



Dedicated valve actuator
致力于阀门执行机构的研发与配套

HV3500

超硬

金属硬密封球阀

适用于---多晶硅, 煤化工**耐磨耐冲击**工况



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WUXI ACCTON FLUID TECHNOLOGY CO., LTD

金属硬密封球阀

METAL-SEALED BALL VALVE

金属硬密封球阀概述 Overview of Metal-sealed Ball Valve

球阀具有流体阻力小、流通畅通、启闭迅速、易于自动化控制的特点，因而得到了越来越广泛的应用。但由于常规球阀的阀座一般采用聚四氟乙烯等非金属材料制作，受阀座密封材料的限制，常规球阀不能在高温工况下使用，也无法用于含固体颗粒、灰渣等介质，故常规球阀的使用受到了一定的限制。为此，经过多年努力，艾克顿成功研制开发了包括浮动球阀和固定球阀在内的全系列金属硬密封球阀产品，并在煤化工、多晶硅、石油、化工、冶金、轻工等行业得到广泛的应用。

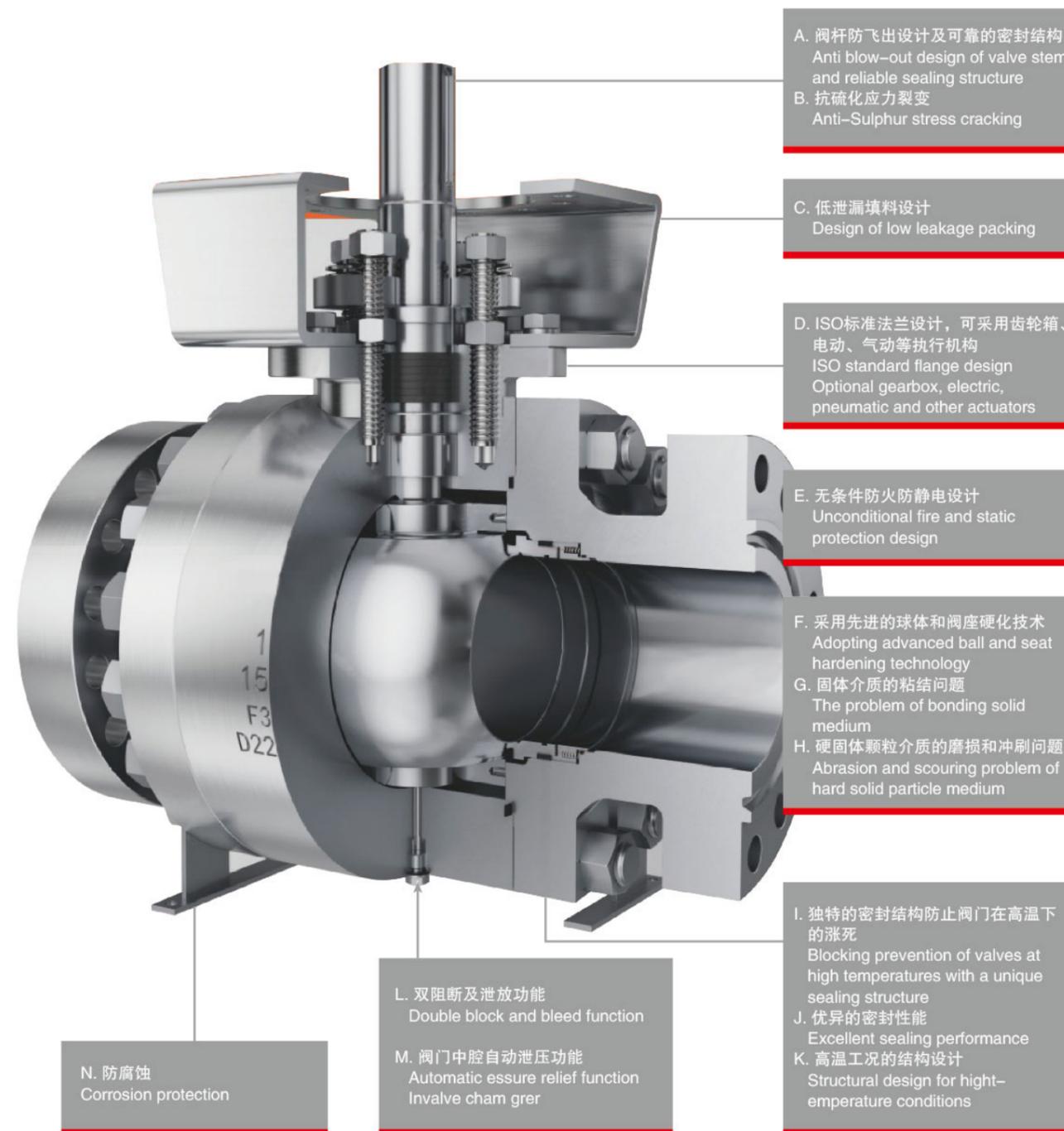
金属硬密封球阀适用于 Class150-Class2500、PN16-PN160、JIS10K-JIS20K 的各种管路上，用于截断或接通管路中介质。选用不同的材质，可分别适用于非腐蚀性介质、弱腐蚀性介质、硝酸、醋酸、氧化性介质、尿素等多重介质，特别适用于含固体颗粒介质、料浆、煤粉、灰渣等苛刻工况。金属硬密封球阀的驱动方式为手动、蜗轮蜗杆传动、气动或电动。金属硬密封球阀一般采用法兰连接，也可采用对焊连接、承插焊连接、螺纹连接及对夹连接。

The ball valve has the characteristics of small fluid resistance, smooth flow channel, quick opening and closing, and easy automatic control, so it has been more and more widely used. However, because the valve seat of the conventional ball valve is generally made of non-metallic materials such as PTFE, limited by the valve seat sealing material, the conventional ball valve can not be used under high temperature conditions, nor can it be used in solid particles, ash and other media, so the use of the conventional ball valve is limited to a certain extent. To this end, after years of efforts, Accton has successfully developed a full series of hard sealed ball valve products including floating ball valve and fixed ball valve, and has been widely used in coal chemical industry, polysilicon, petroleum, chemical industry, metallurgy, light industry and other industries.

Metal-seated ball valves are suitable for Class150-Class2500,PN16-PN160,JIS10K-JIS20K in various pipelines,used to cut off or connect pipelines.Ball valves made of different materials can be suitable for non corrosive medium, weakly corrosive medium,nitric acid,acetic acid,oxidizing medium,urea,and other multiple medium,especially suitable for harsh working conditions containing solid partides,slurry,coal powder,ash,and other medium.The operation of metal seated ball valve can be manual, worm gear, pneumatic or electric.Metal-seated ball valves are generally connected by flanges,and can also be butt welded,socket welded,threaded,and wafer connected.



设计特色 Design Features



金属硬密封球阀

METAL-SEALED BALL VALVE

密封表面采取硬化处理后可获得耐高温、耐磨损、耐腐蚀等特性。根据工况的不同，多种硬化处理方式供选择。
High temperature resistance, wear resistance and corrosion resistance can be obtained by hardening the sealing surface. According to the different working conditions, a variety of hardening treatment methods are available.

1. HVOF 超音速喷涂：采用超音速火焰粉末喷涂 (HVOF) 方法在阀门零件密封面获得碳化钨 / 碳化铬硬化涂层。碳化铝硬化涂层适用温度可达到 540°C，碳化铬硬化涂层可适用于温度 540-950°C 的工况。此硬化方式可获得高硬度、耐高温、耐磨损、耐冲击等特性。硬度可达到 58-80 HRC，硬化层厚度为 0.2-0.25mm。

HVOF supersonic spraying: we and CrC hardened coatings were obtained on the sealing surface of valve parts using the HVOF process. The application temperature of WC hardening coating can reach 540°C, while CrC hardening coating can be suitable for working conditions between 540°C and 950°C. This hardening process can achieve high hardness, high temperature resistance, wear resistance, impact resistance, and other characteristics. The hardness can reach 58-80HRC, and the thickness of the hardening layer is 0.2-0.25mm.

2. 堆焊：堆焊硬质合金，例如司太立等。硬度可达到 38~45HRC，硬化层厚度 1.6mm。
Hard-facing, such as Stellite, can achieve a surface hardness of 38-45HRC and a hardened layer thickness greater than 1.6mm.

3. 喷焊：喷焊镍基合金、硬质合金。此方式和 HVOF 相似。将金属粉末喷焊在密封表面以获得硬化涂层。硬度可达到 50~60HRC，硬化层厚度为 0.8~1.5mm。

Spray welding, spray welding nickel base alloy, cemented carbide, this way is similar to HVOF, spray welding metal powder on the sealing surface to obtain hardening coating. The hardness can reach 50-60HRC and the thickness of hardened layer is 0.8-1.5mm.

A. 阀杆防飞出设计及可靠的密封结构

Anti Blow-out Design of Valve Stem and Reliable Sealing Structure

阀杆采用防吹出结构设计。即使在阀腔异常升压以及填料压板失效等极端情况下，也能保证阀杆不会被介质吹出。阀杆采用有密封的下装式结构设计。密封的密封力随着介质压力的增高而增大，故能在各种压力下均能确保阀杆的可靠密封。

The anti blow out design ensures that the stem will not be blown out by the medium in extreme situations such as abnormal pressure increase in the valve chamber and failure of the packing gland. The bottom entry structure design with sealing is adopted on stem, and the sealing force increases with the increase of medium pressure, so the reliable sealing of the stem can be ensured under various pressures.

B. 抗硫化应力裂变

Anti-Sulphur Stressing Cracking

艾克顿生产系列抗硫球阀。阀门接触介质的材料（包括紧固件）都是按美国腐蚀工程师协会标准 NACE MR0175 的要求进行选择。并在制造过程中作严格的质量控制和质量检测，以求完全符合标准的规定，并满足硫化环境工况的工艺要求。

Accton produces a series of sulfur-resistant ball valves. The materials in contact with the medium (including fasteners) are selected in accordance with the requirements of the American Society of Corrosion Engineers standard NACE MR0175, and strict quality control and testing are carried out during the manufacturing process to fully comply with the standards and meet the process requirements of the sulfurization environment.

C. 低泄漏填料设计

Design of Low Leakage Packing

金属硬密封球阀采用低泄漏填料。填料由平行层与锥形密封层组成。有效降低了阀杆旋转时的摩擦力。确保长期回转条件下阀杆处稳定的密封性能。

Low leakage packing is adopted on metal-seated ball valve, which is composed of parallel layers and conical sealing layers, effectively reducing the friction force when the stem rotates, and ensuring stable sealing performance at the stem under long-term rotation conditions.

D. ISO5211 标准法兰设计。可采用蜗轮箱、电动头、气动头等驱动方式。

ISO Standard Flange Design Optional Gearbox, Electric, Pneumatic and Other Actuators

E. 无条件防火防静电设计

Unconditional Fire and Static Protection Design

防火防静电设计是艾克顿球阀的标准设计。艾克顿金属硬密封球阀密封组件（阀座、球体、垫片和填料等）都是由防火性能极佳的金展或石墨材料制成。能够实现无条件的防火安全。由于球体、阀杆与阀体之间保持持续金属接触，形成导电通路，转移聚集的电荷，避免将阀门开关时摩擦产生的静电积聚或流体冲击阀体内腔产生静电积聚。

Fireproof and antistatic design is the standard design of Accton ball valve. The sealing components of the metal-seated ball valve (seat, ball, gasket, and packing, etc.) are made of metal or graphite materials with excellent fire resistance, which can achieve unconditional fire safety. Due to the continuous metal contact between the ball, stem, and body, a conductive path is formed to transfer the accumulated charge, avoiding the accumulation of static electricity caused by friction during valve opening and closing or the impact of fluid on the inner cavity of the body.

完全的防火结构设计

Complete Fire Protection Design

阀门的密封面采用金属对金属密封结构。填料采用柔性石墨。垫片采用不锈钢 + 柔性石墨结构。因此，阀门即使在火灾情况也能确保可靠的密封。

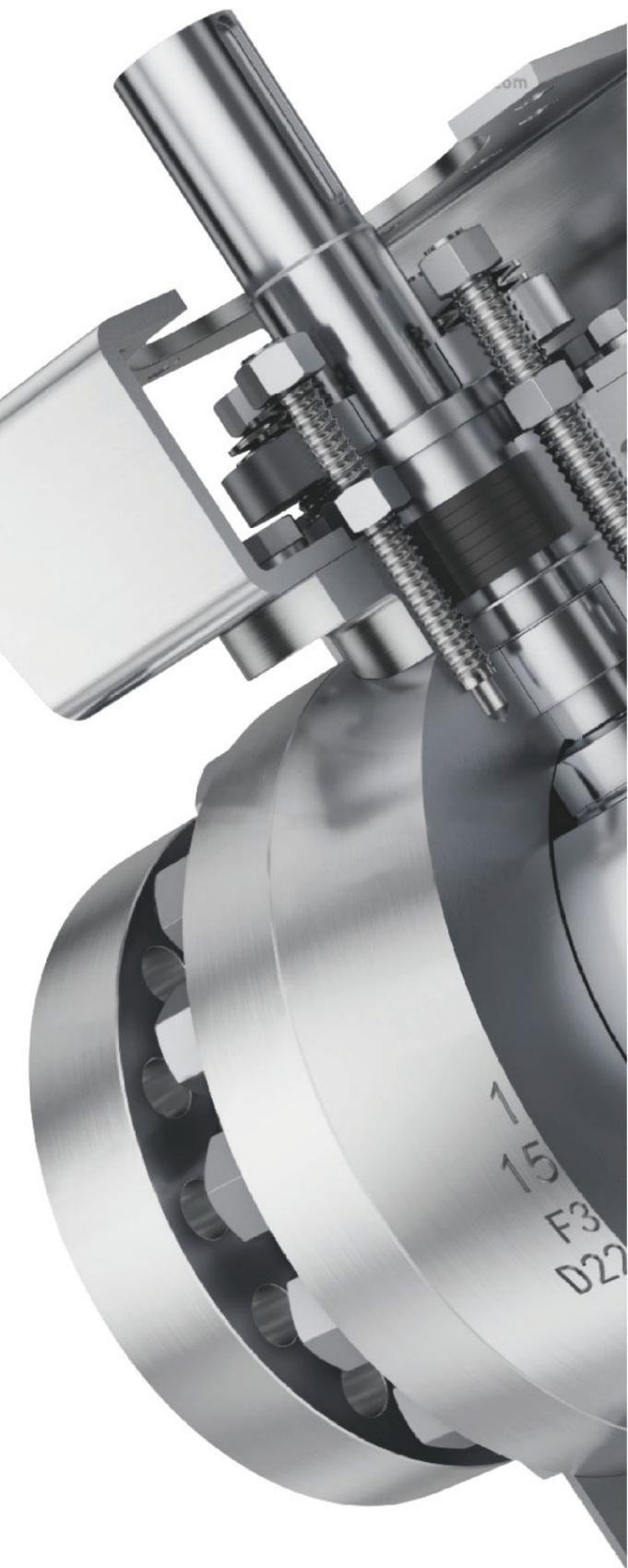
The metal-to-metal structure is adopted on sealing surface, with flexible graphite as the packing and stainless steel + flexible graphite as the gasket. Therefore, even in a fire situation the valve could ensure a reliable seal.

自然的防静电结构设计

Natural Anti-Static Structure Design

金属硬密封球阀的阀体、阀座、球体等金属零部件紧密接触，自然形成了静电通道。因此，金属硬密封球阀不需要设置专门的防静电装置。

Metal-seated ball valve, the body, seat, ball and other metal parts are in close contact, and forming the electrostatic channel naturally. Therefore, the metal-seated ball valves do not require specialized anti-static devices.



金属硬密封球阀

METAL-SEALED BALL VALVE

F. 采用先进的球体和阀座硬化技术

Adopting Advanced Ball and Seat Hardening Technology

金属硬密封球阀的球体与阀座完全采用金属对金属的密封方式。为了确保阀门在各种温度和压力下的可靠密封。针对用户的不同使用工况和要求。可以采用多种先进的球体和阀座的硬化技术。包括超音速喷涂、镍基喷焊表面特殊硬化、硬质合金喷焊以及采用高强度高硬度陶瓷材料等。球体和阀座的表面硬度一般可以达到 HRC6 以上。最高可达 HRC74 以上。密封面材料耐高温一般可达 540°C，最高可达 980°C。材料的结合强度可以达到 10000PSI 以上。密封面材料还具有很好的耐摩擦、耐冲击等性能。艾克顿金属硬密封球阀能够适用于绝大多数的苛刻工况条件。

The ball and the seat of the metal-sealed ball valve are completely sealed with a metal-to-metal sealing method to ensure reliable sealing of the valve under various temperatures and pressures. According to the different usage conditions and requirements of users, various advanced hardening technologies for balls and seats can be adopted, including supersonic spraying, nickel based spray welding, special surface hardening, cemented carbide spray welding, and the use of high-strength and high hardness ceramic materials. The surface hardness of the ball and the seat can generally reach HRC60 or above, with a maximum of HRC74 or above. The high temperature resistance of sealing surface material can generally reach 540 ° C and up to 980 ° C. The bonding strength of the material can reach over 10000 PSI. The sealing surface material also has good resistance to friction, impact, and other properties. Accton metal-sealed ball valve is applicable to the vast majority of harsh working conditions.

G. 固体介质的粘结问题

The Problem of Bonding Solid Medium

金属硬密封球阀通常应用于固体液体混合的介质。某些固体液体混合介质特别容易粘结在球体等零件的表面。导致阀门无法启闭。对于这样的工况介质。通常在阀座密封面的两侧设置刮刀结构。这样在阀门的启闭过程中。阀座两侧的刮刀可以自动的刮除球体表面粘结的杂质。从而确保阀门能够自如的启闭。并同时具有良好的密封性能。对于易粘结的固体液体混合介质。尽管采用刮刀可以刮除球体表面的粘着物。但是球阀的启闭扭矩必然会有较大的增加。因此。在设计时应该考虑到这种不利的影响因素。在阀轴的强度设计、材料的选择。尤其是球体与阀轴的连接强度以及阀轴与驱动装置首的连接强度应该考虑有足够的余量。在驱动装置的配置时同样应该考虑有更大的驱动力。以保证在极端的工况条件下阀门的正常启闭。

Metal-sealed ball valves are usually used in solid-liquid mixed medium, and some are particularly prone to bond on the surface of parts such as the ball, causing the valve to fail to open and close. For such working conditions and medium, scraper structure is usually set on both sides of the sealing surface of the seat. During the opening and closing of the valve, the scraper can automatically scrape away the medium bonded on the surface of the ball, ensuring that the valve can open and close freely and has good sealing performance. Although the scraper can remove the adhesive on the surface of the ball, the opening and closing torque of the ball valve will inevitably increase significantly. Therefore, this unfavorable factor should be considered in design. Sufficient allowance should be considered in the strength design of the stem, material selection, especially the connection strength between the ball and the stem, as well as between the stem and the actuator. A larger torque force should be considered in the assembly of the actuator to ensure proper opening and closing of the valve under extreme operating conditions.

固体介质的粘结还可能引起阀座弹簧的失效，严重的会导致阀门卡死而无法启闭，为了防止弹簧被介质粘结而失效，通常在弹簧腔设置柔性石墨密封圈，以阻挡固体介质进入弹簧腔体。

The bonding of solid medium may also cause the failure of the seat spring, which can seriously lead to the valve jammed and unable to open or close. In order to prevent the spring from becoming ineffective due to medium bonding, flexible graphite sealrings are usually set in the spring chamber to block the entry of solid medium.

H. 硬固体颗粒介质的磨损和冲刷问题

Abrasion and Scouring Problem of Hard Solid Particle Medium

球体全开时的通道相当干一个直管段。流体阻力最小。而且阀座和球体的密封面没有暴露在流动的介质中。因此。处在全开状态下的球阀基本没有磨损和冲刷的问题。而对于关闭状态下的球阀。如果阀门完全密封。则管道中的介质没有流动。因此。阀体也不会产生磨损和冲刷。对于含硬固体颗粒的高压介质。当阀门密封不良时是最容易引起磨损和冲刷的。在一些极端的工况条件下。阀门的泄漏甚至会在一、两个小时就导致阀体因为磨损而穿孔。对于密封性能良好的球阀。在阀门刚刚开启的瞬间是最容易被磨损的。此时。在阀座与球体最先脱开的部件。由于此处压差大。流速高。因此很容易被磨损。

When the ball valve is fully open, the channel is equivalent to a straight pipe section, with minimal fluid resistance, and the sealing surfaces of the seat and the ball are not exposed to the flowing medium. Therefore, the ball valve in the fully open state has basically no problems of abrasion and scouring. If the valve is completely sealed in a closed state, the medium in the pipeline will not flow, and therefore, the valve will not be subjected to abrasion and scoring. For high-pressure medium containing solid particles, poor valve sealing is the most likely to cause abrasion and scouring. In some extreme operating conditions, valve leakage can even lead to valve body perforation due to wear within one to two hours. A valve with perfect sealing performance is most susceptible to abrasion when it is initially opened, due to the high differential pressure and flow rate at the point where the seat and the ball first disengage.

可以通过以下几个方面的措施来减缓阀门的磨损：

Measures to Reduce Valve Abrasion:

提高阀门的启闭速度。

使阀门迅速地在全关闭状态切换到全开启状态。

可以有效地减小磨损。

尤其是对于开关频繁的阀门

Increasing the opening and closing speed of the valve.

to rapidly switch from fully closed to fully open,

can effectively reduce abrasion,

especially for valves with frequent switching;

在开启球阀之前通过旁通对球阀前后的压力进行平衡。

一旦球阀上下游压差减小了。

介质的流速也会相应减小。

介质对阀门的磨损也会同时减小。

Before opening the ball valve, the pressure on both ends of the valve

can be balanced through bypass,

once the pressure difference between the upstream and downstream

of the ball valve decreases,

the flow rate of the medium will also decrease accordingly.

and the abrasion on the valve will also be reduced;

设计时适当考虑增大球体的直径。

使球体的密封部位不容易被磨损。

即使球的在使用过程中出现了磨损。也不会影响阀门的密封性能。

The size of the ball should be appropriately increased during the design

process, to minimize the abrasion of the sealing surfaces.

even if abrasion occurs during the operation of the ball valve,

the sealing performance of the valve will not be affected;

在球体和阀座容易被磨损的部位喷焊耐磨材料。

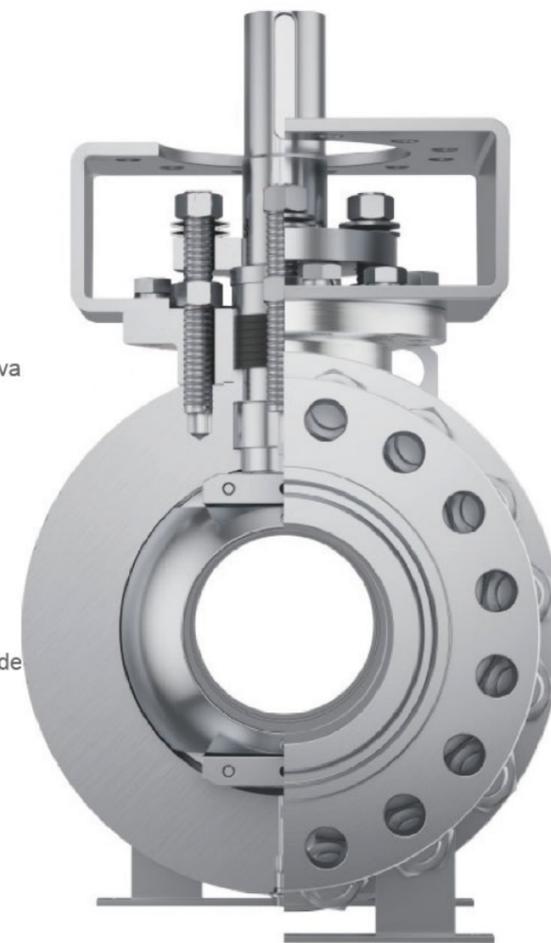
Apply abrasion resistant material by spray welding onto the susceptible areas of the ball and the seat surfaces;

在球阀的通道部位喷焊耐磨材料。以增加球阀的抗磨损能力。

Apply abrasion resistant material by spray welding on the

channel surface of the ball valve to enhance its abrasion

resistance.



金属硬密封球阀

METAL-SEALED BALL VALVE



L. 独特的密封结构防止阀门在高温下的涨死 Blocking Prevention of Valves at High Temperatures with a Unique Sealing Structure

艾克顿金属硬密封球阀采用了碟簧或弹簧加载的专用密封结构。在高温下零部件的热膨胀可以被碟簧或弹簧所吸收。故能够保证阀门在高温下不会被涨死。并能够在高温下灵活启闭。

A special sealing structure of disc springs or loaded springs is adopted in Accton metal-sealed ball valves. This structure allows the absorption of thermal expansion of components at high temperatures by the disc spring or spring, ensuring that the valve is not hindered by thermal expansion and maintains smooth operation at high temperatures.

J. 优异的密封性能 Excellent Sealing Performance

采用独特的球体研磨工艺。通过球体与研磨器具在空间不同方位的旋转。使球体表面达到极高的圆度和光洁度。阀门的密封性能完全达到或超过标准要求。

The unique ball grinding process is adopted, whereby the ball and the grinding tool rotate in different orientations in space, achieving a high level of roundness and smoothness on the surface of the ball. This ensures that the sealing performance of the valve fully meets or exceeds the standard requirements.

K. 高温工况的结构设计

Structural Design for High-Temperature Conditions

金属硬密封球阀通常应用于高温工况。材料在高温下热膨胀是金属硬密封球阀设计必须考虑的问题。高温金属硬密封球阀的阀座与阀体之间的密封通常采用柔性石墨。柔性石墨材料在高温下会产生体积膨胀。如果结构设计没有考虑材料在高温下的膨胀补偿。阀体在高温下必然会因为材料的膨胀而被卡死不能动作。为了解决该问题。通常在阀座背后设置弹簧。通过弹簧来调整和补偿高温下材料膨胀的问题。弹簧可以有多种结构形式。如圆柱螺旋弹簧碟形弹簧板簧及波形弹簧等。为了保证弹簧在高温下的性能。弹簧一般采用 Inconel 材料制造。对于碟形弹簧和板簧。为了改善弹簧的性能。可以采用多片薄型弹簧的组合结构设计。

Metal-seated ball valves are usually used in high-temperature conditions, and the thermal expansion of materials at high temperatures is a design consideration. Flexible graphite is used for sealing between the seat and the body, which will expand in volume at high temperatures. If the expansion compensation at high temperatures is not considered in the structural design, the valve will inevitably seize up at high temperatures. To solve this problem, a spring is usually set behind the seat to adjust and compensate for material expansion at high temperatures. There are various structural forms of springs, such as cylindrical helical springs, disc springs, leaf springs, and waveform springs. To ensure the performance of springs at high temperatures, springs are generally made of Inconel material. For disc springs and leaf springs, in order to improve the performance of the springs, a combination structure design of multiple thin springs can be adopted.

L. 双阻断及泄放功能

Double Block and Bleed Function

根据客户要求或装配系统需求。球阀的阀体上安装有排泄阀。一旦阀门的两端被封闭。阀腔内的积压可通过阀体的排泄阀进行排放。它具有双截止与泄放 (DBB) 功能。阀体的泄放阀的另一种功能是通过它对阀体内的长期淤积物进行冲洗与排放。

The ball valve is equipped with a drain valve. Once both ends of the valve are closed, the accumulated pressure in the valve chamber can be discharged through the drain valve of the body, which has a double block and bleed (DBB) function. Another function of the drain valve is to flush and discharge long term sediment inside the body.

M. 阀门中腔自动泄压功

Automatic Pressure Relief Function in Valve Chamber

L. 独特的密封结构防止阀门在高温下的涨死

当滞留在阀门中腔的液体介质由于温度升高而汽化。导致中腔压力异常升高时。中腔内的介质能够依靠其本身的作用力推动阀座而自动泄压。从而确保阀门的安全。

When the liquid medium trapped in the valve chamber is vaporized due to temperature rise, resulting in an abnormal increase in pressure in the chamber, the medium in the chamber can rely on its own force to push the seat and automatically relieve pressure, thereby ensuring the safety of the valve.

N. 防腐蚀

Corrosion Protection

阀体壁厚设计时留有一定的腐蚀余量。碳钢阀门阀杆、固定轴、球体、阀座及底盖均按 ASTM B733 和 B656 进行表面化学镀层。此外还有多种防腐蚀材料供用户选择。阀门外表使用 International Co 的油漆。满足了各种环境条件的要求。

The wall thickness of the body is designed with a certain corrosion allowance. The stem, trunnion, ball, seat and bottom cover of C.S. valves are chemically coated according to ASTM B733 and B656. In addition, there are various anti-corrosion materials optional. The International Co. paint is used on the surface of valves, meeting the requirements of various environmental conditions.

固定球阀

TRUNNION MOUNTED BALL VALVE

■ 固定球阀概述 Overview of Trunnion Mounted Ball Valve

艾克顿金属硬密封固定球阀适用于工况比较恶劣的情况。它可满足于高温、高压、强腐蚀性及含有颗粒性介质等恶劣工况。在工作状态下，其密封安全可靠，使用寿命长，操作方便，压力损失比较小。

由于硬密封球阀的以上诸多优点，因此，它的应用日益广泛，也越来越受到用户及阀门生产厂家的重视。

Accton metal-sealed trunnion mounted ball valve is suitable for severe working conditions, such as high temperature, high pressure, strong corrosion and medium containing particles. Under working conditions, its seal is safe and reliable, with long service life, convenient operation and small pressure loss.

Due to the above advantages of metal-seated ball valve, the application of it is becoming increasingly widespread and receiving more and more attention from users and valve manufacturers.

可选配操作方式 Optional Operation



■ 设计特点 Design Features

公称口径 DN	口径 NPS	150LB	300LB	600LB	900LB	1500LB	2500LB	PN16	PN25	PN40	PN63	PN100
40	1-1/2	☆	☆	☆	☆	△	△	☆	☆	☆	☆	☆
50	2	☆	☆	☆	△	△	△	☆	☆	☆	☆	☆
65	2-1/2	☆	☆	△	△	△	△	☆	☆	☆	☆	△
80	3	☆	☆	△	△	△	△	☆	☆	☆	☆	△
100	4	△	△	△	△	△	△	☆	☆	△	△	△
125	5	△	△	△	△	△	△	△	△	△	△	△
150	6	△	△	△	△	△	△	△	△	△	△	△
200	8	△	△	△	△	△	△	△	△	△	△	△
250	10	△	△	△	△	△	△	△	△	△	△	△
300	12	△	△	△	△			△	△	△	△	△
350	14	△	△	△	△			△	△	△	△	△
400	16	△	△	△	△			△	△	△	△	△
450	18	△	△	△	△			△	△	△	△	△
500	20	△	△	△	△			△	△	△	△	△
550	22	△	△	△				△	△	△	△	△
600	24	△	△	△				△	△	△	△	△

注：☆表示建议采用手柄操作；△表示建议采用蜗轮蜗杆传动。
Note: ☆ stand for recommendation of handle; △ stand for recommendation of worm gear.

■ 产品介绍 Product Introduction

尺寸 Size	1/2~24" ,DN40~DN600
范围 Range	150LB~2500LB、PN16~PN100
适用温度 Applicable Temperature	-196℃~680℃
阀体材料 Valve Body Material	碳钢、不锈钢、双相钢、合金钢等 Carbon steel, stainless steel, dual phase steel, alloy steel, etc.
密封面硬化处理方式 Hardening Treatment of sealing surface	喷涂碳化钨、喷涂碳化铬、堆焊司太立及镍基合金等 Spraying WC, spraying CrC, surfacing Stellite and nickel base alloy, etc.
操作装置 Operating Device	手柄、蜗轮箱、电动、气动、液动、气液联动等 Handle, gearbox, electric, pneumatic, hydraulic, pneumatic-hydraulic linkage, etc.

固定球阀

TRUNNION MOUNTED BALL VALVE

技术规范 Technical Specifications

规范 Standard	国标系列 GB	美标系列 American Standard	英标系列 British Standard	德标系列 German Standard
设计标准 Design Standard	GB/T 12237	API6D API608 ANSI B 16.34		DIN3357/1,2
结构长度 Face-to-face Dimension	GB/T 12221	ASME B16.10	BS 2080	DIN3202
连接端部 End Connection	GB/T 9113 HG 20592 HG 20615 GB/T 12224	ASME B16.5 ASME B16.47A ASME B16.25	BS 4504	DIN2543-2545
检验与试验 Inspection and Test	GB/T 13927 GB/T 17213 JB/T 9092	API 598	BSS417 BSS146	DIN3230/3

API 6FA	阀门耐火测试 Specification for fire test for valves
API 607	转 1/4 周软阀座阀的耐火试验 Fire test for soft-seated quarter-turn valves
ASME B & PV Section V	锅炉和压力容器规范第 V 部份 - 无损检测 Boiler and pressure vessel code Part V-non destructive examination
ASME B & PV Section VIII	锅炉和压力容器规范第 VI 部份 - 压力容器建造规则 Boiler and pressure vessel code Part VI-Rules for construction of pressure vessels
ASME B & PV Section IX	锅炉和压力容器规范第 IX 部份 - 焊接和钎接评定 Boiler and pressure vessel code Part IX-welding,brazing,and fusing qualifications
SSPC SP10	金属表面处理 Metal surface treatment
ASTM A193/A193M	高温用合金钢和不锈钢控接材料 Alloy steel and stainless steel bolting materials for high temperature service
ASTM A194/A194M	高压和高温用碳钢和合金钢螺母 Carbon and alloy steel nuts for high pressure or high temperature service,or both
ASTM B637	高温用沉淀硬化镍合金棒材、锻件和锻坯 Precipitation Hardening Nickel alloy bars, forgings and forging stock for high temperature service
ASTM A322	标准级合金钢棒材 Steel bars, alloy, standard grades
ASTM A105	管道元件用碳钢锻件 Carbon steel forgings for piping applications
ASTM A182	高温作业管道用锻造的或轧制的合金钢法兰及锻制的配件、阀门和部件 Forged or rolled alloy and stainless steel pipe flanges, forged fittings, and valves and parts for high temperature service
ISO 5211	部份回转型阀门驱动装置连接规范 Industrial valves-part-turn actuator attachments

固定球阀参考力矩 Reference Torque Force of Trunnion Mounted Ball Valve

公称通径 DN	口径 NPS	硬密封固定球阀扭矩 (N-m) Torque Force of Metal-seated Trunnion Mounted Ball Valve										
		150LB	300LB	600LB	900LB	1500LB	2500LB	PN16	PN25	PN40	PN63	PN100
40	1-1/2	120	200	320	560	1360	2400	110	130	190	217.3	320
50	2	140	265	480	705	1450	2800	130	150	250	288	480
65	2-1/2	205	390	705	1200	2100	4300	190	225	365	423.8	705
80	3	290	530	1105	1620	2800	5650	270	315	495	575.9	1105
100	4	450	1080	2050	3010	5600	10000	420	490	1010	1174	2050
125	5	915	1830	3385	5800	9800	18600	855	995	1710	1989	3385
150	6	950	2040	4915	7220	15800	32000	890	1030	1905	2217	4915
200	8	1910	4090	9505	13965	30000	50000	1785	2070	3820	4444	9505
250	10	3125	6752	17940	26420	42300		2920	3385	6305	7337	17940
300	12	5190	11280	31635	46630			4845	5625	10530	12258	31635
350	14	6845	14810	42370	62470			6390	7415	13825	16094	42370
400	16	9510	20420	60905	89830			8880	10300	19060	22190	60905
450	18	14450	31450	85245	100000			13490	15650	29355	34176	85245
500	20	19550	39010	77000	100000			18250	21180	36410	42391	77000
550	22	23560	46200	86200				22000	25530	43120	50204	86200
600	24	26260	51705	93400				24510	28450	48260	56186	93400

流量数据表 Flow Data Sheet

公称通径 DN	口径 NPS	Class150~Class600 PN20~PN110		Class900 PN150		Class1500 PN260		Class2500 PN420	
		全通径 Full Bore	缩径 Reduced Bore	全通径 Full Bore	缩径 Reduced Bore	全通径 Full Bore	缩径 Reduced Bore	全通径 Full Bore	缩径 Reduced Bore
流量系数 Cv									
15	1/2	24	14	24	14	24	14	24	14
20	3/4	55	31	55	31	55	31	55	31
25	1	100	55	100	55	100	55	100	55
32	1 1/4	160	85	160	85	160	85	160	85
40	1 1/2	260	123	260	123	260	123	260	123
50	2	450	218	450	218	450	218	330	160
65	1/2	720	340	720	340	720	340	510	240
80	3	1100	490	1100	490	1100	490	770	350
100	4	2200	880	2200	880	2200	880	1700	680
125	5	3000	1380	3000	1380	3000	1380	2300	1060
150	6	5500	1980	5500	1980	5100	1840	4200	1500
200	8	10000	3500	10000	3500	9100	3200	7900	2800
250	10	17000	5460	17000	5460	15300	4900	13300	4300
300	12	24000	7900	24000	7900	21500	7100	18400	6100
350	14	28000	10700	26000	9940	24900	9500	-	-
400	16	36000	14000	33800	13100	31500	12300	-	-
450	18	46000	18000	43300	17000	-	-	-	-
500	20	57000	22000	53300	20600	-	-	-	-
600	24	75000	31500	70200	29500	-	-	-	-
650	26	84000	37000	-	-	-	-	-	-
700	28	93000	43000	-	-	-	-	-	-
750	30	102000	49000	-	-	-	-	-	-
800	32	110500	56000	-	-	-	-	-	-
900	36	133000	71000	-	-	-	-	-	-

压力-温度额定值 Pressure-Temperature Rating

按照 ASME B16.34 标准规范执行 According to ASME B16.34

固定球阀

TRUNNION MOUNTED BALL VALVE

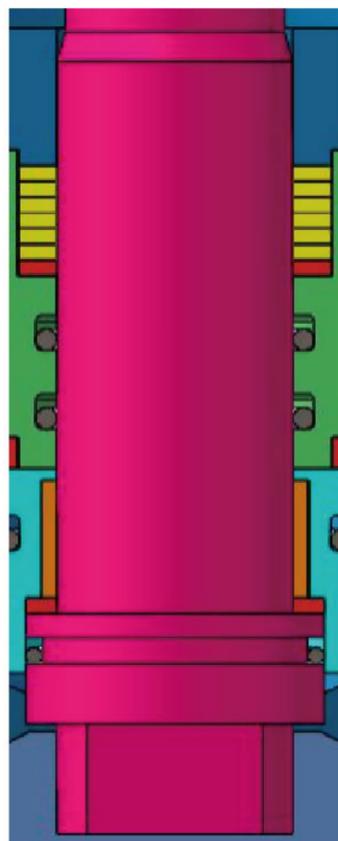
设计特点 Design Features

超音速喷涂 (常用喷涂材料: 碳化钨、碳化铬等)

Supersonic spraying (common spraying materials:WC,CrC,etc.)

艾克顿公司一直坚持根据现代工业的实际使用工况,有针对性的设计研发阀门产品。在石油化工及天然气输送应用上积累了丰富的经验。艾克顿还坚持为现代化工业用阀提供全面的解决方案。建立了产品设计研发中心和分析中心,可根据客户的需求设计出各类完全适合客户需求的产品,已达到“量体裁衣”的效果,从而更有利于阀门的安全使用,大大提高了煤化工球阀的使用寿命。

Accton company has been adhering to the design and development of valve products according to the actual working conditions of modern industry,and has accumulated rich experience in petrochemical and natural gas transportation applications. Accton also insists on providing comprehensive solutions for modern industrial valves,and has established product design and development center and.Analysis Center,which can design all kinds of products completely suitable for customers' needs according to customers needs,and has achieved the effect of "tailor-made",which is more conducive to the safe use of valves and greatly improves the service life of ball valves in coal chemical industry



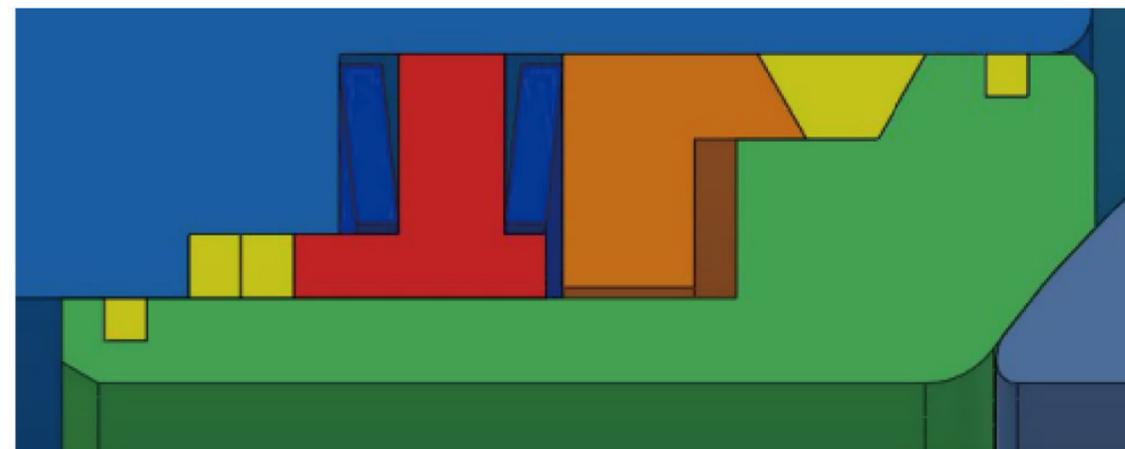
阀杆密封结构

大口径独特的阀杆支撑结构及防尘结构

Large Size Unique Stem Support Structure And Dust-proof Structure

大口径球阀阀杆重量经由平面轴承作用在阀体上,而不是直接作用在球体上,不会造成阀座磨损不均匀的现象。阀杆上装有防尘圈,防止固体颗粒进入阀杆与阀体之间。

The weight of the stem of a large size ball valve acts on the body through a plane bearing,rather than directly acting on the ball, which will not cause uneven abrasion of the seat.The stem is equipped with a dust ring to prevent solid particles from entering between the stem and body.



阀座结构

新型的刮刀结构设计

New Structure Design of Scraper

煤化工球阀使用的工况中常含有粘结性很强的工艺介质,很容易结合在球体表面。刮刀结构设计的好坏对煤化工球阀的使用寿命有很大的影响。新型的刮刀结构设计在煤化工黑水、灰水、渣水、锁渣等工况中使用效果非常好。

The working conditions of ball valve in coal chemical industry often contain highly cohesive process medium,which is easy to adhere to the surface of the ball.The scraper structure design has a great impact on the service life of ball valve in coal chemical industry.The new scraper structure design has a very good eff in the working conditions of black water, ash water,slag water and slag lock in coal chemical industry.



阀座防尘示意图

新型的防尘结构设计

Design of New Dustproof Structure

煤化工球阀使用的工况中常含有固体颗粒的工艺介质,固体颗粒很容易进入弹簧内。防尘结构设计的好坏对煤化工球阀的使用寿命有很大的影响。新型的防尘结构设计在煤化工黑水、灰水、渣水、锁渣等工况中使用效果非常好。

The working conditions of ball valve in coal chemical industry often contain the process medium of solid particles,and the solid particles are easy to enter into the spring.The design of dust-proof structure has a great influence on the service life of ball valve in coal chemical industry.The new dust-proof structure design has a very good effect in the working conditions of black water,gray water,slag water and slag lock in coal chemical industry

固定球阀

TRUNNION MOUNTED BALL VALVE

设计特点 Design Features

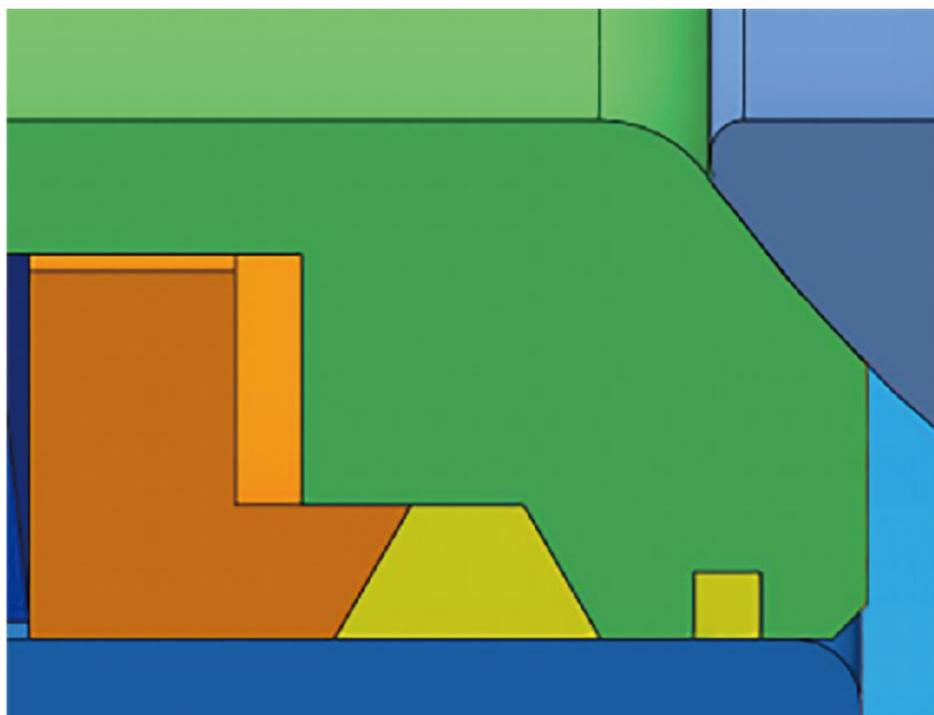
三维辅助设计 3DCAD

艾克顿采用国际先进的阀门设计标准和制造工艺，以及国际上先进的工业辅助设计软件 AutoCAD 进行产品的二维设计，采用 Pro/E, SolidWorks 进行产品的三维建模、产品的模拟装配及产品的外观分析，使实际生产制造的产品结构更加合理，外观更加美观。艾克顿采用 SolidWorks、ANSYS 等先进的分析软件，利用三维仿真技术模拟产品在实际工况下的工作情况及在管道上的受力情况，对产品的受力和变形进行有限元分析，根据分析结果来检验和验证所设计的阀门产品的安全性和可靠性，并通过分析来优化产品的设计，使实际生产制造的产品结构更加合理，尽最大可能消除产品的设计缺陷或不足，保证煤化工球阀产品的使用安全性和性能可靠。

先进的设备可以根据客户的苛刻工况量身定制解决方案

Accton adopts the international advanced valve design standards and manufacturing process, as well as the international advanced industrial Aided Design Software Auto CAD to carry out the two-dimensional design of the product, and uses Pro/E and Solid Works to carry out the three-dimensional modeling, simulation assembly and appearance analysis of the product, so as to make the actual product structure more reasonable and appearance more beautiful.

Accton utilizes advanced analysis software such as SolidWorks and ANSYS, employing 3D simulation technology to simulate the working conditions of the product under actual working conditions and the stress on the pipeline. Finite element analysis is conducted to examine the product's forces and deformations, and to verify the safety and reliability of the designed valves based on the analysis results. Optimizing product design through analysis can make the valve structure in production more reasonable, eliminate design defects as much as possible, and ensure the safety and reliable performance of coal chemical ball valve products. Customized solutions are tailored based on the working conditions and in conjunction with advanced equipment



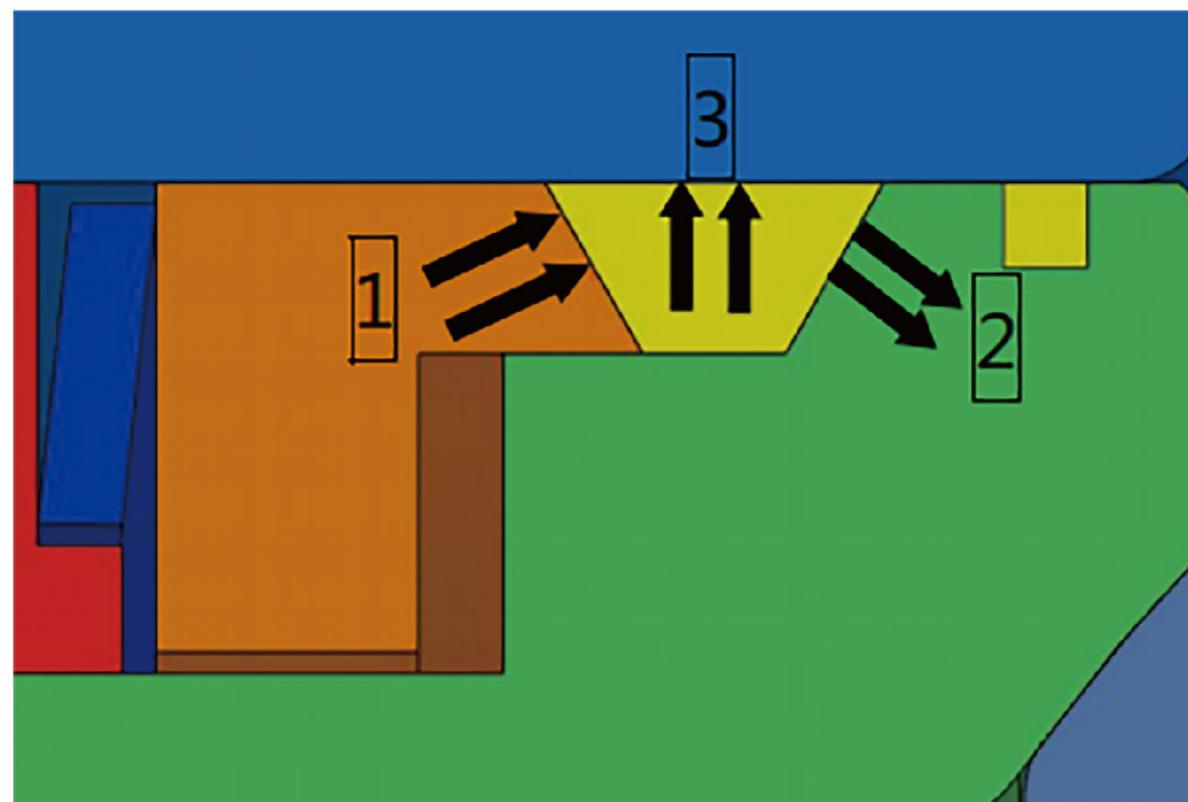
阀座圆弧式刮刀设计

阀杆防飞出结构设计

Design of Anti Blow-out Structure for Valve Stem

阀杆头部设计为凸台形式的大小头结构，用填料箱体将阀杆头部压牢，当阀腔内异常升压时阀杆不会喷出。

The head of the valve stem is designed as a large and small head structure in the form of a boss and the head of the valve stem is firmly pressed by a packing box so that the valve stem will not eject when the pressure in the valve chamber is abnormally increased.



双斜面密封

中腔动泄压结构设计

Design of Automatic Pressure Relief Structure for Middle Chamber

当中腔压力出现异常升高现象时，额定值的 1.1~1.33 倍之间，介质压力将安全阀的阀座推离密封面，完成泄压。

When there is an abnormal increase in the pressure in the middle chamber, between 1.1 and 1.33 times of the rated value, the medium pressure pushes the seat of the safety valve away from the sealing surface, completing pressure relief.

固定球阀

TRUNNION MOUNTED BALL VALVE

阀座的可靠密封

Reliable Sealing of Valve Seat

1. 预紧弹簧

Pretightening Spring

阀座预紧弹簧采用组螺旋弹簧，由 INCONELX-750 或者 INCONELX-718 不锈钢制作。

The seat pre tightening spring is a set of coil springs made of Inconel X-750 or inconel x-718 stainless steel

2 球体和阀座的两种常用硬化处理方法

Two Common Hardening Methods for Ball and Valve Seat

超音速喷涂（常用喷涂材料：碳化铝、碳化铬等）

Supersonic spraying (common spraying materials:WC,CrC,etc.)

超音速火焰喷涂 (HVOF) 主要是通过极高的速度将耐磨粉末涂层材料喷涂到基体材料表面。喷涂时的气流速度在很大程度上决定了喷涂的质量。喷枪能够产生更高的气流速度，则耐磨粉末涂层就能够获得更高的运动速度，从而使耐磨粉末涂层与基体材料就能够获得更高的结合力和更高的致密性。因此也就具有更好的耐磨性能和耐腐蚀性能。超音速喷涂的优点是可以喷涂超硬的涂层材料，涂层的硬度甚至可以达到 HRC74 以上，因此涂层具有很好的抗损伤性能和耐磨性能。另外，超音速喷涂时，

基体材料不需要进行高温加热，因此基体材料不会发生热变形。

Supersonic flame spraying (HVOF)mainly sprays the wear-resistant powder coating material to the surface of the substrate material at a very high speed.The air velocity during spraying largely determines the quality of spraying.If the spray gun can produce a higher air velocity,the wear-resistant powder coating can obtain a higher moving velocity,so that the wear-resistant powder coating and the substrate material can obtain a higher moving velocity Therefore,it has better wear resistance and corrosion resistance.The advantage of supersonic spraying is that it can spray super hard coating materials,and the hardness of the coating can even reach above hrc74,so the coating has good scratch resistance and wear resistance.In addition, high temperature heating is not necessary for the matrix material in supersonic spraying so the thermal deformation of the matrix material will not occur.

镍基合金热喷涂（常用喷涂材料：镍基合金、司太立合金、镍基合金碳化钨等

Nickel base alloy thermal spraying (common spraying materials:nickel base alloy, stellite alloy,nickel base alloy tungsten carbide, etc.)

镍基合金热喷涂是目前在煤化工球阀上成功应用的一种密封面硬化方法。镍基合金耐磨、配腐蚀、耐温等。其综合性能优良。根据我们的实践，镍基合金适用于灰水、黑水、煤浆、煤渣等多种工况介质。镍基合金热喷涂的优点是结合强度高、操作简单、成本低等。

Nickel based alloy thermal spraying is a kind of sealing surface hardening method successfully applied in ball valve of coal chemical industry at present Nickel based alloy has excellent comprehensive properties such as abrasion resistance,corrosion resistance and temperature resistance.According to our practice,nickel based alloy is suitable for various working conditions such as gray water,black water,coal slurry and cinder.The advantages of Ni based alloy thermal spraying are high bonding strength,simple operation and low cost.

球体和阀座硬化处理后的加工处理

Machining of Ball and Valve Seat After Hardening Treatment

工前的准备工作、表面预处理、喷涂、喷涂后处理四个主要步骤。

注：1、球体和阀座密封面硬化处理要根据工况的不同采用不同的处理方法；

2、球体和阀座密封面处理后要求 3-5 度硬度差。

There are four main steps: preparation,surface pretreatment, spraying and post-treatment.

1.The hardening treatment of ball and valve seat sealing surface should adopt different treatment methods according to different Working conditions:

2.After treatment,the sealing surface of ball and valve seat shall have a hardness difference of 3-5 degrees.

球体和阀座密封面的加工

Machining of Sealing Surface of Ball and Valve Seat

密封面采用高精度磨球机进行研磨和数控加工。完成后球阀和阀座要求再研磨，密封面光洁度达到 0.4 以上。

The sealing surface is ground and processed by high precision ball grinder.After finishing,the ball valve and valve seat are required to be grinded.The finish of the sealing surface is above 0.4.

不同工况条件下的材料组合

Material Combinations Under Different Working Conditions

阀体 Body	球体 / 阀座 Ball/Seat	阀杆 Stem				填料压套 Packing Gland		填料压板 Gland Flange	缠绕垫 / 填料 Spiral Wound Gasket/Packing	螺栓 螺钉 Stud Bolt Screw	螺母 Nut
	客户要求 20Cr13 改为 304 Replacement of 20Cr13 with 304 upon Customer Requirement.	150LB/500LB		≥600LB		NPS < 2	NPS ≥2				
		客户未指定 Not Specified	客户指定 Specified	温度 ≤ 350°C Tempemher ≤ 350°C	温度 > 350°C Tempemher > 350°C						
WCB/A105	304	20Cr13	17-4PH	17-4PH	A638 660	304	20Cr13	WCB	316L+ 柔性石墨 316L+Flexible graphile	A193 B7	A194 2H
	316	20Cr13	17-4PH	17-4PH	A638 660	304	20Cr13	WCB	316L+ 柔性石墨 316L+Flexible graphile	A193 B7	A194 2H
WCC/A105	304	20Cr13	17-4PH	17-4PH	A638 660	304	20Cr13	WCB	316L+ 柔性石墨 316L+Flexible graphile	A193 B7	A194 2H
	316	20Cr13	17-4PH	17-4PH	A638 660	304	20Cr13	WCB	316L+ 柔性石墨 316L+Flexible graphile	A193 B7	A194 2H
LCB/LF2	304	20Cr13	17-4PH	17-4PH		304	20Cr13	LCB	316L+ 柔性石墨 316L+Flexible graphile	A320 L7	A194 7
	316	20Cr13	17-4PH	17-4PH		304	20Cr13	LCB	316L+ 柔性石墨 316L+Flexible graphile	A320 L7	A194 7
LCC/LF2	304	20Cr13	17-4PH	17-4PH		304	20Cr13	LCC	316L+ 柔性石墨 316L+Flexible graphile	A320 L7	A194 7
	316	20Cr13	17-4PH	17-4PH		304	20Cr13	LCC	316L+ 柔性石墨 316L+Flexible graphile	A320 L7	A194 7
WC6/F11	304	20Cr13	17-4PH	17-4PH	A638 660	304	20Cr13	WC6	316L+ 柔性石墨 316L+Flexible graphile	A193 B16	A194 7
	316	20Cr13	17-4PH	17-4PH	A638 660	304	20Cr13	WC6	316L+ 柔性石墨 316L+Flexible graphile	A193 B16	A194 7
WC9/F22	304	20Cr13	17-4PH	17-4PH	A638 660	304	20Cr13	WC9	316L+ 柔性石墨 316L+Flexible graphile	A193 B16	A194 7
	316	20Cr13	17-4PH	17-4PH	A638 660	304	20Cr13	WC9	316L+ 柔性石墨 316L+Flexible graphile	A193 B16	A194 7
CF8/F304	304	17-4PH		A638 660		304		CF8	316L+ 柔性石墨 316L+Flexible graphile	A193 B8SH	A194 8
	316	17-4PH		A638 660		304		CF8	316L+ 柔性石墨 316L+Flexible graphile	A193 B8SH	A194 8
	304L	17-4PH		A638 660		304		CF8	316L+ 柔性石墨 316L+Flexible graphile	A193 B8SH	A194 8
	316L	17-4PH		A638 660		304		CF8	316L+ 柔性石墨 316L+Flexible graphile	A193 B8SH	A194 8
CF8M/F316	316	17-4PH		A638 660		316L		CF8	316L+ 柔性石墨 316L+Flexible graphile	A193 B8SH	A194 8
	304L	17-4PH		A638 660		316L		CF8	316L+ 柔性石墨 316L+Flexible graphile	A193 B8SH	A194 8
	316L	17-4PH		A638 660		316L		CF8	316L+ 柔性石墨 316L+Flexible graphile	A193 B8SH	A194 8
CF3/F304L	304L	17-4PH		A638 660		316L	304L	CF3	316L+ 柔性石墨 316L+Flexible graphile	A193 B8SH	A194 8
	316L	17-4PH		A638 660		316L	304L	CF3	316L+ 柔性石墨 316L+Flexible graphile	A193 B8SH	A194 8
CF3M/F316L	316L	17-4PH		A638 660		316L		CF3	316L+ 柔性石墨 316L+Flexible graphile	A193 B8SH	A194 8
CF8C/F321	321	17-4PH		A638 660		321		CF8C	316L+ 柔性石墨 316L+Flexible graphile	A193 B8SH	A194 8
F347	347	17-4PH		A638 660		347		347	316L+ 柔性石墨 316L+Flexible graphile	A193 B8SH	A194 8
CD3MN/F51	F51	F51				F51		CD3MN	316L+ 柔性石墨 316L+Flexible graphile	A193 B8SH	A194 8
CY40/Incone 1600	Inconel 600	Inconel 625	A638 660	Inconel 625	Inconel 625	Inconel 625	Inconel 625	Inconel 625	316L+ 柔性石墨 316L+Flexible graphile	A193 B8SH	A194 8
CW6MC/Inconel 625	Inconel 625	Inconel 625	A638 660	Inconel 625	Inconel 625	Inconel 625	Inconel 625	Inconel 625	316L+ 柔性石墨 316L+Flexible graphile	A193 B8SH	A194 8

固定球阀

TRUNNION MOUNTED BALL VALVE

固定球阀结构示意图
Exploded View of Trunnion Mounted Ball Valve

密封圈压圈/Seal Ring Retainer

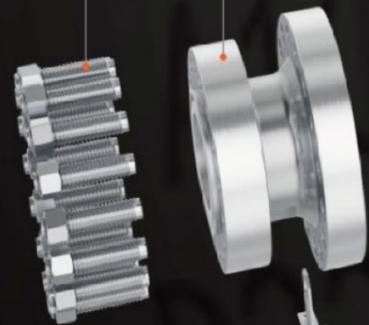
弹簧/Spring

防尘圈/Dust Ring

吊耳/Lifting Lug

副阀体/Sub-body

螺母/Nut 螺柱/Stud



脚架/Support Leg

压套/Gland

填料/Packing

止推垫/Thrust Washer

垫圈/Washer

阀杆/Stem

销/Fixed Pin

支撑板/Bearing Support

球体/Ball



蜗轮箱/Worm Gear Box

螺母/Nut

六角螺栓/Hex Bolt

螺母/Nut 螺柱/Stud 碟簧/Disc Spring

压板/Gland Flange

六角螺栓/Hex Bolt

内六角螺柱
Hexagon Socket Head Cap Screw

填料箱/Stuffing Box



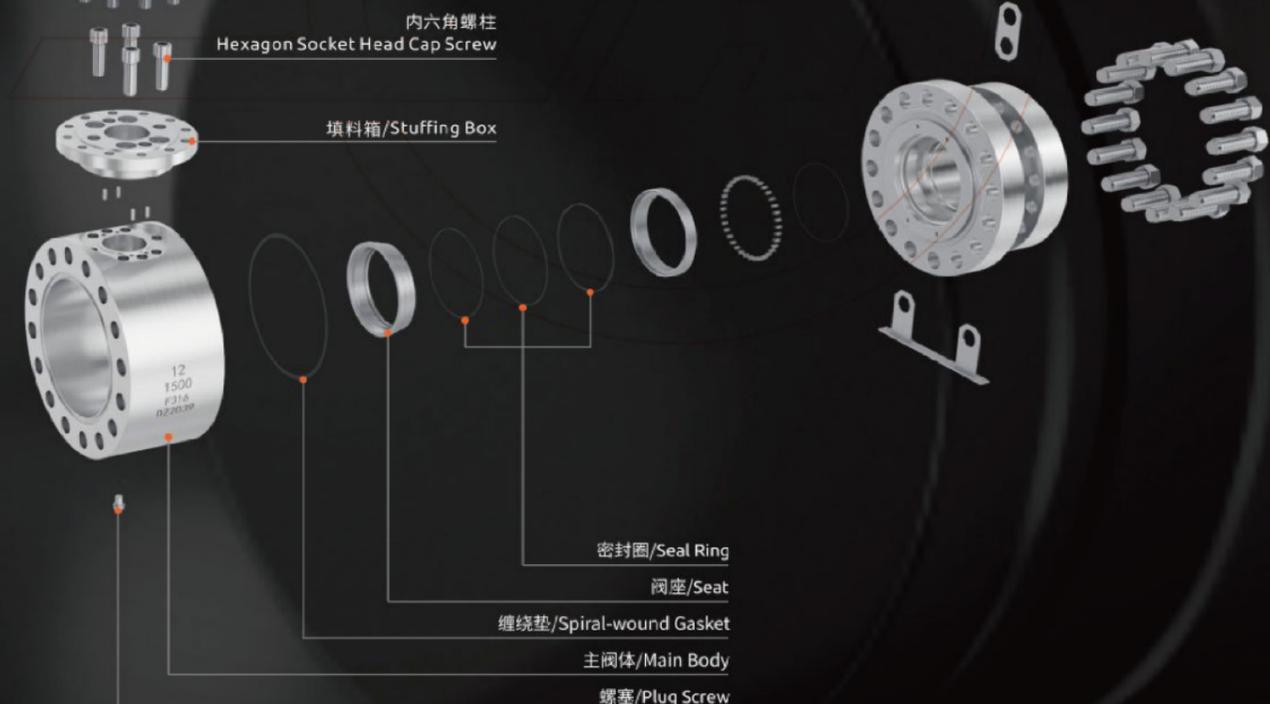
密封圈/Seal Ring

阀座/Seat

缠绕垫/Spiral-wound Gasket

主阀体/Main Body

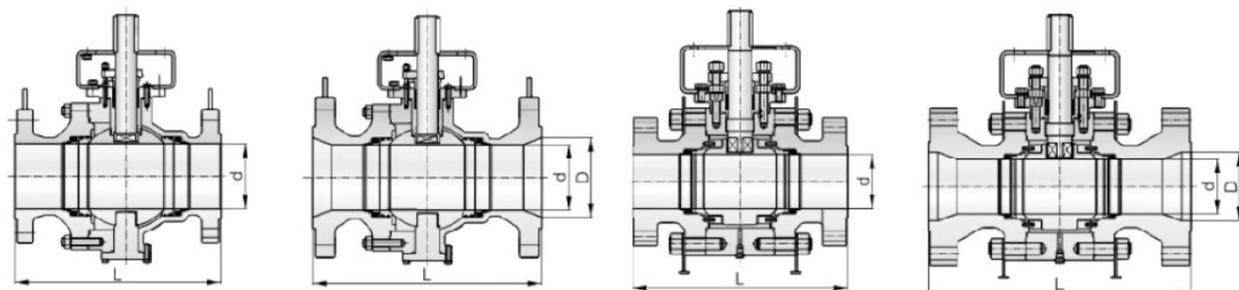
螺塞/Plug Screw



固定球阀

TRUNNION MOUNTED BALL VALVE

主要外形尺寸 Main Dimensions



Class 150全口径

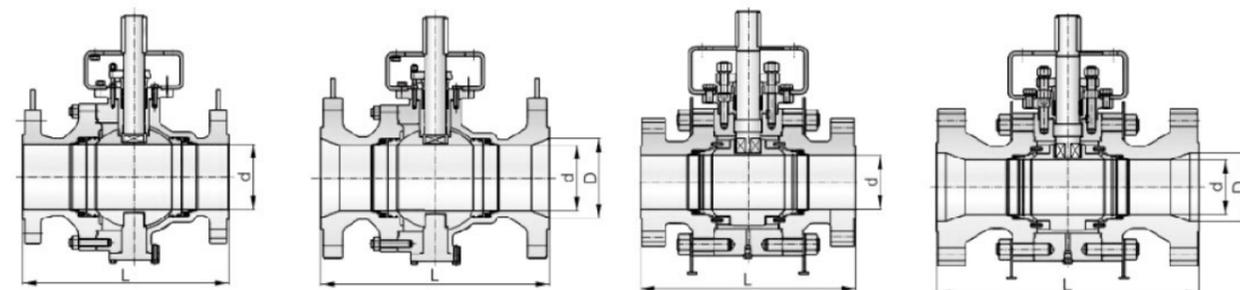
口径 Size		D		L			
in	mm	in	mm	RF		BW	
				in	mm	in	mm
2"	50	1.93	49	7.00	178	8.50	216
3"	80	2.91	74	8.00	203	11.13	283
4"	100	3.94	100	9.00	229	12.00	305
6"	150	5.91	150	15.50	394	18.00	457
8"	200	7.91	201	18.00	457	20.50	521
10"	250	9.92	252	21.00	533	22.00	559
12"	300	11.93	303	24.00	610	25.00	635
14"	350	13.15	334	27.00	686	30.00	762
16"	400	15.16	385	30.00	762	33.00	838
18"	450	17.16	436	34.00	864	36.00	914
20"	500	19.17	487	36.00	914	39.00	991
22"	550	21.18	538	39.00	991	43.00	1092
24"	600	23.19	589	42.00	1067	45.00	1143
26"	650	24.92	633	45.00	1143	49.00	1245
28"	700	26.93	684	49.00	1245	53.00	1346
30"	750	28.94	735	51.00	1295	55.00	1397
32"	800	30.67	779	54.00	1372	60.00	1524
34"	850	32.68	830	58.00	1473	64.00	1626
36"	900	34.41	874	60.00	1524	68.00	1727

Class 150缩径

口径 Size		D		d		L			
in	mm	in	mm	in	mm	RF		BW	
						in	mm	in	mm
2" x1 1/2"	50x40	1.93	49	1.50	38	7.00	178	8.50	216
3" x2"	80x50	2.91	74	1.93	49	8.00	203	11.13	283
4" x3"	100x80	3.94	100	2.91	74	9.00	229	12.00	305
6" x4"	150x100	5.91	150	3.94	100	15.50	394	18.00	457
8" x6"	200x150	7.91	201	5.91	150	18.00	457	20.50	521
10" x8"	250x200	9.92	252	7.91	201	21.00	533	22.00	559
12" x10"	300x250	11.93	303	9.92	252	24.00	610	25.00	635
14" x10"	350x250	13.15	334	9.92	252	27.00	686	30.00	762
16" x12"	400x300	15.16	385	11.93	303	30.00	762	33.00	838
18" x14"	450x350	17.16	436	13.15	334	34.00	864	36.00	914
20" x16"	500x400	19.17	487	15.16	385	36.00	914	39.00	991
22" x18"	550x450	21.18	538	17.16	436	39.00	991	43.00	1092
24" x20"	600x500	23.19	589	19.17	487	42.00	1067	45.00	1143
26" x20"	650x500	24.92	633	19.17	487	45.00	1143	49.00	1245
28" x22"	700x550	26.93	684	21.18	538	49.00	1245	53.00	1346
30" x24"	750x600	28.94	735	23.19	589	51.00	1295	55.00	1397
32" x26"	800x650	30.67	779	24.92	633	54.00	1372	60.00	1524
34" x28"	850x700	32.68	830	26.93	684	58.00	1473	64.00	1626
36" x30"	900x750	34.41	874	28.94	735	60.00	1524	68.00	1727

注：表格 L 栏中，RF 表示凸面法兰结构长度，BW 表示焊接结构长度。
Note: In column L, RF represents raised face flange, and BW represents butt weld.

主要外形尺寸 Main Dimensions



Class 300全口径

口径 Size		D		L			
in	mm	in	mm	RF		BW	
				in	mm	in	mm
2"	50	1.93	49	8.50	216	8.50	216
3"	80	2.91	74	11.13	283	11.13	283
4"	100	3.94	100	12.00	305	12.00	305
6"	150	5.91	150	18.00	457	18.00	457
8"	200	7.91	201	20.50	521	20.50	521
10"	250	9.92	252	22.00	559	22.00	559
12"	300	11.93	303	25.00	635	25.00	635
14"	350	13.15	334	30.00	762	30.00	762
16"	400	15.16	385	33.00	838	33.00	838
18"	450	17.16	436	36.00	914	36.00	914
20"	500	19.17	487	39.00	991	39.00	991
22"	550	21.18	538	43.00	1092	43.00	1092
24"	600	23.19	589	45.00	1143	45.00	1143
26"	650	24.92	633	49.00	1245	49.00	1245
28"	700	26.93	684	53.00	1346	53.00	1346
30"	750	28.94	735	55.00	1397	55.00	1397
32"	800	30.67	779	60.00	1524	60.00	1524
34"	850	32.68	830	64.00	1626	64.00	1626
36"	900	34.41	874	68.00	1727	68.00	1727

Class 300缩径

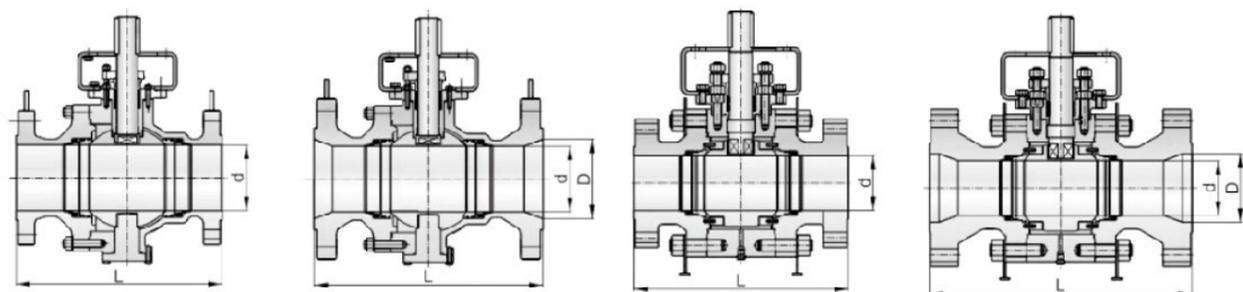
口径 Size		D		d		L			
in	mm	in	mm	in	mm	RF		BW	
						in	mm	in	mm
2" x1 1/2"	50x40	1.93	49	1.50	38	8.50	216	8.50	216
3" x2"	80x50	2.91	74	1.93	49	11.13	283	11.13	283
4" x3"	100x80	3.94	100	2.91	74	12.00	305	12.00	305
6" x4"	150x100	5.91	150	3.94	100	18.00	457	18.00	457
8" x6"	200x150	7.91	201	5.91	150	20.50	521	20.50	521
10" x8"	250x200	9.92	252	7.91	201	22.00	559	22.00	559
12" x10"	300x250	11.93	303	9.92	252	25.00	635	25.00	635
14" x10"	350x250	13.15	334	9.92	252	30.00	762	30.00	762
16" x12"	400x300	15.16	385	11.93	303	33.00	838	33.00	838
18" x14"	450x350	17.16	436	13.15	334	36.00	914	36.00	914
20" x16"	500x400	19.17	487	15.16	385	39.00	991	39.00	991
22" x18"	550x450	21.18	538	17.16	436	43.00	1092	43.00	1092
24" x20"	600x500	23.19	589	19.17	487	45.00	1143	45.00	1143
26" x20"	650x500	24.92	633	19.17	487	49.00	1245	49.00	1245
28" x22"	700x550	26.93	684	21.18	538	53.00	1346	53.00	1346
30" x24"	750x600	28.94	735	23.19	589	55.00	1397	55.00	1397
32" x26"	800x650	30.67	779	24.92	633	60.00	1524	60.00	1524
34" x28"	850x700	32.68	830	26.93	684	64.00	1626	64.00	1626
36" x30"	900x750	34.41	874	28.94	735	68.00	1727	68.00	1727

注：表格 L 栏中，RF 表示凸面法兰结构长度，BW 表示焊接结构长度。
Note: In column L, RF represents raised face flange, and BW represents butt weld.

固定球阀

TRUNNION MOUNTED BALL VALVE

主要外形尺寸 Main Dimensions



Class 600全口径

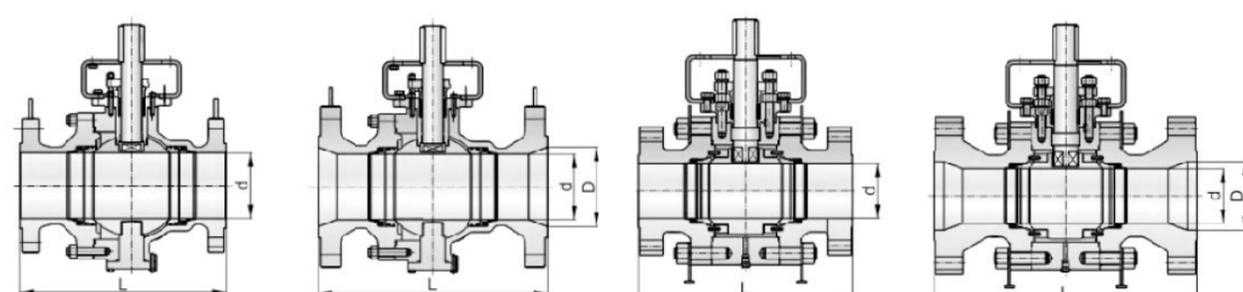
口径 Size		D		L					
in	mm	in	mm	RF		BW		RTJ	
				in	mm	in	mm	in	mm
2"	50	1.93	49	11.50	292	11.50	292	11.63	295
3"	80	2.91	74	14.00	356	14.00	356	14.13	359
4"	100	3.94	100	17.00	432	17.00	432	17.13	435
6"	150	5.91	150	22.00	559	22.00	559	22.13	562
8"	200	7.91	201	26.00	660	26.00	660	26.13	664
10"	250	9.92	252	31.00	787	31.00	787	31.13	791
12"	300	11.93	303	33.00	838	33.00	838	33.13	841
14"	350	13.15	334	35.00	889	35.00	889	35.13	892
16"	400	15.16	385	39.00	991	39.00	991	39.13	994
18"	450	17.16	436	43.00	1092	43.00	1092	43.13	1095
20"	500	19.17	487	47.00	1194	47.00	1194	47.25	1200
22"	550	21.18	538	51.00	1295	51.00	1295	51.38	1305
24"	600	23.19	589	55.00	1397	55.00	1397	55.38	1407
26"	650	24.92	633	57.00	1448	57.00	1448	57.50	1461
28"	700	26.93	684	61.00	1549	61.00	1549	61.50	1562
30"	750	28.94	735	65.00	1651	65.00	1651	65.50	1664
32"	800	30.67	779	70.00	1778	70.00	1778	70.63	1794
34"	850	32.68	830	76.00	1930	76.00	1930	76.63	1946
36"	900	34.41	874	82.00	2083	82.00	2083	82.63	2099

Class 600缩径

口径 Size		D		d		L					
in	mm	in	mm	in	mm	RF		BW		RTJ	
						in	mm	in	mm	in	mm
2" x1 1/2"	50x40	1.93	49	1.50	38	11.50	292	11.50	292	11.63	295
3" x2"	80x50	2.91	74	1.93	49	14.00	356	14.00	356	14.13	359
4" x3"	100x80	3.94	100	2.91	74	17.00	432	17.00	432	17.13	435
6" x4"	150x100	5.91	150	3.94	100	22.00	559	22.00	559	22.13	562
8" x6"	200x150	7.91	201	5.91	150	26.00	660	26.00	660	26.13	664
10" x8"	250x200	9.92	252	7.91	201	31.00	787	31.00	787	31.13	791
12" x10"	300x250	11.93	303	9.92	252	33.00	838	33.00	838	33.13	841
14" x10"	350x250	13.15	334	9.92	252	35.00	889	35.00	889	35.13	892
16" x12"	400x300	15.16	385	11.93	303	39.00	991	39.00	991	39.13	994
18" x14"	450x350	17.16	436	13.15	334	43.00	1092	43.00	1092	43.13	1095
20" x16"	500x400	19.17	487	15.16	385	47.00	1194	47.00	1194	47.25	1200
22" x18"	550x450	21.18	538	17.16	436	51.00	1295	51.00	1295	51.38	1305
24" x20"	600x500	23.19	589	19.17	487	55.00	1397	55.00	1397	55.38	1407
26" x20"	650x500	24.92	633	19.17	487	57.00	1448	57.00	1448	57.50	1461
28" x22"	700x550	26.93	684	21.18	538	61.00	1549	61.00	1549	61.50	1562
30" x24"	750x600	28.94	735	23.19	589	65.00	1651	65.00	1651	65.50	1664
32" x26"	800x650	30.67	779	24.92	633	70.00	1778	70.00	1778	70.63	1794
34" x28"	850x700	32.68	830	26.93	684	76.00	1930	76.00	1930	76.63	1946
36" x30"	900x750	34.41	874	28.94	735	82.00	2083	82.00	2083	82.63	2099

注：表格 L 栏中，RF 表示凸面法兰结构长度，BW 表示焊接结构长度，RTJ 表示环连接形式结构长度。
Note: In column L, RF represents raised face flange, and BW represents butt weld, and RTJ represents ring type joint.

主要外形尺寸 Main Dimensions



Class 900全口径

口径 Size		D		L					
in	mm	in	mm	RF		BW		RTJ	
				in	mm	in	mm	in	mm
2"	50	1.93	49	14.50	368	14.50	368	14.63	371
3"	80	2.91	74	15.00	381	15.00	381	15.13	384
4"	100	3.94	100	18.00	457	18.00	457	18.13	460
6"	150	5.91	150	24.00	610	24.00	610	24.13	613
8"	200	7.91	201	29.00	737	29.00	737	29.13	740
10"	250	9.92	252	33.00	838	33.00	838	33.13	841
12"	300	11.93	303	38.00	965	38.00	965	38.13	968
14"	350	12.67	322	40.50	1029	40.50	1029	40.88	1038
16"	400	14.69	373	44.50	1130	44.50	1130	44.88	1140
18"	450	16.65	423	48.00	1219	48.00	1219	48.50	1232
20"	500	18.54	471	52.00	1321	52.00	1321	52.50	1334

Class 900缩径

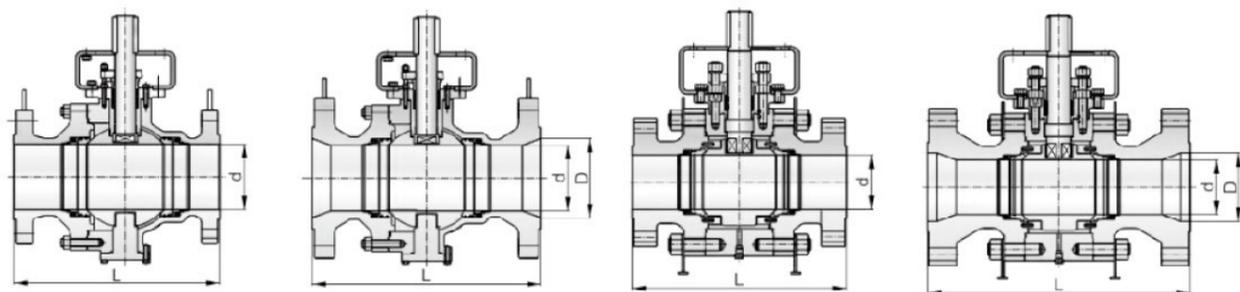
口径 Size		D		d		L					
in	mm	in	mm	in	mm	RF		BW		RTJ	
						in	mm	in	mm	in	mm
2" x1 1/2"	50x40	1.93	49	1.50	38	14.50	368	14.50	368	14.63	371
3" x2"	80x50	2.91	74	1.93	49	15.00	381	15.00	381	15.13	384
4" x3"	100x80	3.94	100	2.91	74	18.00	457	18.00	457	18.13	460
6" x4"	150x100	5.91	150	3.94	100	24.00	610	24.00	610	24.13	613
8" x6"	200x150	7.91	201	5.91	150	29.00	737	29.00	737	29.13	740
10" x8"	250x200	9.92	252	7.91	201	33.00	838	33.00	838	33.13	841
12" x10"	300x250	11.93	303	9.92	252	38.00	965	38.00	965	38.13	968
14" x10"	350x250	12.67	322	9.92	252	40.50	1029	40.50	1029	40.88	1038
16" x12"	400x300	14.69	373	11.93	303	44.50	1130	44.50	1130	44.88	1140
18" x14"	450x350	16.65	423	12.67	322	48.00	1219	48.00	1219	48.50	1232
20" x16"	500x400	18.54	471	14.69	373	52.00	1321	52.00	1321	52.50	1334

注：表格 L 栏中，RF 表示凸面法兰结构长度，BW 表示焊接结构长度，RTJ 表示环连接形式结构长度。
Note: In column L, RF represents raised face flange, and BW represents butt weld, and RTJ represents ring type joint.

固定球阀

TRUNNION MOUNTED BALL VALVE

主要外形尺寸 Main Dimensions



Class 1500全口径

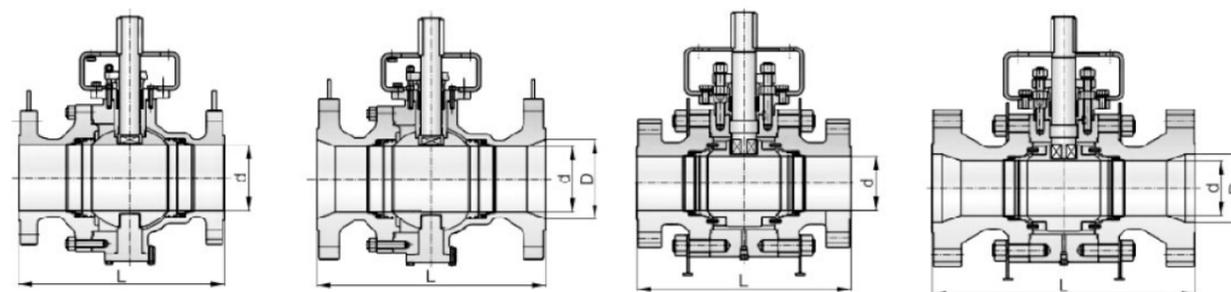
口径 Size		D		L					
in	mm	in	mm	RF		BW		RTJ	
				in	mm	in	mm	in	mm
2"	50	1.93	49	14.50	368	14.50	368	14.63	371
3"	80	2.91	74	18.50	470	18.50	470	15.63	473
4"	100	3.94	100	21.50	546	21.50	546	21.63	549
6"	150	5.67	144	27.75	705	27.75	705	28.00	711
8"	200	7.55	192	32.75	832	32.75	832	33.13	841
10"	250	9.41	239	39.00	991	39.00	991	39.38	1000
12"	300	11.30	287	44.50	1130	44.50	1130	45.13	1146
14"	350	12.40	315	49.50	1257	49.50	1257	50.25	1276
16"	400	14.17	360	54.50	1384	54.50	1384	55.38	1407
18"	450	15.98	406	60.50	1537	60.50	1537	61.38	1559
20"	500	17.87	454	65.50	1664	65.50	1664	66.38	1686

Class 1500缩径

口径 Size		D		d		L					
in	mm	in	mm	in	mm	RF		BW		RTJ	
						in	mm	in	mm	in	mm
2" x1 1/2"	50x40	1.93	49	1.50	38	14.50	368	14.50	368	14.63	371
3" x2"	80x50	2.91	74	1.93	49	18.50	470	18.50	470	18.63	473
4" x3"	100x80	3.94	100	2.91	74	21.50	546	21.50	546	21.63	549
6" x4"	150x100	5.67	144	3.94	100	27.75	705	27.75	705	28.00	711
8" x6"	200x150	7.55	192	5.67	144	32.75	832	32.75	832	33.13	841
10" x8"	250x200	9.41	239	7.55	192	39.00	991	39.00	991	39.38	1000
12" x10"	300x250	11.30	287	9.41	239	44.50	1130	44.50	1130	45.13	1146
14" x10"	350x250	12.40	315	9.41	239	49.50	1257	49.50	1257	50.25	1276
16" x12"	400x300	14.17	360	11.30	287	54.50	1384	54.50	1384	55.38	1407
18" x14"	450x350	15.98	406	12.40	315	60.50	1537	60.50	1537	61.38	1559
20" x16"	500x400	17.87	454	14.17	360	65.50	1664	65.50	1664	66.38	1686

注：表格 L 栏中，RF 表示凸面法兰结构长度，BW 表示焊接结构长度，RTJ 表示环连接形式结构长度。
Note: In column L, RF represents raised face flange, and BW represents butt weld, and RTJ represents ring type joint.

主要外形尺寸 Main Dimensions



Class 2500全口径

口径 Size		D		L					
in	mm	in	mm	RF		BW		RTJ	
				in	mm	in	mm	in	mm
2"	50	1.65	42	17.75	451	17.75	451	17.88	454
3"	80	2.44	62	22.75	578	22.75	578	23.00	584
4"	100	3.42	87	26.50	673	26.50	673	26.88	683
6"	150	5.16	131	36.00	914	36.00	914	36.50	927
8"	200	7.04	179	40.25	1022	40.25	1022	40.88	1038
10"	250	8.78	223	50.00	1270	50.00	1270	50.88	1292
12"	300	10.43	265	56.00	1422	56.00	1422	56.88	1445

Class 2500缩径

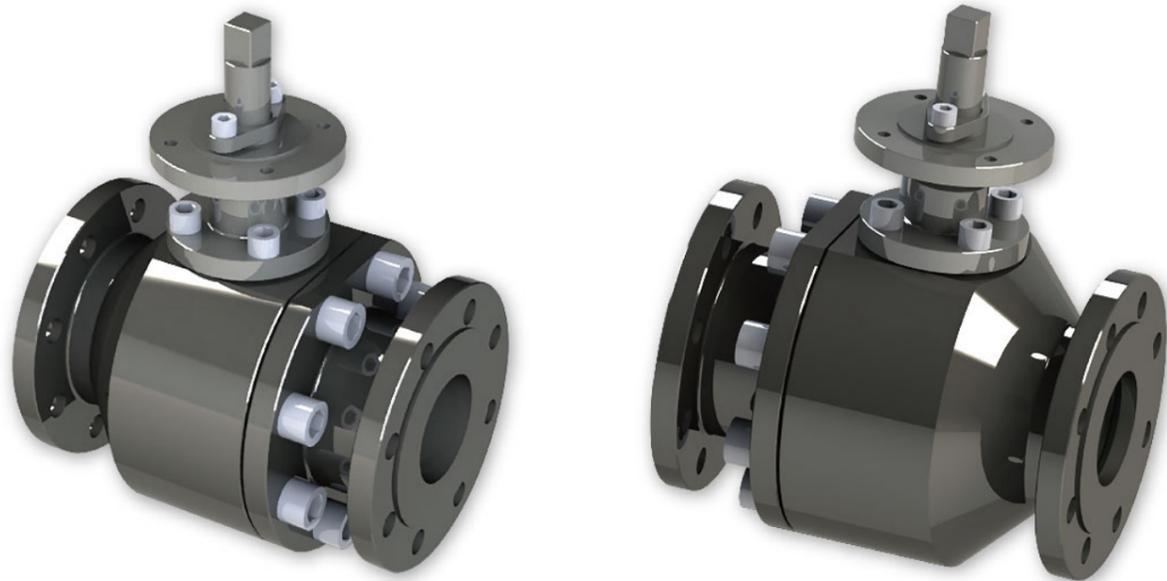
口径 Size		D		d		L					
in	mm	in	mm	in	mm	RF		BW		RTJ	
						in	mm	in	mm	in	mm
2" x1 1/2"	50x40	1.65	42	1.50	38	17.75	451	17.75	451	17.88	454
3" x2"	80x50	2.44	62	1.65	42	22.75	578	22.75	578	23.00	584
4" x3"	100x80	3.42	87	2.44	62	26.50	673	26.50	673	26.88	683
6" x4"	150x100	5.16	131	3.42	87	36.00	914	36.00	914	36.50	927
8" x6"	200x150	7.04	179	5.16	131	40.25	1022	40.25	1022	40.88	1038
10" x8"	250x200	8.78	223	7.04	179	50.00	1270	50.00	1270	50.88	1292
12" x10"	300x250	10.43	265	8.78	223	56.00	1422	56.00	1422	56.88	1445

注：表格 L 栏中，RF 表示凸面法兰结构长度，BW 表示焊接结构长度，RTJ 表示环连接形式结构长度。
Note: In column L, RF represents raised face flange, and BW represents butt weld, and RTJ represents ring type joint.

固定式硬密封特硬球阀说明

DESCRIPTION OF FIXED HARD SEAL EXTRA HARD BALL VALVE

两片式特硬球阀设计三维图



序号	名称	数量	材料
1	球体	1	PTFE
2	球座	2	PTFE
3	球杆	1	316L
4	球杆螺母	1	316L
5	球杆垫圈	1	316L
6	球杆密封套	1	PTFE
7	球杆密封套螺母	1	316L
8	球杆密封套垫圈	1	316L
9	球杆密封套密封环	1	PTFE
10	球杆密封套密封环螺母	1	316L
11	球杆密封套密封环垫圈	1	316L
12	球杆密封套密封环密封环	1	PTFE
13	球杆密封套密封环密封环螺母	1	316L
14	球杆密封套密封环密封环垫圈	1	316L
15	球杆密封套密封环密封环密封环	1	PTFE
16	球杆密封套密封环密封环螺母	1	316L
17	球杆密封套密封环密封环垫圈	1	316L
18	球杆密封套密封环密封环密封环	1	PTFE
19	球杆密封套密封环密封环螺母	1	316L
20	球杆密封套密封环密封环垫圈	1	316L
21	球杆密封套密封环密封环密封环	1	PTFE
22	球杆密封套密封环密封环螺母	1	316L
23	球杆密封套密封环密封环垫圈	1	316L
24	球杆密封套密封环密封环密封环	1	PTFE
25	球杆密封套密封环密封环螺母	1	316L
26	球杆密封套密封环密封环垫圈	1	316L
27	球杆密封套密封环密封环密封环	1	PTFE
28	球杆密封套密封环密封环螺母	1	316L
29	球杆密封套密封环密封环垫圈	1	316L
30	球杆密封套密封环密封环密封环	1	PTFE
31	球杆密封套密封环密封环螺母	1	316L
32	球杆密封套密封环密封环垫圈	1	316L
33	球杆密封套密封环密封环密封环	1	PTFE
34	球杆密封套密封环密封环螺母	1	316L
35	球杆密封套密封环密封环垫圈	1	316L
36	球杆密封套密封环密封环密封环	1	PTFE
37	球杆密封套密封环密封环螺母	1	316L
38	球杆密封套密封环密封环垫圈	1	316L
39	球杆密封套密封环密封环密封环	1	PTFE
40	球杆密封套密封环密封环螺母	1	316L
41	球杆密封套密封环密封环垫圈	1	316L
42	球杆密封套密封环密封环密封环	1	PTFE
43	球杆密封套密封环密封环螺母	1	316L
44	球杆密封套密封环密封环垫圈	1	316L
45	球杆密封套密封环密封环密封环	1	PTFE
46	球杆密封套密封环密封环螺母	1	316L
47	球杆密封套密封环密封环垫圈	1	316L
48	球杆密封套密封环密封环密封环	1	PTFE
49	球杆密封套密封环密封环螺母	1	316L
50	球杆密封套密封环密封环垫圈	1	316L
51	球杆密封套密封环密封环密封环	1	PTFE
52	球杆密封套密封环密封环螺母	1	316L
53	球杆密封套密封环密封环垫圈	1	316L
54	球杆密封套密封环密封环密封环	1	PTFE
55	球杆密封套密封环密封环螺母	1	316L
56	球杆密封套密封环密封环垫圈	1	316L
57	球杆密封套密封环密封环密封环	1	PTFE
58	球杆密封套密封环密封环螺母	1	316L
59	球杆密封套密封环密封环垫圈	1	316L
60	球杆密封套密封环密封环密封环	1	PTFE
61	球杆密封套密封环密封环螺母	1	316L
62	球杆密封套密封环密封环垫圈	1	316L
63	球杆密封套密封环密封环密封环	1	PTFE
64	球杆密封套密封环密封环螺母	1	316L
65	球杆密封套密封环密封环垫圈	1	316L
66	球杆密封套密封环密封环密封环	1	PTFE
67	球杆密封套密封环密封环螺母	1	316L
68	球杆密封套密封环密封环垫圈	1	316L
69	球杆密封套密封环密封环密封环	1	PTFE
70	球杆密封套密封环密封环螺母	1	316L
71	球杆密封套密封环密封环垫圈	1	316L
72	球杆密封套密封环密封环密封环	1	PTFE
73	球杆密封套密封环密封环螺母	1	316L
74	球杆密封套密封环密封环垫圈	1	316L
75	球杆密封套密封环密封环密封环	1	PTFE
76	球杆密封套密封环密封环螺母	1	316L
77	球杆密封套密封环密封环垫圈	1	316L
78	球杆密封套密封环密封环密封环	1	PTFE
79	球杆密封套密封环密封环螺母	1	316L
80	球杆密封套密封环密封环垫圈	1	316L
81	球杆密封套密封环密封环密封环	1	PTFE
82	球杆密封套密封环密封环螺母	1	316L
83	球杆密封套密封环密封环垫圈	1	316L
84	球杆密封套密封环密封环密封环	1	PTFE
85	球杆密封套密封环密封环螺母	1	316L
86	球杆密封套密封环密封环垫圈	1	316L
87	球杆密封套密封环密封环密封环	1	PTFE
88	球杆密封套密封环密封环螺母	1	316L
89	球杆密封套密封环密封环垫圈	1	316L
90	球杆密封套密封环密封环密封环	1	PTFE
91	球杆密封套密封环密封环螺母	1	316L
92	球杆密封套密封环密封环垫圈	1	316L
93	球杆密封套密封环密封环密封环	1	PTFE
94	球杆密封套密封环密封环螺母	1	316L
95	球杆密封套密封环密封环垫圈	1	316L
96	球杆密封套密封环密封环密封环	1	PTFE
97	球杆密封套密封环密封环螺母	1	316L
98	球杆密封套密封环密封环垫圈	1	316L
99	球杆密封套密封环密封环密封环	1	PTFE
100	球杆密封套密封环密封环螺母	1	316L

一种硬密封固定式球阀—实用新型专利

设计：余维章

工艺：余维章

重量：余维章

一种硬密封固定式球阀 -- 实用新型专利

球阀是管道中常用的阀门之一。随着市场发展，有些管道内的流体为粉体和颗粒，并且特别硬。对球阀就有新的更高的要求，传统球阀的结构和材质不能满足使用要求。比如半导体行业的多晶硅粉和化工行业的硬质粉体，这些粉体是混合在气体或者液体中在管道内输送。传统结构的国产球阀使用寿命最多3个月，进口球阀使用寿命最多8个月。

本实用新型产品的设计，具有更强的密封性，更合理的内部结构设计，更硬的材质处理工艺。投放市场后，客户给予了极高的赞誉和评价。

权利范围：

1. 阀座靠蝶形弹簧的推力，与球体保持随动的密封推力，保证良好的密封性。
2. 蝶形弹簧的两边有两道以上的密封圈和迷宫密封结构，保证阀门管道流通的物料，不会进入弹簧位置，从而保证弹簧具有耐久的功能。
3. 球体的上下，有板式球座，保证球的位置度精准。并有耐磨润滑套，保证球体转动的灵活。
4. 阀杆和球之间的连接，采用花键连接或圆柱销连接，保证连接传动的最大有效性。
5. 阀杆下端设计有台阶，利用密封结构和阀盖，压紧密封。既保证了密封的良好，又防止阀杆脱出的功能。6. 阀体上部采用了两段式密封组件，一段为阀体段密封，一段为阀杆段密封。
7. 本球阀的内部结构设计，使得球体与阀体之间的间隙最大可能的减小。在阀门动作时，不容易积料。从而保证阀门的耐用性。
8. 球体和阀座，加工研磨后，做碳化钨镀层，做一级提高球体和阀座的硬度；然后再做金刚石与合金钢的混合特硬涂层为二级提高表面硬度处理。从而保证阀门有极高的硬度和耐磨性。

固定式硬密封特硬球阀说明

DESCRIPTION OF FIXED HARD SEAL EXTRA HARD BALL VALVE

