



Catalogue

# Company Profile



What distinguishes Terofox Valves is the fact that we manufacture industrial valves, employing

dedicated engineers, quality assurance personnel, working on our behalf at all our points of manufacture. In this way we are able to make sure that all our customers' needs and concerns are consistently and professionally met and monitored on an ongoing basis.

Our dedicated team, with many years of experience, specialized in providing own valves and sourcing solutions for valves and fittings in both Taiwan and China. This includes ODM and OEM, designed engineering for our customers. Products sourced, service the chemical, petrochemical, process control, water purification and mechanical engineering requirements of our customers all over the world.

Terofox provides one stop service in diversity of valves' procurement too. Not only our own API594 dual plate check valve and industrial ball valves, but also including the

valves among API600, API602 and API603 Gates, Globes and Check Valves, Knife Gate Valves, Butterfly Valves, API6D Trunnion mounted Ball Valves, Corrosive PFA valves, Strainers, safety relief valves, hygienic components, plug valves as well as fittings, flanges, nuts and bolts are all available on requests. Our manufacturers all adhere to quality management procedures as laid down in ISO 9001 and PED 97/23/EC approvals.

Valves are available in the following materials. Carbon steel LLC, LCB, WCB, WC6 to Austenitic Stainless Steel CF8 ( SS304 ), CF8M (SS316), CF3M ( SS316L), Duplex, Alloy 20, Monel and Hastelloy C. Our Cooperative foundry has certified by ISO 9001 which is our minimum approval in allocating the foundry.

Based in Taiwan, our mission, as a team of dedicated professionals, is to assist our customers in obtaining the best possible solutions to their requirements and needs, at the most advantageous prices, without compromising on delivery or quality.





### Therefore we Guarantee our customers:

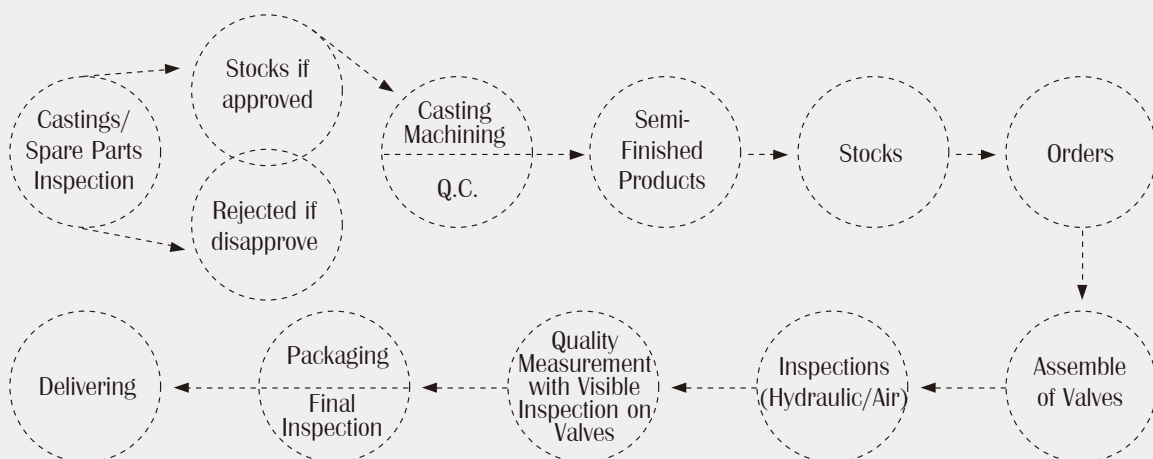
- \* 100% Quality assurance
- \* Cost-Efficient on valve procedures
  - \* Short Delivery
  - \* 1-year warranty
  - \* Inventory Status
  - \* Automation Service
- \* One-Stop Shop Service
- \* Engineering expertise
- \* Free download on our all detailed drawings online

With this in mind, we believe in developing long-term relationships, based on mutual trust and honesty. So we do believe “ The Right Valve For The Right Application, Always. “

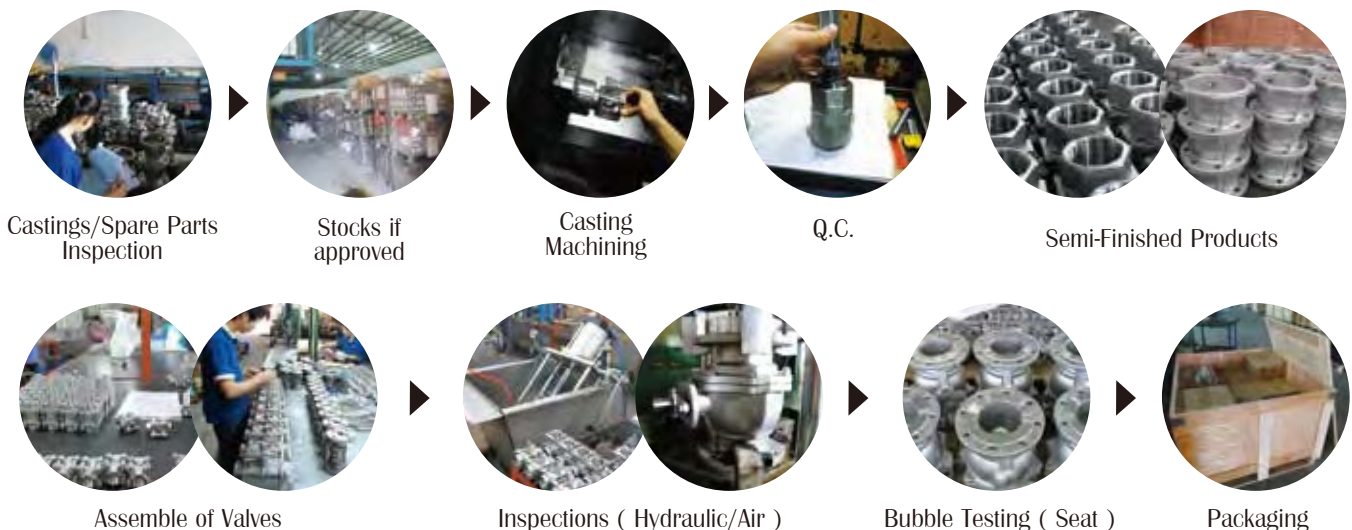


### Manufacturing Procedures

## WORKSHOP PROCEDURES



### Demonstration



# Terofox Ball Valves



**B**all valves are mostly used in shutoff applications. They are not recommended to be used in a partially open position for a long time under conditions of a high pressure drop across the valve, thus the soft seat could tend to flow through the orifice and block the valve movement.

The benefits on the type of body the ball valve can be more or less easily maintained. Drop pressure relative its hole size is low.

The seat material resistance of the ball valve limits the working temperature and pressure of the valve. The seat is plastic ( such as PTFE, RPTFE, 50%Carbon powder + 50% PTFE ) or metal ( S.S. + Stellite / Chrome hard face ) made.

They are used in diversity of applications such as steam, water, oil, gas, air, corrosive fluids, and can also handle slurries and dusty dry fluids. Abrasive and fibrous materials can damage the seats and the ball surface. Hence, purchasers must provide the necessary information on fluids / temperature for consideration of seat material.

For valve interior structures, Terofox provides blow-out-proof stem ( Fig. 01 ) and Anti-Static Device ( Fig. 02 ) as essential parts in the valve. API607 Fire Safe Design ( Fig. 03) is optional for some certain applications.

## ● Blow-out proof stem

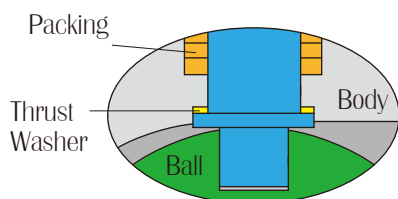


Fig. 01

## ● Anti Static Device

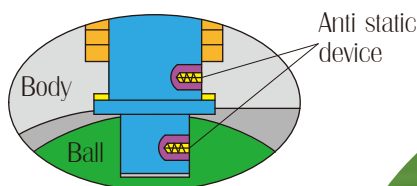
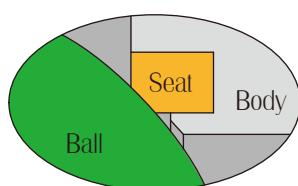


Fig. 02

## ● Fire Safe Seat Sealing

**Before fire**



**After fire**

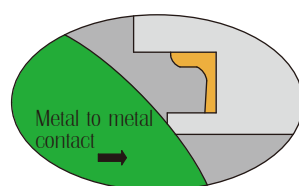


Fig. 03



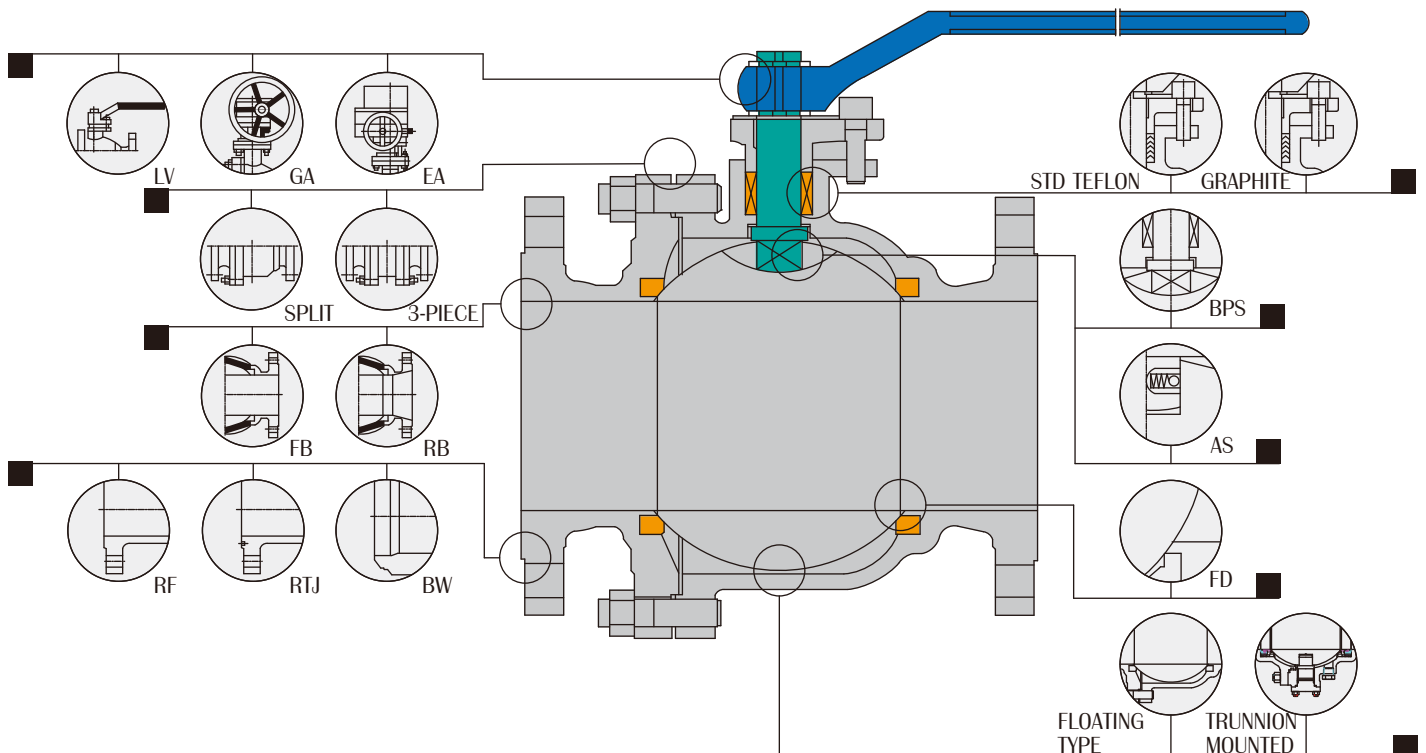
# Type of Ball valve

## Float ball valve:

The ball is held on two seat rings.

## Trunnion ball valve:

The ball is supported on its vertical rotation axis by a trunnion. The trunnion absorbs the pressure from the flow, therefore the contact between the ball and the seat is not excessively stressed and the operating torque can remain low. This design is recommend for big diameters and high pressure.



# Type of Ball valve



## Operation

Lever operated is most cost-efficient for ball valve. Also available with gear box, motor actuator, pneumatic or hydraulic actuator for more difficult services.

## Bore

Full bore or reduce bore. Full bore design provides exceptional flow control.

## Body & Bonnet

Single, split or 3-pc design, disassembles easily for repair or replacement of internal components.

## End Connections:

Available for RF, RTJ, and Butt weld Connection

## Blow-out proof design & Anti-Static Device (BPS&AS)

A stem shoulder design protects against the failure under excess pressure.

For anti-static device, it means a metallic contact is always granted between ball and stem / body to discharge eventual statics building up during service

## Fire Safe Design

Terofox certain valves are applicable of according to API607 or BS 6755 fire safe design. To grant their operation stable in case of fire accident. API607 / BS 5755 will provide graphite packing and gaskets.



# Industrial Valves



They are the commercial commodities for industrial, oil & gas, chemical and petrochemical application. Providing good diversity of valve types, connections, and wide range of pressure rating. Terofox offers good quality industrial valves with full inspection by air / hydraulic testing. Most of seats will be in soft seat such as PTFE, RTFE, Delrin, Peek as well as MG-1241, 50% S.S.+ 50% PTFE, TFM1600 for different applications.

## 1-PC Design

**1000psi / 2000psi**

Body material: ASTM A216 WCB, ASTM A351 CF8M, DIN 1.0619, DIN 1.4408

Ball : CF8M

Stem : SS316

Seat : PTFE

Connections: Screw Ends / Socket Weld Ends

Screw Ends Cover : ASME B 1.20.1 NPT / BS21 ( BSP ) / BSPT / ISO228-1 / DIN2999 / ISO 7-1 Rp

Socket Weld Ends Cover : ASME B16.11 Socket Weld Ends

**EB-112**

**800psi / PN40 bar**

1-pc design reduce bore ball valve, Hex. body design blow-out-proof stem design, MALE x FEMALE



Size: 1/4"~1"(DN8~DN25)  
Pressure: 800 psi(PN40 bar)  
Temp.: -20 to 180°C (-4 to 356°F)  
Conn.: Male x Female

**EB-120**

**2000psi / PN140 bar**

1-pc design reduce bore, ball valve blow-out-proof stem design



Size: 1/4"~2"(DN8~DN50)  
Pressure:  
1/4" ~ 1" 2000psi (DN8~DN25 PN140 bar),  
1 1/4" ~ 2" 1500psi (DN32~DN50 PN100 bar)  
Temp.: -20 to 180°C (-4 to 356°F)  
Conn.: Threaded ends

**EB-110**

**1000psi / PN63 bar**

1-pc design reduce bore ball valve, blow-out-proof stem design



Size: 1/4"~2"(DN8~DN50)  
Pressure: 1000psi (PN63 bar)  
Temp.: -20 to 180°C (-4 to 356°F)  
Conn.: Threaded ends

**EB-120H**

**2000psi / PN140 bar**

1-pc design reduce bore ball valve, Hex. body design blow-out-proof stem design



Size: 1/4"~2" (DN8~DN50)  
Pressure:  
1/4" ~ 1" -- 2000psi (DN8~DN25 PN140 bar)  
1 1/4" ~ 2" -- 1500psi (DN32~DN50 PN100 bar)  
Temp.: -20 to 180°C (-4 to 356°F)  
Conn.: Threaded ends



### EB-110H

**1000psi / PN63 bar**

1-pc design reduce bore ball valve, Hex. body design blow-out-proof stem design



Size: 1/4"~2"(DN8~DN50)  
Pressure: 1000 psi(PN63 bar)  
Temp.: -20 to 180°C (-4 to 356°F)  
Conn.: Threaded ends

### EB-122

**2000psi / PN140 bar**

1-pc design reduce bore ball valve, Hex. body design blow-out-proof stem design



Size: 1/4"~2"(DN8~DN50)  
Pressure: 2000psi(PN140 bar)  
Temp.: -20 to 180°C (-4 to 356°F)  
Conn.: Threaded ends

## 2-PC Design

**1000psi / 2000psi / 3000psi / 6000psi**

**Blow-out-proof Stem & Anti-static Design**

Body material: ASTM A216 WCB, ASTM A351 CF8M, DIN 1.0619, DIN 1.4408

Ball : CF8M

Stem : SS316

Seat : PTFE

Connections: Screw Ends / Socket Weld Ends

Screw Ends Cover : ASME B 1.20.1 NPT / BS21 ( BSP ) / BSPT / ISO228-1 / DIN2999 / ISO 7-1 Rp

Socket Weld Ends Cover : ASME B16.11 Socket Weld Ends

### EB-212

**800psi / PN40 bar**

2-pc design reduce bore ball valve, blow-out-proof stem design. Male x Male



Size: 1/4"~2"(DN8~DN50)  
Pressure: 800psi ( PN40 bar )  
Temp.: -20 to 180°C (-4 to 356°F)  
Conn.: Male x Male

### EB-210E

**1000psi / PN63 bar**

2-pc design full bore ball valve, ECONOMY TYPE, blow-out-proof stem design.



Size: 1/4"~3"(DN8~DN80)  
Pressure:  
1000psi/800psi ( PN63/PN40 bar )  
1/4"~2" 1000psi (DN8~DN50 PN63 bar)  
2-1/2"~3" 800psi (DN65~DN80 PN40 bar)  
Temp.: -20 to 180°C (-4 to 356°F)  
Conn.: Threaded ends

### EB-210

**1000psi / PN63 bar**

2-pc design full bore ball valve, blow-out-proof stem design.



Size: 1/4"~3"(DN8~DN80)  
Pressure:  
1/4"~2" 1000 psi (DN8~DN50 PN63 bar)  
2 1/2"~3" 800psi ( DN65~DN80 PN40 bar)  
Temp.: -20 to 180°C (-4 to 356°F)  
Conn.: Threaded ends

### EB-213

**1000psi / PN63 bar**

2-pc design full bore ball valve, blow-out-proof stem design.  
face to face according to DIN 3202 M3



Size: 1/4"~3"(DN8~DN80)  
Pressure: 1000psi ( PN 63 bar )  
Temp.: -20 to 180°C (-4 to 356°F)  
Conn.: Threaded ends



### EB-210D

#### 1000psi / PN63 bar

2-pc design full bore ball valve, blow-out-proof stem design.  
ISO 5211 Direct-mounted pad, with locking device



Size: 1/4"~2"(DN8~DN50)  
Pressure: 1000psi (PN 63 bar)  
Temp.: -20 to 180°C (-4 to 356°F)  
Conn.: Threaded ends

### EB-214

#### 2000psi / PN140 bar

2-pc design full bore ball valve. blow-out-proof stem design, face to face according to DIN 3202 M3, with locking device



Size: 1/4"~2"(DN8~DN50)  
Pressure:  
1/4"~1"--2000psi (DN8~DN25 PN140 bar)  
1-1/4"~2"--1500psi (DN32~DN50 PN100 bar)  
Temp.: -20 to 180°C (-4 to 356°F)  
Conn.: Threaded ends

### EB-220

#### 2000psi / PN140 bar

2-pc design reduce bore ball valve, blow-out-proof stem design, with locking device



Size: 1/4"~2"(DN8~DN50)  
Pressure: 2000psi (PN140 bar)  
Temp.: -20 to 180°C (-4 to 356°F)  
Conn.: Threaded ends

### EB-221

#### 2000psi / PN140 bar

2-pc design full bore ball valve, blow-out-proof stem design.  
face to face according to DIN 3202 M3, with locking device



Size: 1/4"~4"(DN8~DN100)  
Pressure:  
1/4"~2"--2000psi (DN8~DN50 PN140 bar)  
2-1/2"~4"--1500psi (DN65~DN100 PN100 bar)  
Temp.: -20 to 180°C (-4 to 356°F)  
Conn.: Threaded ends

### EB-224

#### 2000psi / PN140 bar

2-pc design full bore ball valve, blow-out-proof stem design.  
ISO 5211 Mounted pad.



Size: 1/4"~4"(DN8~DN100)  
Pressure:  
1/4"~2"--2000psi (DN8~DN50 PN140 bar)  
2-1/2"~4"--1500psi (DN65~DN100 PN100 bar)  
Temp.: -20 to 180°C (-4 to 356°F)  
Conn.: Threaded ends

### EB-224B

#### 2000psi / PN140 bar

2-pc design full bore ball valve, Full Welding Design on cap. blow-out-proof stem design.  
ISO 5211 Mounted pad.



Size: 1/4"~2"(DN8~DN50)  
Pressure: 2000psi (PN140 bar)  
Temp.: -20 to 180°C (-4 to 356°F)  
Conn.: Threaded ends

### HPV-230

#### 3000psi / PN210 bar

2-pc full bore high pressure ball valve, blow-out-proof stem,  
ISO 5211 mounted pad. investment casting



Size: 1/4"~2" (DN8~DN50)  
Pressure: 3000psi (PN210 bar)  
Temp.: Delrin seat: -20 to 80°C  
Peek seat: -20 to 250°F  
Conn.: Threaded ends  
(2" : reduce bore)

### HPV-260

#### 6000psi / PN420 bar

2-pc full bore high pressure ball valve, blow-out-proof stem,  
ISO 5211 mounted pad. investment casting



Size: 1/4"~2" (DN8~DN50)  
Pressure: 6000psi (PN420 bar)  
Temp.: Delrin seat: -20 to 80°C  
Peek seat: -20 to 250°F  
Conn.: Threaded ends  
(2" : reduce bore)

## 3-PC Design

1000psi / 2000psi / 3000psi

Blow-out-proof Stem & Anti-static Design

Body material: ASTM A216 WCB, ASTM A351 CF8M, DIN 1.0619, DIN 1.4408

Ball : CF8M

Stem : SS316

Seat : PTFE

Connections: Screw Ends / Socket Weld Ends / Butt Weld Ends

Screw Ends Cover : ASME B 1.20.1 NPT / BS21 ( BSP ) / BSPT / ISO228-1 / DIN2999 / ISO 7-1 Rp

Socket Weld Ends Cover : ASME B16.11 Socket Weld Ends

Butt Weld Ends Cover : ASME B16.25 Butt Weld Ends

### EB-310

**1000psi / PN63 bar**

3-pc design full bore ball valve, blow-out-proof stem design



Size: 1/4"~4"(DN8~DN100)  
Pressure:  
1/4" ~ 2" 1000psi (DN8 ~ DN50 PN63 bar)  
2 1/2" ~ 4" 800psi (DN65 ~ DN100 PN40 bar)  
Temp.: -20 to 180°C (-4 to 356°F)  
Conn.: Threaded ends

### EB-310M

**1000psi / PN63 bar**

3-pc design full bore ball valve, blow-out-proof stem design, ISO 5211 mounted pad



Size: 1/4"~4"(DN8~DN100)  
Pressure:  
1/4"~2" 1000psi (DN8~DN50 PN63 bar)  
2-1/2"~4" 800psi (DN65~DN100 PN40 bar)  
Temp.: -20 to 180°C (-4 to 356°F)  
Conn.: Threaded ends

### EB-310D

**1000psi / PN63 bar**

3-pc design full bore ball valve, blow-out-proof stem & anti-static design, ISO5211 direct-mounted pad



Size: 1/4"~4"(DN8~DN100)  
Pressure:  
1/4"~2" 1000psi (DN8~DN50 PN63 bar)  
2-1/2"~4" 800psi (DN65~DN100 PN40 bar)  
Temp.: -20 to 180°C (-4 to 356°F)  
Conn.: Threaded ends

### EB-320

**2000psi / PN140 bar**

3-pc design full bore ball valve blow-out-proof stem & anti-static design, ISO 5211 mounted pad



Size: 1/4"~4"(DN8~DN100)  
Pressure:  
1/4"~1" 2000psi (DN8~DN25 PN140 bar)  
1-1/4"~2" 1500psi (DN32~DN50 PN100 bar)  
2-1/2"~4" 1000psi (DN65~DN100 PN63 bar)  
Temp.: -20 to 180°C (-4 to 356°F)  
Options : Reduce bore EB-320R  
Flange type EB-320F  
T-clamp type EB-320TC

### EB-3201

**2000psi / PN140 bar**

3-pc design full bore ball valve, blow-out-proof stem design, ISO 5211 mounted pad



Size: 1/4"~4"(DN8~DN100)  
Pressure:  
1/4"~2" 2000 psi (DN8~DN50 PN140 bar)  
2-1/2"~4" 1500psi (DN65~DN100 PN100 bar)  
Temp.: -20 to 180°C (-4 to 356°F)  
Conn.: Threaded ends

### EB-320D

**2000psi / PN140 bar**

3-pc design full bore ball valve, blow-out-proof stem & anti-static design, ISO 5211 Direct-mounted pad



Size: 1/4"~4"(DN8~DN100)  
Pressure:  
1/4"~1" 2000psi (DN8~DN25 PN140 bar)  
1-1/4"~2" 1500psi (DN32~DN50 PN100 bar)  
2-1/2"~4" 1000psi (DN65~DN100 PN63 bar)  
Temp.: -20 to 180°C (-4 to 356°F)  
Conn.: Threaded ends



**EB-3208D**

**2000psi / PN140 bar**

2-pc design full bore ball valve, blow-out-proof & anti-static design, ISO 5211 Direct-mounted body



Size: 1/4"~2"(DN8~DN50)  
Pressure: 2000psi (PN140 bar)  
Temp.: -20 to 180°C (-4 to 356°F)  
Conn.: Threaded ends

## Flange Ends / Flange Ball Valve

ANSI Class150/Class300, DIN PN10/16, PN25/40 bar

Blow-out-proof Stem & Anti-static Design

Body material: ASTM A216 WCB, ASTM A351 CF8, ASTM A351 CF8M, DIN 1.0619, DIN1.4308, DIN 1.4408

Ball: CF8M

Stem: SS316

Seat: RTFE ( 15% Glass Fiber + PTFE )

Flange: ASME B16.5 RF Flange Ends, DIN2501 PN40/PN16

Finished Surface: 125-250 AARH

Body Wall Thickness: ASME B16.34 / EN12516-1/2

Marking: MSS SP-25

Valve Test: API 598

Temperature: -20 to 180 °C (-4 to 356 °F)

## 1-PC Design

**ANSI  
TF-10**

1-pc full bore ball valve, compact body ( wafer type ), blow-out-proof stem & anti-static design  
ISO 5211 mounted pad on top body



Size: 1/2"~6"  
Pressure: Class150/Class300  
Temp.: -20 to 180°C (-4 to 356°F)  
Conn.: Flange ends

**ANSI  
TF-11**

1-pc reduce bore ball valve, blow-out-proof stem & anti-static design  
ISO 5211 mounted pad



Size: 1/2"~6"  
Pressure: Class 150, Class 300  
Temp.: -20 to 180°C (-4 to 356°F)  
Conn.: Flange ends



## 1-PC Design

### ANSI/JIS TF-10D

1-pc full bore ball valve, compact body (wafer type), Class150, JIS10K, blow-out-proof stem & anti-static design, ISO 5211 Direct-mounted pad



Size: 1/2"~6"  
Pressure: Class150, JIS10K  
Temp.: -20 to 180°C (-4 to 356°F)  
Conn.: Flange ends

### DIN TF-10

1-pc full bore ball valve, compact body (wafer type), blow-out-proof stem & anti-static design ISO 5211 mounted pad on top body



Size: DN15~DN150  
Pressure: PN10/16  
Temp.: -20 to 180°C (-4 to 356°F)  
Conn.: Flange ends

### DIN TF-10D

1-pc full bore ball valve, compact body (wafer type), PN10/16, blow-out-proof stem & anti-static design, ISO 5211 Direct-mounted pad



Size: DN15~DN150  
Pressure: PN10/16  
Temp.: -20 to 180°C (-4 to 356°F)  
Conn.: Flange ends

## 2-PC Design

### ANSI TF-20

2-pc full bore ball valve, Class150, Class300 economic type, blow-out-proof stem & anti-static design, ISO 5211 mounted pad



Size: 1/2"~6"  
Pressure: Class 150, Class 300  
Temp.: -20 to 180°C (-4 to 356°F)  
Conn.: Flange ends

### ANSI TF-20D

2-pc full bore ball valve, Class 150, Class 300 blow-out-proof stem & anti-static design ISO 5211 Direct-mounted pad



Size: 1/2"~6"  
Pressure: Class 150, Class 300  
Temp.: -20 to 180°C (-4 to 356°F)  
Conn.: Flange ends

### DIN TF-20

2-pc full bore ball valve, PN40/PN16 , Economic type blow-out-proof stem & anti-static design  
ISO 5211 mounted pad



Size: DN15~DN150  
Pressure: EN1092-1 PN40/PN16  
Temp.: -20 to 180°C (-4 to 356°F)  
Conn.: Flange ends

### DIN TF-20D

2-pc full bore ball valve, PN40/PN16 blow-out-proof stem & anti-static design  
ISO 5211 Direct-mounted pad



Size: DN15~DN150  
Pressure: EN1092-1 PN40/16  
Temp.: -20 to 180°C (-4 to 356°F)  
Conn.: Flange ends



## 3-PC Design

### EB-310F

3-pc design full bore ball valve, blow-out-proof stem design



Size: 1/4"~4"(DN8~DN100)  
Pressure: EN1092-1 PN40  
Temp.: -20 to 180°C (-4 to 356°F)  
Conn.: Flange ends

### EB-310DF

3-pc design full bore ball valve, blow-out-proof stem & anti-static design,  
ISO5211 direct-mounted pad



Size: 1/4"~4"(DN8~DN100)  
Pressure: 1/4"~2" PN40, 2 1/2"~4" PN16  
Temp.: -20 to 180°C (-4 to 356°F)  
Conn.: Flange ends

# Fire Safe Design Ball Valves



## API607 Fire safe design ball valves

### Screw EB-320FS

3-pc design full bore ball valve blow-out-proof stem & anti-static design ISO 5211 mounted pad, API607 Fire safe design



Size: 1/4"~4" (DN8~DN100)  
Pressure:  
1/4"~1" 2000psi (DN8~DN25 PN140 bar)  
1-1/4"~2" 1500psi (DN32~DN50 PN100 bar)  
2-1/2"~4" 1000psi (DN65~DN100 PN63 bar)  
Temp.: -20 to 180°C (-4 to 356°F)  
Conn.: Threaded ends

### TF-1 1FS

1-pc reduce bore ball valve, API607 Fire Safe Design Type, blow-out-proof stem & anti-static design ISO 5211 mounted pad Double-sealing on stem is to comply with TA-Luft requirement design



Size: 1/2"~6"  
Pressure: Class 150, Class 300  
Temp.: -20 to 180°C (-4 to 356°F)  
Conn.: Flange ends

### Flange TF-20FS

2-pc full bore ball valve, PN16 blow-out-proof stem & anti-static design ISO 5211 Direct-mounted pad



Size: 1/2"~6" (DN15~DN150)  
Pressure: Class 150, Class 300  
Temp.: -20 to 180°C (-4 to 356°F)  
Conn.: Flange ends

### TF-40FS

API6D trunnion-mounted ball valve, 2-pc full bore casting type ball valve, API6FA fire safe design, anti-static device, blow-out-proof stem, all in bio-directional function.



Size: 2"~16"  
Pressure: Class 150, Class 300  
Temp.: -20 to 180°C (-4 to 356°F)  
Conn.: Flange ends





# Flow Control Ball Valves



**V port valves offer better and more consistent control than traditional round ported ball valves.**



We offer this valve with the control port cast and machined into the ball, not in the seat. This allows for much better flow characteristics and eliminates the need to replace seats. By means of angles between slotted to 90°, that controls throughout the valve rotation and the larger angles offer a larger Cv in addition to control flow.

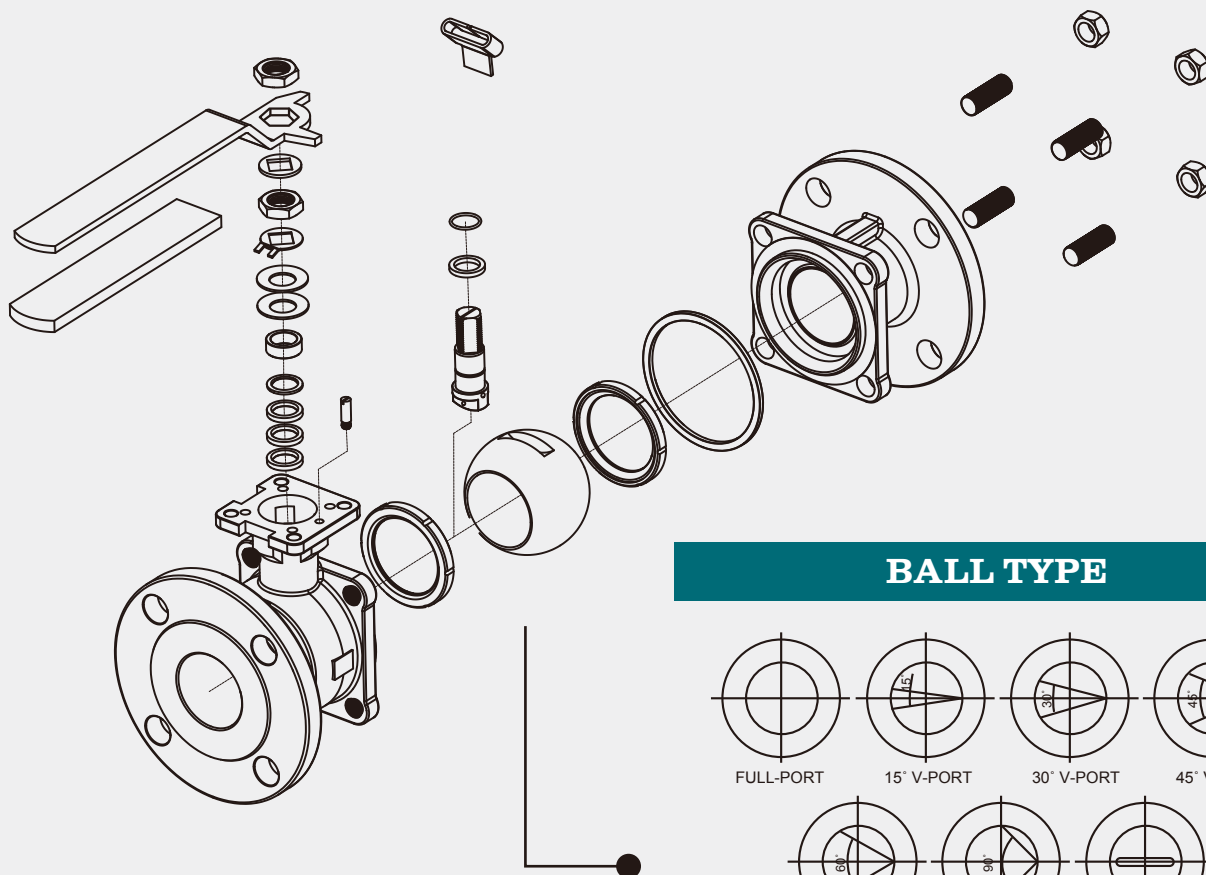
## Flange Ends

Blow-out-proof stem & anti-static design  
 Bore: 15°, 30°, 45°, 60°, 90°, slotted.  
 ANSI Class150/Class300, DIN PN10/16, PN25/40 bar  
 Body material:  
 ASTM A216 WCB, ASTM A351 CF8, ASTM A351 CF8M  
 DIN 1.0619, DIN1.4308, DIN 1.4408  
 Ball : CF8M  
 Stem : SS316  
 Seat : PTFE/50% S.S. + 50% PTFE  
 Flange : ASME B16.5 RF Flange Ends  
 DIN2501 PN40/PN16  
 Finished Surface : 125-250 AARH  
 Body Wall Thickness : ASME B16.34 / EN12516-1/2  
 Marking: MSS SP-25  
 Valve Test - API 598  
 Temperature : -20 to 180°C (-4 to 356°F)

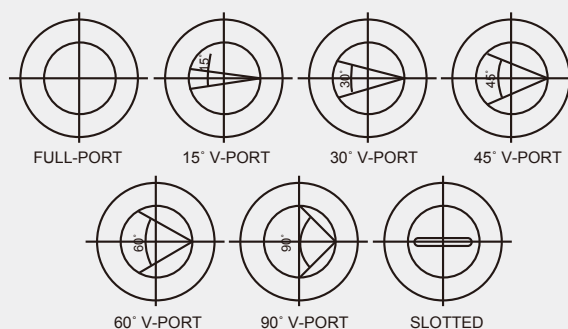
## Screw Ends

Blow-out-proof stem & anti-static design  
 Bore: 15°, 30°, 45°, 60°, 90°, slotted.  
 1000 psi/PN 63 bar, 2000 psi/PN 140 bar  
 Body material: ASTM A216 WCB, ASTM A351 CF8M  
 DIN 1.0619, DIN 1.4408  
 Ball : CF8M  
 Stem : SS316  
 Seat : PTFE/50% S.S. + 50% PTFE  
 Connections:  
 Screw Ends / Socket Weld Ends / Butt Weld Ends  
 Screw Ends Cover :  
 ASME B 1.20.1 NPT / BS21 ( BSP ) / BSPT / ISO228-1  
 / DIN2999 / ISO 7-1 Rp  
 Socket Weld Ends Cover : ASME B16.11 Socket Weld Ends  
 Butt Weld Ends Cover : ASME B16.25 Butt Weld Ends

## V Port Ball Selection:



### BALL TYPE



Terofox "V" port control valves are available with slotted to 90° V notch. V port valves offer better and more consistent control than traditional round ported ball valves.

We offer this valve with the control port cast and machined into the ball, not in the seat.

This allows for much better flow characteristics and eliminates the need to replace seats,

By the means of angles between slotted to 90°, that controls throughout the valve

rotation and the larger angles offer a larger Cv in addition to controlled flow.

15°

30°

45°

60°

90°

Slotted



\* 30°, 45°, 60° are standard angle

\* 15°, 90° and slotted are available

# V-port Ball Valves



## Screw Ends

### EB-V310D

3-pc design v-bore ball valve, Bore: 15°, 30°, 45°, 60°, 90°, slotted. blow-out-proof stem & anti-static design, ISO5211 direct-mounted pad



Size: 1/4"~4"(DN8~DN100)  
Pressure:  
1/4"~2" 1000psi (DN8~DN50 PN63 bar)  
2-1/2"~4" 800psi (DN65~DN100 PN40 bar)  
Temp.: -20 to 180°C (-4 to 356°F)  
DIN 3202 M3, S13 length available

### EB-V310

3-pc design V-bore ball valve, blow-out-proof stem design  
Bore: 15°, 30°, 45°, 60°, 90°, slotted.



Size: 1/4"~4"(DN8~DN100)  
Pressure:  
1/4"~2" 1000psi (DN8~DN50 PN63 bar)  
2-1/2"~4" 800psi (DN65~DN100 PN40 bar)  
Temp.: -20 to 180°C (-4 to 356°F)  
Conn.: Threaded ends

### EB-V320

3-pc design V-bore ball valve blow-out-proof stem & anti-static design ISO 5211 mounted pad  
Bore: 15°, 30°, 45°, 60°, 90°, slotted.



Size: 1/4"~4"(DN8~DN100)  
Pressure:  
1/4"~1" 2000psi (DN8~DN25 PN140 bar)  
1-1/4"~2" 1500psi (DN32~DN50 PN100 bar)  
2-1/2"~4" 1000psi (DN65~DN100 PN63 bar)  
Temp.: -20 to 180°C (-4 to 356°F)  
Conn.: Threaded ends

## Flange Ends

### TF-V20

2-pc V-bore ball valve, Class 150, Class 300, PN40/PN16 bar, Bore: 15°, 30°, 45°, 60°, 90°, slotted shape bore design blow-out-proof stem & anti-static design  
ISO 5211 mounted pad



Size:  
1/2"~6" ( DN15 ~ DN150 )  
Pressure:  
Class 150, Class 300 /  
PN16/40 bar  
Temp.:  
-20 to 180°C (-4 to 356°F)  
Conn.: Flange ends

### TF-V20D

2-pc V-bore ball valve, Class 150, Class 300 / PN40/PN16 bar, Bore: 15°, 30°, 45°, 60°, 90°, slotted shape bore design blow-out-proof stem & anti-static design  
ISO 5211 Direct-mounted pad



Size: 1/2"~6"( DN15 ~ DN150 )  
Pressure:  
Class 150, Class 300 / PN16 bar  
Temp.: -20 to 180°C (-4 to 356°F)  
Conn.: Flange ends



**EB-  
V310DF**

3-pc design V-bore ball valve, Flange Ends 15°, 30°, 45°, 60°, 90°, slotted shape bore design blow-out-proof stem & anti-static design, ISO5211 direct-mounted pad



Size: 1/2"~4" ( DN15~DN100 )  
Pressure: PN 40/PN 16 bar  
Temp.: -20 to 180°C (-4 to 356°F)  
Conn.: Flange ends

**TF-V40**

**( Trunnion mounted type )**

API6D trunnion-mounted ball valve, 2-pc V-bore 15°, 30°, 45°, 60°, 90°, slotted shape bore design casting type ball valve, API6FA fire safe design, anti-static device, blow-out-proof stem, all in bio-directional function.

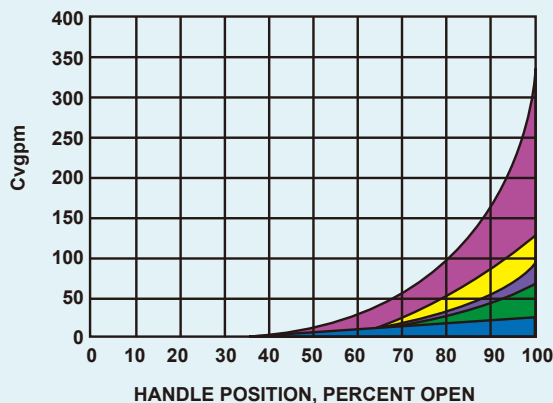


Size: 2"~16"  
Pressure: Class 150, Class 300  
Temp.: -20 to 180°C (-4 to 356°F)  
Conn.: Flange ends



## V-Flow Ball Valve Series Flow Coefficient - Cv vs. Travel

| SIZE   | Material    | Percent of rated travel in degree of rotation |       |       |        |        |        |         |         |         |         |         |
|--------|-------------|---|-------|-------|--------|--------|--------|---------|---------|---------|---------|---------|
|        |             | 0%  | 10%   | 20%   | 30%    | 40%    | 50%    | 60%     | 70%     | 80%     | 90%     | 100%    |
| 1/2"   | 1/32" SOLT. | 0.000   | 0.000 | 0.000 | 0.070  | 0.120  | 0.160  | 0.200   | 0.240   | 0.280   | 0.320   | 0.360   |
|        | 1/16" SOLT. | 0.000   | 0.000 | 0.075 | 0.145  | 0.250  | 0.330  | 0.410   | 0.570   | 0.650   | 0.740   | 0.890   |
|        | 1/8" SOLT.  | 0.000   | 0.000 | 0.145 | 0.261  | 0.550  | 0.660  | 0.850   | 1.120   | 1.350   | 1.500   | 1.780   |
|        | 30° V       | 0.000   | 0.000 | 0.100 | 0.172  | 0.324  | 0.429  | 0.649   | 0.873   | 1.350   | 1.749   | 2.435   |
|        | 60° V       | 0.000   | 0.000 | 0.120 | 0.236  | 0.539  | 0.643  | 1.081   | 1.587   | 2.615   | 3.664   | 5.525   |
|        | 90° V       | 0.000   | 0.100 | 0.200 | 0.400  | 0.600  | 0.900  | 1.500   | 2.200   | 3.800   | 5.400   | 6.900   |
| 3/4"   | 1/16" SOLT. | 0.000   | 0.000 | 0.070 | 0.160  | 0.330  | 0.410  | 0.620   | 0.750   | 0.950   | 1.112   | 1.250   |
|        | 1/8" SOLT.  | 0.000   | 0.000 | 0.163 | 0.260  | 0.536  | 0.658  | 1.021   | 1.166   | 1.615   | 1.760   | 2.115   |
|        | 30° V       | 0.000   | 0.000 | 0.128 | 0.159  | 0.338  | 0.489  | 0.850   | 1.166   | 1.805   | 2.408   | 2.884   |
|        | 60° V       | 0.000   | 0.000 | 0.151 | 0.238  | 0.453  | 0.729  | 1.275   | 1.915   | 3.419   | 4.630   | 6.440   |
|        | 90° V       | 0.000   | 0.200 | 0.400 | 0.800  | 1.200  | 2.000  | 3.100   | 4.600   | 8.000   | 11.300  | 14.000  |
| 1"     | 1/16" SOLT. | 0.000   | 0.030 | 0.149 | 0.312  | 0.442  | 0.580  | 0.770   | 0.940   | 1.080   | 1.240   | 1.370   |
|        | 3/16" SOLT. | 0.000   | 0.030 | 0.327 | 0.639  | 0.923  | 1.172  | 1.604   | 1.942   | 2.223   | 2.610   | 2.805   |
|        | 30° V       | 0.000   | 0.030 | 0.312 | 0.436  | 0.659  | 0.986  | 1.539   | 2.129   | 2.921   | 4.045   | 4.761   |
|        | 60° V       | 0.000   | 0.030 | 0.445 | 0.607  | 0.790  | 1.417  | 2.308   | 3.318   | 5.270   | 7.568   | 10.108  |
|        | 90° V       | 0.000   | 0.200 | 0.600 | 1.800  | 3.400  | 5.100  | 8.100   | 11.400  | 16.000  | 21.000  | 29.000  |
| 1-1/4" | 3/16" SOLT. | 0.000   | 0.050 | 0.350 | 1.200  | 2.215  | 3.150  | 4.230   | 5.220   | 6.150   | 6.775   | 7.350   |
|        | 30° V       | 0.000   | 0.050 | 0.359 | 0.857  | 1.661  | 2.686  | 4.230   | 6.186   | 8.530   | 11.193  | 13.230  |
|        | 60° V       | 0.000   | 0.060 | 0.441 | 1.114  | 1.845  | 3.426  | 5.575   | 8.215   | 13.290  | 18.360  | 24.499  |
|        | 90° V       | 0.000   | 0.300 | 0.800 | 2.000  | 5.000  | 8.000  | 14.000  | 19.000  | 28.000  | 39.000  | 55.000  |
| 1-1/2" | 3/16" SOLT. | 0.000   | 0.050 | 0.470 | 1.650  | 2.850  | 4.120  | 4.200   | 6.650   | 7.650   | 8.500   | 9.300   |
|        | 30° V       | 0.000   | 0.050 | 0.410 | 1.099  | 1.995  | 3.430  | 4.044   | 7.432   | 10.230  | 13.540  | 16.126  |
|        | 60° V       | 0.000   | 0.060 | 0.570 | 1.556  | 2.849  | 5.488  | 7.077   | 12.908  | 19.665  | 28.068  | 37.099  |
|        | 90° V       | 0.000   | 0.400 | 0.900 | 3.500  | 7.000  | 13.000 | 20.000  | 31.000  | 42.000  | 63.000  | 78.000  |
| 2"     | 1/4" SOLT.  | 0.000   | 0.050 | 0.745 | 2.765  | 4.685  | 6.650  | 8.650   | 10.650  | 12.150  | 13.550  | 14.850  |
|        | 30° V       | 0.000   | 0.050 | 0.549 | 1.620  | 3.320  | 5.574  | 8.252   | 11.931  | 16.397  | 21.797  | 26.234  |
|        | 60° V       | 0.000   | 0.060 | 0.698 | 2.477  | 4.784  | 9.094  | 15.410  | 21.889  | 31.707  | 46.343  | 60.981  |
|        | 90° V       | 0.000   | 0.500 | 2.000 | 6.000  | 12.000 | 22.000 | 35.000  | 45.000  | 70.000  | 105.000 | 135.000 |
| 2-1/2" | 3/8" SOLT.  | 0.000   | 0.060 | 0.955 | 3.700  | 6.400  | 8.800  | 11.450  | 14.300  | 16.200  | 18.300  | 20.000  |
|        | 30° V       | 0.000   | 0.060 | 0.955 | 3.115  | 6.400  | 10.364 | 15.210  | 22.440  | 30.620  | 41.270  | 49.400  |
|        | 60° V       | 0.000   | 0.090 | 0.955 | 3.699  | 7.100  | 13.199 | 22.222  | 31.972  | 46.028  | 68.120  | 89.400  |
|        | 90° V       | 0.000   | 0.500 | 1.700 | 7.000  | 14.000 | 28.000 | 48.000  | 70.000  | 106.000 | 160.000 | 218.000 |
| 3"     | 7/16" SOLT. | 0.000   | 0.100 | 1.200 | 4.450  | 7.680  | 10.950 | 14.000  | 17.650  | 19.855  | 22.150  | 24.260  |
|        | 30° V       | 0.000   | 0.100 | 0.750 | 2.610  | 5.907  | 10.153 | 16.661  | 24.500  | 33.650  | 44.300  | 53.880  |
|        | 60° V       | 0.000   | 0.120 | 1.000 | 4.156  | 9.943  | 18.514 | 28.984  | 48.566  | 66.704  | 93.350  | 123.860 |
|        | 90° V       | 0.000   | 0.700 | 3.500 | 8.000  | 18.000 | 35.000 | 60.000  | 90.000  | 135.000 | 205.000 | 310.000 |
| 4"     | 1/2" SOLT.  | 0.000   | 0.100 | 2.500 | 9.100  | 15.500 | 21.950 | 27.850  | 35.000  | 40.100  | 44.850  | 48.880  |
|        | 30° V       | 0.000   | 0.100 | 0.900 | 3.522  | 8.390  | 15.990 | 26.280  | 39.850  | 56.460  | 72.098  | 89.580  |
|        | 60° V       | 0.000   | 0.120 | 1.200 | 5.576  | 15.200 | 28.600 | 47.980  | 72.760  | 106.730 | 149.800 | 199.500 |
|        | 90° V       | 0.000   | 1.000 | 3.500 | 16.000 | 40.000 | 75.000 | 125.000 | 190.000 | 295.000 | 442.000 | 670.000 |



|                |
|----------------|
| Full Port Ball |
| 60° V-BALL     |
| 45° V-BALL     |
| 30° V-BALL     |
| Slotted ball   |

# Pneumatic / Electronic Actuator



## EB-210D Series

2-pc design full bore ball valve, blow-out-proof stem design  
ISO 5211 Direct-mounted pad, with locking device



Size: 1/4"~2"(DN8~DN50)  
Pressure: 1000psi (PN 63 bar)  
Temp.: -20 to 180°C (-4 to 356°F)  
Conn.: Threaded ends

## EB-310D Series

3-pc design full bore ball valve, blow-out-proof stem & anti-static design,  
ISO5211 direct-mounted pad



Size: 1/4"~4"(DN8~DN100)  
Pressure:  
1/4"~2" 1000psi (DN8~DN50 PN63 bar)  
2-1/2"~4" 800psi (DN65~DN100 PN40 bar)  
Temp.: -20 to 180°C (-4 to 356°F)  
Conn.: Threaded ends

## EB-320D Series

3-pc design full bore ball valve, blow-out-proof stem & anti-static design,  
ISO 5211 Direct-mounted pad



Size: 1/4"~4"(DN8~DN100)  
Pressure:  
1/4"~1" 2000psi (DN8~DN25 PN140 bar)  
1-1/4"~2" 1500psi (DN32~DN50 PN100 bar)  
2-1/2"~4" 1000psi (DN65~DN100 PN63 bar)  
Temp.: -20 to 180°C (-4 to 356°F)  
Conn.: Threaded ends

## TF-20D Series

2-pc full bore ball valve, Class 150, Class 300  
blow-out-proof stem & anti-static design  
ISO 5211 Direct-mounted pad



Size: 1/2"~6"  
Pressure: Class 150, Class 300  
Temp.: -20 to 180°C (-4 to 356°F)  
Conn.: Flange ends

## TF-10D Series

1-pc full bore ball valve, compact body ( wafer type ), Class150, JIS10K, blow-out-proof stem & anti-static design,  
ISO 5211 Direct-mountedpad



Size: DN15~DN150  
Pressure: PN10/16  
Temp.: -20 to 180°C (-4 to 356°F)  
Conn.: Flange ends

## MW-310 Series

3 way T/L port full bore ball valve seat supported,  
ISO 5211 Direct- mounting pad Four seat with screw body design



Size: 1/2"~3"(DN15~DN80)  
Pressure: 1000psi(PN63 bar )  
Temp.: -20 to 180°C (-4 to 356°F)  
Conn.: Threaded ends



### MW-305 Series

3 way T / L-port standard bore ball valve.  
ISO 5211 Direct-Mounted Pad. Four-seated loaded.



Size: 1/4"~2" (DN8~DN50)  
Pressure: 1000psi (PN63 bar)  
Temp.: -20 to 180°C (-4 to 356°F)  
Conn.: Threaded ends



## Multi-way Ball Valves



Multi-way ball valve has at least L or T - shaped hole through the middle. Nowadays, X ( or called double - L ) has also commercially available for certain applications. Simply, T port can connect any pair of ports, but the 45 degree position might disconnect all three leaving no margin for error. Oppositely, the L valve can connect the centre port to either side port, or disconnect all three, but it cannot connect the side ports together.

The 4 -way ball valve has two L -shaped ports ( Normally we called X-port ) in the ball that do not interconnect.

### Flange Ends

Blow-out-proof stem & anti-static design  
L/T/X Port Design, Reduce or Full Bore  
ANSI Class150/Class300, DIN PN10/16, PN25/40 bar  
Body material:  
ASTM A216 WCB, ASTM A351 CF8, ASTM A351 CF8M, DIN 1.0619, DIN1.4308, DIN 1.4408  
Ball : CF8M  
Stem : SS316  
Seat : PTFE  
Flange : ASME B16.5 RF Flange Ends  
DIN2501 PN40/PN16  
Finished Surface : 125-250 AARH  
Body Wall Thickness : ASME B16.34 / EN12516-1/2  
Marking: MSS SP-25  
Valve Test - API 598  
Temperature : -20 to 180°C (-4 to 356°F)

### Screw Ends

Blow-out-proof stem & anti-static design  
L/T/X Port Design, Standard or Full Bore  
Body material: ASTM A216 WCB, ASTM A351 CF8M  
DIN 1.0619, DIN 1.4408  
Ball : CF8M  
Stem : SS316  
Seat : PTFE  
Connections:  
Screw Ends / Socket Weld Ends /  
Butt Weld Ends  
Screw Ends Cover :  
ASME B 1.20.1 NPT / BS21 ( BSP ) / BSPT /  
ISO228-1 / DIN2999 / ISO 7-1 Rp  
Socket Weld Ends Cover :  
ASME B16.11 Socket Weld Ends  
Butt Weld Ends Cover :  
ASME B16.25 Butt Weld Ends

## 3-way

### Screws:

#### MW-302

3 way T / L-port standard bore ball valve



Size: 1/4"~2"(DN8~DN50)  
Pressure: 1000psi(PN63 bar )  
Temp.: -20 to 180°C (-4 to 356°F)  
Conn.: Threaded ends

#### MW-303

3 way T / L-port reduce bore ball valve blow-out-proof stem, with ISO 5211 mounted pad



Size: 1/4"~3"(DN8~DN80)  
Pressure: 1000psi(PN63 bar )  
Temp.: -20 to 180°C (-4 to 356°F)  
Conn.: Threaded ends

#### MW-304

3 way T / L-port reduce bore ball valve, with ISO 5211 mounted pad Bottom port design



Size: 1/4"~2"(DN8~DN50)  
Pressure: 1000psi(PN63 bar )  
Temp.: -20 to 180°C (-4 to 356°F)  
Conn.: Threaded ends

#### MW-305

3 way T / L-port standard bore ball valve. ISO 5211 Direct-Mounted Pad. Four-seated loaded.



Size: 1/4"~2"(DN8~DN50)  
Pressure: 1000psi ( PN63 bar )  
Temp.: -20 to 180°C (-4 to 356°F)  
Conn.: Threaded ends

#### MW-310

3 way T/L port full bore ball valve seat supported, ISO 5211 Direct-mounting pad Four seat with screw body design



Size: 1/2"~4"(DN15~DN100)  
Pressure: 1000psi(PN63 bar )  
Temp.: -20 to 180°C (-4 to 356°F)  
Conn.: Threaded ends

#### MW-314

3 way T / L-port full bore ball valve blow-out-proof stem, with ISO 5211 mounted pad



Size: 1/4"~2"(DN8~DN50)  
Pressure: 1000psi(PN63 bar )  
Temp.: -20 to 180°C (-4 to 356°F)  
Conn.: Threaded ends

## MW-316

3 way T / L-port full bore ball valve blow-out-proof stem, with ISO 5211 Direct-mounted pad



Size: 1/4"~2"(DN8~DN50)  
Pressure: 1000psi(PN63 bar )  
Temp.: -20 to 180°C (-4 to 356°F)  
Conn.: Threaded ends



## Flange Ends:

### MWF-310

3 way L/T -port full bore ball valve, ISO 5211 Direct-mounted pad, blow-out-proof stem.



Size: 1/2"~6" (DN15~DN150 )  
Pressure:  
Class 150 , PN40/PN16 bar  
Temp.: -20 to 180°C (-4 to 356°F)  
Conn.: Flange ends

### MWF-314

3 way L/T -port full bore ball valve, ISO 5211 Direct-mounted pad, blow-out-proof stem.



Size: 11/2"~12" (DN40~DN300)  
Pressure:  
Class 150 / Class 300,  
PN40/PN16 bar  
Temp.: -20 to 180°C (-4 to 356°F)  
Conn.: Flange ends

## 4-way

### Screws:

#### MW-410

4 way T/L/X -port full bore ball valve seat supported ISO 5211 Direct- mounting pad  
Four seat with screw body design



Size: 1/2"~4"(DN15~DN100)  
Pressure: 1000psi(PN63 bar )  
Temp.: -20 to 180°C (-4 to 356°F)  
Conn.: Threaded ends

### Flange Ends:

#### MWF-410

4 way L/T/X -port full bore ball valve, ISO 5211 Direct-mounted pad, blow-out-proof stem.



Size: 1/2"~6" (DN15~DN150)  
Pressure: Class150, PN40/PN16  
Temp.: -20 to 180°C (-4 to 356°F)  
Conn.: Flange ends

# High Pressure / High Temperature Ball Valves



High pressure ball valve is likely its name, the valves are installed under high pressure or high temperature fluids passing through. Mostly it could be used in severe condition. With PTFE, Delrin, Peek or even metal seat is applicable for such application. API607 fire Safe Design is optional for purchasers.



## Soft Seat

### Floating

#### HPV-230

##### 3000psi / PN210 bar

2-pc full bore high pressure ball valve, blow-out-proof stem, ISO 5211 mounted pad, by investment casting



Size: 1/4"~2" (DN8~DN50)  
Pressure: 3000psi (PN210 bar)  
Temp.:  
Delrin seat: -20 to 80°C ;  
Peek seat: -20 to 250°F  
Conn.: Threaded ends  
( 2" : reduce bore)

#### HPV-260

##### 6000psi / PN420 bar

2-pc full bore high pressure ball valve, blow-out-proof stem, ISO 5211 mounted pad, by investment casting



Size: 1/4"~2" (DN8~DN50)  
Pressure: 6000psi (PN420 bar)  
Temp.:  
Delrin seat: -20 to 80°C ;  
Peek seat: -20 to 250°F  
Conn.: Threaded ends  
( 2" : reduce bore)

#### HPV-364

##### 6000psi / PN420 bar

3-pc full bore high pressure ball valve, 6000psi (PN420 bar), blow-out-proof stem, Anti-static design, ISO 5211 mounted pad on body design, By bar material



Size: 1/4"~ 2" (DN8~DN50)  
Pressure: 6000psi (PN420 bar)  
Temp.:  
Delrin seat: -20 to 80°C ;  
Peek seat: -20 to 250°F  
Conn.: Threaded ends



## Metal Seat

### Floating

#### TF-24Q

2-pc full bore ball valve, Class 150, Class 300 Metal Seated Ball Valve blow-out-proof stem & anti-static design  
ISO 5211 Direct-mounted pad



Size: 1/2"~6" (DN15~DN150)  
Pressure: Class 150, Class 300  
Temp.: -29 to 350°C (-20 to 662°F)  
Tightness Ratings:  
Δ P: ASME / FCI 70-2 Class V  
Conn.: Flange ends

#### EB-320Q

3-pc design Metal Seated ball valve blow-out-proof stem & anti-static design  
ISO 5211 mounted pad.



Size : 1/4"~4" (DN8~DN100)  
Pressure: 1/4"~4" (DN8~DN100 PN40 bar)  
Temp.: -29 to 350°C (-20 to 662°F)  
Tightness Ratings:  
Δ P: ASME / FCI 70-2 Class V  
Conn.: Threaded ends

## Trunnion mounted



The trunnion mounted ball valve design is used mainly with the split body or 3-pc design in both casting and forging. The torque required to turn a trunnion -mounted ball is significantly less than that needed for a floating ball. Therefore, the trunnion mounted ball design is standard for large sizes of the application.

#### ( Trunnion mounted type )

#### TF-40Q

API6D trunnion-mounted ball valve, 2-pc metal seated ball valve design, casting type ball valve, API6FA fire safe design, anti-static device, blow-out-proof stem, all in bio-directional function.



Size: 2"~16"  
Pressure: Class 150, Class 300  
Temp.: -29°C to 350°C (-20 to 662°F)  
Conn.: Flange ends  
Tightness Ratings:  
Δ P: ASME / FCI 70-2 Class V



# Trunnion mounted



## Our Trunnion mounted ball valves are :

**Anti-static & Blow-out-proof Design**  
**Double block-and-bleed design**  
**Emergency Sealant Injection**  
**Independent ball and stem**

### Trunnion-mounted ball

The ball is fixed and the seat rings are floating, free to move along the valve axis. Side load generated by the pressure acting on the ball is absorbed by bearings.

At low pressure the seat sealing action is achieved by the thrust of the springs acting on the seat rings.

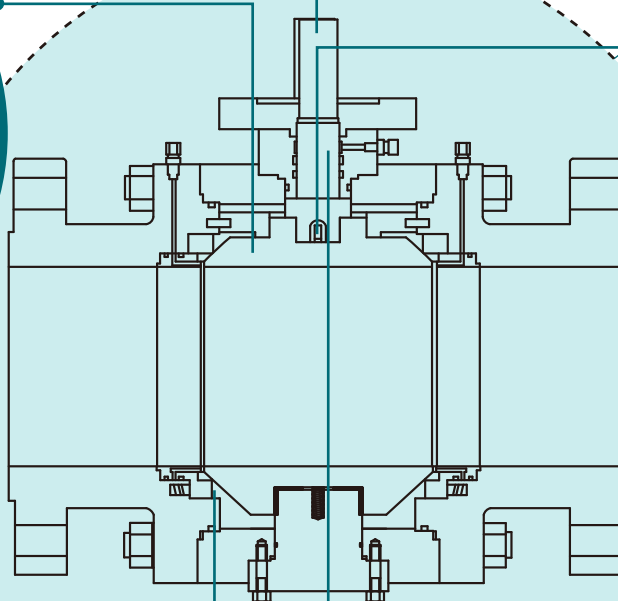
As the pressure increases the fluid pressure pushes the seat rings against the ball.

### Independent ball and stem

The ball and stem are independent to minimize the affect of the sidethrust generated by the pressure acting on the ball.

### Anti-static design

The electrical conductance continuity between all the metallic components is guaranteed and certified.



### Floating self-relieving seat rings

Two independent floating seat rings assure the bi-directional tightness of the valve.

The seats are carefully designed to minimize the torque required to operate the valves without losing sealing power, which is assured from zero differential pressure to the valve's maximum rated pressure.

Self-relieving seats are supplied as a standard feature.

Double piston or combination seats (self-relieving/upstream, double piston/downstream) can be supplied on request.

### Low emission valves

Accurate machining of stem and bonnet sealing surfaces ensures compliance with the most severe pollution control regulations.

Special "live" seals are available on request.

Double block & bleed

The double block and bleed feature, both with the ball in the fully closed or fully open position, is a standard feature.

### Stem Sealing

Two O-ring and one graphite gasket ensure the stem seal. The graphite gasket can be replaced while the valve is under pressure and with the ball in any position, by removing the adaptor plate, after having released any pressure that may exist between the upper O-ring and the graphite gasket, through the grease injection fitting hole.

The O-rings can be replaced with the valve in fully open or fully closed position by removing the stem cover after having released all the pressure in the body cavity.

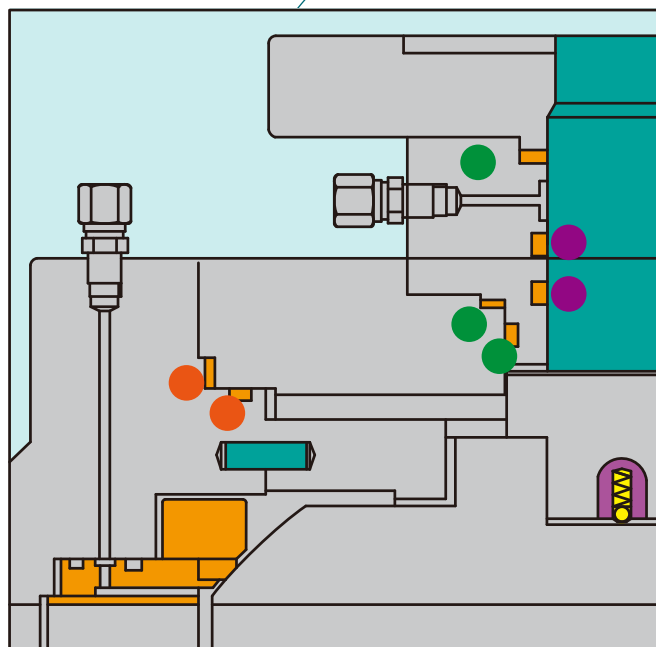
### Anti-blow-out stem

Stem is retained by the stem cover. Other designs available on request

### Body Sealing

The double sealing action of O-rings and graphite gaskets in all the static joints of the body components, ensures zero leakage and the fire safe feature.

Lip-seal rings and/or graphite gaskets can be used for special service.



## TF-40 Series



API 6D Trunnion Ball Valve. Reduce or Full bore type. API 6FA fire safe design, anti-static device, blow-out-proof stem, all in bio-directional function.

| Model No. |                                | Size Range  |
|-----------|--------------------------------|---|
| TF-40     | 2-pc, castings, Full Bore      | 2"~16"  |
| TF-41     | 2-pc, castings, Reduce Bore    | 3"x2"~20"x16"   |
| TF-44     | 3-pc, castings, Full Bore      | 10"~24"   |
| TF-43     | 3-pc, castings, Reduce Bore    | 3"~24"  |
| TF-46     | 3-pc, forging, Full Bore       | 2"~36" for class 150, class 300, class 600<br>2" ~ 24" for class 900, class 1500<br>2" ~ 12" for class 2500 |
| TF-45     | 3-pc, forging, Reduce Bore     | 2"~36" for class 150, class 300, class 600<br>2" ~ 24" for class 900, class 1500<br>2" ~ 12" for class 2500 |
| TF-49     | Full Welding Design, Full Bore | 2"~36" for class 150, class 300, class 600<br>2" ~ 24" for class 900, class 1500<br>2" ~ 12" for class 2500 |

# Special Material Ball Valves



Terofox provides special material as mentioned below for certain applications. The type of valves will include Ball Valve, Gate, Globe, Check Valve upon on request.

## Material Table

| Material Code                           | Nominal                 | Casting           |        |        |
|---|-------------------------|-------------------|--------|--------|
|   | Designation             | ASTM              | DIN    | UNS    |
| <b>Austenitic Stainless Steel</b>       |                         |                   |        |        |
| SS304                                   | 18Cr-8Ni                | A351 CF8          | 1.4308 | J92600 |
| SS304L                                  | 18Cr-8Ni-LC             | A351 CF3          | 1.4306 | J92500 |
| SS316                                   | 18Cr-9Ni-2Mo            | A351 CF8M         | 1.4408 | J92900 |
| SS316L                                  | 18Cr-9Ni-2Mo-C<0.03%    | A351 CF3M         | 1.4404 | J92800 |
| SS317                                   | 18Cr-12Ni-3.5Mo         | A351 CG8M         |        | J93000 |
| SS317L                                  | 18Cr-12Ni-3.5Mo-C<0.03% | A351 CG3M         |        | J92999 |
| SS347                                   | 18Cr-10Ni-Nb            | A351 CF8C         | 1.4552 | J92710 |
| 904L                                    | 19Cr-23Ni-4.0Mo         |                   |        |        |
| Alloy 20                                | 29Ni-20.5Cr-3.5Cu-2.5Mo | A351 CN7M         | 1.4536 | J95150 |
| <b>Super Austenitic Stainless Steel</b> |                         |                   |        |        |
| 254 Mo                                  | 20Cr-18Ni-6.5Mo-N-Cu    | A351 CK3MCuN      | 1.4308 | J93254 |
| Nickel based Alloy                      |                         |                   |        |        |
| Monel 400                               | 67Ni-30Cu               | A494 M-35-1       | 2.4365 | N24135 |
| Hastelloy B                             | 67Ni-28Mo-5Fe           | A494 N-12MV       | 2.4882 | N30012 |
| Hastelloy B2                            | 67Ni-30Mo-1Fe           | A494 N-7M         | 2.4617 |        |
| Hastelloy C276                          | 58Ni-16Cr-16Mo-6Fe-4W   | A494 CW12MW       | 2.4686 | N30002 |
| Hastelloy C                             | 64Ni-18Cr-18Mo          | A494 CW6M         | 2.4819 | N30107 |
| Hastelloy C22                           | 58Ni-21Cr-14Mo-4Fe-3W   | A494 CX2MW        | 9.4602 | N26022 |
| Inconel 600                             | 78Ni-15Cr-5Fe           | A494 CY-40        | 2.4816 | N06040 |
| Inconel 625                             | 65Ni-22Cr-9Mo-3.5Nb     | A494 CW6MC        | 2.4856 | N26625 |
| Nickel CZ100                            | 97Ni                    | A494 CZ-100       | 2.4066 | N02100 |
| <b>Duplex Stainless Steel</b>           |                         |                   |        |        |
| 1A                                      | 25Cr-5Ni-Mo-Cu          | A890 CD4Mu        | 1.4507 | J93370 |
| 1B                                      | 25Cr-5Ni-Mo-Cu-N        | A890/955 CD4MCuN  | 1.4507 | J93372 |
| 2A                                      | 24Cr-5Ni-Mo-N           | A955 CE8MN        |        | J93345 |
| 2205/4A                                 | 22Cr-5Ni-Mo-N           | A890/955 CD3MN    | 1.4462 | J92205 |
| <b>Super Duplex Stainless Steel</b>     |                         |                   |        |        |
| 2507/5A                                 | 25Cr-7Ni-4Mo-N          | A890/955 CE3MN    |        | J93404 |
| Z100/6A                                 | 25Cr-7Ni-3Mo-Cu-N-W     | A890/955 CD3MWCuN | 1.4468 | J93380 |
| Ferrallium 255/1C                       | 25Cr-6Ni-Mo-Cu-N        | A890 CD3MCuN      |        | J93373 |
| 329                                     | 25Cr-7Ni-3Mo-N          |                   | 1.4507 |        |



| Material Code                    | Bar or Forged |        |        | Typical Application  |
|----------------------------------|---------------|--------|--------|--|
|                                  | ASTM          | DIN    | UNS    |  |
| Austenitic Stainless Steel       |               |        |        |  |
| SS304                            | A276 304      | 1.4301 | S30400 | nitric acid, phosphoric acid, organic acid   |
| SS304L                           | A276 304L     | 1.4306 | S30403 |  |
| SS316                            | A276 316      | 1.4401 | S31600 |  |
| SS316L                           | A276 316L     | 1.4404 | S31603 | alkali chloride, boiled acid   |
| SS317                            | A276 317      | 1.4449 | S31700 |  |
| SS317L                           | A276 317L     | 1.4438 | S31703 |  |
| SS347                            | A276 347      | 1.4550 | S34700 | sulfuric acid  |
| 904L                             | AISI 904L     | 1.4539 | N08904 |  |
| Alloy 20                         | B473          | 2.4660 | N08020 |  |
| Super Austenitic Stainless Steel |               |        |        |  |
| 254 Mo                           | A276          |        | S31254 |  |
| Nickel based Alloy               |               |        |        |  |
| Monel 400                        | B164          | 2.4360 | N04400 | alkali chloride, boiled acid   |
| Hastelloy B                      | B335          | 2.4819 | N10001 | hydrochloric acid, sulfuric acid (up to 60%), phosphoric acid, copper chloride         |
| Hastelloy B2                     | B335          | 2.4856 | N10665 |  |
| Hastelloy C276                   | B574          | 2.4819 | N10002 | wet chlorine gas, chlorine dioxide, organic acid, acetic acid, seawater                |
| Hastelloy C                      | B574          | 1.7752 | N10276 |  |
| Hastelloy C22                    | B574          | 2.4602 | N06022 |  |
| Inconel 600                      | B166          | 2.4817 | N06600 |  |
| Inconel 625                      | B446          | 2.4856 | N06625 | oxidizing and high temperature environment   |
| Nickel CZ100                     |               |        |        |  |
| Duplex Stainless Steel           |               |        |        |  |
| 1A                               | A790 31260    |        | S31260 | nitric acid, phosphoric acid , organic acid  |
| 1B                               | A790 31260    |        |        |  |
| 2A                               |               |        |        |  |
| 2205/4A                          | A790 31803    | 1.4462 | S31803 |  |
| Super Duplex Stainless Steel     |               |        |        |  |
| 2507/5A                          | A479 32750    | 1.4410 | S32750 | salt / seawater application, sulfuric acid, phosphoric acid, formic acid, acetic acid, |
| Z100/6A                          | A479 32760    | 1.4460 | S32760 |  |
| Ferrallium 255/1C                | A479 39277    |        | S39277 |  |
| 329                              | A479 32760    | 1.4460 | S32900 |  |



# Cryogenic Ball Valves



Terofox has its' line of cryogenic ball valve in 3-pc design or 2-pc flange design to ANSI class 150, DIN PN16/40 as well as 2000psi/1000psi screw type design.

Terofox offers tight shutoff, high flow capacity, low torque and long service life under sever cold working temperature condition ( Max. - 196 ° C ). Extended stem is basic design, and normal stem is subject to the temperature, working pressure.

## Screw

### CRV-320D

3-Pc Design Full bore,  
ISO 5211 Direct-Mounted Pad. Extended Stem



Size: 1/4" ~ 2"  
Pressure: 2000psi  
Temp.:  
TFM 1600 seat: -40 to 180°C (-40 to 356°F)  
PCTFE seat: -195 to 150°C (-319 to 302°F)



## Flange

### CRV-20F

2-Pc Design Full bore,  
ISO 5211 Direct-Mounted Pad. Extended Stem



Size: 1/2" ~ 4"  
Pressure: Class 150  
Temp.:  
TFM 1600 seat: -40 to 180°C (-40 to 356°F)  
PCTFE seat: -195 to 150°C (-319 to 302°F)

### CRV 320DF

3-Pc Design Full bore,  
ISO 5211 Direct-Mounted Pad. Extended Stem



Size: 1/2" ~ 2"  
Pressure: Class 300  
Temp.:  
TFM 1600 seat: -40 to 180°C (-40 to 356°F)  
PCTFE seat: -195 to 150°C (-319 to 302°F)

# Sanitary Ball Valves



terofex provides good quality sanitary ball valves for Biopharmaceutical and Clean Industry. Sanitary ball valve range consists of many types : 2-pc, 3-pc and 3-way design with T-clamp, Butt-weld and Tube ends as option. They are engineered and designed to specifically meet the demanding process in the application.

Body wall thickness : ASME B16.34  
Face to Face : Manufacture Standard  
Inside Polish  $\leq$  Ra0.4  
Oil-Free  
Standard, L/T Port Design  
Pressure Rating : 1000psi / 800psi

Body material: ASTM A351 CF8M / CF3M  
Ball : CF8M / CF3M  
Stem : SS316 / SS316L  
Seat : PTFE / Cavity Filled PTFE / TFM1600 / Cavity Filled TFM1600  
Connections : T-Clamp / Tube Ends

## 2-PC Design

ST-2111

2-pc sanitary ball valve, Standard Bore, bore and body with polishing surface as mirror for food, beverage and any other clean applications. ISO 5211 mounted pad.



Size: 1" ~ 2"  
Pressure:  
1000psi ( PN 63 bar )  
Conn.: T-Clamp Ends /  
Butt Weld Ends

## 3-PC Design

ST-3101

3-pc sanitary ball valve, Standard Bore, Investment Casting, Inside Polish  $\leq$  Ra0.4



Size: 1/2" ~ 4"  
Pressure:  
1000psi (PN63 bar)  
Conn.: T-Clamp Ends /  
Butt Weld Ends

## 3-PC Design

ST-3103

3-pc sanitary ball valve, Standard Bore, Investment Casting, ISO 5211 Mounted Pad.



Size: 1/2" ~ 4"  
Pressure:  
1000psi (PN63 bar)  
Conn.: T-Clamp Ends /  
Butt Weld Ends

ST-3105

3-pc sanitary ball valve, Standard Bore, Investment Casting, Inside Polish  $\leq$  Ra0.4 , ISO 5211 Direct-Mounted Pad, Square Stem.



Size: 1/2" ~ 4"  
Pressure:  
1000psi/800psi  
(PN63/PN40 bar)  
Conn.: T-Clamp Ends /  
Butt Weld Ends



## 3-PC Design

### ST-3111

3-pc sanitary ball valve, bore and body with polishing surface as mirror for food, beverage and any other clean applications. ISO 5211 Mounted holes on the body of valve.



Size: 1" ~ 2"  
Pressure:  
1000psi (PN63 bar)  
Conn.: T-Clamp Ends /  
Butt Weld Ends

## 3-way Design

### STM-3130

3-way T/L bore sanitary ball valve, Investment Casting, Inside Polish  $\leq$  Ra0.4 , ISO 5211 Direct-Mounted Pad, Square Stem.



Size: 1/2" ~ 4"  
Pressure:  
1000psi/800psi  
(PN63/PN40 bar)  
Conn.: T-Clamp Ends /  
Butt Weld Ends



# Corrosion Lined Valves



## FPA/FEP Lined Valves





With specific demands by customers, Terofox also provide many alternative materials such as PFA, PTFE, FEP, UHMW-PE on coated seats which could be upon customers' demands. All valves are tested by strictly hydraulic test, spark test and perfectly protective package.

Lined product covers lined ball valve, lined butterfly valve, lined diaphragm valve, lined plug valve, lined check valve, pipe equipment and so on

**15KV ~ 20KV sparkle testing for each lined valve for warranty of the valve quality.**



## Valve Accessories

|                            |  |   |  |                                    |
|----------------------------|--|---|--|------------------------------------|
| <b>Spare Kits</b>          |  |    | Customized Seat, Stem, Ball or adpotor are upon on request   |                                    |
| <b>Positioner</b>          | Single/Double, Type                                    |    | Type: Single/Double<br>Input Signal: DC 4-20mA<br>Supply Pressure: 1.4 ~ 7 kgf/cm <sup>2</sup><br>Stroke: 0° ~ 90°<br>Air Connection: PT(NPT)1/4"<br>Gauge Connection: PT(NPT)1/8"<br>Explosion Proof: Ex dm IIBT5<br>Protection: IP66<br>Ambient Temp.: -20° C~ 60°C<br>Material: Aluminum  |                                    |
| <b>Solenoid Valves</b>     | 3/2, 5/2 Position Number , 1/4"PT, 3/8" PT, 1/2" PT    |  | Solenoid valves are the most frequently used control elements in fluidics. Their tasks are to shut off, release, dose, distribute or mix fluids. They are found in many application areas. Solenoids offer fast and safe switching, high reliability, long service life, good medium compatibility of the materials used, low control power and compact design. For our valves application, air would be the main media for switching the actuators.   |                                    |
| <b>Limit Switch Box</b>    | Namur Type Limit Switch Box                            |  | ES-300   | 2-3/4" PF(PT) (NPT), ExdIIC6(IP66) |
|                            |  |   | ES-100   | 2-1/2" PF IP67                     |
| <b>Electronic Actuator</b> | OM-series Electronic actuator (Quarter-turn Actuator ) |  | UM-1 to UM-6 provide direct-mounted on ISO5211 Valves<br>UM series is a model with low-power consumption, high efficiency and weatherproof heavy-duty motor<br>All the joint on the housing are armed with waterproof seal (IP67), with applicable for outdoor environment<br>Stabilized start speed to avoid water hammer for prolonging the service life on tubes<br>The UM series have continuous mechanism positioning indication<br>All UM series provide thermal protector<br>Standard Voltage:<br>100VAC ~ 120VAC<br>220VAC ~ 250VAC<br>24VDC<br>Enclosure: IP67 waterproof and dust-proof enclosure<br>Working Temperature Range : -10°C ~ +60°C |                                    |
| <b>Pneumatic Actuator</b>  | Terofox C-series Actuator, C-125 ~C-11000              |  | Cost-Efficient models<br>ISO5211 Mounting pad for valves' installation<br>NAMUR type on side of actuator<br>Operating Pressure Range from 40 to 120PSIG<br>Maximum Allowable Working Pressure was 150PSIG<br>Maximum Operating Pressure was 120PIGS<br>Operating Media -- Dry or lubricated non-corrosive gas<br>Operating Temperature Standard: -40°F to +200°F<br>Normal-closed Design ( Default )   |                                    |

## Valve Seat Material Selection Guide

| Material               |  | Features  | Color             | Color  |        | Max. Working pressure |
|------------------------|--|---|-------------------|--------|--------|-----------------------|
|                        |  |   |                   | Min.   | Max.   |                       |
| PTFE                   | Virgin Polytetrafluoroethylene           | PTFE is the most well known seat material in the world. As it's good elastic features, it's the common material to be used for valve seat.  | White             | -20°C  | 160°C  | 70 bar                |
|                        |  |   |                   | -4°F   | 320°F  | 1015 psi              |
| 15% GF (RTFE)          | Reinforced PTFE                          | With high temperature range than PTFE, offering good chemical resistance.   | Chalky white      | -20°C  | 180°C  | 140 bar               |
|                        |  |   |                   | -4°F   | 356°F  | 2000psi               |
| MG 1241                | 20% glass filled + 5% graphite           | Tougher material for high cycle and reduced creep in moderate temperatures. Commonly use for low pressure steam service.  | Black             | -20°C  | 180°C  | 140 bar               |
|                        |  |   |                   | -4°F   | 356°F  | 2000psi               |
| MG1431                 | 15%GF+5%MOS2                             | 15% glass fiber and 5% MoS2 filled. High wear resistance, good electrical properties, low friction, high creep resistance. Mainly application is for Mechanical and electrical service  | Grey              | -20°C  | 180°C  | 140 bar               |
|                        |  |   |                   | -4°F   | 356°F  | 2000psi               |
| TFM 1600               | PTFE+PFA                                 | Features reduced cold flow, lower porosity and permeability, and lower void content. Offers the advantage of smoother surfaces, reduce deformation under load, and improved design flexibility.   | White             | -40°C  | 180°C  | 140 bar               |
|                        |  |   |                   | -40°F  | 356°F  | 2000psi               |
| 25% Carbon filled PTFE | 25% Carbon filled PTFE                   | This material exhibits a unique combination of heat resistance and low friction together with outstanding chemical and good electrical properties.  | Grey              | -60°C  | 200°C  | 140 bar               |
|                        |  |   |                   | -76°F  | 392°F  | 2000psi               |
| 50% S.S.               | 50% S/S + 50% PTFE                       | 50% 316 powder combined with 50% PTFE, Offering the abrasion resistance of metal with higher pressure and temperature ratings than RTFE.  | Grey              | -20°C  | 200°C  | 150 bar               |
|                        |  |   |                   | -4°F   | 392°F  | 2175psi               |
| PEEK                   | Poly Ether Keton                         | PolyEtherEtherKetone. Excellent choice for high pressure and high temperature service. Which provides excellent abrasion and corrosion resistance, was one of the widely usage materials.   | Tan               | -20°C  | 240°C  | 400 bar               |
|                        |  |   |                   | -4°F   | 464°F  | 5800psi               |
| Delrin                 |  | Delrin possesses high tensile strength, creep resistance and toughness. It also exhibits low moisture absorption. It is chemically resistant to hydrocarbons, solvents and neutral chemicals.   | Translucent White | -20°C  | 80°C   | 425 bar               |
|                        |  |   |                   | -4°F   | 176°F  | 6164 psi              |
| NYLON                  |  | Nylon seats are offered for higher pressure but lower temperature service.  | Translucent White | -20°C  | 100°C  | 350 bar               |
|                        |  |   |                   | -4°F   | 212°F  | 5076psi               |
| UHMWP Polyethylene     | Ultra High Molecular Weight Polyethylene | Ideal for use in low level radiation service. This seat also meets the requirements of the tobacco industry where TFE is prohibited and it offers an excellent resistance to abrasive media.  | Opaque White      | -20°C  | 80°C   | 350 bar               |
|                        |  |   |                   | -4°F   | 176°F  | 5076psi               |
| PCTFE                  |  | PCTFE offers the unique combination of physical and mechanical properties, nonflammability, chemical resistance, near zero moisture absorption, and excellent electrical properties. PCTFE also has extremely low outgassing, making it well suited for use in aerospace and flight applications. | Translucent White | -195°C | 150°C  | 150 bar               |
|                        |  |   |                   | -319°F | 302°F  | 2175psi               |
| GRAFOIL                | High temp. graphite                      | Good in high working pressure / temperature condition, most of them used for stem packing or sealing.   | Black             | -100°C | 600°C  | 300 bar               |
|                        |  |   |                   | -148°F | 1112°F | 4351 psi              |

## Rubber Seat Material

Features of Rubber

The following is general information and special application shall be referred to the manufacturer's representatives.

| Common Name | ASTM Code | Max. Temperature | Abrasion  | Aging     | Sun Light Resistance | Water Resistance | Oil Resistance | Solvent | Strong Acid | Weak Acid | Strong Alkali | Weak Alkali |
|-------------|-----------|------------------|-----------|-----------|----------------------|------------------|----------------|---------|-------------|-----------|---------------|-------------|
| Buna-N      | NBR       | 90               | excellent | excellent | good                 | excellent        | excellent      | fair    | poor        | good      | good          | excellent   |
| EPDM        | EPT       | 130              | good      | excellent | excellent            | excellent        | poor           | poor    | good        | excellent | excellent     | excellent   |
| Silicone    | Si        | 200              | good      | excellent | excellent            | good             | poor           | fair    | poor        | good      | good          | excellent   |
| Viton       | FPM       | 200              | good      | excellent | excellent            | excellent        | excellent      | good    | excellent   | excellent | excellent     | excellent   |



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