

Q41TC 陶瓷球阀

Q41TC Ceramic Ball Valve

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开维喜阀门集团有限公司
Kaiweixi Valve Group Co., Ltd.

Q41TC 陶瓷球阀

型号: Q41TC-10/16

公称压力: PN10, PN16

适用温度: $\leq 425^{\circ}\text{C}$

连接方式: 法兰

其他参数: 制造标准按 GB/T 12237

规格: DN15-DN200

适用介质: 硅粉、煤粉、粉状颗粒、盐酸等腐蚀性介质

阀体材质: 铸钢+陶瓷、不锈钢+陶瓷

驱动方式: 手动、气动、电动

Q41TC Ceramic Ball Valve

Model: Q41TC-10/16

Specifications: DN15-DN200

Nominal Pressure: PN10, PN16

Applicable Media: Corrosive media such as silicon powder, coal powder, powdered particles, hydrochloric acid, etc

Applicable Temperature: $\leq 425^{\circ}\text{C}$

Body Material: Cast steel + ceramic, Stainless steel + ceramic

End Connection : Flange

Operation: Manual, pneumatic, electric

Other Parameters: Manufacturing standard according to GB/T 12237.

Q41TC 陶瓷球阀概述

Q41TC 陶瓷球阀是一种采用特种工程陶瓷作为关键部件材料的耐磨耐腐型球阀。其球体、阀座及阀体内腔过流表面通常采用氧化铝、氧化锆或碳化硅等高性能陶瓷材料，具备极高的硬度与化学惰性。阀门采用法兰连接和固定球或浮动球结构，通过球体 90 度旋转实现启闭，专为应对极端恶劣的工况而设计。适用于火力发电、矿山冶金、化工、煤化工及污水处理等行业，能有效控制含有硬质颗粒、纤维的浆液或强腐蚀、高磨损性介质，提供长寿命的可靠密封与截断功能。

Q41TC Ceramic Ball Valve Overview

Q41TC ceramic ball valve is a wear-resistant and corrosion-resistant ball valve that uses special engineering ceramics as the key component material. The flow surface of its sphere, valve seat, and valve body cavity is usually made of high-performance ceramic materials such as alumina, zirconia, or silicon carbide, which have extremely high hardness and chemical inertness. The valve adopts flange connection and fixed ball or floating ball structure, which can be opened and closed by rotating the ball 90 degrees. It is designed to cope with extremely harsh working conditions. Suitable for industries such as thermal power generation, mining and metallurgy, chemical industry, coal chemical industry, and sewage treatment, it can effectively control slurries containing hard particles and fibers or strongly corrosive and highly abrasive media, providing reliable sealing and cutting functions with long service life.



Q41TC 陶瓷球阀产品图
Q41TC Ceramic Ball Valve Product Image

Q41TC 陶瓷球阀特点

1. 卓越的耐磨与耐腐蚀性能：关键部件采用高硬度、高耐磨性的结构陶瓷材料，其硬度仅次于金刚石，能有效抵抗固体颗粒的冲刷磨损，同时对大多数酸、碱、盐等腐蚀性介质具有优异的耐腐蚀性。
2. 长寿命与高可靠性：陶瓷材料极低的磨损率显著延长了阀门在恶劣工况下的使用寿命，减少了维护频率和更换成本，提高了系统运行的连续性与可靠性。
3. 稳定的密封性能：采用陶瓷对陶瓷的硬密封或陶瓷与柔性材料的组合密封，密封面精度高，即使在含有细微颗粒的介质中也能保持良好的密封效果，泄漏等级高。
4. 广泛的工况适应性：能够承受较高的操作温度（视具体陶瓷材料而定），适用于从低温到高温的广泛温度范围。其设计兼顾了耐压与耐磨损的双重要求。
5. 维护相对简便：尽管陶瓷部件硬度高，但针对磨损问题，部分设计支持便捷的在线或离线维护与部件更换。阀门结构兼顾了陶瓷的脆性特点，通常具备防爆保护措施。

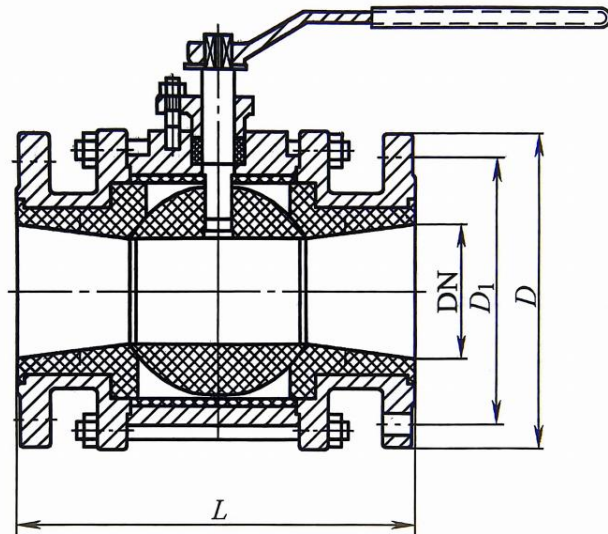
Q41TC Ceramic Ball Valve Features

1. Excellent wear and corrosion resistance: The key components are made of high hardness and high wear resistant structural ceramic materials, which are second only to diamond in hardness and can effectively resist the erosion and wear of solid particles. At the same time, they have excellent corrosion resistance to most corrosive media such as acids, alkalis, and salts.
2. Long life and high reliability: The extremely low wear rate of ceramic materials significantly extends the service life of valves under harsh working conditions, reduces maintenance frequency and replacement costs, and improves the continuity and reliability of system operation.
3. Stable sealing performance: Using ceramic to ceramic hard sealing or a combination of ceramic and flexible materials for sealing, the sealing surface accuracy is high, and it can maintain good sealing effect

even in media containing fine particles, with high leakage level.

4. Wide adaptability to working conditions: able to withstand high operating temperatures (depending on the specific ceramic material), suitable for a wide temperature range from low to high temperatures. Its design takes into account the dual requirements of pressure resistance and wear resistance.

5. Relatively easy maintenance: Although ceramic components have high hardness, some designs support convenient online or offline maintenance and component replacement for wear issues. The valve structure takes into account the brittle characteristics of ceramics and usually has explosion-proof protection measures.



Q41TC 陶瓷球阀结构图

Q41TC Ceramic Ball Valve Structure Diagram

零部件名称材料表

Parts Name Material List

序号 NO.	名称 Name	材料 Material
1	阀体 Body	碳钢、不锈钢 Carbon steel, stainless steel
2	球体 Ball	工程陶瓷 engineering ceramics
3	密封圈 sealing ring	工程陶瓷 engineering ceramics
4	填料 packing	柔性石墨 graphite、PTFE
5	阀杆 Stem	2Cr13、不锈钢 stainless steel

性能规范表 Performance Specification

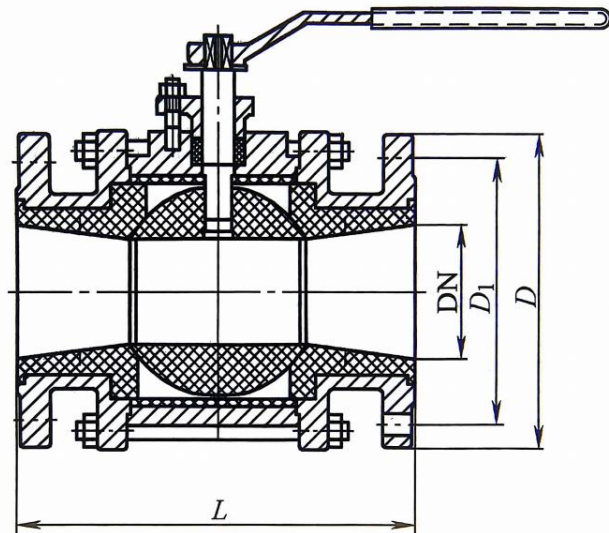
公称压力 Nominal Pressure	1.0/1.6	Mpa
强度试验压力 Shell Test	1.5/2.4	
密封试验压力 Seal Test	1.1/1.76	
适用温度 Suitable Temp.	≤425	℃

外形尺寸标准要求

1、阀门的结构长度按 GB/T 12221 的标准

Dimensions Standard Requirements

1. The structural length of the valve shall conform to the standard GB/T 12221.
2. The connecting flange shall conform to the standard GB/T 9113.



Q41TC 陶瓷球阀外形图
Q41TC Ceramic Ball Valve View Drawing

Q41TC 陶瓷球阀外形尺寸表

Q41TC Ceramic Ball Valve Dimensions Table

型号 Model	尺寸 Size	公称尺寸 DN					
		15	20	25	32	40	50
Q41Tc-10C	L	130	140	150	165	180	200
	D	95	105	115	140	150	165
	D1	65	75	85	100	110	125
Q41Tc-16C	L	130	140	150	165	180	200
	D	95	105	115	140	150	165
	D1	65	75	85	100	110	125
型号 Model	尺寸 Size	公称尺寸 DN					
		65	80	100	125	150	200
Q41Tc-10C	L	220	250	280	320	360	400
	D	185	200	220	250	285	340
	D1	145	160	180	210	240	295
Q41Te-16C	L	220	250	280	320	360	400
	D	185	200	220	250	285	340
	D1	145	160	180	210	240	295

Q41TC 陶瓷球阀安装、使用与维护说明书

安装指南

1. 安装前准备：核对阀门型号、压力等级及法兰标准是否符合管路要求。彻底清理管道内焊渣、硬质颗粒等异物，防止安装时划伤陶瓷密封面。检查阀门，确认陶瓷件无运输造成的裂纹或崩边。
2. 吊装与搬运：必须轻吊轻放，避免任何形式的猛烈撞击或敲打。不可将吊绳直接套挂在阀杆或执行机构上，应使用阀体吊耳或通过阀体本身平稳起吊。
3. 对中与连接：安装时确保阀门法兰与管道法兰准确对中，平行插入。使用材质合适的垫片，按对角线顺序分步、均匀地拧紧连接螺栓，力矩值需符合规范，确保应力均匀，防止陶瓷部件因单侧受力而破裂。
4. 操作空间与支撑：阀门应安装在便于操作和维护的位置。对于大口径阀门，管道系统应提供适当支撑，以消除管线应力对阀体结构的直接影响。
5. 系统测试：系统压力试验前，建议将阀门部分开启。试压介质应清洁，不含固体颗粒，压力需缓慢升高，避免压力冲击损坏陶瓷密封面。

使用操作

1. 启闭操作：操作手柄、齿轮箱或执行器时，应平稳施力，进行 90 度旋转。切忌急速、猛烈的开关动作，以防止产生水击或机械冲击损伤陶瓷件。遇到异常阻力应立即停止操作并检查。
2. 状态确认：通过手柄位置（与管线平行通常为开，垂直为关）或执行器指示器明确阀门开关状态。
3. 适用工况：本阀门专为磨损、腐蚀性介质设计，尤其适用于含颗粒浆液的截断。严禁用于节流调节，以避免介质高速冲刷导致陶瓷密封面过早损坏。
4. 定期动作：若阀门长期处于固定位置，建议定期进行全行程开关操作数次，以防止颗粒沉积卡滞阀座。

维护保养

1. 定期检查：定期检查法兰连接处有无外漏，阀杆填料处是否渗漏。观察阀门外部有无异常损伤或腐蚀。
2. 清洗注意事项：当需要清洗阀门内部时，应使用软质工具和中性清洗剂，严禁使用金属工具刮擦或撞击陶瓷表面。
3. 内漏处理：若阀门出现关闭不严，首先尝试多次全开全关操作，利用介质冲洗密封面可能附着的颗粒。若无效，则需隔离管路，拆解阀门检查陶瓷球体与阀座密封面。轻微损伤可由专业厂家研磨修复，严重破损需整体更换陶瓷密封副。
4. 拆卸维修：任何维修前必须确认系统已完全隔离、泄压。拆卸时务必小心，标记零件位置。由于陶瓷材料的特性，非专业技术人员请勿尝试拆卸或修理核心陶瓷组件。
5. 储存：备用阀门应存放于干燥环境，法兰端口需加盖保护。长期储存期间，建议定期手动操作阀杆，保持机构灵活性。

Q41TC Ceramic Ball Valve Installation, Use and Maintenance Manual

Installation Guide

1. Preparation before installation: Check whether the valve model, pressure rating, and flange standard meet the pipeline requirements. Thoroughly clean the welding slag, hard particles and other foreign objects inside the pipeline to prevent scratching the ceramic sealing surface during installation. Check the valve and confirm that the ceramic parts have no cracks or broken edges caused by transportation.
2. Lifting and handling: It must be lifted and placed gently to avoid any form of violent impact or knocking. It is not allowed to directly hang the lifting rope on the valve stem or actuator. The valve body lifting ear or the valve body itself should be used for smooth lifting.
3. Alignment and Connection: During installation, ensure that the valve flange is accurately aligned with the pipeline flange and inserted parallel. Use suitable gaskets and tighten the connecting bolts in diagonal order step by step and evenly. The torque value should comply with the specifications to ensure uniform stress and prevent ceramic components from cracking due to one-sided stress.
4. Operating space and support: Valves should be installed in a location that is easy to operate and maintain. For large-diameter valves, the pipeline system should provide appropriate support to eliminate the direct impact of pipeline stress on the valve body structure.
5. System testing: Before conducting the system pressure test, it is recommended to partially open the valve. The pressure test medium should be clean and free of solid particles. The pressure should be slowly increased to avoid damage to the ceramic sealing surface caused by pressure impact.

Usage and Operation

1. Opening and closing operation: When operating the handle, gearbox, or actuator, apply force smoothly and rotate 90 degrees. Avoid rapid and violent switching actions to prevent damage to ceramic parts from water or mechanical impact. If encountering abnormal resistance, the operation should be stopped immediately and checked.
2. Status confirmation: Clearly indicate the valve switch status through the handle position (usually open when parallel to the pipeline and closed when perpendicular) or actuator indicator.
3. Applicable working conditions: This valve is designed specifically for wear and corrosive media, especially for cutting off slurry containing particles. It is strictly prohibited to use it for throttling adjustment to avoid premature damage to the ceramic sealing surface caused by high-speed flushing of the medium.
4. Regular action: If the valve is in a fixed position for a long time, it is recommended to perform full stroke switch operations several times on a regular basis to prevent particle deposition from sticking to the valve seat.

maintenance

1. Regular inspection: Regularly check whether there is any leakage at the flange connection and whether there is any leakage at the valve stem packing. Observe the exterior of the valve for any abnormal damage or corrosion.
2. Cleaning precautions: When cleaning the inside of the valve, soft tools and neutral cleaning agents should be used. It is strictly prohibited to use metal tools to scratch or impact the ceramic surface.
3. Internal leakage treatment: If the valve is not tightly closed, first try multiple full open and full close operations, and use the medium to flush any particles that may adhere to the sealing surface. If it is ineffective, isolate the pipeline and disassemble the valve to check the sealing surface between the ceramic ball and the valve seat. Minor damage can be repaired by professional manufacturers through grinding, while severe damage requires the replacement of the ceramic sealing pair as a whole.

4. Disassembly and maintenance: Before any maintenance, it is necessary to confirm that the system has been completely isolated and depressurized. Be careful when disassembling and mark the position of the parts. Due to the characteristics of ceramic materials, non professional technicians should not attempt to disassemble or repair core ceramic components.

5. Storage: Backup valves should be stored in a dry environment, and flange ports should be covered for protection. During long-term storage, it is recommended to manually operate the valve stem regularly to maintain the flexibility of the mechanism.

非常感谢您的阅读！

Thank you very much for reading!

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