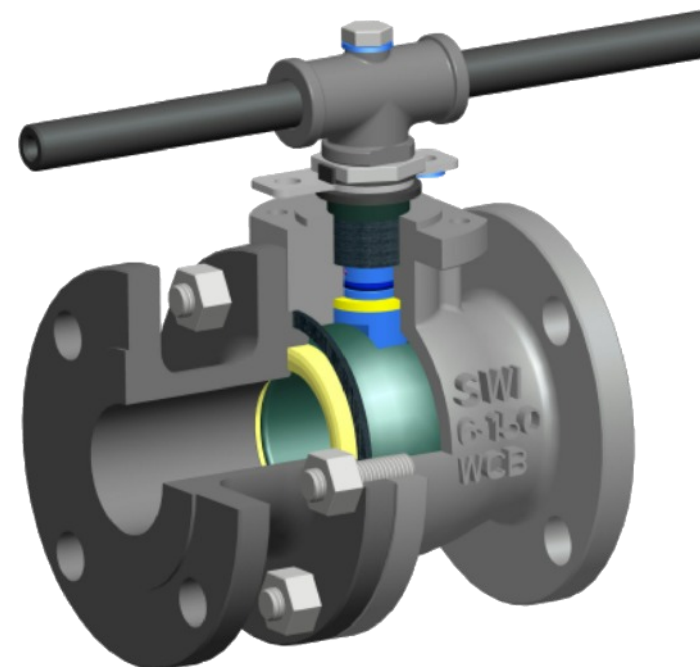
Positive engagement and alignment of the 2-piece bolted body with 'GAP FREE' connection of body joint ensures maximum resistance against pipeline stresses and loads without any effect on valve sealing capability or influencing operational torque. Effective body joint is guaranteed via the fully contained Spiral Wound Gasket or via an O-ring and fully contained graphite gasket; ensuring zero leakage and fire safety assurance.

All bolting calculations satisfy the requirements of ASME B16.34. In particular, allowable bolt stress used in the body or bonnet joints do not exceed the maximum value of either 7,000 or 9,000 psi respectively whichever bolt material is used.

The design complies with the requirements of ASME B16.34. Other codes (in particular ASME VIII Division 1) are only used as a supplement to ASME B16.34 for additional calculations not already covered in ASME B16.34.



## DESIGN FEATURES



## ISO 15848-1 Class AH Certified

## MAINTENANCE FREE STEM SEALING

High Integrity Conical metal to metal sealing combined with wedging PTFE and Graphite live loaded and pressure energized; provides double sealing capability before and after fire condition whilst ensuring performance well within the requirements of the ISO 15848-1 Class AH, US EPA, API 622 and TA-Luft VDI 2440.

Optional bolted gland is available.

## LIVE LOADED GLAND

Live loading of gland ensures constant load of the high integrity stem sealing element whilst minimizing operational torque and providing effectively a maintenance free gland arrangement.

## TOP &amp; BOTTOM BEARINGS

Radial and axial stem loading is minimized due to dual support of the stem via effective bearings at the top and bottom of the stem.

## BOTTOM ENTRY STEM

Integral shoulder stem with metal to metal conical seal internally assembled and retained by the body guarantees the stem cannot blow-out of the body due to pressure. Even after fire condition, effective sealing is provided via engagement of the metal to metal conical seal.

## ANTI-STATIC DESIGN

Positive grounding between the ball, stem and valve body is ensured via spring loaded plungers assembled and contained within the stem. Certified compliance with ATEX 94/9/EC requirements.

## PRECISION BALL

Precision manufactured ball with high sphericity and surface finish ensures sealing capability combined with lower operational torques.

## GAP FREE BODY JOINT

'GAP FREE' connection ensures maximum resistance against pipeline stresses and loads without any effect of valve sealing capability or influence on operational torque.

## ISO 5211 &amp; EN 15081 ACTUATOR MOUNTING

Allows precise mounting of actuator, mounting bolts are independent from stem packing gland bolts or cover bolts. Exact alignment reduces torque requirements and prevents side load causing out-of-line wear and additional stress to stem.

## STEM WEATHER SEAL

Gland ring incorporates a wiper / weather seal to prevent environmental contamination to stem sealing element. (not shown)

## FLEX SEAT DESIGN

Machined seats are designed to FLEX under operational conditions ensuring positive sealing performance across the pressure range whilst providing controlled operational torque and cavity relief capability.

## BODY DRAIN CONNECTION

Cast in body boss provides for the provision of a drain bleed port when required (Optional and not shown).

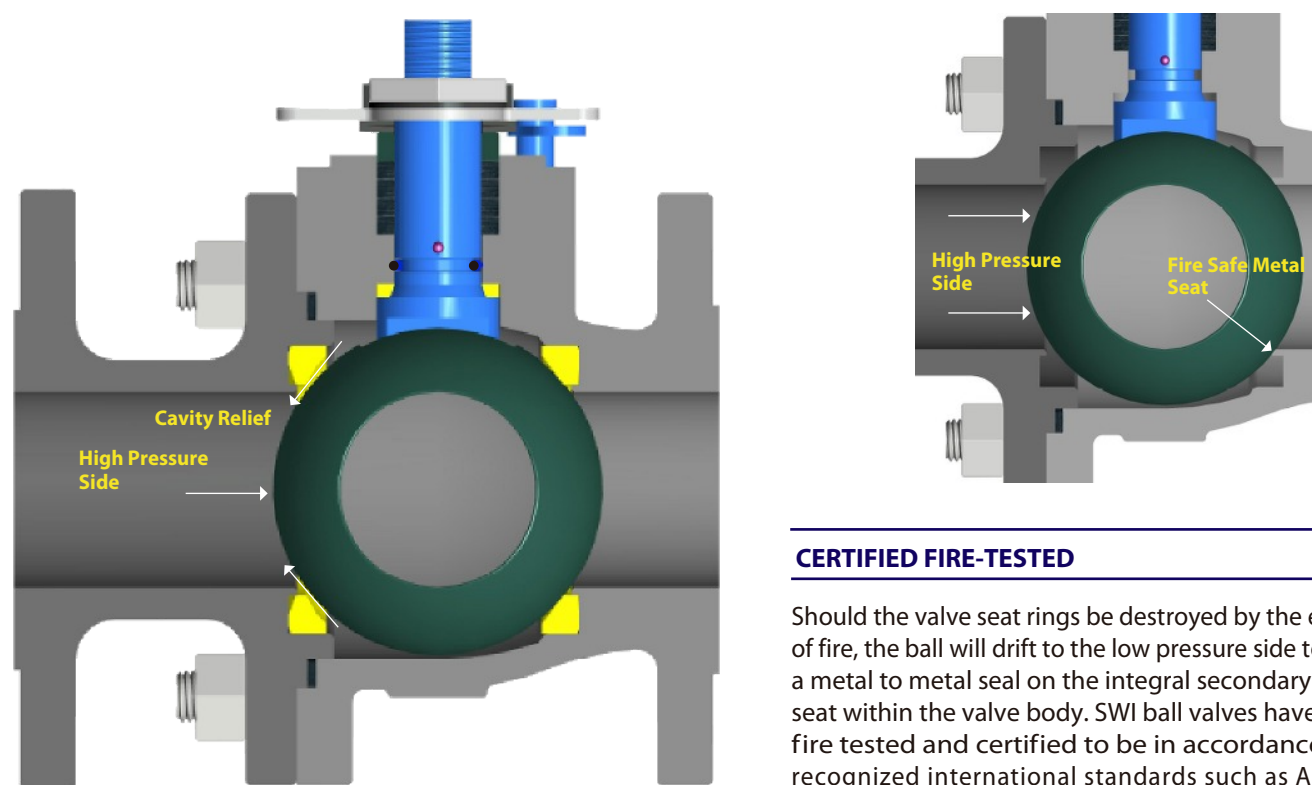
**SEAT DESIGN**

Standard valves utilise Reinforced PTFE seats for maximum chemical compatibility and are designed to FLEX ensuring positive sealing performance across a wide pressure range whilst providing controlled operational torque and cavity relief capability.

Reliable sealing is enhanced via precise pre-compression of the ball between the two flexing seat rings allowing the ball to float along the valve axis providing bubble tight and bi-directional performance.

Slots are incorporated in the external diameter of the R-PTFE seat rings to aid pressure equalization between the high pressure side and the valve cavity thus minimizing the load on the downstream seat rings and optimising the operating torque.

Support and containment of the seat rings within the valve body provides enhanced pressure temperature resistance whilst maintaining the flexing ability under load.

**CERTIFIED FIRE-TESTED**

Should the valve seat rings be destroyed by the effects of fire, the ball will drift to the low pressure side to form a metal to metal seal on the integral secondary metal seat within the valve body. SWI ball valves have been fire tested and certified to be in accordance with recognized international standards such as API 607 6<sup>th</sup> Edition, ISO 10497 and API 6FA.

**CAVITY RELIEF**

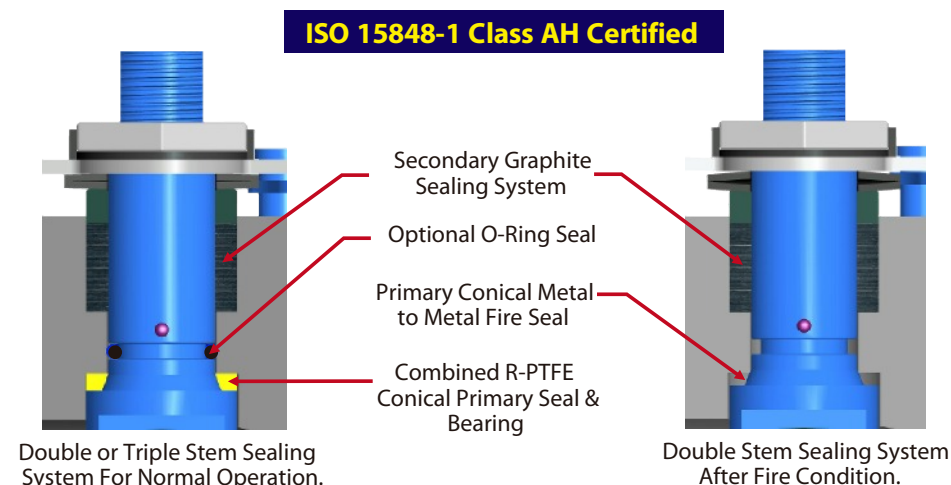
Soft seated valves are designed to relieve cavity over pressure in the closed position to the high pressure side in the event of thermal expansion of the trapped fluid. The ability for cavity relief is however influenced by many factors, including soft seat material, ball to seat compression, temperature and pressure variances and fluid characteristics.

For High Volatility Duty where in some services the fluid is known to possess rapid thermal expansion characteristics and cavity over pressure could occur when trapped, it is recommended that direct discharge relief is provided via the body or a vented ball. This adaptation does render the valve uni-directional and the valve body will be marked accordingly.

Pressure equalization between the body cavity and the process stream when the valve is in the open position is provided via direct venting through the ball via a vent hole in the stem drive slot. This pressure equalization feature is only in effect when the valve is in the open position.

**HIGH INTEGRITY STEM SEALING**

SWI recognize the vital role of high integrity stem sealing as standard in eliminating possible emissions from valves. The CN range of valves incorporate a high integrity live loaded stem sealing system designed to provide the highest level of performance in quarter turn valves via double sealing capability before and after fire condition ensuring performance well within the requirements of the ISO 15848, US EPA and TA-Luft. Certified in accordance with ISO 15848-1 Class AH & API 622.

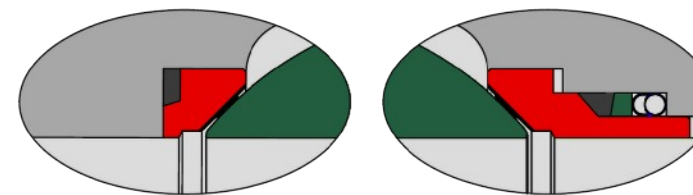


The primary stem seal is wedge-shaped RTFE thrust seal and bearing which is line pressure energized and live loaded by opposing gland springs to automatically compensate for wear, combined with and backed up by secondary graphite seals forming a dual sealing system for normal operational conditions. The sealing performance may be additionally enhanced by the addition of an optional third elastomeric seal when required.

In the event of destruction by fire condition of the soft sealing elements, the live loaded and line pressure energized stem features an integral metal conical seal which engages with the body to form a metal to metal primary FIRE SAFE seal backed up by the secondary fully contained flexible graphite seals.

**METAL SEATING**

The complete failure of a valve in service is often due to the deterioration of its sealing element or one of the operating parts impairing its operation. Solid metal seats should be adopted for hostile conditions, CRITICAL and SEVERE applications, particularly when the service is dirty, abrasive, highly corrosive, at elevated temperature or a combination of all.

**Typical Metal Seat Arrangement**

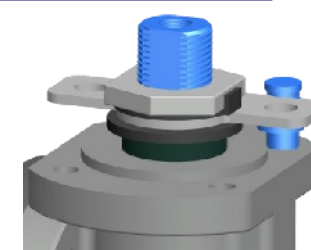
SWI offer a range of solid metal seating with various surface treatments such as NITRIDING or hard facing by thermal-spraying of STELLITE or TUNGSTEN CARBIDE or HARD NICKEL ALLOY to suit almost any application or base material. Stellite & Nickel Alloy coating can additionally be fully fused to the base metal to form a metallurgical bond providing the highest integrity sealing

surface, virtually porous free with hardness up to 60 ~ 65 HRC, dependant on alloy.

Suitable for a temperature range up to 538°C (1000°F), Uni or Bi-directional service combined with superior shut-off capability; SWI offers a high performance solution for many difficult applications.

**LEVER REMOVAL / STOP PLATE**

In the event that lever is removed to prevent unauthorized or accidental operation, the removal of the lever does not affect the integrity of the stem sealing system or operational performance of the valve.



With the lever removed, the stem remains positively loaded and cannot be forced downwards. Additionally, the stop plate is independent of the lever and remains securely attached to the valve stem, even after removal of the lever or T-Bar operator.



## DESIGN FEATURES

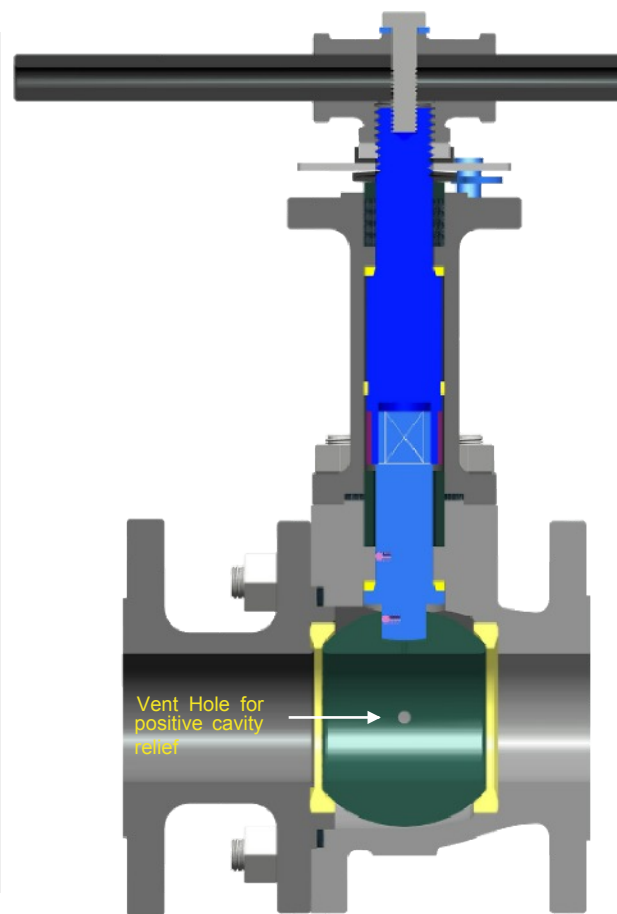
## LOW TEMPERATURE &amp; CRYOGENIC SERVICE

Floating ball valves have been widely used in low temperature and cryogenic applications, including LNG (Liquefied Natural Gas) plants by major users and engineering contractors worldwide. SWI valve designs are available with extended bonnets and special preparation for applications in extreme temperature service conditions.

Extended bonnets are recommended for valves which are required to be operated (cycled open & closed) for service at temperatures below -30°C (-22°F) down to -196°C (-320°F).

SWI low temperature and cryogenic valves are designed with special consideration in the following areas :

- Vapour space extended bonnet to relocate the stem seals outside of the cold zone
- Excellent seat & seal design to minimize potential for leakage
- Cavity pressure relief in case thermal expansion of trapped fluid
- Lower operational torque for reliable and smoother operation
- Rigid body construction to minimize effects of thermal shock
- Fugitive emission compliance as standard
- Modular design with ease of maintenance
- Firesafe design
- Drip collar, optional when specified
- Acceptance test criteria



## EXTENDED BONNET

Extended bonnet designs are of the bolted fully enclosed vapour space type with an internally assembled two part anti-blow-out stem design whereby all stem seals are located at the top of the bonnet away from the cold zone.

The one-piece bonnet design provides for a pressurised column in which the cold liquid phase is changed, by heat transfer with the environment, to the gaseous phase forming a gas gap under the primary stem seals which protects the valve from malfunctioning due to freezing.

SWI offer two extension lengths for each size of valve in accordance with internationally recognized practices such as Shell GSI MESG, BS6364 and MSS SP-134.

Short Bonnet for temperatures between -30°C ~ -100°C

Long Bonnet for temperatures below -101°C

The length of the extensions offered are sufficient to maintain the stem packing at a temperature high enough to permit operation within the normal temperature range of the packing material.

## CAVITY RELIEF

For valves in liquid service at temperatures below -50°C (-58°F) it is recommended a direct relief path (vent hole in ball) is provided to the high pressure side (upstream side) of the valve for positive cavity relief. This renders the valve as UNI-DIRECTIONAL and the body is marked accordingly.

## DRIP COLLAR

The fitting of a drip collar helps to minimize ice accumulation on the extension and prevent possible damage to any lagging. Customers may specify the fitting of drip collars which is optional.

## DESIGN FEATURES

## OPERATING TORQUE

Valves in low temperature and cryogenic service experience higher operational torques as a result of the increased rigidity of the seat material and changes in frictional coefficient. The level and variation in operational torques is dependant on the selected seat material and minimum operational service conditions. This increased operational torque must be taken into account when selecting operators or sizing for actuation. SWI has detailed experience of torque variations resulting from low temperature or cryogenic service and users are recommended to provide full application details to SWI technical for consideration.

## MATERIAL TEMPERATURE LIMITS

The lower temperature limits for standard valve body materials are as follows;

## BODY MATERIAL (ASTM)

Carbon Steel A216-WCB / A105N	-29°C	-20°F
Carbon Steel A352-LCB	-46°C	-50°F
Carbon Steel A352-LCC / A350-LF2	-50°C	-58°F
Stainless Steel A351-CF8M / A182-F316	-200°C	-328°F

## SEAT MATERIAL

Reinforced PTFE	-200°C	-328°F
PEEK	-100°C	-148°F
PTFE (TFM1600)	-200°C	-328°F
PCTFE (Kel-F)	-250°C	-418°F

## ACCEPTANCE TESTING

SWI's dedicated in-house test facilities enable valves to be performance tested at low temperature or cryogenic conditions in accordance with major international standards or a customer's individual requirements.

COOLANT NITROGEN [N<sub>2</sub>]

- Liquid
- Gaseous

TEST GAS NITROGEN [99% N<sub>2</sub> + 1% He]

- for temperatures down to -160°C (-256°F)
- HELIUM [He]**
- for temperatures down to -200°C (-328°F)

## LEAKAGE DETECTION

## EXTERNAL

- by mass spectrometer

## ACROSS SEATS

- by gas flow meters down to 5Nm<sup>3</sup>/min,
- then by soap bubble displacement for readings down to 0.1 Nm<sup>3</sup>/min.

## TEMPERATURE BAND DEFINITION

SWI have adopted the following band definitions for subzero services

BAND	TEMPERATURE RANGE
Low Temperature	-30°C ~ -100°C (-22°F ~ -148°F)
Cryogenic	-101°C (-150°F) & below

## BOILING POINTS OF LIQUEFIED GASES

Propane	-42°C	-43.6°F
Carbon Dioxide	-78°C	-108.4°F
Ethylene	-104°C	-155.2°F
Methane	-161.5°C	-258.7°F
Liquid Natural Gas	-163°C	-261.4°F
Oxygen	-182.9°C	-297.2°F
Carbon Monoxide	-192°C	-313.6°F
Air	-194.4°C	-317.9°F
Nitrogen	-195.8°C	-320.4°F
Hydrogen	-252.7°C	-422.9°F
Helium	-268.9°C	-452°F



### PERFORMANCE FOR ANY PROCESS

SWI recognizes the vital role correct seat material selection plays in delivering the highest levels of sealing performance and longevity of service which are directly effected by the process and operational requirements.

With a wide variety of SOFT & METAL seat materials to suit an extensive range of applications, SWI offers dependable operation combined with pressure integrity and endurance over the valves service life. The below outlines commonly used seat materials; other grades such as UHMWPE, Delrin®, Vespel® etc.... are available on request.

#### Virgin PTFE < Polytetrafluoroethylene >

This seating material has excellent chemical resistance over a wide range of chemicals and offers the lowest operational torques due to its low coef cient of friction. PTFE is non-contaminating and accepted by FDA for use in food services.

#### Modified PTFE TFM1600 < Modified Polytetrafluoroethylene >

Dyneon® TFM PTFE is a modified TFE Polymer. A second generation PTFE that maintains the exceptional chemical and heat resistance properties of first generation PTFE with added process purity, strength, low permeability and high resiliency. The low permeability especially makes this material ideal for use on reactive monomer (such as styrene) and butadiene.

#### R-PTFE < Reinforced Polytetrafluoroethylene >

PTFE’s mechanical properties are enhanced by adding 15% or 25% percent glass fiber filler material to provide improved strength, stability and wear resistance. This reinforcement permits application at higher pressure and temperature limits than unfilled PTFE.

#### CF-PTFE < Carbon Filled Polytetrafluoroethylene >

This is a PTFE based resin reinforced with a special composition of glass amorphous carbon powder and graphite fillers for enhanced pressure and heat resistance properties whilst providing superior abrasion and wear resistance. It is particularly suited to high temperature, steam and modulating service /applications.

#### PEEK < Polyetheretherketone >

Peek Polymer offers a unique combination of chemical, mechanical and thermal properties where high strength and high temperature is required in corrosive applications. Excellent for water and steam application at elevated temperatures and possesses excellent resistance to radiation and abrasion compared to PTFE’s.

#### Metallized Carbon Insert

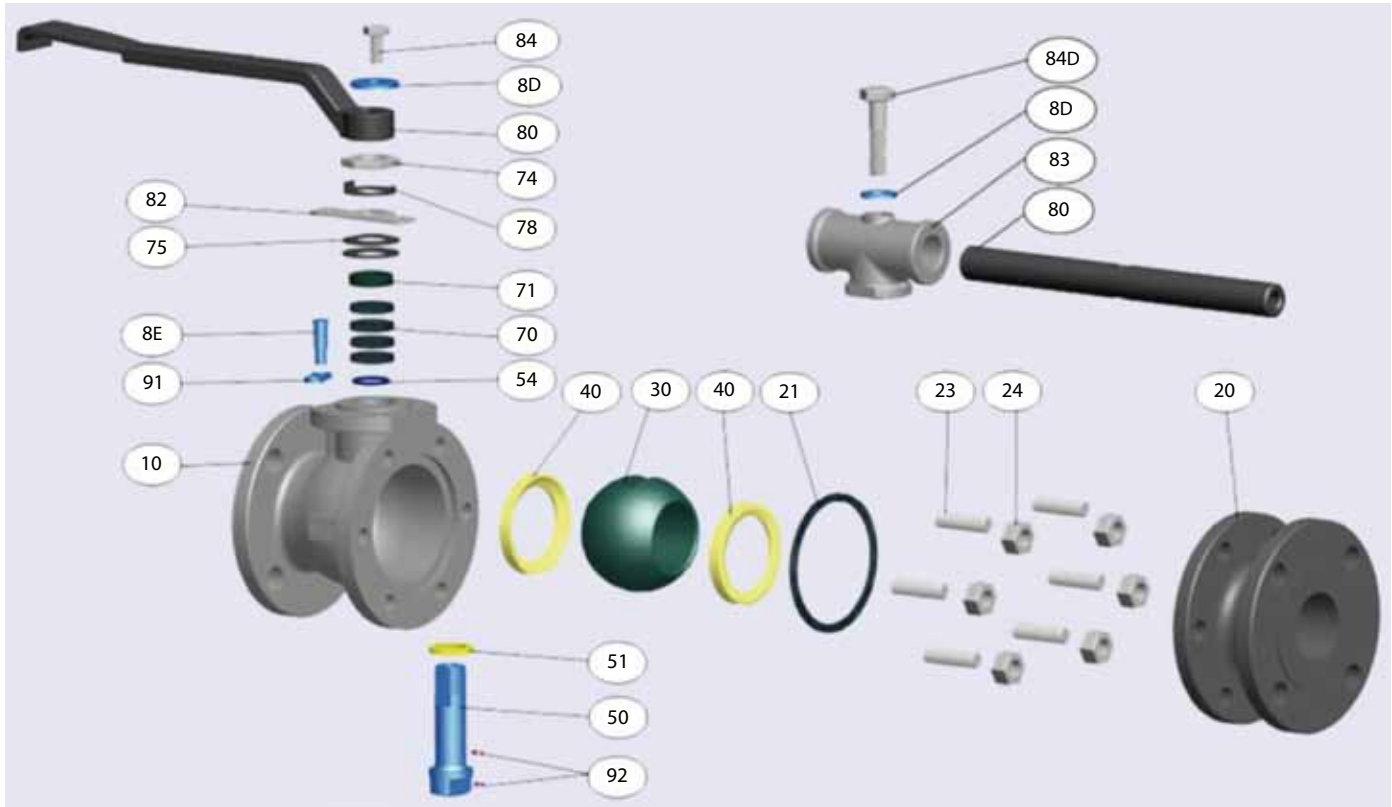
Metallized Carbon is a proprietary product for applications where traditional SOFT seating materials cannot be utilized. This material has exceptional capabilities and is suitable for use in a variety of SEVERE SERVICE applications ranging from high temperatures to cryogenic temperatures, harsh caustics and strong acids, dry service, whilst providing one of the lowest operational torques (coefficient of friction 0.1~0.2) due to its self-lubricating & non-galling characteristics. Being a solid and homogeneous material throughout; there are no coatings, plating or surface treatments to wear out.

#### Solid Metal Seats

The complete failure of a valve in service is often due to the deterioration of its sealing element or one of the operating parts impairing its operation. Solid metal seats should be adopted for hostile conditions, CRITICAL and SEVERE applications, particularly when the service is dirty, abrasive, highly corrosive, at elevated temperature or a combination of all.

SWI offer a range of solid metal seating with various surface treatments such as NITRIDING or hard facing by thermal-spraying of STELLITE or TUNGSTEN CARBIDE or HARD NICKEL ALLOY to suit almost any application or base material. Stellite & Nickel Alloy coating can additionally be fully fused to the base metal to form a metallurgical bond providing the highest integrity sealing surface, virtually porous free with hardness up to 60 ~ 65 Hrc, dependant on alloy.

Precision lapping of ball & seat results in superior interfacing for tight shut-off.

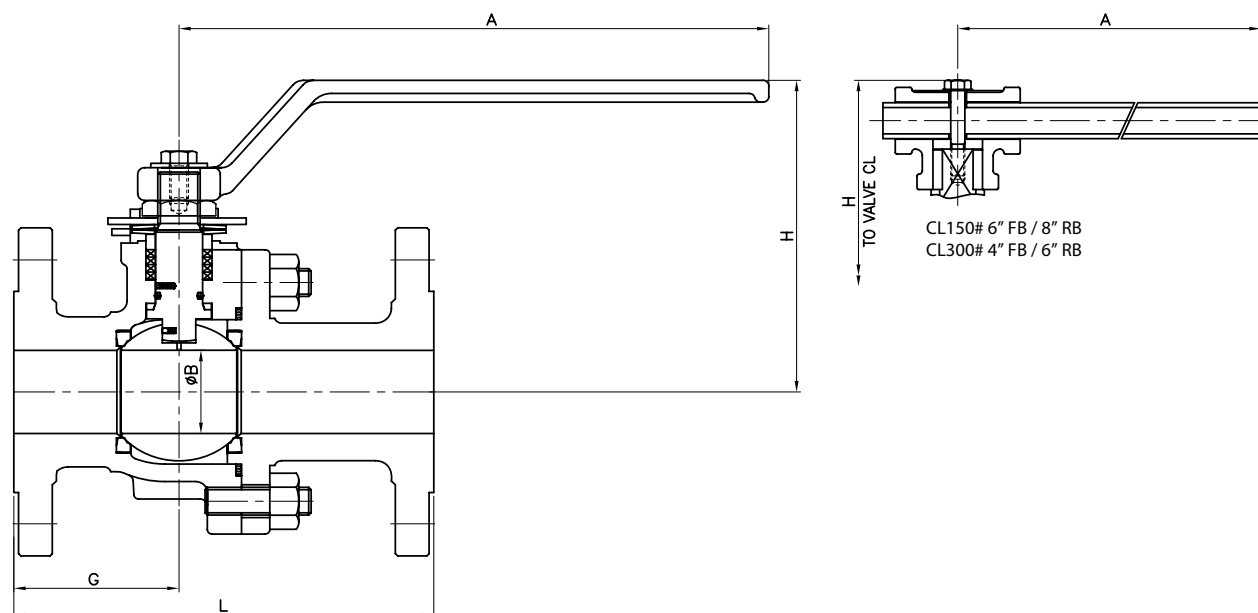


BILL OF MATERIALS <sup>(1)</sup>						
No.	Part Description	Qty.	CS	ITCS	SS	Notes Spares
10	BODY	1	A216-WCB/A105	A352-LCC/A350-LF2	A351-CF8M/A182-F316	
20	CAP (ADAPTOR)	1	A216-WCB/A105	A352-LCC/A350-LF2	A351-CF8M/A182-F316	
21	CAP GASKET	1	HNBR / FKM-B / FKM-GLT & GRAPHITE or 316+ GRAPHITE SWG			2 S
23	CAP BOLT	1 Set	A193-B7	A320-L7	A193-B8M CL2	3
24	CAP NUT	1 Set	A194-2H	A194-4	A194-8M	3
30	BALL	1	A351-CF8M / A182-F316 / A276-316			
40	SEAT RING	2	R-PTFE			4 S
50	STEM	1	A182-F316 / A276-316			
51	THRUST SEAL / BEARING	1	R-PTFE			S
54	STEM O-RING	1	HNBR / FKM-B / FKM-GLT			5 S
70	GLAND PACKING	1 Set	INHIBITED FLEXIBLE GRAPHITE			6 S
71	GLAND RING	1	A182-F316 / A276-316			
74	STEM NUT	1	316 STAINLESS STEEL			
75	GLAND SPRING	2	SPRING STEEL			
78	TOOTH WASHER	1	304 STAINLESS STEEL			S
80	LEVER / T-BAR TUBE	1	A395 + BLACK PAINT / A53 + GALVANIZED			7
82	STOP PLATE	1	316 STAINLESS STEEL			
83	T-BAR SOCKET	1	A395 + BLACK PAINT			
84	LEVER / T-BAR BOLT	1	A193-B8M			
8D	LEVER WASHER	1	304 STAINLESS STEEL			
8E	STOP PIN	1	316 STAINLESS STEEL			
91	LOCKING PLATE	1	316 STAINLESS STEEL			
92	ANTI STATIC DEVICE	1	316 STAINLESS STEEL			

### NOTES

- Typical materials for standard valves. Alternative materials available on request.
- DN15 (½") ~ DN40 (1½") O-Ring & fully contained Graphite. DN50 (2") ~ DN200 (8") 316 + Graphite SWG. Addition of O-Ring seal to SWG Gasket available on request.
- Quantity is according to valve size & rating. B7M & L7M bolting for NACE valves. Alternative grades on request.
- Virgin PTFE, TFM1600, PCTFE, PEEK or all Metal Seated options available on request.
- Stem O-Ring seal is optional and alternative grades available.
- Alternative for PTFE packing available on request.
- Class 150# 6" FB / 8" RB Class 300# 4" FB / 6" RB valves fitted with T-Bar operator. Option for Gear or alternative operators on request

## DIMENSIONS



## FULL BORE CLASS 150#

SIZ		DN15		DN20		DN25		DN40		DN50		DN80		DN100		DN150		DN200	
		1/2"		3/4"		1"		1½"		2"		3"		4"		6"		8"	
		mm	ins	mm	ins	mm	ins	mm	ins	mm	ins	mm	ins	mm	ins	mm	ins	mm	ins
ØB		13	0.51	19	0.75	25	0.98	38	1.50	49	1.93	74	2.91	100	3.94	150	5.91		
L		108	4.25	117.5	4.63	127.5	5.02	165	6.50	178	7.01	203	7.99	229	9.02	394	15.51		
H		97.5	3.84	108.5	4.27	112	4.41	128	5.04	165	6.50	222	8.74	242	9.53	319	12.56		
A		150	5.91	150	5.91	200	7.87	200	7.87	250	9.84	450	17.72	450	17.72	600	23.62		
G		52	2.05	58	2.28	67	2.64	69	2.72	77	3.03	96	3.78	108	4.25	130	5.12		
Kg	lbs	2.5	5.51	3.6	7.94	5.5	12.13	8	17.64	15	33.07	20	44.09	36	79.37	70	154.32		

## FULL BORE CLASS 300#

ØB		13	0.51	19	0.75	25	0.98	38	1.50	49	1.93	74	2.91	100	3.94	150	5.91		
L		140	5.51	152	5.98	165	6.50	190.5	7.50	216	8.50	283	11.14	305	12.01	403	15.87		
H		97.5	3.84	108.5	4.27	112	4.41	128	5.04	165	6.50	222	8.74	242	9.53	319	12.56		
A		150	5.91	150	5.91	200	7.87	200	7.87	250	9.84	450	17.72	450	17.72	600	23.62		
G		52	2.05	58	2.28	67	2.64	69	2.72	77	3.03	96	3.78	108	4.25	140	5.51		
Kg	lbs	3.2	7.05	4.2	9.26	7	15.43	11	24.25	17	37.48	25.5	56.22	44	97.00	88	194.00		

## FULL BORE CLASS 600#

SIZ	DN15		DN20		DN25		DN40		DN50		DN80		DN100		DN150		DN200	
	1/2"		3/4"		1"		1½"		2"		3"		4"		6"		8"	
	mm	ins	mm	ins	mm	ins	mm	ins	mm	ins	mm	ins	mm	ins	mm	ins	mm	ins
ØB	13	0.51	19	0.75	25	0.98	38	1.50										
L	185	7.28	190.5	7.50	216	8.50	241.3	9.50										
H	97.5	3.84	108.5	4.27	112	4.41	128	5.04										
A	150	5.91	150	5.91	200	7.87	250	9.84										
G	75	2.95	78	3.07	93	3.66	94	3.70										
Kg	lbs	3.9	8.60	5.1	11.24	8	17.64	12	26.46									

## REDUCED BORE CLASS 150#

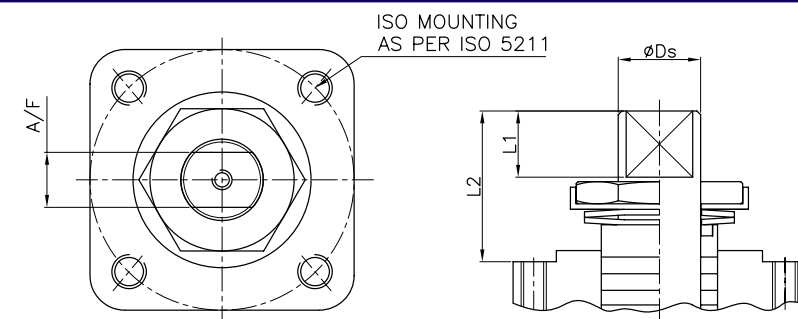
SIZ	DN15		DN20		DN25		DN40		DN50		DN80		DN100		DN150		DN200	
	1/2"		3/4"		1"		1½"		2"		3"		4"		6"		8"	
	mm	ins	mm	ins	mm	ins	mm	ins	mm	ins	mm	ins	mm	ins	mm	ins	mm	ins
ØB									38	1.50	49	1.93	74	2.91	100	3.94	150	5.91
L									178	7.01	203	7.99	229	9.02	394	15.51	457	17.99
H									128	5.04	165	6.50	222	8.74	242	9.53	319	12.56
A									250	9.84	250	9.84	450	17.72	450	17.72	600	23.62
G									69	2.72	77	3.03	96	3.78	108	4.25	130	5.12
Kg	lbs								9	19.84	17	37.48	26	57.32	45	99.21	87	191.80

## REDUCED BORE CLASS 300#

SIZ	DN15		DN20		DN25		DN40		DN50		DN80		DN100		DN150		DN200	
	1/2"		3/4"		1"		1½"		2"		3"		4"		6"		8"	
	mm	ins	mm	ins	mm	ins	mm	ins	mm	ins	mm	ins	mm	ins	mm	ins	mm	ins
ØB									38	1.50	49	1.93	74	2.91	100	3.94	150	5.91
L									216	8.50	283	11.14	305	12.01	403	15.87	502	19.76
H									128	5.04	165	6.50	222	8.74	242	9.53	319	12.56
A									250	9.84	250	9.84	450	17.72	450	17.72	600	23.62
G									69	2.72	77	3.03	96	3.78	108	4.25	130	5.12
Kg	lbs								11.2	24.69	22.5	49.60	34	74.96	63	138.89	129	284.39

## TECHNICAL DATA

## VALVE TOP FLANGE &amp; STEM DIMENSIONS



TOP FLANGE & STEM DIMENSIONS							
STEM SIZE	ØDs	A/F	ISO 5211 Mtg.Flange	L1	L2		
					Nominal	Tolerance	
1	mm	12	8	F03	9	22	0/-1.0
	ins	0.472	0.315		0.354	0.866	0/-0.039
	ins	0.709	0.472		0.512	1.299	0/-0.039
2	mm	18	12	F05	13	33	0/-1.0
	ins	0.709	0.472		0.512	1.299	0/-0.039
	ins	0.709	0.472		0.512	1.299	0/-0.039
3	mm	22	15	F07	16	34	0/-1.0
	ins	0.866	0.59		0.63	1.339	0/-0.039
	ins	0.866	0.59		0.63	1.339	0/-0.039
4	mm	28	19	F10	21	45	0/-1.0
	ins	1.102	0.748		0.827	1.772	0/-0.039
	ins	1.102	0.748		0.827	1.772	0/-0.039
5	mm	36	24	F12	26	56	0/-1.0
	ins	1.417	0.945		1.024	2.205	0/-0.039
	ins	1.417	0.945		1.024	2.205	0/-0.039

STEM SIZE SELECTION						
VALVE SIZE		FULL BORE			REDUCED BORE	
		150#	300#	600#	150#	300#
DN15	1/2"	1	1	1		
DN20	3/4"	1	1	1		
DN25	1"	2	2	2		
DN40	1 1/2"	2	2	2		
DN50	2"	3	3		2	2
DN80	3"	4	4		3	3
DN100	4"	4	4		4	4
DN150	6"	5	5		4	4
DN200	8"				5	5

## VALVE TORQUES

To calculate the valve required torque at any pressure use the formula in the below table.

Example: 3" Full Bore Class 150# Valve fitted with RTFE Seats at 285 psi = 49.72 + (0.136 x 285)= 88.5 Nm

VALVE NOMINAL INTERNAL PORT SIZE 'Ø	BALL VALVE OPERATING STEM TORQUES						
	R-PTFE SEAT						
	CL 150#		CL 300#		CL 600#		
	ΔP (Psi)	285	ΔP (Psi)	740	ΔP (Psi)	1480	
1/2" (13mm)	4.97 + 0.003 * ΔP	5.8	4.97 + 0.003 * ΔP	7.2	5.71 + 0.005 * ΔP	13.1	
3/4" (19mm)	9.50 + 0.004 * ΔP	10.6	9.50 + 0.004 * ΔP	12.5	10.91 + 0.006 * ΔP	19.8	
1" (25mm)	14.92 + 0.005 * ΔP	16.3	14.92 + 0.005 * ΔP	18.6	17.15 + 0.007 * ΔP	27.5	
1½" (38mm)	17.90 + 0.006 * ΔP	19.6	17.90 + 0.006 * ΔP	22.3	20.52 + 0.009 * ΔP	33.8	
2" (49mm)	28.93 + 0.034 * ΔP	38.6	28.93 + 0.034 * ΔP	54.1			
3" (74mm)	49.72 + 0.136 * ΔP	88.5	49.72 + 0.136 * ΔP	150.4			
4" (100mm)	74.58 + 0.385 * ΔP	184.3	74.58 + 0.385 * ΔP	359.5			
6" (150mm)	142.38 + 0.735 * ΔP	351.9	142.38 + 0.735 * ΔP	686.3			

MAX. ALLOWABLE 316 SS Material	
Stem Size	Lb ins
1	358
2	1219
3	2262
4	4642
5	9697

For alternative stem materials & strengths, contact SWI Technical.

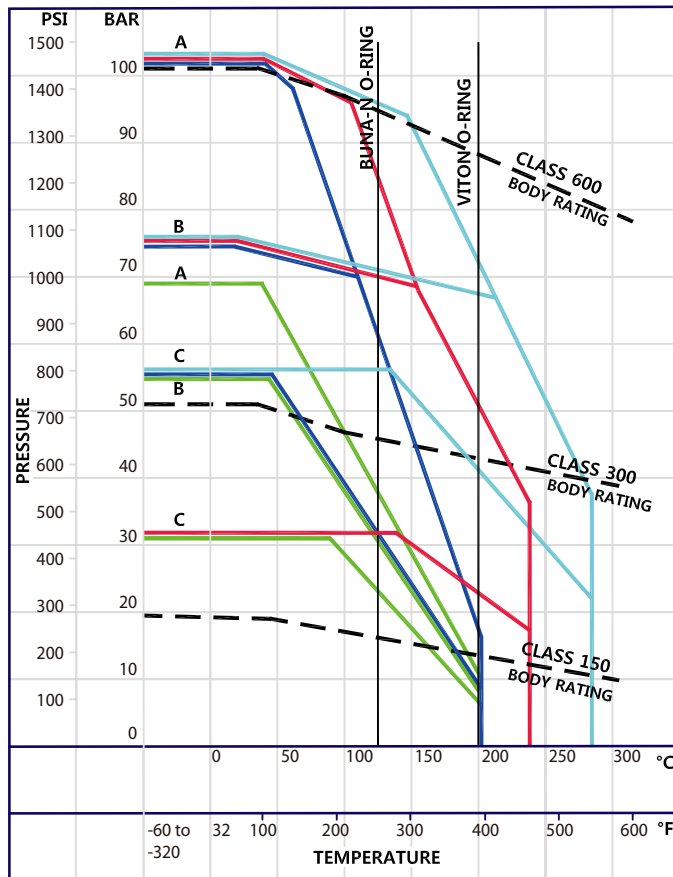
## FLOW COEFFICIENTS

SIZE		FULL BORE	REDUCED BORE
mm	ins		
DN15	1/2"	17	
DN20	3/4"	32	
DN25	1"	130	
DN40	1 1/2"	260	
DN50	2"	460	110
DN80	3"	1200	312
DN100	4"	2200	478
DN150	6"	5000	1000
DN200	8"		1800



## TECHNICAL DATA

## PRESSURE &amp; TEMPERATURE LIMITS



GRAPH	FULL BORE	REDUCED BORE
A	1/2"~2"	2"
B	3"~4"	3"~6"
C	6"	8"

—	PTFE
—	R-PTFE
—	CF-PTFE
—	PEEK
- - -	BODY RATING

PRESSURE/TEMPERATURE RATINGS  
(SOFT SEAT AND SEALS)

## SOFT SEAT / SEAL MATERIAL SELECTION &amp; LIMITS

MATERIAL	STATIC / SHORT PERIODS				OPERATING CONDITIONS			
	TEMP. ° C		TEMP. ° F		TEMP. ° C		TEMP. ° F	
	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.
PEEK	-100	+300	-148	572	-100	+270	-148	518
R-PTFE (15% or 25% Glass Filled)	-200	+232	-328	450	-200	+204	-328	399
CF-PTFE (Carbon & Glass Reinforced)	-100	+288	-148	550	-100	+240	-148	464
PTFE & TFM1600	-200	+232	-328	450	-200	+204	-328	399
PCTFE (KEL-F)	-250	+160	-418	320	-250	+150	-418	302
FKMA & B (Viton)	-15	+230	-5	446	-10	+200	14	392
FKMGLT (Viton)	-46	+210	-50.8	410	-40	+180	-40	356
NITRILE	-30	+150	-22	302	-30	+120	-22	248
HNBR	-46	+200	-50.8	392	-25	+160	-13	320
SILICONE	-60	+250	-76	482	-60	+200	-76	392
FLUOROSILICONE	-60	+200	-76	392	-60	+180	-76	356

## NOTES

- 1) Temperature limitations may vary between manufacturer grades; always consult with SWI Technical if in doubt.
- 2) Valves Pressure~ temperature (P~T) ratings are limited by the body ratings according to ASME B16.34, seat and seal material.
- 3) Metal seated valves seat P~T ratings are equal to the body ratings.
- 4) The P~T ratings advised for seats & seals are a guide for general service; always consult with SWI Technical for specific recommendations.

## VALVE MODEL NUMBER

CODE TABLE    **A B**    **C D E F**    **G H J K**  
Sample Valve Code **CN B**    **11 S2 R1 C**    **R 2 1 1**

2-PCE, CLASS 150#, WCB BODY, 316SS TRIM, RTFE SEAT, RTFE & GRAPHITE STEM SEALS  
316/GRAPHITE SWG BODY GASKET, B7/2H BODY BOLTING  
FLANGED & DRILLED ANSI 150 RF, FULL BORE, STD. BONNET, WRENCH OPERATED

A		B		C		D	
VALVE TYPE / SERIES		CLASS / CONN.		SHELL MATERIAL		TRIM MATERIAL	
CN	2 PIECE BOLTED BODY	B	ANSI 150#	11	A216-WCB / A105	S1	410SS
		D	ANSI 300#	13	A352-LCC / A350-LF2	S2	304SS
		E	ANSI 600#	23	A351-CF8M / A182-F316	S3	316
		9	SPECIAL	24	A351-CF3M / A182-F316L	S4	316L
				29	ASTM A890-4A / A182-F51	S5	17-4PH SS
				30	ASTM A890-5A / A182-F53	D1	F51/ S31803
				31	ASTM A890-6A / A182-F55	D3	F55/ S32760
				33	ASTM A494-M 35-1/ MONEL 400	D4	F44/ S31254
				35	ASTM A494-CW6M C / INCONEL 625	A6	INCONEL 625
				44	ASTM A351-CK3M CUN / A182-F44	M1	MONEL 400
				61	ASTM B148-C95800 / NI-AL-BZ	H1	HASTELLOY C276
				99	SPECIAL	N1	NI-AL-BZ
						99	SPECIAL

E			F		G		H	
SEAT & STEM SEAL MATERIAL <sup>(1)</sup>			BODY JOINT SEAL / GASKET <sup>(2)</sup>		END CONNECTION <sup>(3)</sup>		BORE	
	SEATS	STEM SEALS	A	O-RING & GRAPHITE	W	BUTT WELD - ASME B16.25	1	REDUCED BORE
R1	PTFE	RTFE & GRAPHITE	C	316 + GRAPHITE SWG	R	FLANGED - A SME B16.5 RF	2	FULL BORE
R2	R-PTFE	RTFE & GRAPHITE	D	316L + GRAPHITE SWG	F	FLANGED - ASME B16.5 FF		
R3	R-PTFE	RTFE / HNBR / GRAPHITE	E	MONEL + GRAPHITE SWG	J	FLANGED - ASME B16.5 RTJ		
R4	R-PTFE	RTFE / FKM-B & GRAPHITE	F	A20 + GRAPHITE SWG				
R5	R-PTFE	RTFE / FKM-GLT & GRAPHITE	G	UNS S31803 + GRAPHITE SWG				
P1	PEEK	RTFE & GRAPHITE	H	INCONEL 625 + GRAPHITE SWG				
P2	PEEK	RTFE & GRAPHITE	9	SPECIAL				
P3	PEEK	RTFE / HNBR / GRAPHITE						
P4	PEEK	RTFE / FKM-B & GRAPHITE						
P5	PEEK	RTFE / FKM-GLT & GRAPHITE						
T1	PTFE (TFM 1600)	RTFE & GRAPHITE						
M	METAL SEATED							
99	SPECIAL							

BOLTING MATERIAL <sup>(5 &amp; 6)</sup>		
BODY CODE	BOLT	NUT
11	A193-B7	A194-2H
13	A320-L7	A194-4
23	A193-B8	A194-8
24	A193-B8	A194-8
29	A193-B8M CL2	A194-8M
31	A193-B8M CL2	A194-8M
33	A193-B8M CL2	A194-8M
35	A193-B8M CL2	A194-8M
44	A193-B8M CL2	A194-8M
61	A193-B8M	A194-8M

J		K	
BONNET <sup>(4)</sup>		OPERATION	

(1) Metal seating and primary seal selection to suit application.



**OPTIONS & VARIATIONS****ACTUATION & OPERATION METHODS**

SWI 'CN' range of valves may be manually operated by lever or gearbox depending on torque requirements, and are built to easily accept pneumatic, hydraulic or electric actuators.

Valve designs minimize operational torques, which normally affects actuator sizing, allowing for economical automation packages. Complete valve / actuator assemblies can be provided fully tested and certified according to customer requirements as a single package, supplied directly from SWI.

Over many years, SWI has built up a reputation for providing high quality valves supported by factory field experts. To maintain and extend our reputation, we have aligned ourselves with highly accredited and respected Automation Manufacturers in the industry. With fully equipped valve automation assembly & test shop combined with our extensive knowledge of the valves and actuator requirements, SWI can offer competitive prices, best service and proven products.

Production is centered at our new 14,500 m<sup>2</sup> World Class facility near Seoul with all manufacturing processes covered by the same documentation that ensures compliance to our standardized quality assurance programs. Product quality has been subject to continued enhancements and all products are constantly reviewed so as to improve quality and maintainability.

From general on / off duty with position indication and solenoid control to complete modulating packages with smart positioners, regulators, partial stroke and sophisticated control systems are all available from SWI.

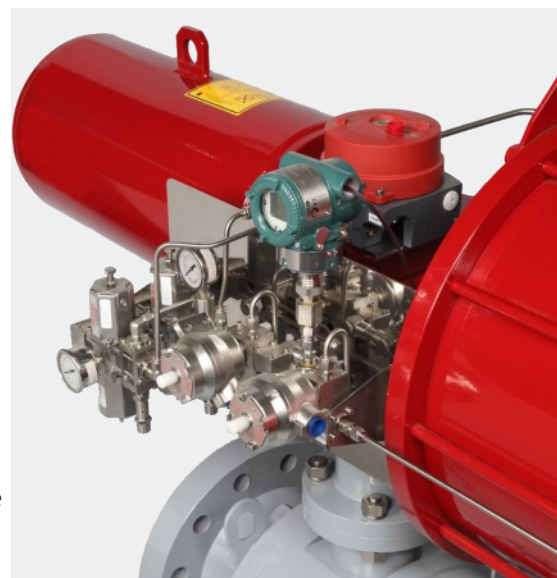
The 'CN' valves are ideal for ESD applications. Valves specified as ESD are equipped with actuators which ensure their positive operation in an emergency. In the case of such critical equipment, full details of the application conditions and relevant specifications should always be provided to our technical department.

To provide further customer support, SWI has partnered with key companies worldwide to distribute products and respond quickly to our client needs.

**METAL TO METAL SEATED VALVES**

For applications where solid particles may be present in the fluid or involve very high pressure and / or elevated temperature beyond the capability of soft seats, SWI can provide valves with metal to metal seating. SWI achieves the metal to metal seating through the use of various advanced hard facing technologies incorporating Tungsten Carbide coatings, Stellite, Hard Nickel Alloy or alternative processes considering the intended application.

Please consult with our technical department for specific requirements.

**OPTIONS & VARIATIONS****LOW TEMPERATURE SERVICE**

CN ball valves can be supplied for use in low temperature or cryogenic service.

Extended bonnet designs are of the fully enclosed vapour space type featuring an internally assembled anti-blow-out stem with the bonnet bolted to the body. Critical stem seals are located at the top of the bonnet outside of the cold zone.

Extended bonnets are recommended for valves which are required to be operated (opened & closed) in service at temperatures below -30°C (-22°F) or above 200°C (392°F).

**UNDERGROUND / EXTENDED OPERATOR**

Operator extensions may be required where valves are to be installed in underground (buried service) locations or whereby extended operators are required due to inaccessibility. SWI can offer a full range of extensions in a wide range of materials, from simple spindle type extensions to fully enclosed and oil filled type extensions. Extensions and lengths are manufactured according to client requirements.

**SOUR SERVICE**

Valves are available conforming to the requirements of the NACE specification MR 01-75 or MR 01-03 for use on applications where the presence of wet H<sub>2</sub>S generates a risk of stress corrosion cracking. NACE compliance certificates are available on request.

**QUALITY ASSURANCE**

SWI Valves operate under a Quality Assurance system which is approved by Bureau Veritas to ISO 9001:2008 / KS Q ISO 9001: 2009 / KEPIC-MN and API Q1. The company is licensed to use the API Monogram in respect of API 6D ball valves and our facilities are always open to customer audits.

SWI ball valves have been independently accredited for Design and Fire Safety. In addition, manufacture and materials comply with the essential safety requirements of the Pressure Equipment Directive 97/23/EC (PED).





● Before installation, these instructions must be fully read and understood.

## INSTALLATION

### Warning

For safety reasons, it is important to take the following precautions before you start work on the valve.

1. Before installing, operating or maintaining the valve, read all labels fitted to the valve. Where ancillary equipment (actuator & controls etc...) is provided which is not of SWI manufacture, the original manufacturers Installation & Operational Safety Instructions must also be read. For further information, contact SWI.
2. The valve should only be used for the intended purpose, according to contract.
3. No changes to the equipment are allowed without prior approval from SWI Valve Co. Ltd.
4. Personnel installing, operating and/or making any adjustments to the valves should use appropriate equipment and protective clothing normally used to work with the process and area where the valve is installed.
5. The line must be depressurized, drained, vented and cooled down before installing or working on the valve.
6. Handling & Installation of valves, operators, actuators and ancillary controls must be carried out by qualified personnel trained in all aspects of installation and manual / mechanical handling techniques.
7. Ensure the valve materials of construction and pressure/temperature limitations marked on the identification label are suitable for the service and operating conditions.
8. Double seated valves on liquid service, or fluids which have rapid rates of thermal expansion will need a positive means for relieving excessive cavity pressures. For further information, contact SWI.

### Installation

1. Verify that the direction of flow in the line corresponds to the flow arrow or high pressure side warning label indicated on the valve body. Valves without any of these markings are bi-directional.
2. With exception of certain valve types and services, installation may be carried out with stem displaced through any angle permitted by the bolting / installation. We recommend that actuated valves are always installed with the operator upright and in the horizontal position to avoid any undue stresses or side loads on the valve.
3. For certain services (cryogenic, etc...) and certain valve types (lift check etc...), valves shall be installed in the horizontal position only. Where valves are provided with extended bonnets for low temperature or cryogenic service, the extended bonnet shall be in the vertically upright position.
4. Ensure adequate and proper support for the valves is provided, in particular where valves are fitted with Pneumatic or hydraulic actuators.
5. For flanged valves, ensure that the mating flanges and gaskets are clean and undamaged.
6. For weld end valves, ensure that the weld profile & mating pipe are clean, in suitable condition and the valve disc and seat must be suitably protected from possible splatter. Valves are to be kept partially open during any welding and heat treatment, but the valve must be fully closed again after completion.
7. Weld end soft seated ball valves shall have valve internal parts, seals & gaskets removed during welding and heat treatment. Valve is only to be reassembled after completion of all welding, heat treatment and once suitably cooled to avoid damage to soft seats.
8. Welding and heat treatment: Consideration must be given to temperature limitations indicated on the valve nameplate. Preheat & heat treatments must be performed in accordance with relevant WPS/PQR and they are under complete responsibility of the customer.
9. For screwed valves, ensure mating pipe connections are the same thread form as the valve, clean and in suitable condition. Always use the proper size wrenches with flat jaws. All pipe threads in valve bodies are gauged to standard tolerances.

## PROTECTION / STORAGE / SELECTION

### Note

#### Protection

SWI valves are delivered with protection according to customer's specification, or in accordance with SWI Quality Assurance Manual and established procedures to protect the valve seats and closure member from damage. Valve preservation, wrapping and/or covers should be left in place until immediately before fitting to the pipe.

#### Storage

When valves are to be stored for some time before installation, they should be maintained in the original delivered condition, within their crates with any waterproof lining and/or desiccant remaining in place. Storage should be off the ground in a clean, dry, indoor area. If storage is for a period exceeding six months, the desiccant bags (if supplied) should be changed at this interval. If valves are to be stored for longer than 12 months, they should be inspected by SWI personnel before installation.

#### Selection

Ensure the valve's materials of construction and pressure/temperature limits shown on the identification plate are suitable for the process fluid conditions. If in doubt, contact SWI.

## HANDLING / LIFTING REQUIREMENTS

### Caution

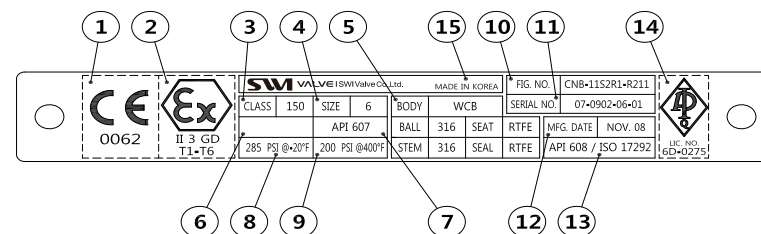
Handling / lifting of valves must be carried out by qualified personnel trained in all aspects of lifting & handling techniques.

Handling & lifting equipment (slings, hooks, etc...) must be sized adequately taking into account the valve weight indicated in the packing list and / or delivery note. Where valves are provided with lifting points, these shall be used. Do not utilize lifting points on actuators as these may not be sized for the combined valve / actuator weight, unless instructed otherwise by SWI. All safety regulations must be respected when handling equipment.

● Before installation, these instructions must be fully read and understood.

## Installation

10. Remove protective covers from the valve faces and any transportation protection applied. Inspect valve internally to ensure it is free of any foreign matter, packaging and/or desiccant bags.
11. Fit the valve into the pipe work ensuring easy access of the operator and ensure a stress free installation at the valve ends.
12. Ensure mating pipe flanges / connections are aligned correctly; bolting should be easily inserted through mating flange bolt holes.
13. Flange bolting should be tightened in the correct sequence and a sufficient number of circuits undertaken to ensure that the specified bolt torques are achieved. Torque applied shall be as recommended by the bolting manufacturer and good engineering practice.
14. Pipeline flushing: Should there be any possibility of abrasive particles (weld slag, sand, dirt, foreign matter etc...) within the piping system, this could damage the valve and its sealing performance. The system must be flushed clean prior to valve installation. If this is not possible, valves must be set in the full open position before flushing commences. Whilst valve materials are generally resistant against pickling fluids, always check with the supplier to ensure suitability of the fluid against valve materials of construction as stated on the valve label.
15. Note: Damage may occur to the valve sealing surfaces during high speed flushing operation as a result of particles that could be present in the line. For this reason, valves shall not be operated until all flushing is completed. After any pickling operation, check with particular care the dead spaces in the valve and replace gaskets and gland packing which has been in contact with the pickling fluid. Carefully clean sealing areas before replacement.



## OPERATION & ROUTINE MAINTENANCE

### Warning

**Depressurize the line before starting any maintenance. Failure to do so may cause serious personal injury and/or equipment damage.**

#### Scope

SWI Valves both manual and actuated. For special service designs, typically cryogenic and fugitive emissions see separate instructions.

#### Operation

All standard manually operated valves are 'clockwise to close'. The closed position is indicated by either the handlever or handwheel indicator or an indicator arrow being at 90° to the pipe / valve bore axis.

#### Routine Maintenance

No routine maintenance is required other than periodic inspection to ensure satisfactory operation and sealing. Any sign of leakage should be addressed immediately by depressurizing the valve and tightening the gland gradually and evenly. If no further adjustment is possible, or if seat or joint leakage is suspected, the valve will require a complete overhaul. This should be carried out after depressurization and in accordance with SWI Maintenance Instructions. Only SWI spares should be used.

#### Spare Parts

SWI valves are identified by a Figure Number, which is located on the valve identification label/plate. This reference should be quoted in respect of any after sales queries, spare parts or repair enquiries/orders.

## PRESSURE TEST

### Important

If piping system is to be pressurized with water for testing, the following recommendations should be adopted.

1. The valve should be in the partially open position and pressures must not exceed those as stated within SWI test procedures.
2. Prolonged use in the partially open position should be avoided with soft seated ball valves as this may cause damage to the valve soft seat.
3. Use corrosion inhibitor.
4. After testing, the piping system should be depressurized and completely drained.

### How to Read SWI Valve Name Plate

1	CE Mark and Notified Body, when applied
2	ATEX mark, when applied
3	ANSI pressure class
4	NPS size (Inches)
5	Materials of construction for main parts
6	Test / Sealing configuration per API 6D
7	Firesafe Standard
8	Valve max. pressure at min. design temperature
9	Valve max. pressure at max. design temperature
10	Valve model / figure number
11	Valve serial number
12	Date of manufacture (Month / Year)
13	Applied design code
14	API 6D Monogram, when applicable
15	Country of manufacture