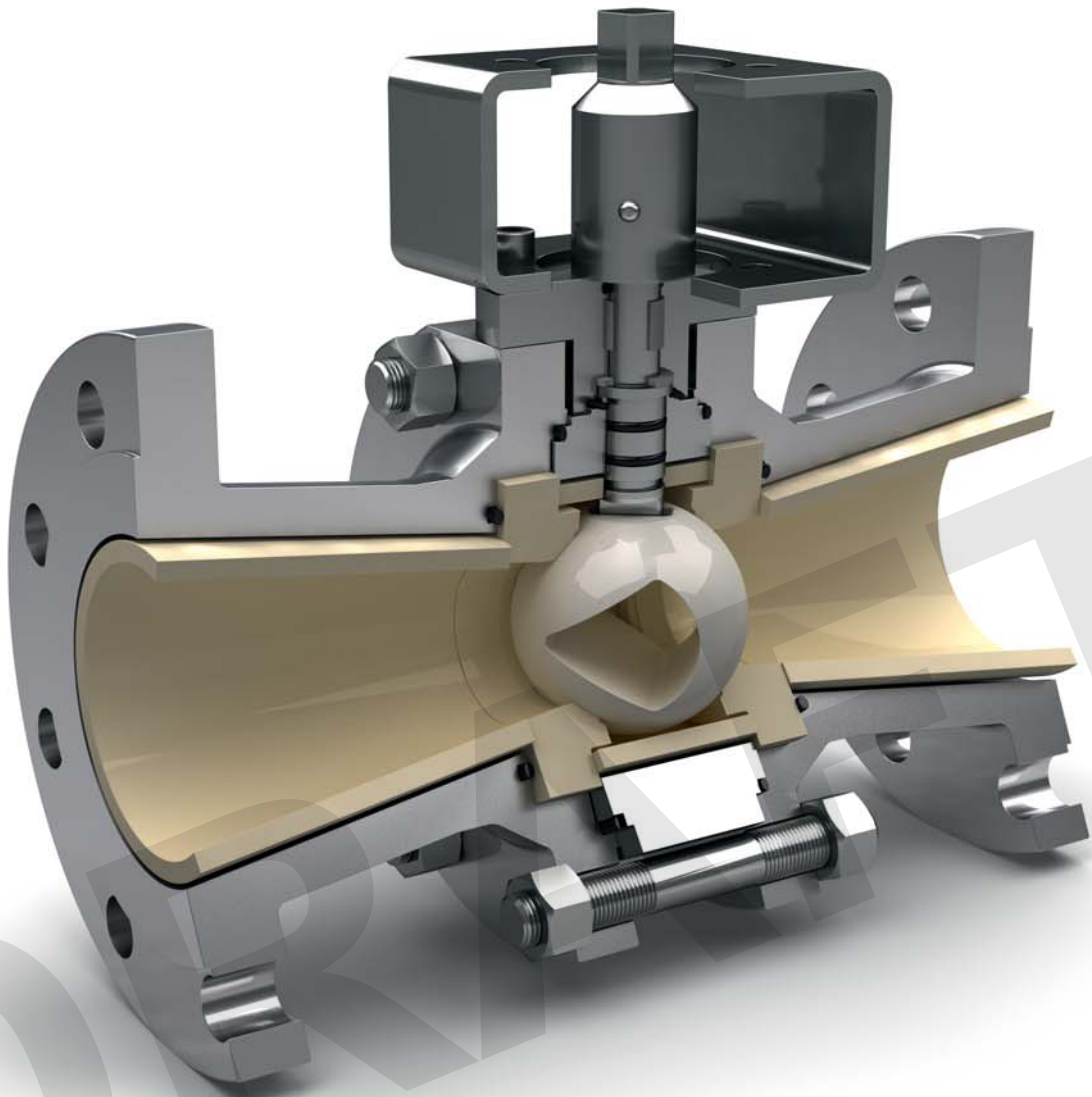


**CERA SYSTEM**®

✓ more than ceramics



**CERA VALVE**®

## WEAR AND CORROSION RESISTANT BALL VALVES



## Wear protection in the toughest operating conditions

2

Conventional materials in valves reach their limits in many industrial areas. Entirely new perspectives often arise when ceramic high-performance materials are used.

Ceramics can be deployed to an advantage everywhere where wear and corrosion

resistance and high temperature stability are needed.

There is a comprehensive range of tried and tested standard products available to our customers. Many of our ceramic lined valves can be purchased cheaply and at short notice.

As the technological market leader for ceramic lined industrial valves and pipeline components, we continually open up new areas of application together with our customers.

Our range of services consists of the design, testing, production and delivery of such systems. An optimum customer service is in place thanks to our after sales service. Our system solutions enable a great economic benefit in many applications.

Due to the fact that our products are used in almost all industrial sectors, our application engineers are aware of the different problems and are also usually already aware of the solution.

Our standard products are designed for use in

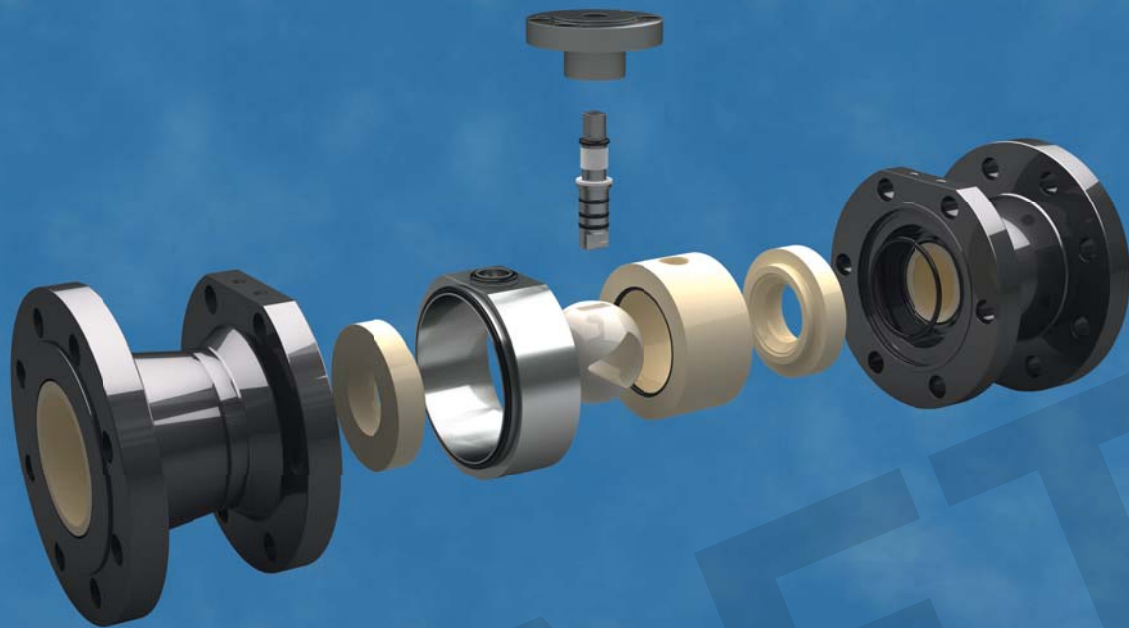
extreme conditions. If particular fields of application cannot be covered by our delivery programme, we develop new solutions in close cooperation with our customers.

In the valve sector, this includes:

- Valves with multiple protective casings
- Valves with blocking media
- Valves with heating and cooling casings
- Valves manufactured from characteristic material
- Multi-ported valves
- Sampling systems

Famous companies from all over the world trust our experience.





## TYPICAL APPLICATIONS



3

**COAL FIRED POWER PLANTS:** Flue gas desulphurisation plants (FGD): Lime milk and plaster suspension, process water with solid content

**STEEL WORKS:** Injection of carbon powder (PCI); Injection of carbon powder in electric arc furnaces (EAF); Raw iron desulphurisation (supply of additives: CaC, MgO<sub>2</sub>...)

**POLYSILICON:** Si<sub>3</sub>Cl<sub>4</sub>, TCS, raw silicon, splitting of silicon with acids, conveying of silicon powder ...

**WASTE INCINERATION PLANTS:** HCl - prewashers, limestone suspension for pH regeneration, corrosive washing water (HF loaded)

**PAPER & PULP/dye works:** Kaolin, bentonite, fillers, dyes, bleachers, talcum....

**Paper machine:** Pulp residue, lime suspension, MgO<sub>2</sub>, green liquor, wood particles in suspension...

**MINING:** Copper: Splitting of ore with H<sub>2</sub>SO<sub>4</sub>, copper residues in suspension, concentrated copper slurries ("floatation") to the filter, pneumatic conveying of copper powder to smeltery, air bleed valve on the pneumatic conveying container...

There are similar applications for **zinc** and other **noble metals**.

**PNEUMATIC CONVEYING:** All types of dry bulk material (quartz, silicon, lime, coal, glass, cement, PP pellets...)

**PETROCHEMISTRY:** FCC aluminium oxide powder as the catalyst, catalyst slurry...

**FERTILISER:** Ammonium nitrate slurry, phosphoric acid with solids (lime), dolomite, washing water with hydrofluoric acid content...

**CHEMISTRY: PIGMENTS:** TiO<sub>2</sub> suspension, Ti<sub>3</sub>Cl<sub>4</sub>, H<sub>2</sub>SO<sub>4</sub> + TiO<sub>2</sub>, FeCl<sub>2</sub>...

## BALL VALVE • SYSTEM OVERVIEW



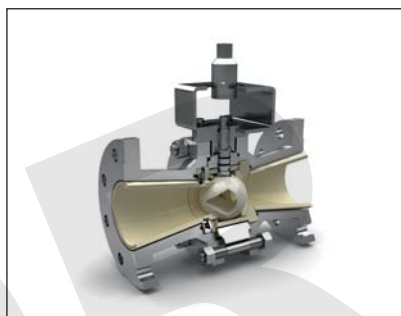
**KSV** The valve of the KSV type is a ceramic lined ball valve for the open / close function and the control tasks for corrosive media with solid content. It is an alternative to PTFE / PFA lined valves in the event that their performance limits (pressure, temperature, wear) are exceeded.

The seats are rigid (fixed), The ball has a defined clearance, it is pressed against the downstream seat by the differential pressure, sealing it.



**KST** The valve of the KST type is a ceramic lined ball valve for the open / close function and the control tasks for highly abrasive and corrosive media. It can be produced in all customary housing materials (e.g. stainless steel, Hastelloy, titanium, PVDF). Furthermore, special requirements (low / high working temperatures, TA-Luft [German Clean Air Act] and similar matters) can be taken into consideration.

The seats are rigid (fixed). The ball has a defined ball clearance, is pressed into the outlet seat by means of differential pressure and seals as a result.



**KAT** The valve of the KAT type is a ceramic lined ball valve for the open / close function and the control tasks for excessive abrasive and corrosive media. It can be produced in all customary housing materials (e.g. stainless steel, Hastelloy, titanium, Monel). Furthermore, special requirements (low / high working temperatures, TA-Luft [German Clean Air Act] and similar matters) can be taken into consideration.

The upstream seat is resilient. As a result, the ball has no clearance and always seals. Applications with low differential pressure and / or slow pressure build-up can be solved in this manner.



**KZT** The valve of the KZT type is a ceramic lined ball valve for the open / close function and the control tasks for excessive abrasive and corrosive media. It can be produced in all customary housing materials (e.g. stainless steel, Hastelloy, titanium, Monel). Furthermore, special requirements (low / high working temperatures, TA-Luft [German Clean Air Act] and similar matters) can be taken into consideration. Higher pressure differentials are possible due to the trunnion mounted ball. The seats are cushioned. The valve can be pressurised from both sides.

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### DESIGN:

Wear, corrosion and high-temperature resistant design

Three-part construction, therefore providing optimum adaptation to the operating conditions

### NOMINAL SIZE RANGE:

Flange connections from DN 15 up to DN 300 (1/2" up to 12")

Centre housing from DN 15 up to DN 150 (1/2" up to 6")

### PRESSURE RANGE:

PN 10 up to PN 63, ANSI class 150, class 300 and class 600

Other nominal pressure ranges on request

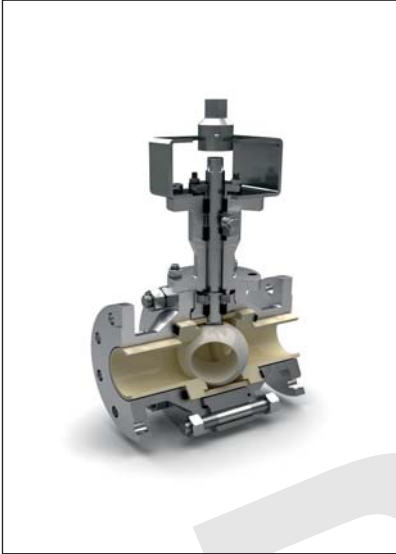
### TEMPERATURE:

-25 to +950 °C possible





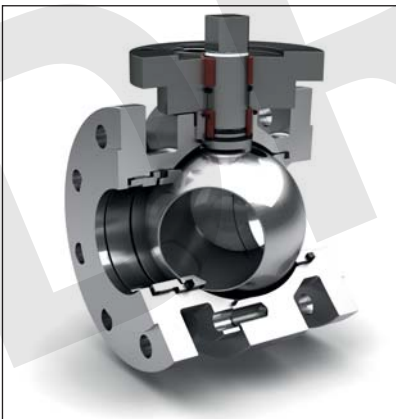
**KGT** The valve of the KGT type is a ceramic lined ball valve for the open / close function and the control tasks for excessive abrasive and corrosive media. It can be produced in all customary housing materials (e.g. stainless steel, Hastelloy, titanium, Monel). Furthermore, special requirements (low / high working temperatures, TA-Luft and similar matters) can be taken into consideration. Higher pressure differentials are possible due to the trunnion mounted ball. The valve only seals on one side. A "dead space" is avoided as a result. Therefore, the ball valve is particularly suitable for pneumatic transport.



**KST-HT** The valve of the KST-HT type is a ceramic lined ball valve for the open / close function and the control tasks for excessive abrasive and corrosive media in a temperature range of up to 550°C.

It can be produced in all customary housing materials (e.g. stainless steel, Hastelloy, titanium).

Special housing and ceramic materials permit special solutions of up to 950°C. The seats are rigid (fixed), The ball has a defined clearance, it is pressed against the downstream seat by the differential pressure, sealing it.



**KBR** The valve of the KBR type is a wear resistant ball valve for the open / close function for abrasive and excessive abrasive media, preferred for applications when pneumatically transporting bulk materials.

The sealing is carried out on a metallic basis. The seats can be optionally produced in ceramic.

Further versions with HT and TA Luft modifications such as disarmed light modifications are possible in consultation with our sales engineers. We are happy to advise you.

### TYPENCODIERUNG

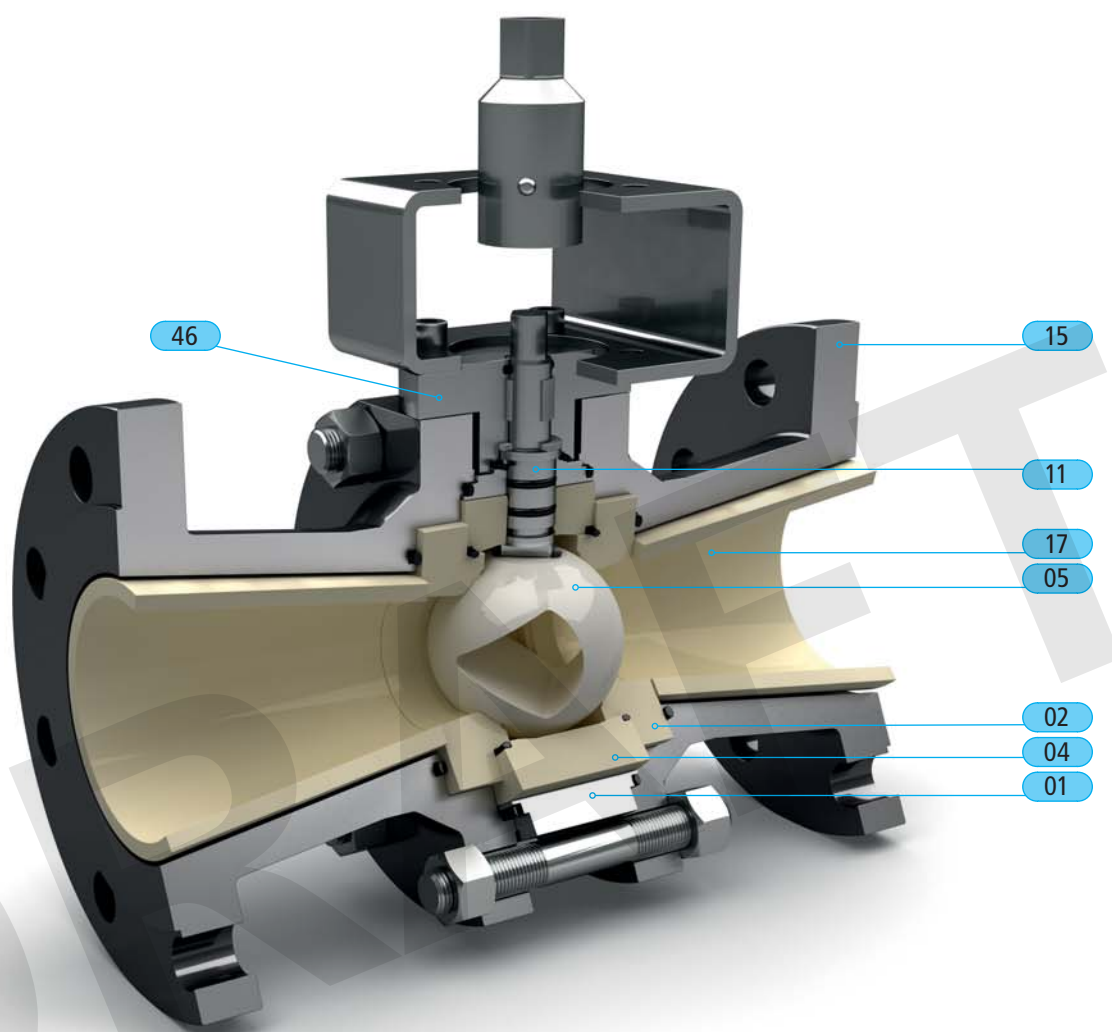
X	X	X	-	X	X	-	X	X	TYPE
K									Ball valve
	S								Floating ball
	A								Spring loaded seat
	Z								Trunnion mounted ball
	G								Granule version
		W							Full wear protection
		T							Partial wear protection
		L							Without wear protection (light)
		C							Chemistry design
				H	T				High temperature
							T	A	TA-Luft
K	B	R							Particularly robust design





## BALL VALVE • KSV

MATERIALS / MATERIAL OPTIONS:



D

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Item	Part description	Materials	Material options
01	Housing	1.4301	
02	Seat ring	Al <sub>2</sub> O <sub>3</sub>	Si <sub>3</sub> N <sub>4</sub> - SSiC
04	Ball socket	Al <sub>2</sub> O <sub>3</sub>	Si <sub>3</sub> N <sub>4</sub> - SSiC
05	Ball	ZrO <sub>2</sub>	Si <sub>3</sub> N <sub>4</sub> - WoC -2.4605
11	Stem shaft	2.4605	3.7035 - Tantal - ZrO <sub>2</sub>
15	Flange	C22.8 Halar	
17	Wear protection sleeve	Al <sub>2</sub> O <sub>3</sub>	Si <sub>3</sub> N <sub>4</sub> - SSiC
46	Bonnet flange	1.4301	
	O-rings	FKM(Viton)	FFKM (Kalrez)
	Seals	FKM(Viton)	PTFE
	Bearing bushes	PTFE	
	Screws / nuts	A2-/A4-70	

## FUNCTION:

The valve of the KSV type is a ceramic lined ball valve for the open / close function and the control tasks for use in excessive abrasive and corrosive media, preferred for suspensions.

The basic principle is based on a ball in a floating bearing. The seats are rigid (fixed), The ball has a defined clearance, it is pressed against the downstream seat by the differential pressure, sealing it. The turn movement of the ball between 0 and 90 ° releases an accurately defined opening cross-section.

The geometric shape of the ball bore impacts upon the function and control characteristic.

This ball valve is designed in three parts. Consequently, it can be adapted to existing pipelines and the flow and control characteristics can be optimised.

These valves are available with manual lever or gear box, as well as with pneumatic, electric and hydraulic actuators. The actuator is mounted by means of a yoke and adapter arrangement. All customary actuators can be used as part-turn valve actuators.

Special connections are possible.

## NOMINAL SIZE RANGE:

Flange connections DN 15 (1/2") up to DN 300 (12")

Centre housing: DN 15 (1/2") to DN 150 (6")

## PRESSURE RANGE:

PN 10 to PN 40

ANSI class 150 and class 300

Other nominal pressure ranges on request

## OVERALL LENGTH:

according to EN 558-1 Series 1+27

according to ASME / ANSI B 16.10 / EN 558-2 Series 37+38

## OPTIONS:

TA-Luft design

Wafer-type

Diverse ceramics, stem shafts and

Sealing materials

Chemistry design (KSC type)

## TEMPERATURE RANGE:

-30°C to + 160°C

## TYPICAL APPLICATION AREAS:

### Coal fired power plants: FGD

#### (flue gas desulphurisation plants)

- Lime milk dosing for the FGD washer
- Plaster suspension dosing for the hydrocyclone
- Process water regulation

### Waste incineration plants:

- Dosing of HCl washing water (prewasher)
- Dosing of the lime milk for the absorber (pH regulation, desulphurisation)

### Dye production:

- Dosing of TiO<sub>2</sub> suspension with sulphuric acid
- Diluted acid preparation

### Mining:

- Dosing of copper suspension with acid content

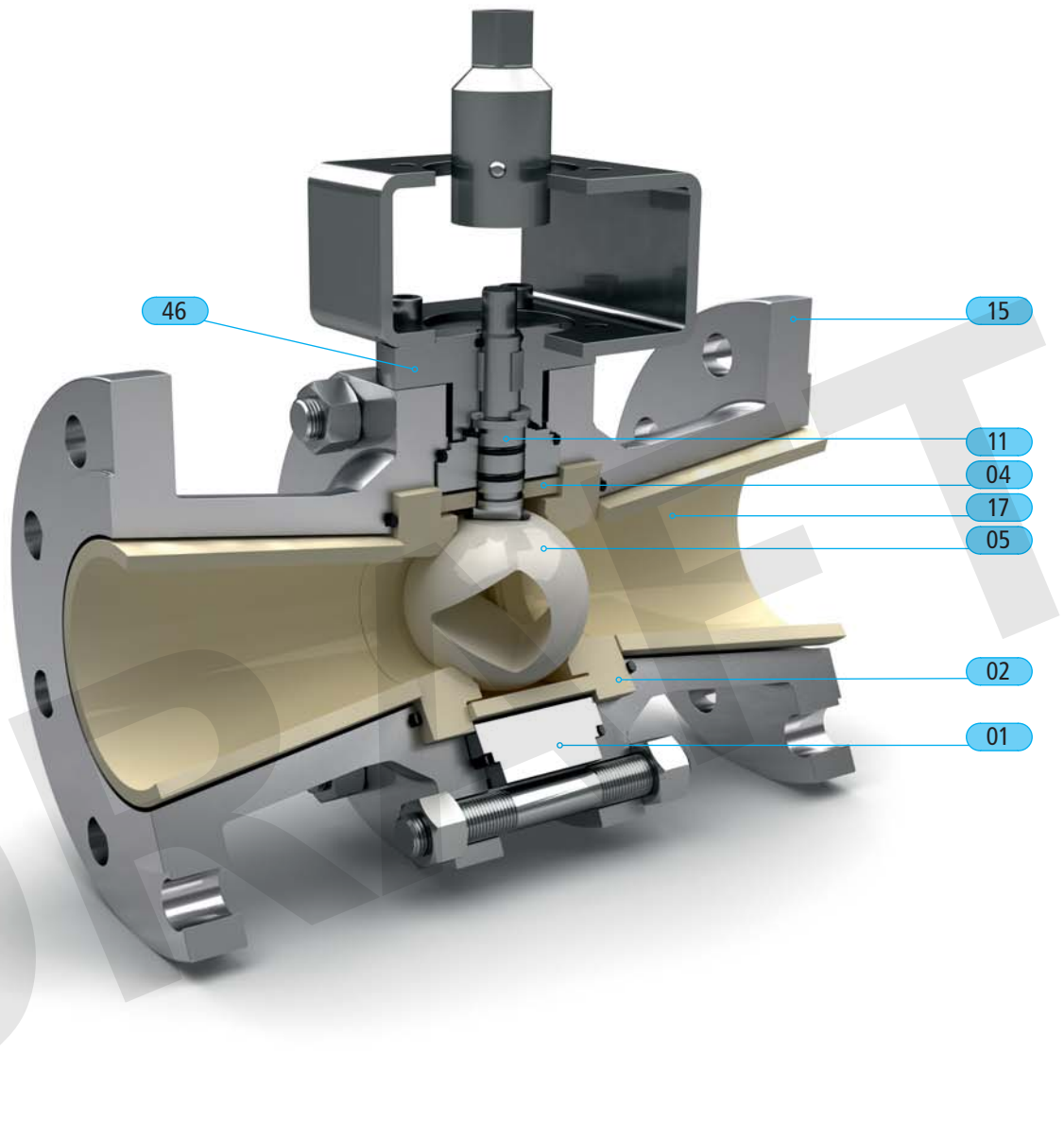
### Chemistry:

Alternatives to PTFE / PFA lined valves when the media is abrasive

Alternatives to valve manufactured from special materials (e.g. Hastelloy, titanium, etc.).

## BALL VALVE • KST

MATERIALS / MATERIAL OPTIONS:



Item	Part description	Materials	Material options
01	Housing	1.4301	1.4462 - 1.4571 - 1.4539 - C22.8 - PVDF - PP - 3.7035
02	Seat ring	Al <sub>2</sub> O <sub>3</sub>	Si <sub>3</sub> N <sub>4</sub> - SSiC -
04	Ball socket	Al <sub>2</sub> O <sub>3</sub>	Si <sub>3</sub> N <sub>4</sub> - SSiC
05	Ball	ZrO <sub>2</sub>	Si <sub>3</sub> N <sub>4</sub> - WoC - 2.4605 - 1.4112
11	Stem shaft	1.4462	3.7035 - Tantal - ZrO <sub>2</sub> - 2.4605
15	Flange	1.4301	1.4462 - 1.4571 - 1.4539 - C22.8 - PVDF - PP - 3.7035
17	Wear protection sleeve	Al <sub>2</sub> O <sub>3</sub>	Si <sub>3</sub> N <sub>4</sub> - SSiC
46	Bonnet flange	1.4301	1.4462 - 1.4571 - 1.4539 - C22.8 - 3.7035
	O-rings	FKM(Viton)	FFKM (Kalrez)
	Seals	FKM(Viton)	PTFE - Viton/FEP - graphite
	Bearing bushes	PTFE	
	Screws / nuts	A2-/A4-70	



## FUNCTION:

The valve of the type KST is a ball valve with ceramic lining for OPEN/CLOSE function and control tasks to be used in excessively abrasive and corrosive media. It is to be preferably used if special requirements are placed on the stem sealing, on the housing materials (PVDF, titanium) or if there are very high or very low operating temperatures and high pressures.

The basic principle is based on a ball in a floating bearing. The seats are rigid (fixed), The ball has a defined clearance and is pressed against the downstream seat by the differential pressure, sealing it. The turn movement of the ball between 0 and 90 ° releases an accurately defined opening cross-section. The geometric shape of the ball bore impacts upon the function and control characteristic. This ball valve is designed in three parts. Consequently, it can be adapted to existing pipelines and the flow and control characteristics can be optimised.

These valves are available with manual lever or gear box, as well as with pneumatic, electric and hydraulic actuators. The actuator is mounted by means of a yoke and adapter arrangement. All customary actuators can be used as part-turn valve actuators.

Special connections are possible.

## NOMINAL SIZE RANGE:

Flange connections DN 15 (1/2") up to DN 300 (12")

Centre housing: DN 15 (1/2") to DN 150 (6")

## PRESSURE RANGE:

PN 10 to PN 63

ANSI class 150, class 300, and class 600

Other nominal pressure ranges on request

## OVERALL LENGTH:

according to EN 558-1 Series 1+27

According to ASME / ANSI B16.10 / EN 558-2 Series 37+38

## OPTIONS:

all metallic materials for the housing

Plastic housing (e.g. PP or PVDF)

Fire-safe design

TA-Luft design

High temperature design (KST-HT type)

Wafer-type

Chemistry design (KSC type)

## TEMPERATURE RANGE:

Standard: -30°C to +180°C

Up to 310°C possible with Kalrez + graphite

## TYPICAL APPLICATION AREAS:

### Steel works:

- Control valve for coal injection (PCI)
- Expansion valve for coal silo
- Dosing of additive in  
Electric arc furnace (EAF): e.g. carbon powder
- Raw iron desulphurisation with CaC, SiO<sub>2</sub>, MgO<sub>2</sub>  
...
- Slag formation with quartz sand

### Paper & pulp:

- Control valve for lime slurry
- Control valve for Kaolin, talcum, pulp with wood residue...

### Chemistry: (with PVDF housing)

- Solid-containing media with a low pH value

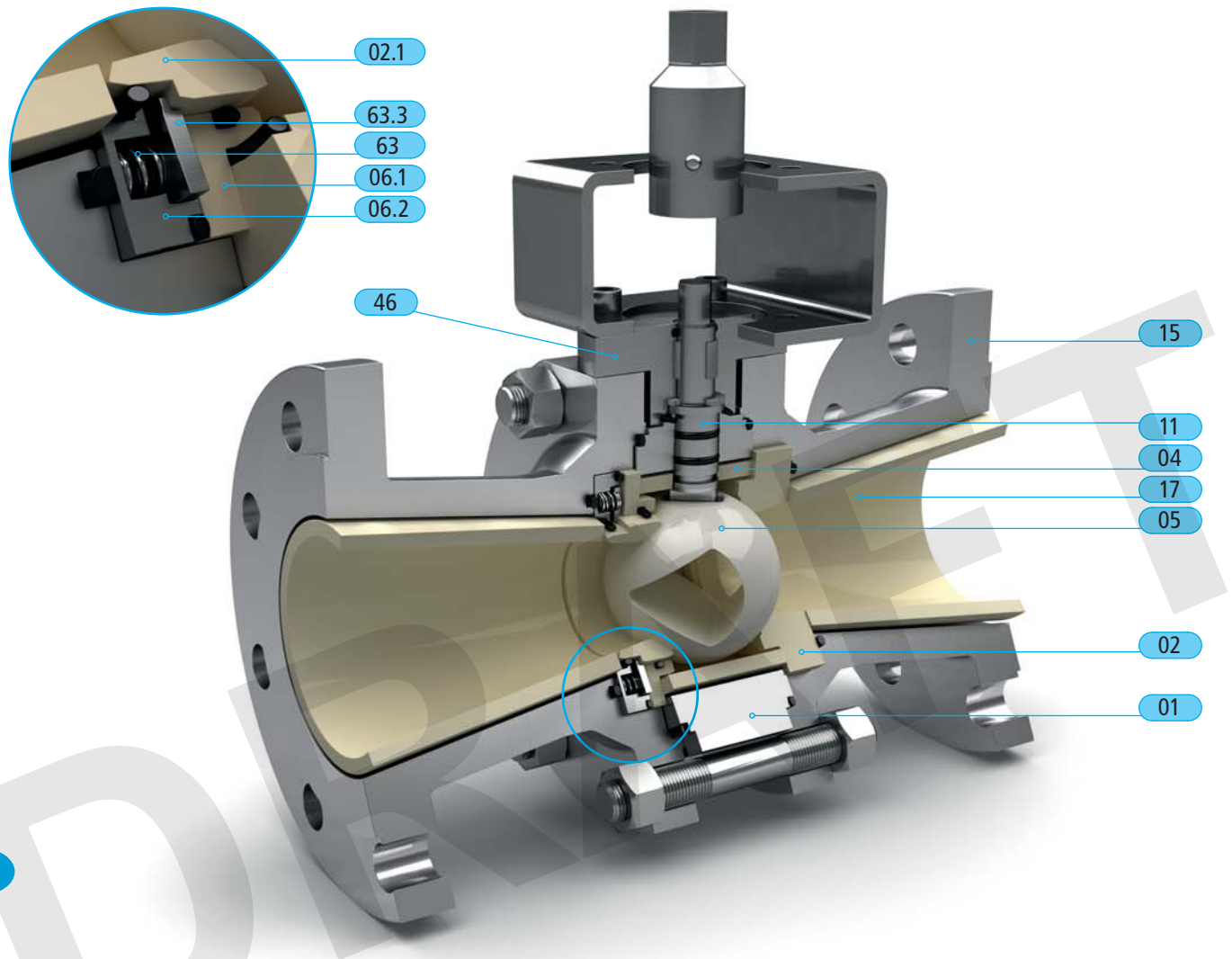
Abbreviations:

PCI: Pulverised Coal Injection

EAF: Electric Arc Furnace

## BALL VALVE • KAT

MATERIALS / MATERIAL OPTIONS:



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Item	Part description	Materials	Material options
01	Housing	1.4301	1.4462 - 1.4571 - 1.4539 -C22.8 - PVDF -PP - 3.7035
02	Seat ring	Al <sub>2</sub> O <sub>3</sub>	Si <sub>3</sub> N <sub>4</sub> - SSiC - ZrO <sub>2</sub>
02.1	Spring loaded seat ring	Al <sub>2</sub> O <sub>3</sub>	Si <sub>3</sub> N <sub>4</sub> - SSiC
04	Ball socket	Al <sub>2</sub> O <sub>3</sub>	Si <sub>3</sub> N <sub>4</sub> - SSiC
05	Ball	ZrO <sub>2</sub>	Si <sub>3</sub> N <sub>4</sub> - WoC -2.4605 - 1.4112
06.1	Holding ring	Al <sub>2</sub> O <sub>3</sub>	1.4301
06.2	Pressure ring spring	1.4301	1.4462
06.3	Pressure ring seat	1.4301	1.4462
11	Stem shaft	1.4462	3.7035 - Tantal - ZrO <sub>2</sub> - 2.4605
15	Flange	1.4301	1.4462 - 1.4571 - 1.4539 -C22.8 - PVDF -PP - 3.7035
17	Wear protection sleeve	Al <sub>2</sub> O <sub>3</sub>	Si <sub>3</sub> N <sub>4</sub> - SSiC
46	Bonnet flange	1.4301	1.4462 - 1.4571 - 1.4539 -C22.8 - 3.7035
63	Pressure spring	1.4310	
	O-rings	FKM(Viton)	FFKM (Kalrez)
	Seals	FKM(Viton)	PTFE - Viton/FEP - graphite
	Bearing bushes	PTFE	
	Screws / nuts	A2-/A4-70	

## FUNCTION:

The valve of the type KAT is a ball valve with ceramic lining for OPEN/CLOSE function and control tasks to be used in excessively abrasive media. It is to be preferably used if special requirements are placed on the stem sealing, on the housing materials (PVDF, titanium) or if there are very high or very low operating temperatures and high pressures. The basic principle is based on a ball in a floating bearing.

The outlet seat ring is fixed. The inlet seat ring is spring loaded. As a result, the ball has no clearance and always seals.

The turn movement of the ball between 0 and 90 ° releases an accurately defined opening cross-section.

The geometric shape of the ball bore impacts upon the function and control characteristic.

This ball valve is designed in three parts. Consequently, it can be adapted to existing pipelines and the flow and control characteristics can be optimised.

These valves are available with manual lever or gear box, as well as with pneumatic, electric and hydraulic actuators. The actuator is mounted by means of a yoke and adapter arrangement. All customary actuators can be used as part-turn valve actuators. Special connections are possible.

## NOMINAL SIZE RANGE:

Flange connections DN 15 (1/2") up to DN 300 (12")

Centre housing: DN 15 (1/2") to DN 150 (6")

## PRESSURE RANGE:

PN 10 to PN 63

ANSI class 150, class 300, and class 600

Other nominal pressure ranges on request

## OVERALL LENGTH:

according to EN 558-1 Series 1+27

according to ASME / ANSI B16.10 / EN 558-2 Series 37+38

## OPTIONS:

all metallic materials for the housing

Fire-safe design

TA-Luft design

High temperature design (KAT-HT type)

Wafer-type

Chemistry design (KAC type)

## TEMPERATURE RANGE:

Standard: -30°C to +180°C

Up to 310°C possible with Kalrez + graphite

## TYPICAL APPLICATION AREAS:

### Steel works:

- Silo expansion valve with low seat leakage (ANSI class V)
- Pneumatic conveying of carbon powder, quartz, carbide...

### Silicon:

- Conveying of silicon powder
- Silicon conveyor silo expansion valve

### Petrochemistry:

- Dosing of FCC cat cracker (Al<sub>2</sub>O<sub>3</sub> powder)

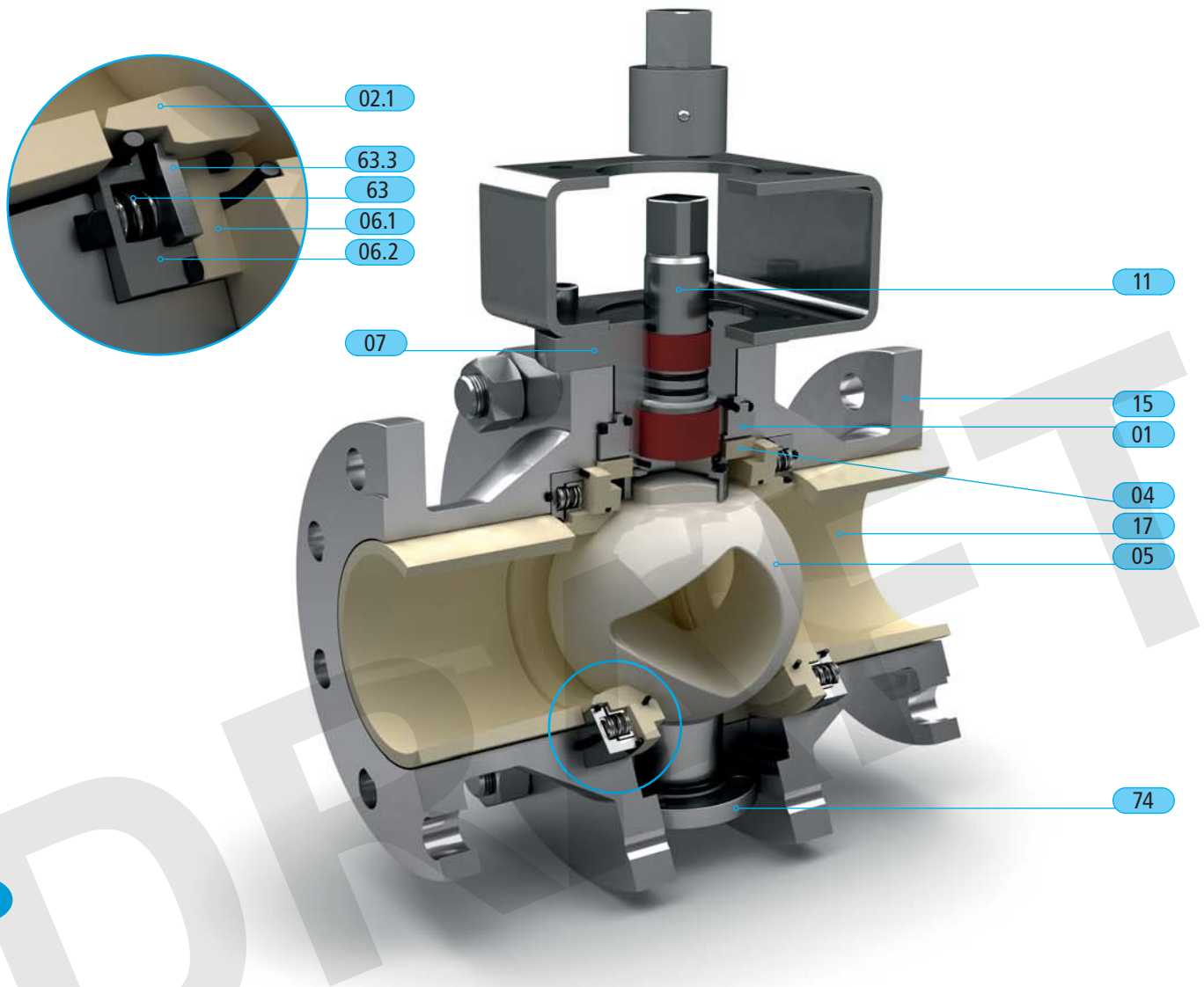
### Mining:

- Dosing and conveying of copper concentrate
- Copper conveying silo expansion valve



## BALL VALVE • KZT

### MATERIALS / MATERIAL OPTIONS:



12

Item	Part description	Materials	Material options
01	Housing	1.4301	1.4462 - 1.4571 - 1.4539 - C22.8 - 3.7035
02.1	Spring loaded seat ring	Al <sub>2</sub> O <sub>3</sub>	Si <sub>3</sub> N <sub>4</sub> - SSiC - ZrO <sub>2</sub>
04	Ball socket	Al <sub>2</sub> O <sub>3</sub>	Si <sub>3</sub> N <sub>4</sub> - SSiC
05	Ball	ZrO <sub>2</sub>	Si <sub>3</sub> N <sub>4</sub> - WoC -2.4605 - 1.4112
06.1	Holding ring	Al <sub>2</sub> O <sub>3</sub>	1.4301
06.2	Pressure ring spring	1.4301	1.4462
06.3	Pressure ring seat	1.4301	1.4462
07	Packing housing	1.4301	1.4462 - 1.4571 - 1.4539 -C22.8 - 3.7035
11	Stem shaft	1.4462	3.7035 - Tantal
15	Flange	1.4301	1.4462 - 1.4571 - 1.4539 -C22.8 - 3.7035
17	Wear protection sleeve	Al <sub>2</sub> O <sub>3</sub>	Si <sub>3</sub> N <sub>4</sub> - SSiC
63	Pressure spring	1.4310	
74	Counter bearing trunnion	1.4301	1.4462 - 1.4571 - 1.4539 -C22.8 - 3.7035
	O-rings	FKM(Viton)	FFKM (Kalrez) - Viton/FEP
	Seals	FKM(Viton)	PTFE - Graphite
	Bearing bushes	PTFE	Stellite
	Screws / nuts	A2-/A4-70	

## FUNCTION:

The valve of the type KZT is a ball valve with ceramic lining for OPEN/CLOSE function and control tasks to be used in excessively abrasive and corrosive media. It is to be preferably used if special requirements are placed on the stem sealing, on the housing materials (titanium) or if there are very high or very low operating temperatures and high pressures.

The valve can be pressurised from both sides.

The functional principle is based on the ball equipped with a journal. The seats are cushioned. The upstream seat primarily seals.

The turn movement of the ball between 0 and 90 ° releases an accurately defined opening cross-section.

The geometric shape of the ball bore impacts upon the function and control characteristic.

This ball valve is designed in three parts. Consequently, it can be adapted to existing pipelines and the flow and control characteristics can be optimised.

These valves are available with manual lever or gear box, as well as with pneumatic, electric and hydraulic actuators. The actuator is mounted by means of a yoke and adapter arrangement. All customary actuators can be used as part-turn valve actuators. Special connections are possible.

## NOMINAL SIZE RANGE:

Flange connections DN 65 (2 1/2") up to DN 300 (12")

Centre housing: DN 65 (2 1/2") to DN 150 (6")

## PRESSURE RANGE:

PN 10 to PN 63

ANSI class 150, class 300, and class 600

Other nominal pressure ranges on request

## OVERALL LENGTH:

according to EN 558-1 Series 1+27

according to ASME / ANSI B16.10 / EN 558-2 Series 37+38

## OPTIONS:

all metallic materials for the housing

Fire-safe design

TA-Luft design

High / low temperature design

Wafer-type

## TEMPERATURE RANGE:

Standard: -30°C to +180°C

Up to 310°C possible with Kalrez + graphite

## TYPICAL APPLICATION AREAS:

Similar applications to KGT, with pressure load on both sides however.

### Petrochemistry:

- Catalyst container valve

### Pneumatic conveying:

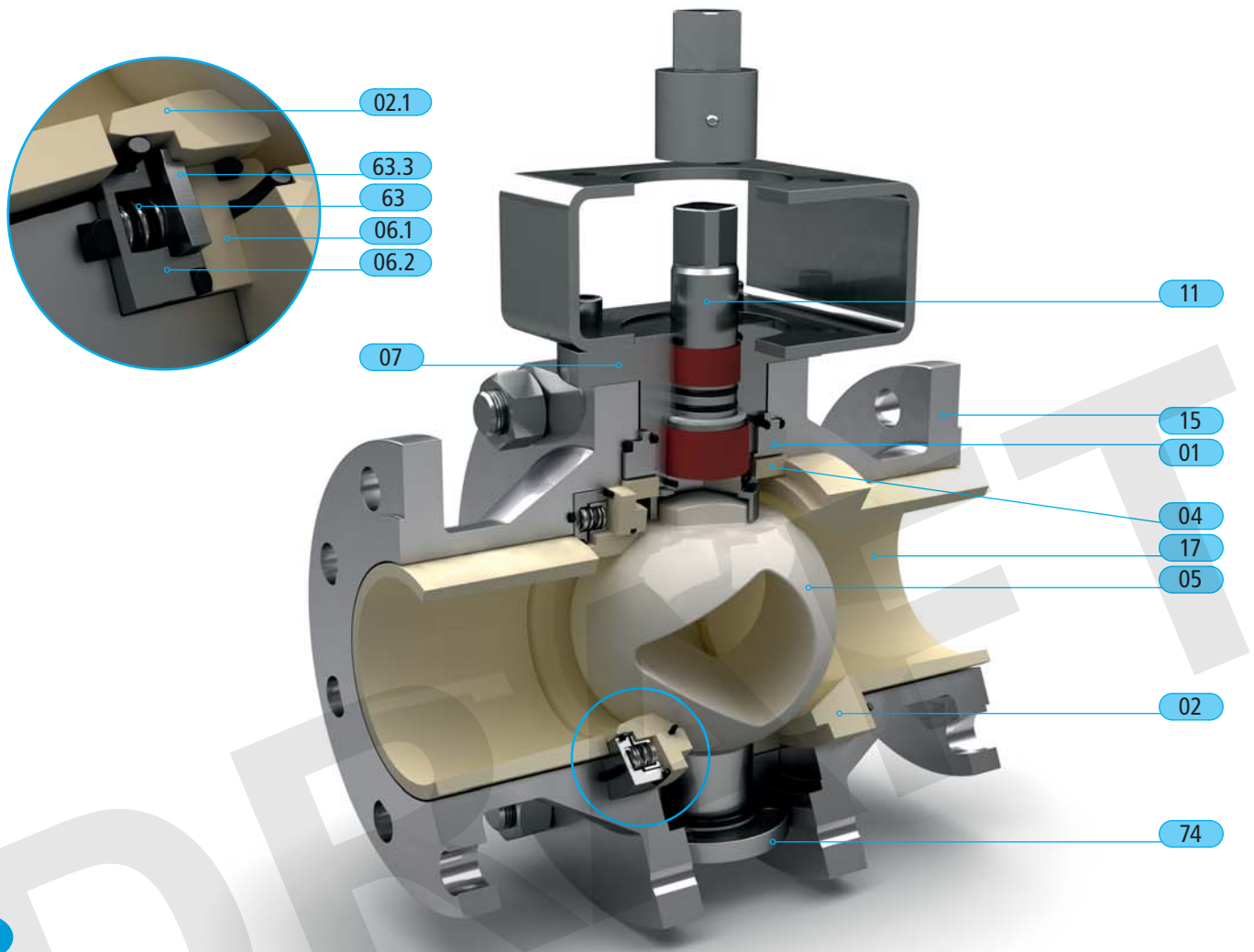
- at higher operating pressures (trunnion mounted balls)  
suitable for: Silicon, lime, coal, cement, glass....

### Mining:

- Ore conveying, ore dosing, copper concentrate....

## BALL VALVE • KGT

### MATERIALS / MATERIAL OPTIONS:



14

Item	Part description	Materials	Material options
01	Housing	1.4301	1.4462 - 1.4571 - 1.4539 - C22.8 - 3.7035
02	Cone sleeve	Al <sub>2</sub> O <sub>3</sub>	Si <sub>3</sub> N <sub>4</sub> - SSiC - ZrO <sub>2</sub>
02.1	Spring loaded seat ring	Al <sub>2</sub> O <sub>3</sub>	Si <sub>3</sub> N <sub>4</sub> - SSiC - ZrO <sub>2</sub>
04	Ball socket	Al <sub>2</sub> O <sub>3</sub>	Si <sub>3</sub> N <sub>4</sub> - SSiC
05	Ball	ZrO <sub>2</sub>	Si <sub>3</sub> N <sub>4</sub> - WoC -2.4605 - 1.4112
06.1	Holding ring	Al <sub>2</sub> O <sub>3</sub>	1.4301
06.2	Pressure ring spring	1.4301	1.4462
06.3	Pressure ring seat	1.4301	1.4462
07	Packing housing	1.4301	1.4462 - 1.4571 - 1.4539 - C22.8 - 3.7035
11	Stem shaft	1.4462	3.7035 - Tantal
15	Flange	1.4301	1.4462 - 1.4571 - 1.4539 - C22.8 - 3.7035
17	Wear protection sleeve	Al <sub>2</sub> O <sub>3</sub>	Si <sub>3</sub> N <sub>4</sub> - SSiC
63	Pressure spring	1.4310	
74	Counter bearing trunnion	1.4301	1.4462 - 1.4571 - 1.4539 - C22.8 - 3.7035
	O-rings	FKM(Viton)	FFKM (Kalrez) - Viton/FEP
	Seals	FKM(Viton)	PTFE - Graphite
	Bearing bushes	PTFE	Stellite
	Screws / nuts	A2-/A4-70	



## FUNCTION:

The valve of the type KGT is a ball valve with ceramic lining for OPEN/CLOSE function and control tasks to be used in excessively abrasive media. It is to be preferably used for solid particles outfeed if special requirements are placed on the stem sealing, on the housing materials (titanium) or if there are very high or very low operating temperatures and high pressures.

On the outlet side, the ball valve has a cone sleeve instead of a seat ring. The pressurisation should take place in the direction of flow-through.

The functional principle is based on the ball equipped with a journal. The seat ring is resilient. The round geometrical shape of the ball bore is standard.

This ball valve is designed in three parts. Consequently, it can be adapted to existing pipelines and the flow and control characteristics can be optimised.

These valves are available with manual lever or gear box, as well as with pneumatic, electric and hydraulic actuators. The actuator is mounted by means of a yoke and adapter arrangement. All customary actuators can be used as part-turn valve actuators. Special connections are possible.

## NOMINAL SIZE RANGE:

Flange connections DN 65 (2 1/2") up to DN 300 (12")

Centre housing: DN 65 (2 1/2") to DN 150 (6")

## PRESSURE RANGE:

PN 10 to PN 63

ANSI class 150, class 300, and class 600

Other nominal pressure ranges on request

## OVERALL LENGTH:

according to EN 558-1 Series 1+27

according to ASME / ANSI B16.10 / EN 558-2 Series 37+38

## OPTIONS:

all metallic materials for the housing

Fire-safe design

TA-Luft design

High / low temperature design

Wafer-type

## TEMPERATURE RANGE:

Standard: -30°C to +180°C

Up to 310°C possible with Kalrez + graphite

## TYPICAL APPLICATION AREAS:

### Steel works:

- Silo expansion valve with low seat leakage (ANSI class V)
- Pneumatic conveying of carbon powder, quartz, carbide...

### Silicon:

- Conveying of silicon powder
- Silicon conveyor silo expansion valve

### Petrochemistry:

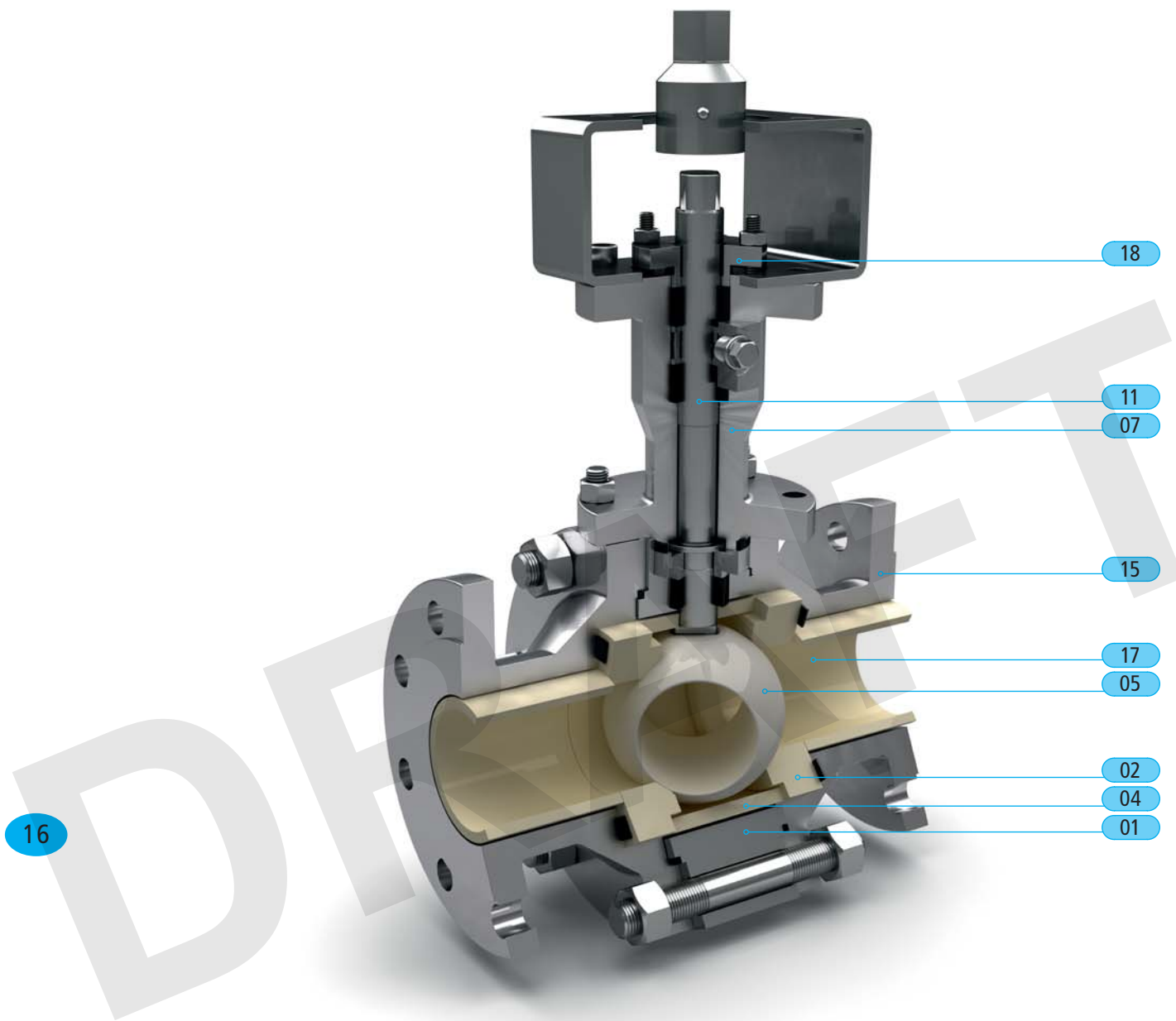
- Dosing of FCC cat cracker (Al<sub>2</sub>O<sub>3</sub> powder)

### Mining:

- Dosing and conveying of copper concentrate
- Copper conveying silo expansion valve

## BALL VALVE • KST-HT

MATERIALS / MATERIAL OPTIONS:



Item	Part description	Materials	Material options
01	Housing	1.4301	1.4876(H) - 1.4462 - 1.4571 - 1.4539 - C22.8
02	Seat ring	SSiC	Si <sub>3</sub> N <sub>4</sub>
04	Ball socket	SSiC	Si <sub>3</sub> N <sub>4</sub>
05	Ball	ZrO <sub>2</sub>	Si <sub>3</sub> N <sub>4</sub> - 1.4112
07	Packing housing	1.4301	1.4876(H) - 1.4462 - 1.4571 - 1.4539 - C22.8
11	Stem shaft	1.4542	1.4876 - 1.4462
15	Flange	1.4301	1.4876(H) - 1.4462 - 1.4571 - 1.4539 - C22.8
17	Wear protection sleeve	Al <sub>2</sub> O <sub>3</sub>	Si <sub>3</sub> N <sub>4</sub> - SSiC
18	Stuffing box gland	1.4301	1.4462 - 1.4571 - 1.4539 - C22.8
	Packages	Graphite	Stuffing box packaging
	Seals	Graphite	
	Bearing bushes	Stellite / Graphite	
	Screws / nuts	A2-/A4-70	21CrMoV57 / 24CrMo5 - 1.4876/1.4910

## FUNCTION:

The valve of the KST-HT type is a ceramic lined ball valve for the open / close function and the control tasks for use in excessive abrasive and corrosive media at temperatures above 300°C.

Special housing and ceramic materials permit solutions of up to 950°C.

The basic principle is based on a ball in a floating bearing. The seats are rigid (fixed), The ball has a defined clearance and is pressed against the downstream seat by the differential pressure, sealing it. The turn movement of the ball between 0 and 90 ° releases an accurately defined opening cross-section.

The geometric shape of the ball bore impacts upon the function and control characteristic.

This ball valve is designed in three parts. Consequently, it can be adapted to existing pipelines and the flow and control characteristics can be optimised.

These valves are available with manual lever or gear box, as well as with pneumatic, electric and hydraulic actuators. The actuator is mounted by means of a yoke and adapter arrangement. All customary actuators can be used as part-turn valve actuators. Special connections are possible.

## NOMINAL SIZE RANGE:

Flange connections DN 15 (1/2") up to DN 300 (12")

Centre housing: DN 15 (1/2") to DN 150 (6")

## PRESSURE RANGE:

PN 10 to PN 63

ANSI class 150, class 300, and class 600

Other nominal pressure ranges on request

## OVERALL LENGTH:

according to EN 558-1 Series 1+27

according to ASME / ANSI B16.10 / EN 558-2 Series 37+38

## OPTIONS:

all metallic materials for the housing

(e.g. 1.4876H)

Special ceramics that are suitable for high temperatures and thermal shock

Fire-safe design

TA-Luft design

Wafer-type

## TEMPERATURE RANGE:

HT design: max. 450°C

X-HT design: max 950°C possible

## TYPICAL APPLICATION AREAS:

### Steel works:

- Ore direct reduction (DRI), ore-air mixture at 750 °C

### Dye production:

- Cl<sub>2</sub>-Gas with Ti<sub>3</sub>Cl<sub>4</sub> at 800°C with Ti slurry and coke

### Polysilicon:

- Control of trichlorosilane (TCS) at 500°C
- Conveying of Si<sub>3</sub>Cl<sub>4</sub> at 400°C

### Petrochemistry:

- Catalyst "cracking" process 750°C
- Recycling of FCC catalyst 400-600°C

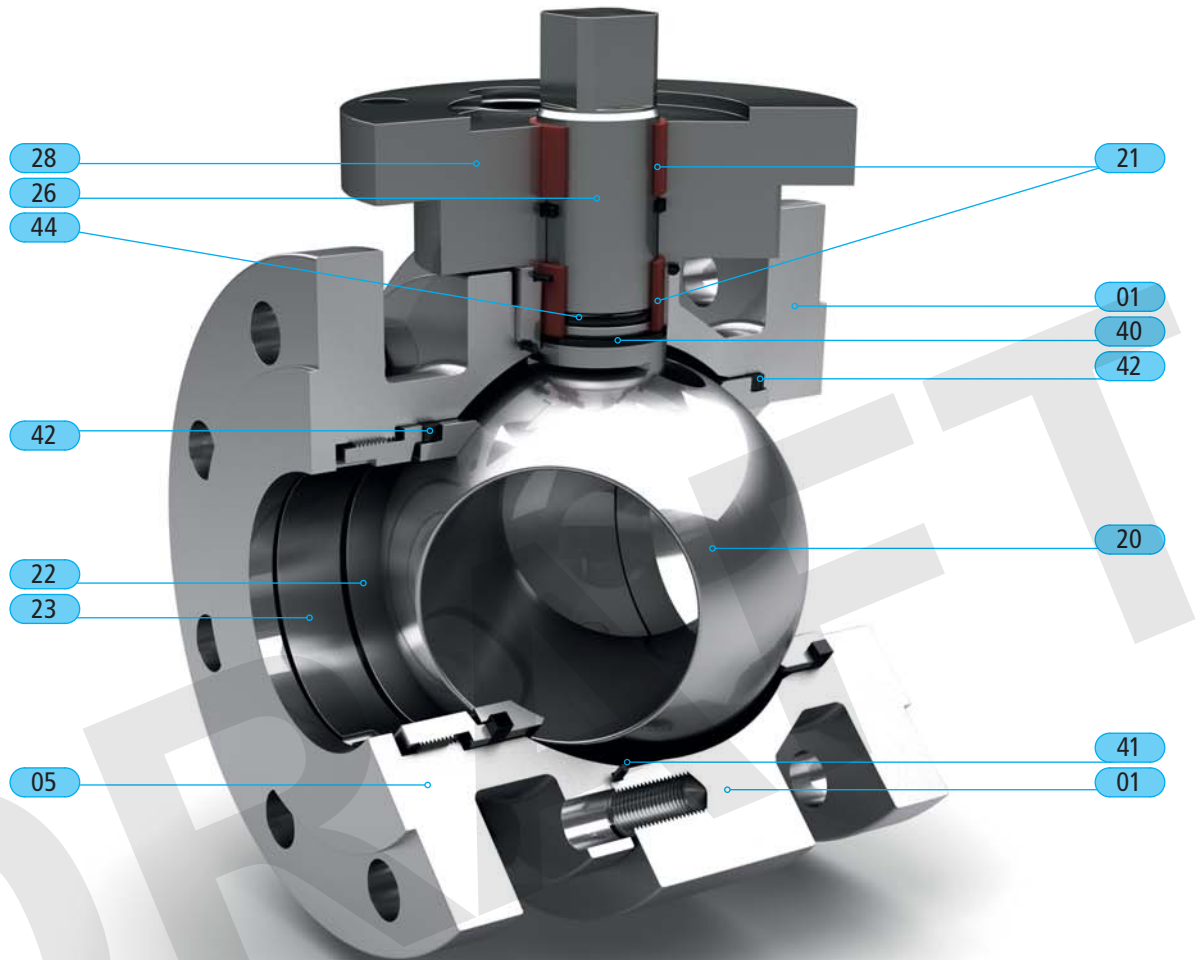
### Energy:

- Biomass to combustible gas (pyrolysis) 600-800°C



## BALL VALVE • KBR

MATERIALS / MATERIAL OPTIONS:



Item	Part description	Materials	Material options
01	Housing	1.4301	1.4571 - C22.8
05	Flange	1.4301	1.4571 - C22.8
20	Ball	30EH	
21	Bearing bushes	DU	
22	Seat ring	1.4462/KVT433	Al <sub>2</sub> O <sub>3</sub>
23	Screwed ring	1.4301	1.4571 - C22.8
26	Stem shaft	1.4301	1.4462
28	Bonnet flange	1.4301	1.4571 - C22.8
40	Slide plate	Graphite	
41	Housing seal	Viton	Graphite
42	Spring element	Graphite	
43	Cover flange seal	Viton	Graphite
44	CW seal	Viton	FFKM(Kalrez)- Graphite
	Housing screws	A2-70	
	Cover flange screws	A2-70	

## **FUNCTION:**

The valve of the KBR type is a particularly robust, metallic ball valve for the open / close function for abrasive and excessive abrasive media, preferred for applications when pneumatically transporting bulk materials. Both the stem shaft as well as the stem shaft insert and the seats are designed in a particularly stable manner.

The valve can be pressurised from both sides. The functional principle is based upon the floating ball (trunnion mounted ball as of DN 150). The seat rings are pressed against the ball by means of spring elements. The round geometrical shape of the ball bore is standard.

This ball valve is designed in two parts.

These valves are available with manual lever or gear box, as well as with pneumatic, electric and hydraulic actuators.

All customary actuators can be used as part-turn valve actuators. Special connections are possible.

## **NOMINAL SIZE RANGE:**

DN 32 (1 1/4") to DN 300 (12")

## **PRESSURE RANGE:**

PN 10 to PN 40

ANSI class 150 and class 300

Other nominal pressure ranges on request

## **OVERALL LENGTH:**

DIN overall lengths according to EN 558-1 Series 27

ANSI class 150 overall lengths according to EN 558-2 Series 3 (up to 4") and Series 12 (from 5")

ANSI class 300 overall lengths according to EN 558-2 Series 4

## **OPTIONS:**

Diverse metallic materials

Wear protection bushing in the outlet

Seats manufactured from ceramic

## **TEMPERATURE RANGE:**

Standard: -30°C to +180°C

Up to 310°C possible with Kalrez and graphite

## **TYPICAL APPLICATION AREAS:**

### **Pneumatic conveying:**

- Bulk material silo, silo drain valve,  
Conveying valve for media such as: Fly ash, cement, glass, sand, plaster, ore...

### **Power plants:**

- Fly ash, plaster, lime ...

### **Steel works:**

- Ore, coal, coke...

## TA-LUFT SEALING UNIVERSAL SEALING KITS FOR STEM SHAFTS

The strict regulations of the current TA-Luft place the highest of demands on the stem shaft seals of valves, especially with regard to fugitive emissions. The TA-Luft sealing kits cover the majority of applications, especially in the chemical and petrochemical sector and are suitable for use in new valves or to retrofit existing valves.

### Available TA-Luft sealing kits:

#### BuraTAL® T3 9650/T3

Application limits

Temperature: -10 to +250°C

Pressure: 63 bar

Chemical resistance: pH value 1-13

#### BuraTAL® T3 9650/T1

Application limits

Temperature: -40 to +280°C

Pressure: 40 bar

Chemical resistance: pH value 1-14

#### BuraTAL® HT 9650/HT

Application limits

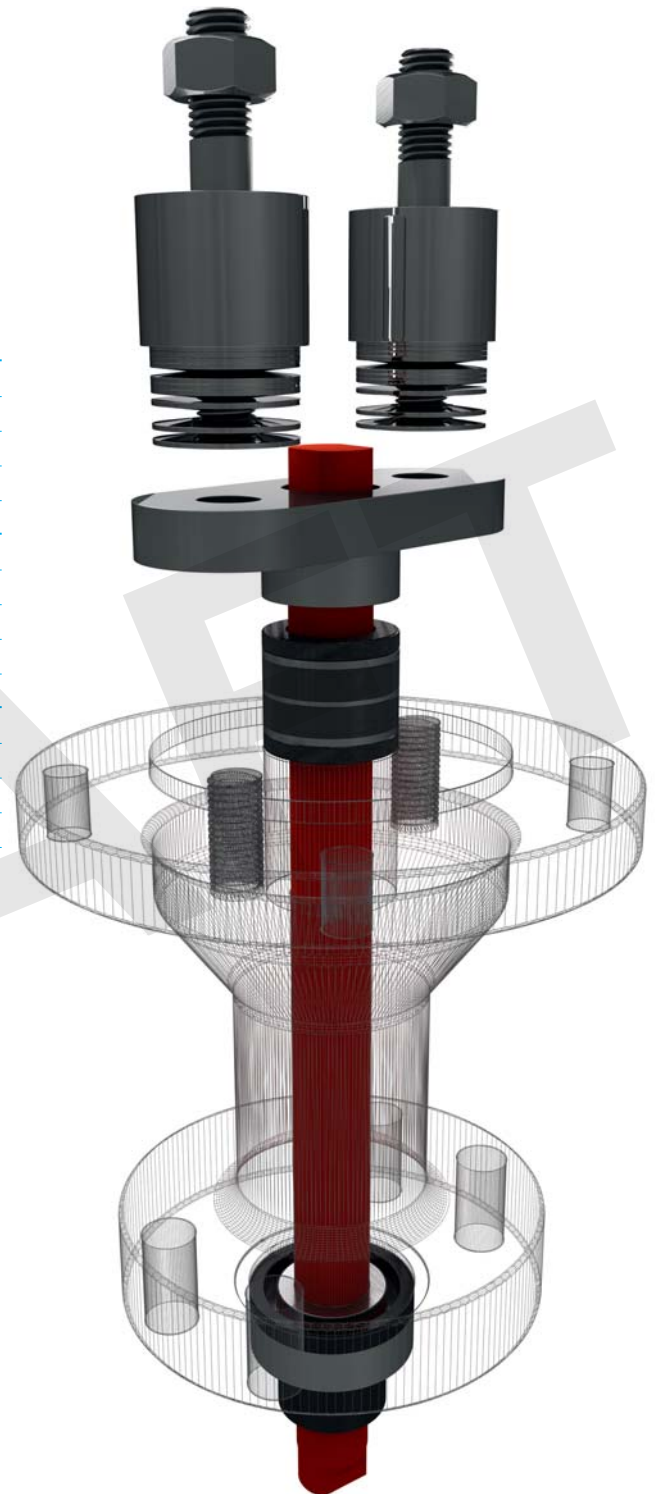
Temperature: -200 to +400°C

Pressure: 300 bar

Chemical resistance: pH value 1-13

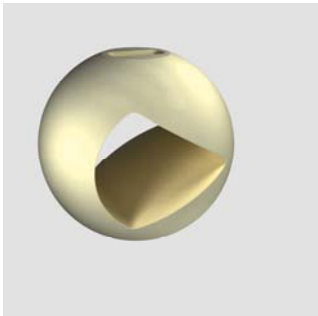
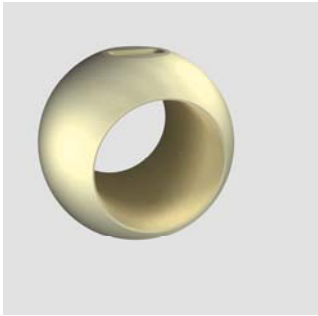
These sealing kits cover the required leakage values according to the VDI directives across the whole temperature range.

This means that the leakage values of  $10^{-4} \frac{\text{mbar} \cdot \text{l}}{\text{s} \cdot \text{m}}$  are not reached at temperatures below 250°C and  $10^{-2} \frac{\text{mbar} \cdot \text{l}}{\text{s} \cdot \text{m}}$  are not reached at temperatures above 250°C on the seal. The checking of this is assumed by a spring application system designed especially for this application. This so-called live loading system ensures the constant surface pressure on the sealing kits that consists of a combination of diverse packing rings as a chamber, sealing rings and flat seal as intermediate layers. The live loading system is designed according to the operating temperature and operating pressure (spring package) and set according to the assembly directive (checking gap between the spring sleeve and the stuffing box gland).



# VALVE BALLS

## BALL BORE FLOW VERSIONS



CVS flow-through rate CERA VALVE BL F1

Nominal diameter	Ball bore	Centre housing									
		DN15	DN25	DN40	DN65	DN80	DN100	DN125	DN150	DN200	
DN15	triangle	7									
	round	13									
DN20	triangle	7									
	round	17									
DN25	triangle	8	31								
	round	17	38								
DN32	triangle	10	31								
	round	18	52								
DN40	triangle	8	31	102							
	round	14	53	130							
DN50	triangle	9	31	105							
	round	13	54	195							
DN65	triangle		27	104	203						
	round		39	229	315						
DN80	triangle		23	100	208	343					
	round		37	192	403	536					
DN100	triangle			98	201	345	364				
	round			170	389	695	775				
DN125	triangle				199	345	420				
	round				310	545	960	1260			
DN150	triangle					340	360				
	round					535	825	1675	1890		
DN200	triangle						300				
	round						730	1280	2035	3360	

The desired control behaviour of the valve is determined by the nominal diameter of the centre housing and the geometry of the ball bore. Round or triangular bores can be rotated by between 0 and 90° and define exact opening cross-sections. **Special contours across all nominal diameters with adjusted  $K_v$  values are available.**

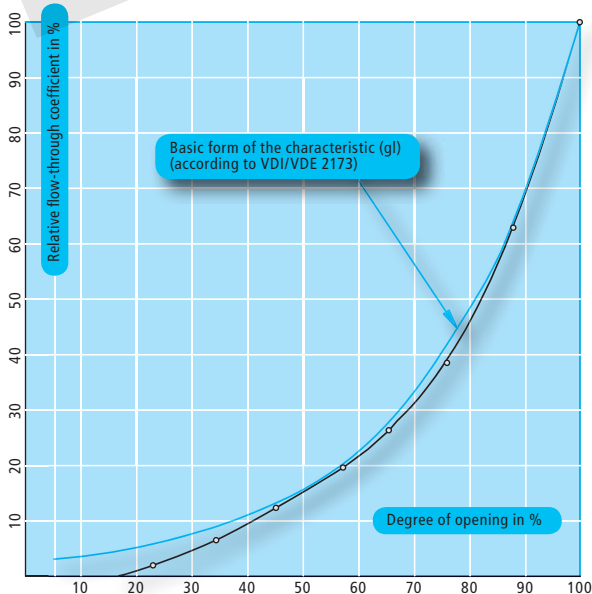
The installation lengths of the ball valves correspond to those of the control valves.

### CHARACTERISTICS

Nominal diameter: DN 15-200 • 1/2" - 8"

Ball bore: triangle

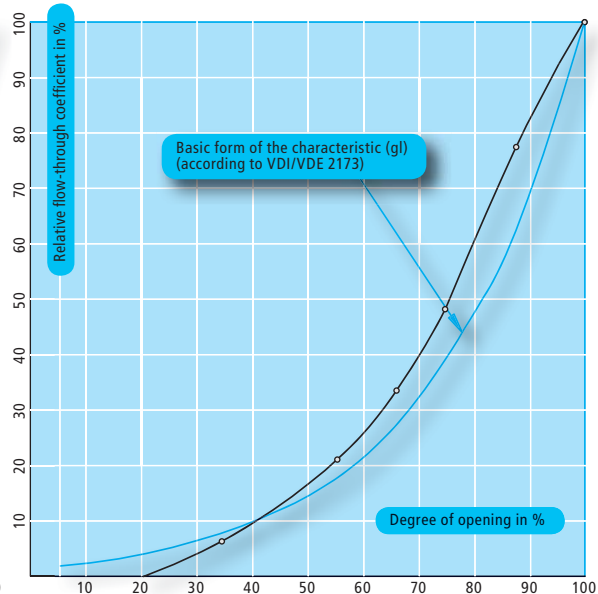
Characteristic: equal percentage



Nominal diameter: DN 15-200 • 1/2" - 8"

Ball bore: round

Characteristic: equal percentage



## CERAMIC MATERIALS PROPERTIES – ADVANTAGES AND DISTINCTIVE FEATURES

### CORROSION RESISTANCE

Compared to other materials, the corrosion resistance of the ceramic materials is significantly more universal and higher. Ceramics are completely resistant against the majority of solvents. Aqueous brines are generally no problem. The ceramics used are highly resistant against the majority of acids up to relatively high temperatures. Nevertheless, there are large differences that are to be observed. All oxidic ceramic materials are not resistant against fluorides for example. Some materials (e.g. Y-PSZ) are sensitive to water vapour (not hydrothermally resistant). It must be observed that mixtures of reagents generally react differently than the individual components.

### PRESSURE RESISTANCE AND FLEXURAL STRENGTH

In contrast to metals, the mechanical strength properties of ceramic materials are different when bent, when under load and when under pressure. Whilst the pressure resistance in almost all dense ceramics is many times higher than that of metals, the tensile and flexural strength must be closely observed.

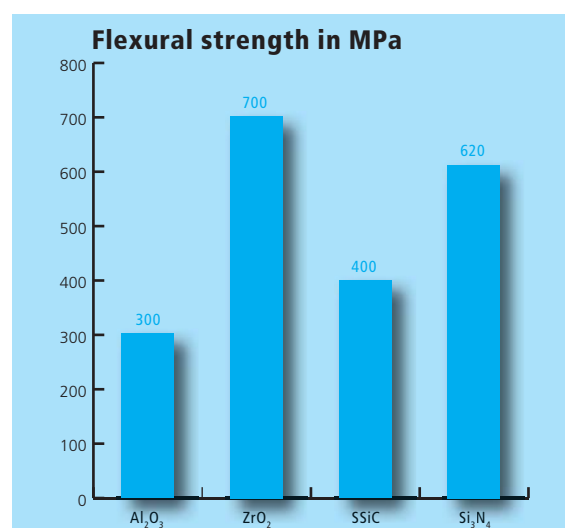
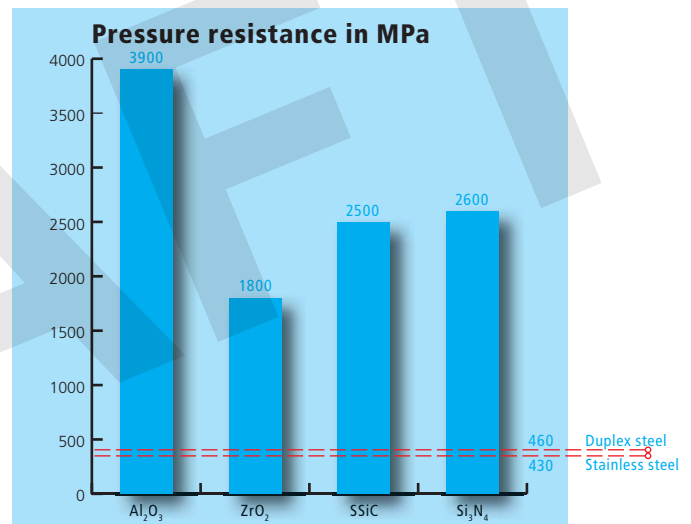
The extremely high pressure resistance of  $Al_2O_3$  can be an advantage, especially in the seat of a ball valve.

Even if the comparison of the strength values of metals and ceramics is problematic, it does demonstrate the difference in size:

Due to the high torque load, balls require materials with a high flexural strength. Therefore, the materials zirconium dioxide and silicon nitride are used for balls.

### CERAMIC MATERIALS

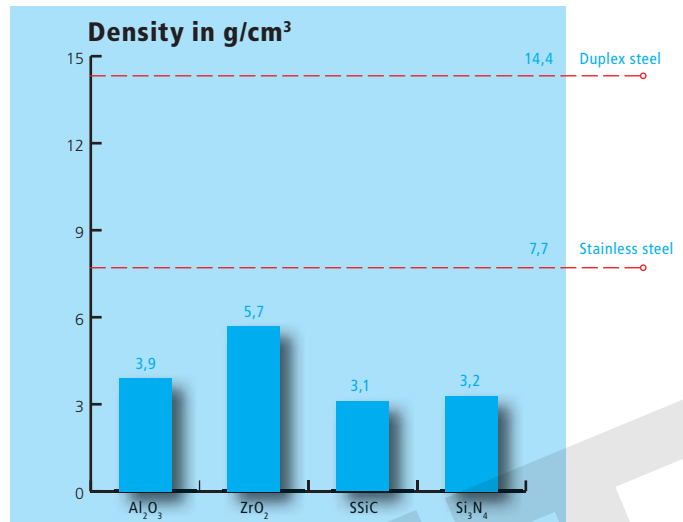
$Al_2O_3$	Aluminium oxide
$ZrO_2$	Zirconium dioxide
SiC	Silicon carbide
$Si_3N_4$	Silicon nitride





## DENSITY

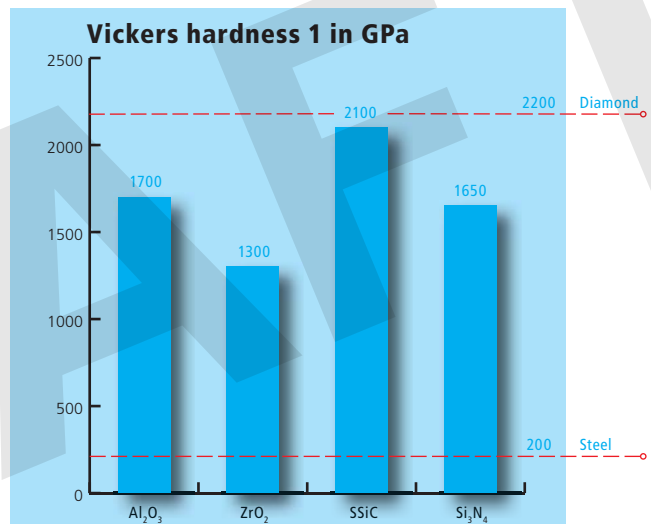
Weight is also generally saved when ceramics are used as these materials have a density up to 78% less than that of hard metal / 60% less than that of stainless steel.



## HARDNESS AND WEAR RESISTANCE

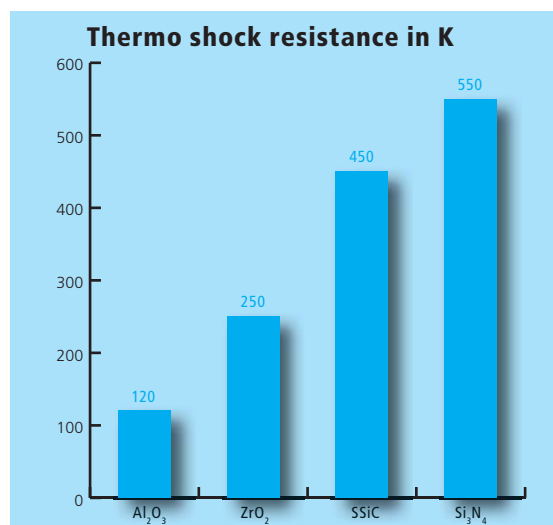
The wear resistance of components is significantly influenced by the respective type of load. Thanks to their extremely high hardness, ceramic materials have a wear resistance against friction that is many times higher than metals.

The mixture of loads that often occur in practice such as friction wear, radiation wear and impact wear as well as cavitations are generally absorbed better by ceramic components than metal components. All direct impact loads required closer observation.



## THERMO SHOCK RESISTANCE

In contrast to the maximum operating temperature, the thermo shock resistance must be closely observed. Ceramic components maintain their shape and strength as well as their further physical characteristics up to extremely high temperatures. In addition to the material dependency, the thermo shock resistance is also highly dependent upon the geometry. Simple geometric shapes such as pipes are less sensitive than such parts that have highly differing wall thicknesses for example.

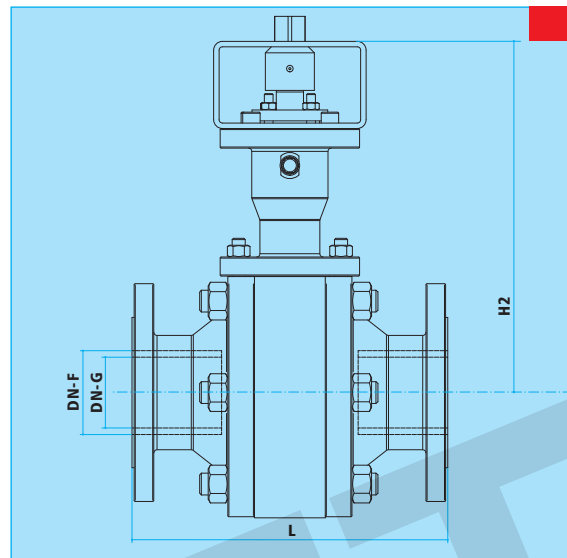
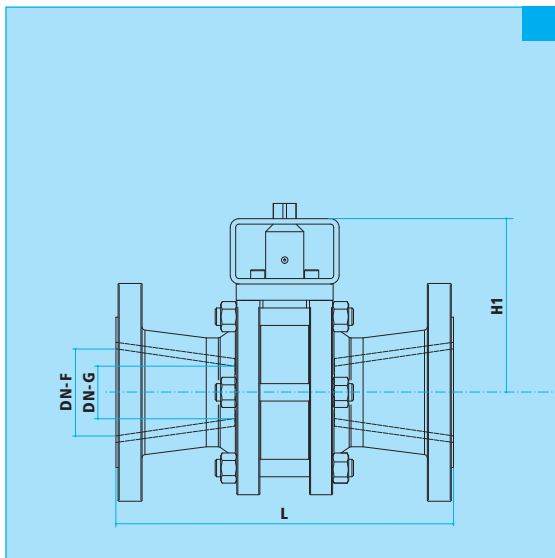


## TORQUE VALUES

type	Stem shaft	Max. temperature	Bearing	Ball material	Centre housing	Recommended TORQUE in Nm at $\Delta p$ up to												Max. permitted torque Nm	Max. switchable pressure difference bar
						1bar	2bar	3bar	4bar	6bar	10bar	16bar	20bar	25bar	40bar	Nm	bar		
KS_	1.4462 / 2.4605	310 °C / 180°C	Floating ball	Ceramic ZrO <sub>2</sub> / Si <sub>3</sub> N <sub>4</sub>	DN12	12	12	12	12	12	12	12	12	12	12	16	40	80	
					DN 25	23	23	23	23	23	23	28	35	45	71	100	50		
					DN 40	45	45	45	45	45	51	82	103	128		160	35		
					DN 65	65	65	65	65	95	158					180	15		
					DN 80	116	116	116	116	150	170					190	10		
					DN 100	165	165	165	165	200						230	8		
					DN 125	250	250	250	250	330						340	6		
					DN 150	450	450	450	450							500	4		
KS_	1.4462 / 2.4605	310 °C / 180°C	Floating ball	Steel 1.4112	DN 15	12	12	12	12	12	12	12	12	12	16	50	160		
					DN 25	23	23	23	23	23	23	28	35	45	71	130	100		
					DN 40	45	45	45	45	45	51	82	103	128		160	35		
					DN 65	65	65	65	65	95	158	215	250			250	20		
					DN 80	116	116	116	116	150	170					340	12		
					DN 100	165	165	165	165	150	270					520	10		
					DN 125	250	250	250	250	330	490					1800	10		
					DN 150	450	450	450	450	530	700					3000	10		
KA_	1.4462 / 2.4605	310 °C / 180°C	Floating ball	Ceramic ZrO <sub>2</sub> / Si <sub>3</sub> N <sub>4</sub>	DN 15	12	12	12	12	12	12	15	18	23	36	40	40		
					DN 25	25	25	25	25	25	40	60	73	90		100	25		
					DN 40	50	50	50	60	80	120					160	13		
					DN 65	50	70	95	120	170						180	7		
					DN 80	80	120	150	180							190	5		
					DN 100	100	165	200								230	3		
					DN 125	190	340									340	2		
					DN 150	250	450									500	2		
KA_	1.4462 / 2.4605	310 °C / 180°C	Floating ball	Steel 1.4112	DN 15	12	12	12	12	12	12	15	18	23	36	50	40		
					DN 25	25	25	25	25	25	40	60	73	90		130	30		
					DN 40	50	50	50	60	80	160					160	13		
					DN 65	70	70	95	120	170	250					250	10		
					DN 80	120	120	150	210	340						340	6		
					DN 100	200	250	380	470	650						520	4		
					DN 125	280	370	560	750	1110						1630	6		
					DN 150	360	750	1100	1550	2500						3000	6		

type	Stem shaft	Max. temperature	Bearing	Ball material	Centre housing	Recommended TORQUE in Nm at $\Delta p$ up to										Max. permitted torque	Max. switchable pressure difference	
						1bar	2bar	3bar	4bar	6bar	10bar	16bar	20bar	25bar	40bar			Nm
KBR liquid conveying	Stainless steel 1.4301	310 °C	Trunnion mounted ball	Floating ball	Chromium chilled cast 30EH	DN 40	80	80	80	80	80	80	80				425	16
						DN 50	120	120	120	120	120	120	120				450	16
						DN 65	230	230	230	230	230	230	230				820	16
						DN 80	270	270	270	270	270	270	270				820	16
						DN 100	330	330	330	330	330	330					820	10
						DN 125	550	550	550	550	550	550					1630	10
			DN 150	1050		1050	1050	1050	1050	1050					4000	10		
			DN 175	1250		1250	1250	1250	1250	1250					4000	10		
			DN 200	on request														
			DN 250	on request														
			DN 300	on request														
			DN 350	on request														
KBR dust conveying	Stainless steel 1.4301	310 °C	Trunnion mounted ball	Floating ball	Chromium chilled cast 30EH	DN 40	230	230	230	230	230	230	230				425	16
						DN 50	290	290	290	290	290	290	290				450	16
						DN 65	400	400	400	400	400	400	400				820	16
						DN 80	520	520	520	520	520	520	520				820	16
						DN 100	680	680	680	680	680	680					820	10
						DN 125	1110	1110	1110	1110	1110	1110					1630	10
			DN 150	2000		2000	2000	2000	2000	2000					4000	10		
			DN 175	2300		2300	2300	2300	2300	2300					4000	10		
			DN 200	on request														
			DN 250	on request														
			DN 300	on request														
			DN 350	on request														
KZ_	1.4462 / 2.4605	310 °C / 180 °C	Trunnion mounted ball	ZrO <sub>2</sub> / Si <sub>3</sub> N <sub>4</sub>	DN 80	300	300	300	300	300	350	360	380			430	20	
					DN 100	380	380	380	380	380	450	470			560	16		
					DN 125	580	580	580	580	580	880	920			950	16		
					DN 150	1200	1200	1200	1200	1200	1800				1800	10		
					DN 200	2200	2200	2200	2200	2200	2990				3750	10		
KG_	1.4462 / 2.4605	310 °C / 180 °C	Trunnion mounted ball	ZrO <sub>2</sub> / Si <sub>3</sub> N <sub>4</sub>	DN 80	200	200	200	200	200	250	250	360	370		430	25	
					DN 100	250	250	250	250	250	340	350	380		560	20		
					DN 125	450	450	450	450	450	650	810			950	18		
					DN 150	850	850	850	850	850	1300	1700			1800	16		
					DN 200	1300	1300	1300	1300	1300	1800	2250			3750	16		

## CONNECTION DIMENSIONS



Size		Installation height DIN ISO 5211 (H1)					
DN-G		F05-VK14	F07-VK17	F10-VK22	F12-VK27	F14-VK36	F16-VK46
DIN	ANSI	mm	mm	mm	mm	mm	mm
DN 15	½"	124.0	124.0	144.0	-	-	-
DN 25	1"	142.5	142.5	162.5	162.5	172.5	-
DN 40	1 ½"	158.0	158.0	178.0	178.0	188.0	-
DN 65	2 ½"	201.5	201.5	201.5	201.5	211.5	241.5
DN 80	3"	216.0	216.0	216.0	216.0	226.0	256.0
DN 100	4"	232.5	232.5	232.5	232.5	242.5	272.5
DN 150	6"	-	-	282.5	282.5	328.5	328.5
DN 200	8"	-	-	-	-	-	-

Size		Installation length (L)									
DN-F		Series 1	Series 27	Series 37		Series 38		Series 3		Series 12	
DIN	ANSI	mm	mm	inch	mm	inch	mm	inch	mm	inch	mm
DN 15	½"	130	115	-	-	-	-	-	-	-	-
DN 20	¾"	150	120	-	-	-	-	-	-	-	-
DN 25	1"	160	125	7.25"	184	7.75"	197	5"	127	-	-
DN 32	1¼"	180	130	-	-	-	-	-	-	-	-
DN 40	1½"	200	140	8.75"	222	9.25"	235	6½"	165	-	-
DN 50	2"	230	150	10.00"	254	10.50"	267	7"	178	-	-
DN 65	2½"	290	170	11.40"	290	-	-	7½"	190	-	-
DN 80	3"	310	180	11.75"	298	12.50"	317	8"	203	-	-
DN 100	4"	350	190	13.88"	352	14.50"	368	9"	229	-	-
DN 125	5"	400	325	-	-	-	-	-	-	9"	356
DN 150	6"	480	350	17.75"	451	18.62"	473	-	-	14½"	394
DN 200	8"	600	400	21.38"	543	22.38"	568	-	-	18"	475
DN 250	10"	730	450	26.50"	673	27.87"	708	-	-	-	-
DN 300	12"	850	500	29.02"	737	30.51"	775	-	-	-	-

Size		Installation height DIN ISO 5211 (H2)					
DIN	ANSI	F05	F07	F10	F12	F14	F16
		mm	mm	mm	mm	mm	mm
DN 15	1/2"	224.0	224.0	244.0	-	-	-
DN 25	1"	242.5	242.5	262.5	262.5	272.5	-
DN 40	1 1/2"	258.0	258.0	278.0	278.0	288.0	-
DN 65	2 1/2"	321.5	321.5	321.5	321.5	331.5	361.5
DN 80	3"	336.0	336.0	336.0	336.0	346.0	376.0
DN 100	4"	382.5	382.5	382.5	382.5	392.5	402.5
DN 150	6"	-	-	-	-	472.0	472.0

## WEIGHTS

CERAVALVE valve weights in kg								
Nominal diameter	Centre housing							
	DN 15	DN 25	DN 40	DN 65	DN 80	DN 100	DN 125	DN 150
DN 15	6.3							
DN 20	6.3							
DN 25	6.3	10						
DN 32	6.9	11						
DN 40	7.3	12	18					
DN 50	7.9	15	18					
DN 65		18	21	38				
DN 80		22	24	39	48			
DN 100			28	40	50	66		
DN 125				44	54	77	99	
DN 150				51	58	81	110	165
DN 200						105	140	177
DN 250							165	188
DN 300								233
DN 350								289

Example: Ball valve DN 80 - 40 - 80

Nominal diameter	CERAVALVE valve weights KBR in kg
DN 32	11
DN 40	12
DN 50	13
DN 65	26
DN 80	34
DN 100	38
DN 125	80
DN 150	138
DN 175	178
DN 200	195



# PRODUCTS AND SERVICES



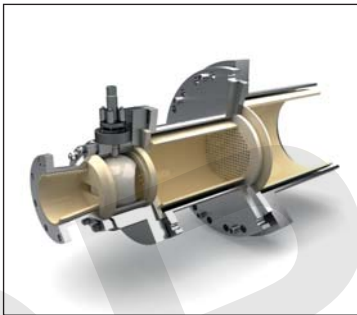
## BALL VALVES

Cera System offers wear and corrosion resistant ball valves for open / close and control function. The use of ceramic lined valves is sensible in all cases where standard valves reach their limits (abrasion, corrosion, temperature and pressure). A large range of metallic and ceramic materials permits solutions for almost all industrial sectors. Special applications are solved in close cooperation with our customers.



## DISC SLIDE VALVE

Cera System offers wear and corrosion resistant disc slide valves for open / close and control function. With this type of construction, the media is exclusively ceramic. It is therefore suitable for highly corrosive media. Further advantages: Excellent control of small amounts containing solids - completely cavity free. The slide valve is available from DN 2 up to DN 50.



## CERAMIC SYSTEM SOLUTIONS

Cera System offers system solutions with ceramic components. In-house development and sales engineers ensure for the complete design of ceramic systems and create economical, customer-specific complete solutions all over the world. Product developments in the coal gasification and photovoltaic sector are only examples of numerous other industry-specific applications.

## CERTIFICATES

ISO 9001:2008 • TA Luft 2000 • Pressure equipment directive 97/22/EC Module H • Fire-safe according to EN ISO 10497:2004 • Safety shut-off device according to DIN EN ISO 23553-1 • Rostechndador • GOST R





## PIPE WEAR PROTECTION

Cera System offers wear resistant pipe elbows, Y and T parts as well as other shaped pieces. The most diverse of ceramics are used. The ceramic is solid (wall thickness approx. 6 mm). All solutions are nominal diameter conformant, they can be assembled problem-free without having to adjust the pipelines. The clear width corresponds to the flange connection. Our speciality: the ceramic pipe elbows are actually curved (no apposition of straight sections).



## CERAMIC HOSES

Cera System supplies wear resistant flexible solutions. Ceramic hoses manufactured by Cera System can be used everywhere where hoses regularly wear and must be replaced. The hose consists of ceramic rings that are vulcanised together with special reinforced rubber materials. Pressures of up to 10 bar are permitted.

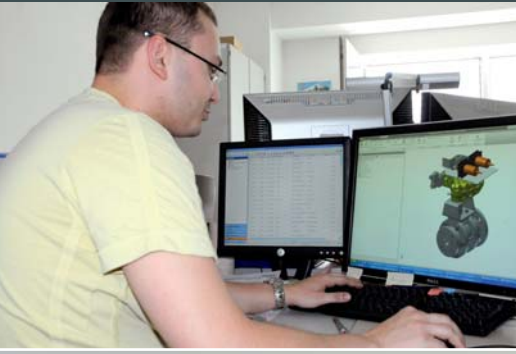


## CERAMIC COMPONENTS

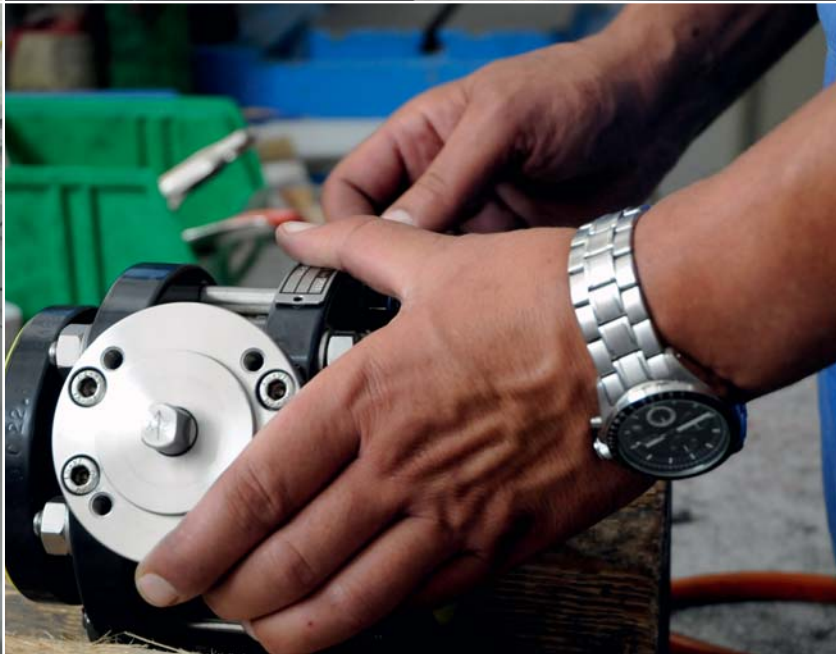
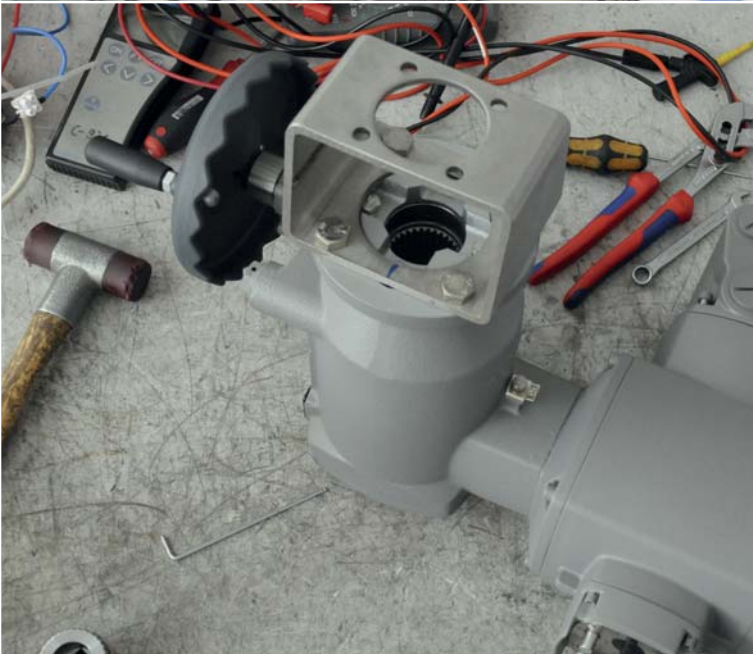
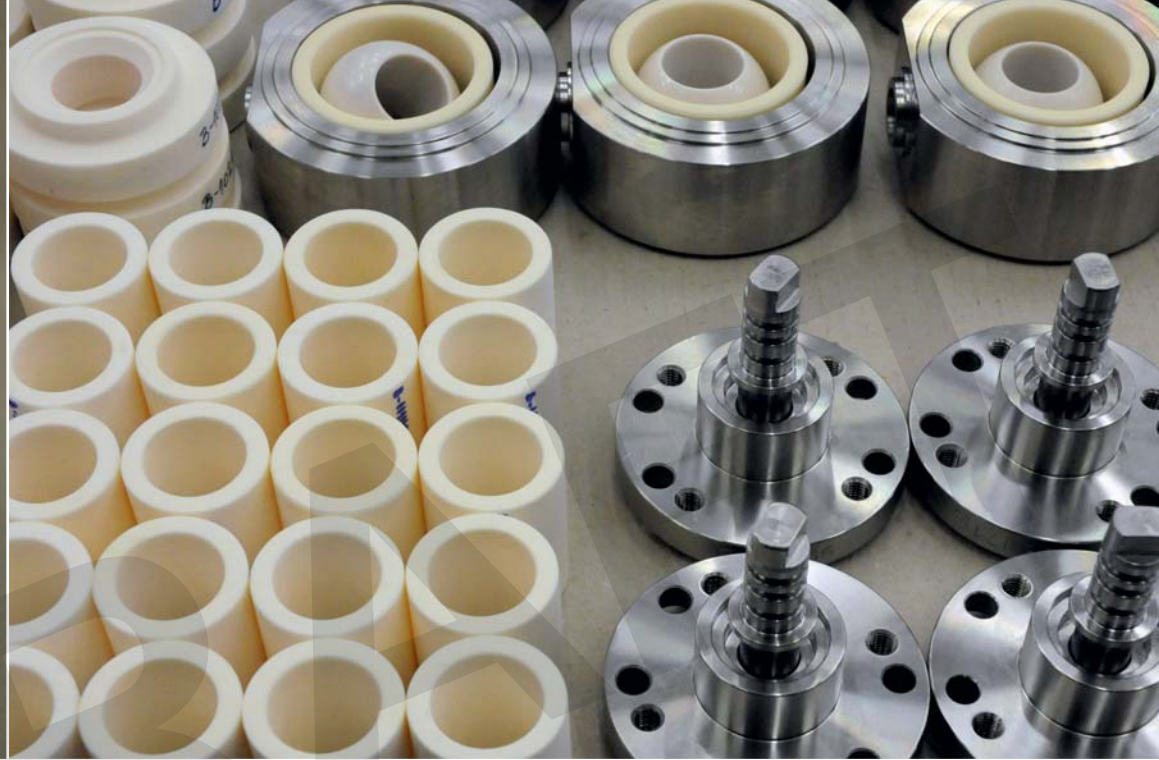
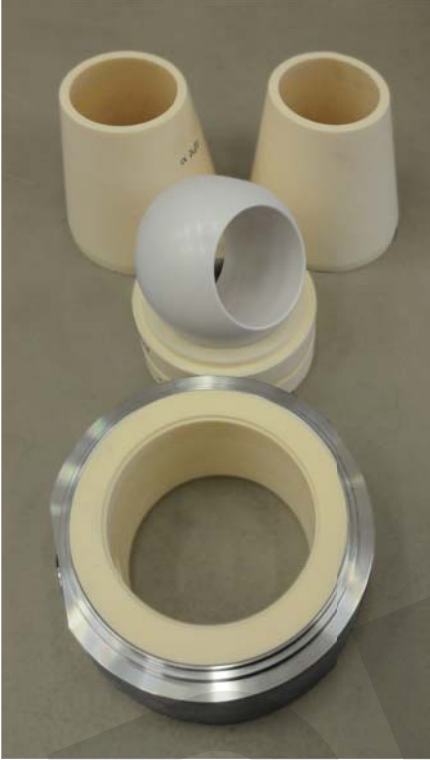
Cera System develops and produces customer-specific ceramic precision components in small batch sizes through to series production for the most diverse areas of application. Focal points are sealing and control discs for air conditioning, sanitary fittings as well as many other applications. Ceramic components for the sensor, food engineering and building services sectors round off our portfolio.













**CERA SYSTEM**®

✓ **more than ceramics**

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