



**BALLOSTAR® KHA**  
**3 PIECE BALL VALVE:**

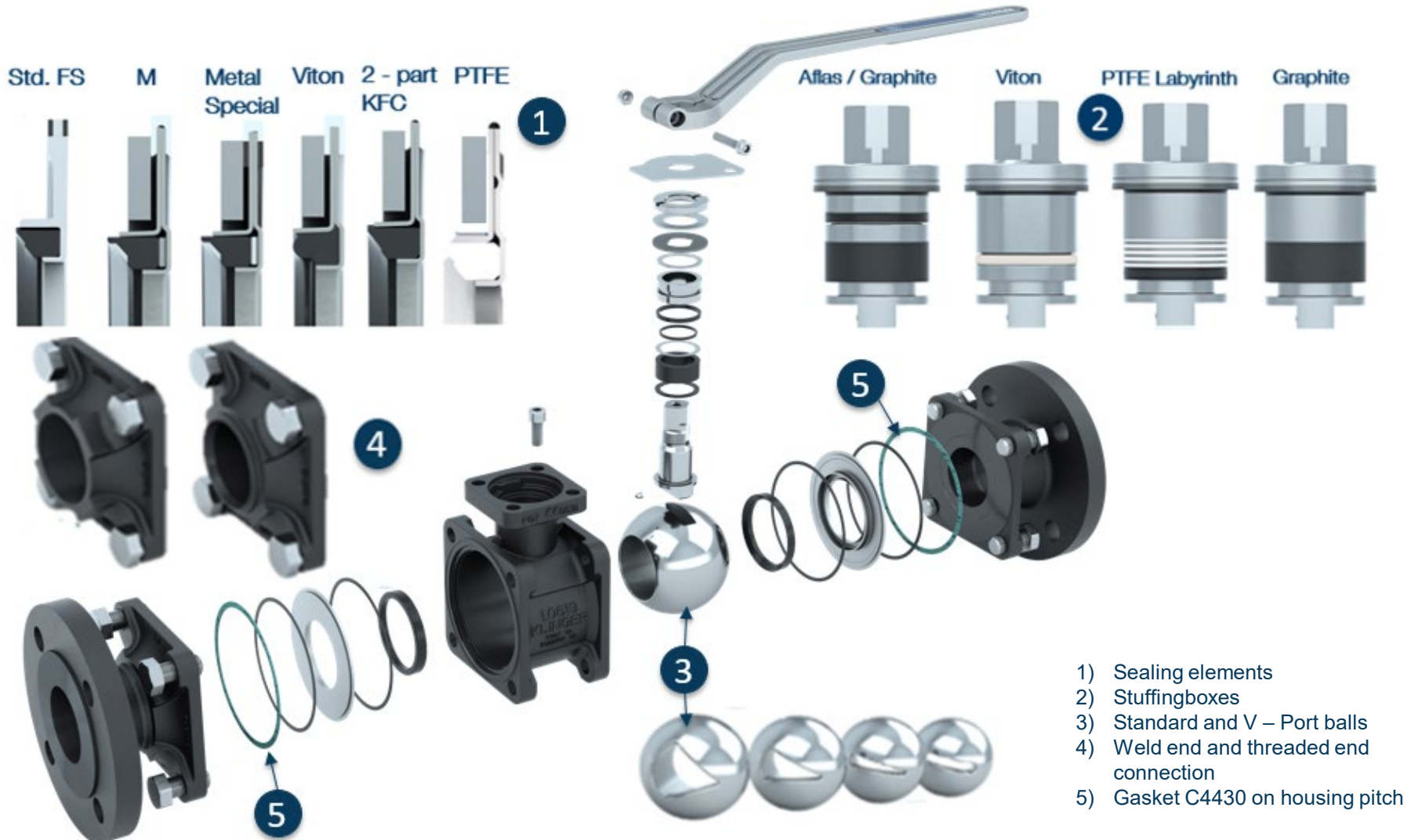
# KHA – DESIGN OVERVIEW

## Design data:

- » **Line size range:** DN15 – DN125, ½“ – 5“
- » **Pressure classes:** PN 16, 25, 40 and 63 or ANSI150 and 300
- » **Temperature range:** -196°C to +400°C
- » **Connections:** DIN or ANSI Flanges, weld ends , threaded ends BSP or NPT or mixed
- » **Body materials:** carbon steel 1.0619, stainless steel 1.4408, and duplex
- » **Ball bearing:** floating ball, trunnion mounted or double block & bleed
- » **Ball version:** Standard solid ball or V-Port balls in 10°,30°,60° and slotted cuttings for control applications; material: acid prove stainless steel
- » **Operation:** with hand lever or with installed gear, electric and pneumatic actuator on demand
- » **Passage:** Full bore
- » **Standard version:** → Fire safe acc. to API607 7th edition and EN10487:2010 and TA- Luft / ISO15848
- » **Corrosion protection:** New KACP protection (equal C3)
- » **Marking:** Laser marking on center piece acc. EN19

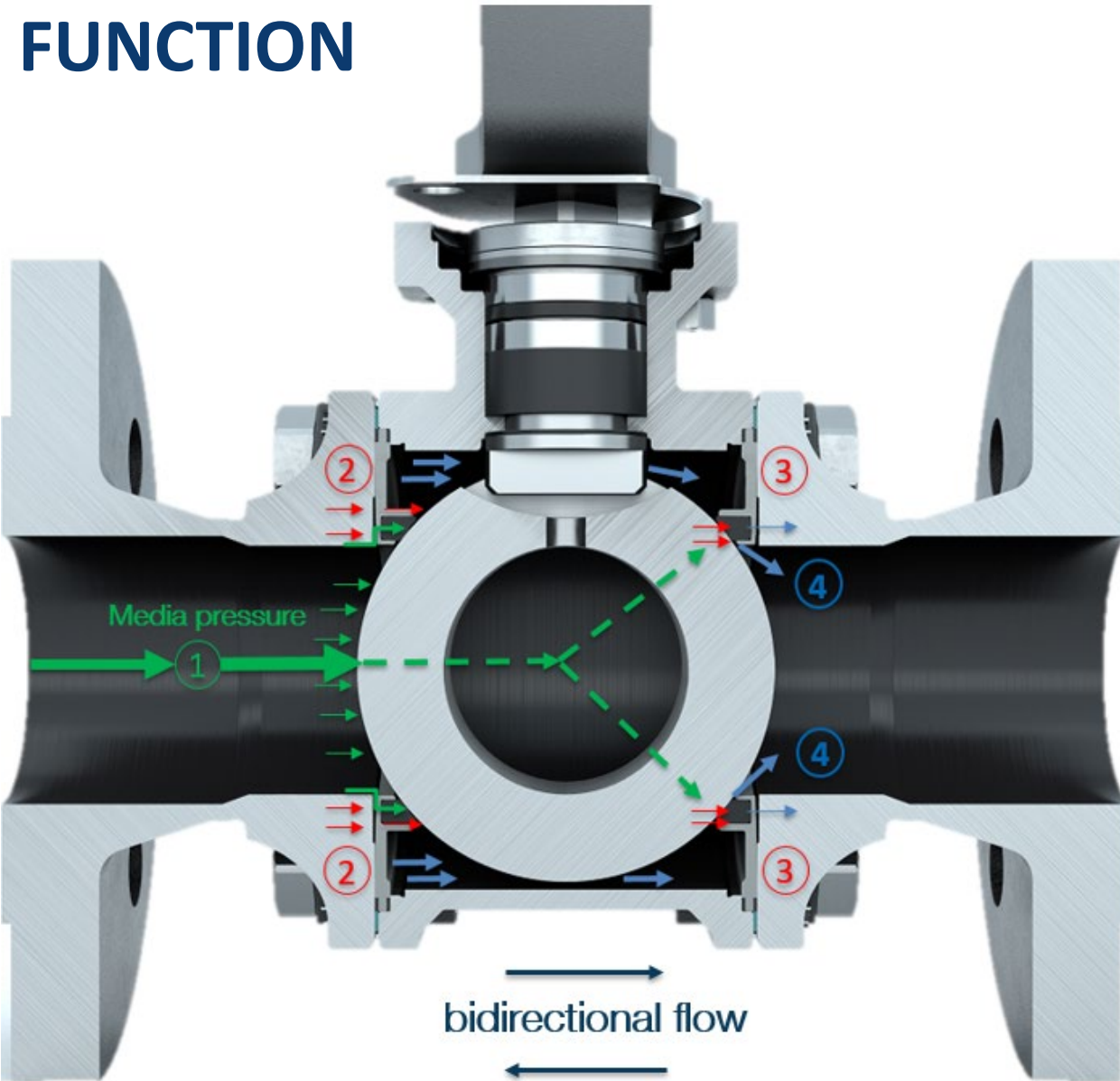


# KHA MODULAR CONSTRUCTION



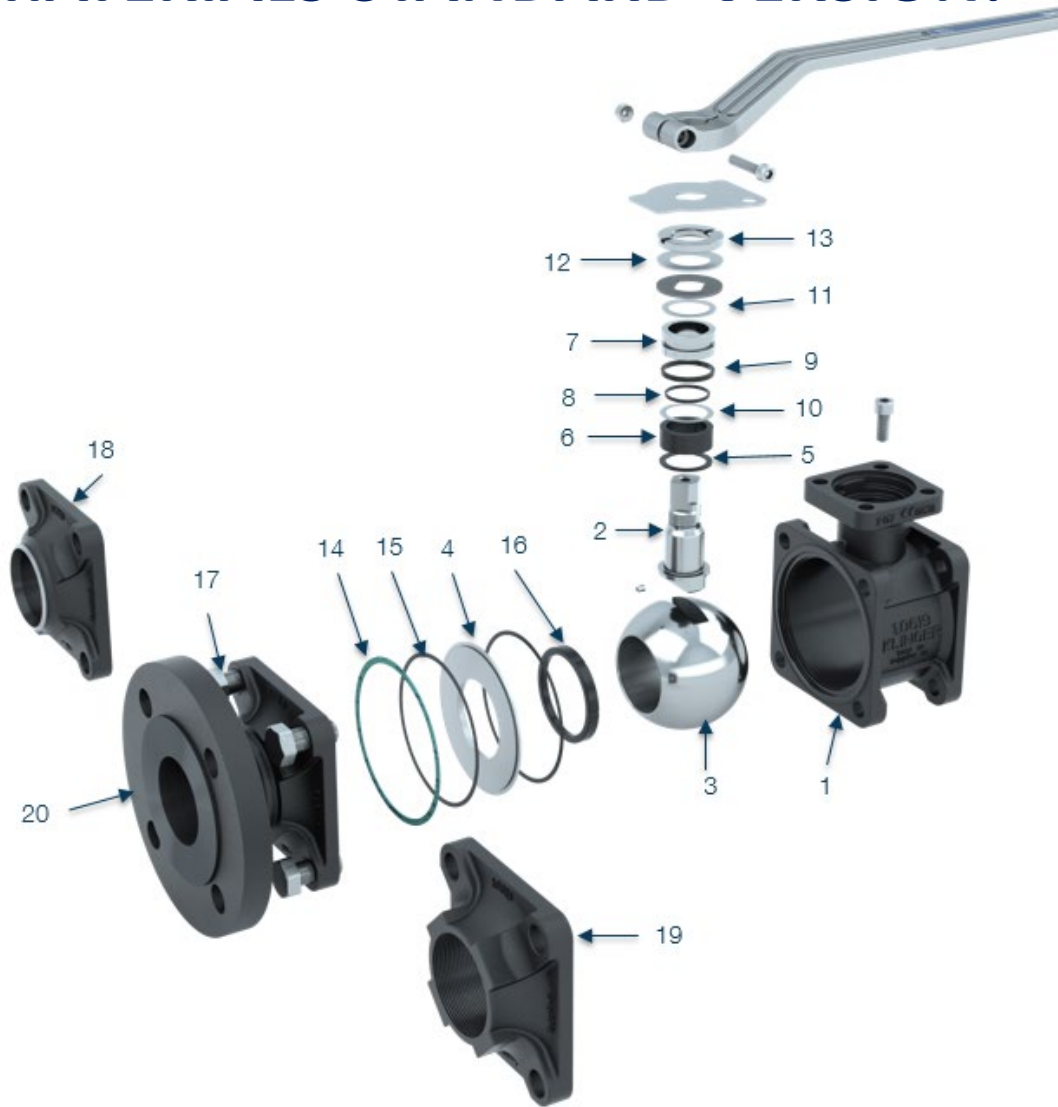
- 1) Sealing elements
- 2) Stuffingboxes
- 3) Standard and V – Port balls
- 4) Weld end and threaded end connection
- 5) Gasket C4430 on housing pitch

# FUNCTION



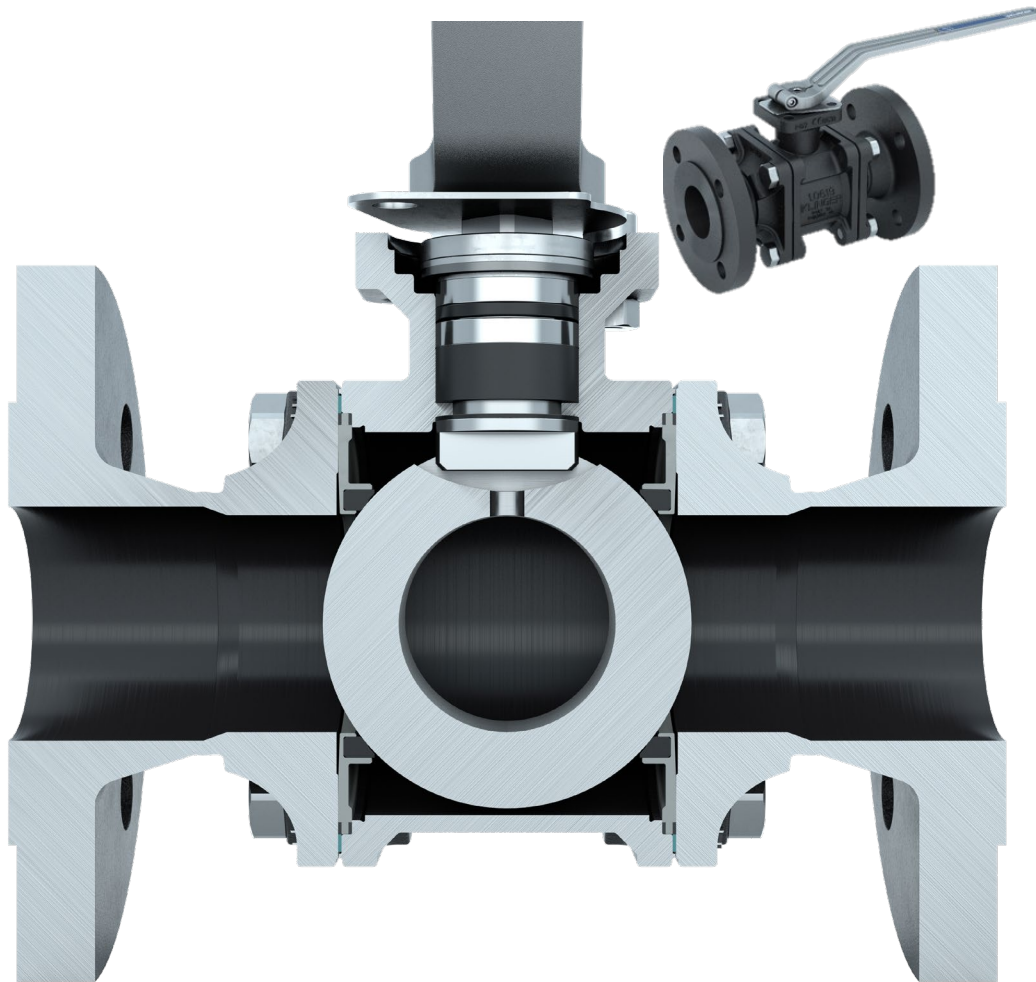
- » (1) Function due to floating ball principle. The ball is guided only from the stem. First, the media press on the ball and moves it in downstream direction. Afterwards, media also come behind the upstream sealing element.
- » (2) The media behind the upstream sealing element applies additional contact force of the seal ring on the ball.
- » (3) The ball is moving in the downstream seal ring of the sealing element and also applies additional contact force.
- » (4) Inner pressure in the cavity can occur due to temperature changes. If the cavity pressure is higher than the spring force of the downstream sealing element, this element will lift off the ball and drain the cavity pressure in the pipeline. After that the sealing element will move back in original position. This effect is only possible with the elastic design of the sealing elements.

# MATERIALS STANDARD VERSION:



| Part list | VIII, CS body      | Xc, SS body    |                 |
|-----------|--------------------|----------------|-----------------|
| 20        | Flange end         | 1.0619         | 1.4404 / 1.4408 |
| 19        | Threaded end       | 1.0619         | 1.4404 / 1.4408 |
| 18        | Weld end           | 1.0619         | 1.4404 / 1.4408 |
| 17        | Body screws        | A4-70          | A4-70           |
| 16        | Seal ring          | KFC            | KFC             |
| 15        | Gasket             | Graphite       | Graphite        |
| 14        | Flat gasket        | Klingsil C4430 | Klingsil C4430  |
| 13        | Stuffingbox nut    | 1.4404         | 1.4404          |
| 12        | Belleville washer  | 1.4310         | 1.4310          |
| 11        | Disc               | 1.4404         | 1.4404          |
| 10        | Disc               | 1.4401         | 1.4401          |
| 9         | O - Ring           | FEPM A75H      | FEPM A75H       |
| 8         | O - Ring           | FEPM A75H      | FEPM A75H       |
| 7         | Seal insert        | 1.4401         | 1.4401          |
| 6         | Sealing bush       | Graphite       | Graphite        |
| 5         | Friction washer    | Peek 583-z     | Peek 583-z      |
| 4         | Sealing element FS | 1.4462         | 1.4462          |
| 3         | Ball               | V4A            | V4A             |
| 2         | Stem               | 1.4104         | 1.4404          |
| 1         | Body               | 1.0619         | 1.4404 / 1.4408 |

# KHA FLANGED



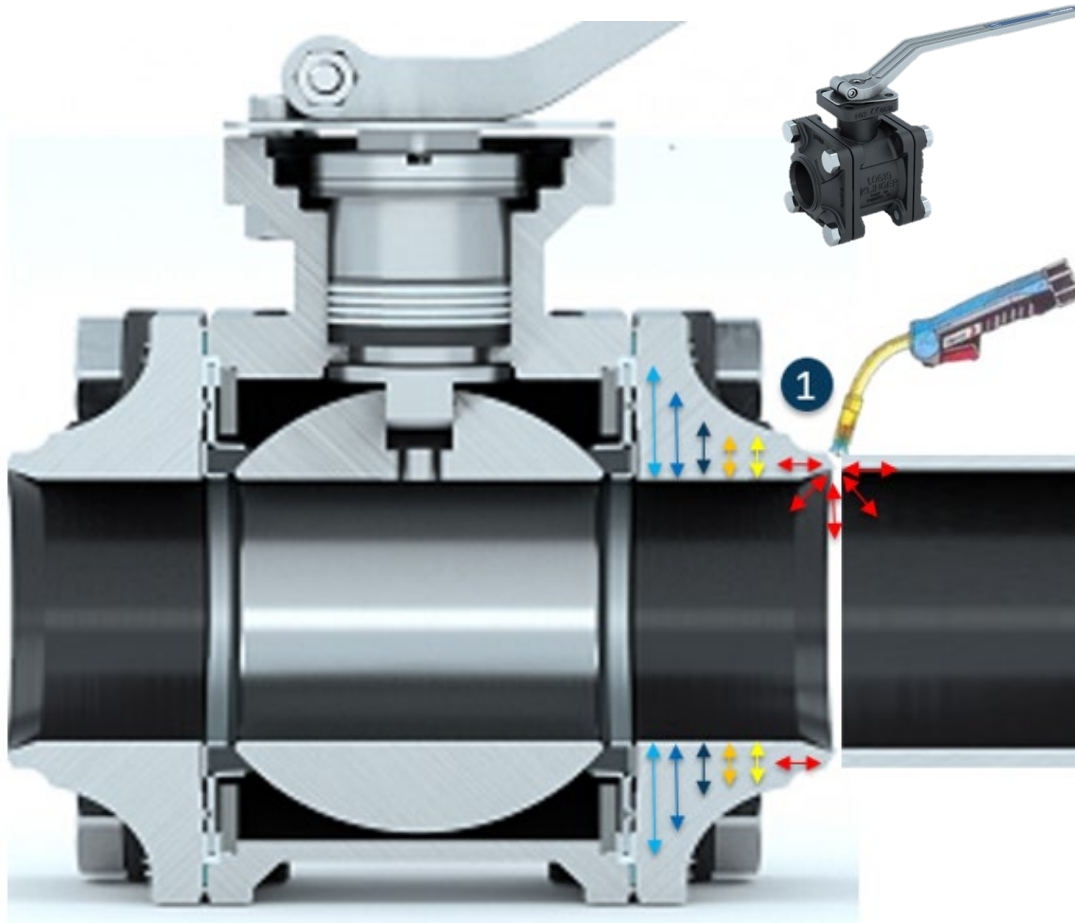
- » Line size range DN15 to 125 or ASME ½" to 5"
- » Flanges are available in the pressure stages PN16, PN25 and PN40 as well as ASME 150 and ASME 300
- » The flanged version is only available in full bore design
- » Cylindrical passage
- » Solid ball in stainless steel 1.4401 / 1.4408. Option V – port ball 10°, 30°, 60° and slotted
- » Valve length EN558 Gr.1 (EN-flanges) and ASME B16.10 Cl.300 (for ANSI150 and ANSI300)
- » Body materials in carbon steel 1.0619, stainless steel 1.4408 and duplex
- » Floating ball, trunnion mounted and "double block & bleed" version with drain / test cock
- » ISO TOP flange acc. EN ISO5211
- » Labelling (laser) acc. EN 19
- » Klinger Advanced Corrosion Protection (KACP)
- » Hand lever, bare stem or automated with el. mech. and pneumatic actuators

**Model code example of KHA flanged standard:**

**KHA-F 50 V0 P3 M1 FF FS HA**

- » KHA-F → KHA with flanges
- » 50 → line size
- » V0 → ball material 1.4401
- » P3 → Pressure stage flanges PN40
- » M1 → Body material 1.0619
- » FF → Seats fire safe (one – part sealing element KFC)
- » FS → Stuffingbox AFLAS/graphite
- » HA → Hand lever

# KHA WITH WELD ENDS



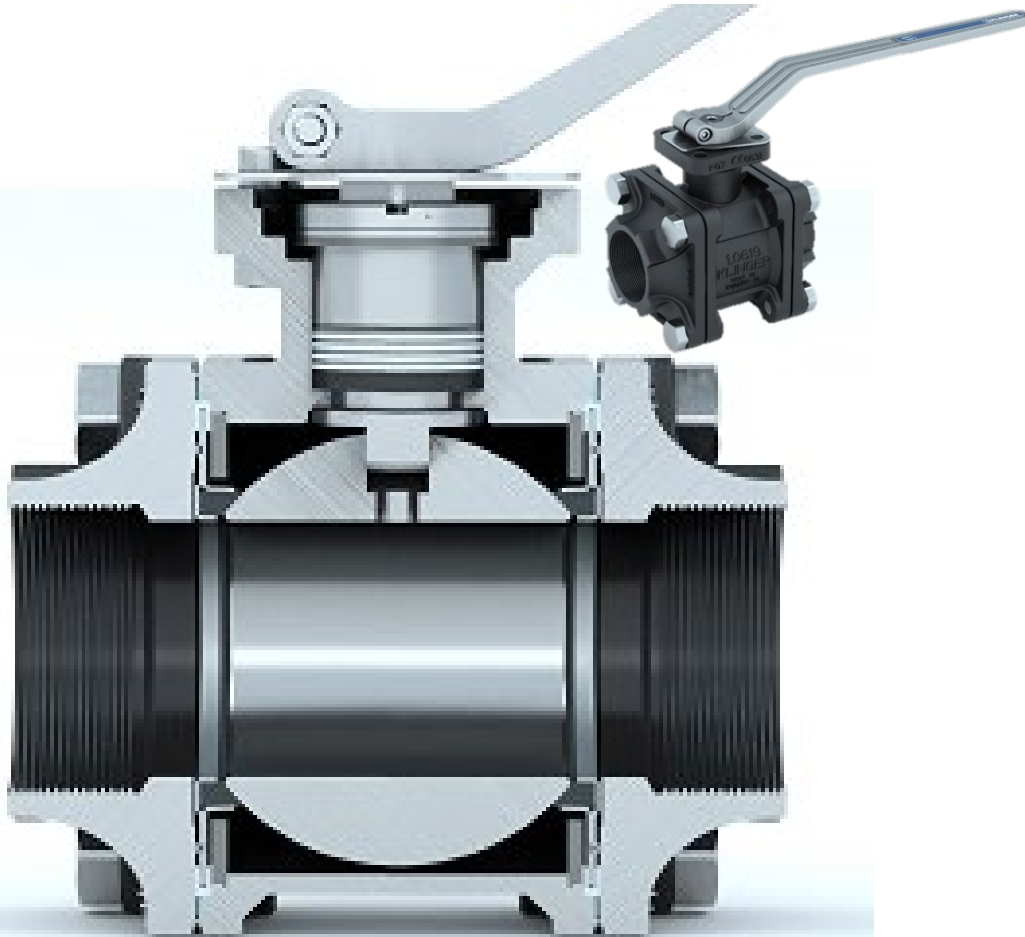
- » Pressure stages PN16 to PN100, DN15 to 125
- » Version with weld ends is only available in full bore design
- » Cylindrical passage
- » Solid ball in stainless steel 1.4401 / 1.4408. Option V – port ball 10°, 30°, 60° and slotted
- » Body length length is acc. EN12982 row 67
- » Weld end connection acc. EN12627
- » Body materials in 1.0619, 1.4408 and duplex
- » Floating ball, trunnion mounted and “double block & bleed” version with drain / test cock
- » ISO TOP flange acc. EN ISO5211
- » Labelling (laser) acc. EN 19
- » Klinger Advanced Corrosion Protection (KACP)
- » Hand lever, bare stem or electric + pneumatic actuators
- » **(1) New “KHA-S” ball valves do not need to be disassembled when welding the fitting into the pipeline: The heat generated during welding has no influence on the sealing elements because there is enough wall thickness of the housing material to act as a cooling zone. This saves time and costs during installation.**

Model code example of KHA with weld ends standard:

**KHA-S 50 V0 P3 M1 FF FS HA**

- » KHA-S → KHA with weld ends
- » 50 → line size
- » V0 → ball material 1.4401
- » P3 → Pressure stage flanges PN40
- » M1 → Body material 1.0619
- » FF → Seats fire safe (one – part sealing element KFC)
- » FS → Stuffingbox AFLAS/graphite
- » HA → Hand lever

# KHA WITH THREADED ENDS



- » Line size range ½" to 2"
- » Pressure stages PN16 to PN100
- » Version with threaded ends is only available in full bore design
- » Cylindrical passage
- » Solid ball in stainless steel 1.4401 / 1.4408.  
Option V – port ball 10°, 30°, 60° and slotted
- » Body length length is acc. EN16722-114
- » Threaded ends Rp acc. EN10226-1 or NPT
- » Body materials in carbon steel 1.0619, stainless steel 1.4408 and duplex
- » Floating ball, trunnion mounted and “double block & bleed” version with drain / test cock
- » ISO TOP flange acc. EN ISO5211
- » Labelling (laser) acc. EN 19
- » Klinger Advanced Corrosion Protection (KACP)
- » Hand lever, bare stem or automated with el. mech. and pneumatic actuators

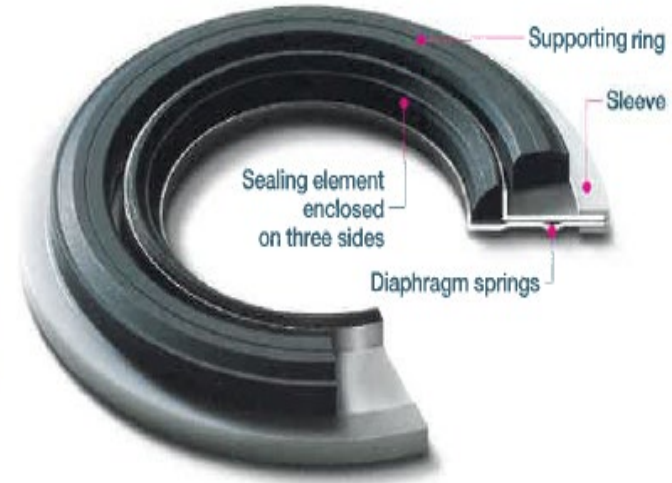
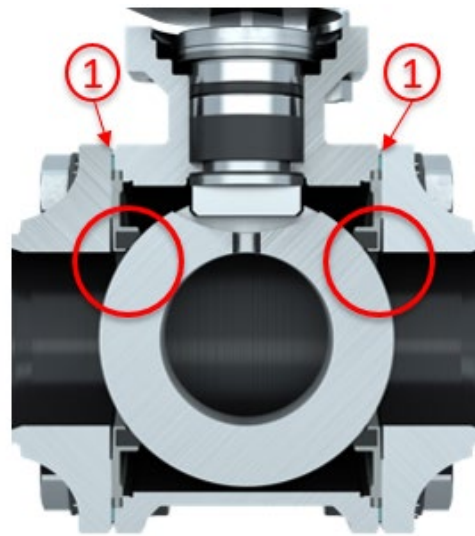
**Model code example of KHA with threaded ends standard:**

**KHA-G 2" V0 P3 M1 FF FS HA**

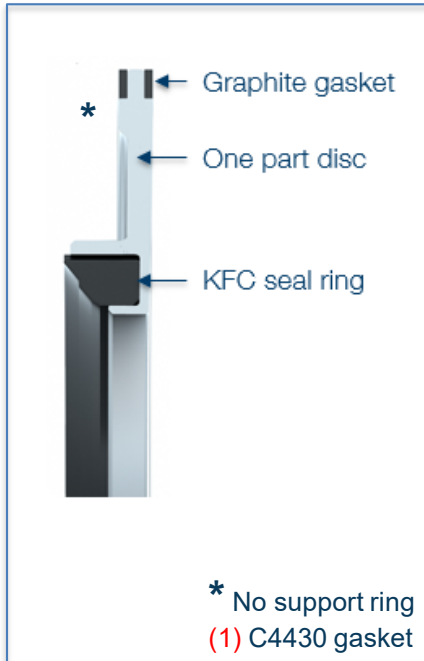
- » KHA-G → KHA with threaded ends
- » 2" → line size
- » V0 → ball material 1.4401
- » P3 → Pressure stage flanges PN40
- » M1 → Body material 1.0619
- » FF → Seats fire safe (one – part sealing element KFC)
- » FS → Stuffingbox AFLAS/graphite
- » HA → Hand lever



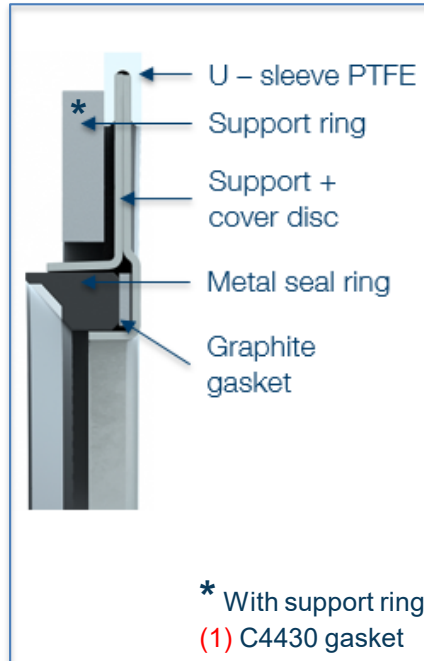
# DETAIL SEALING ELEMENTS



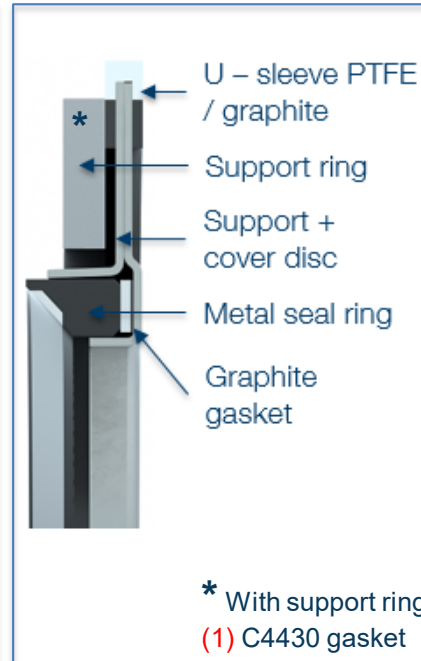
**Standard – Fire safe - 300°C**



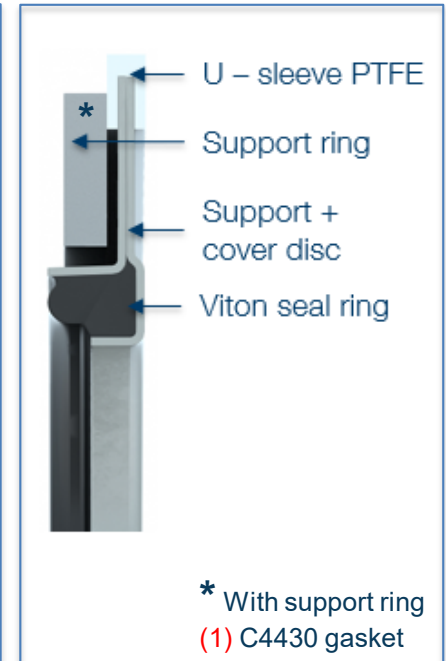
**Metal - 300°C**



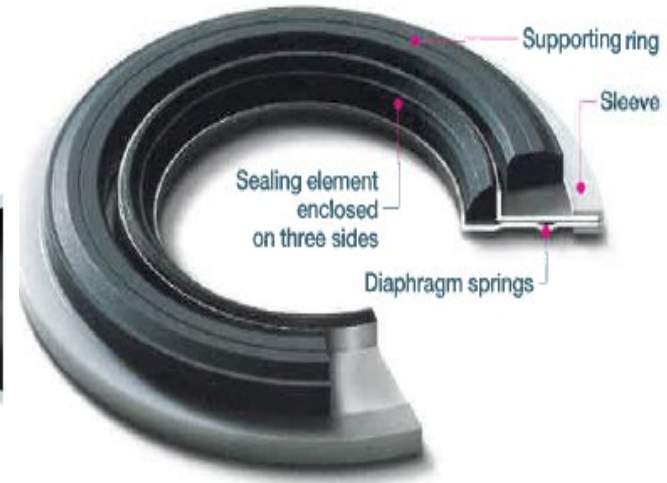
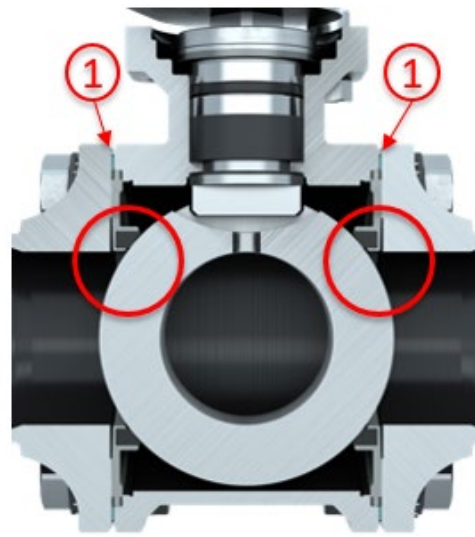
**Metal – special - 400°C**



**Viton - 150°C**



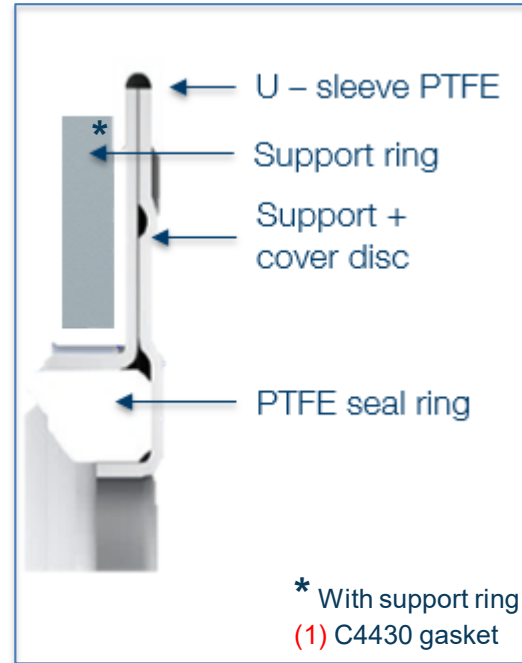
# DETAIL SEALING ELEMENTS



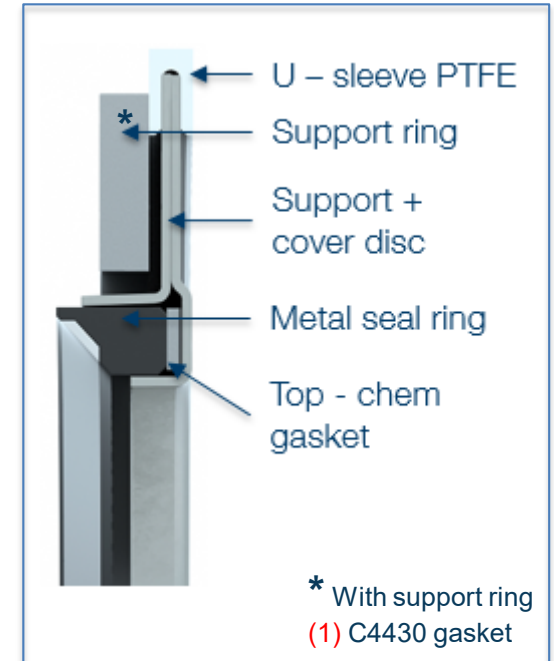
2 – part KFC- 300°C



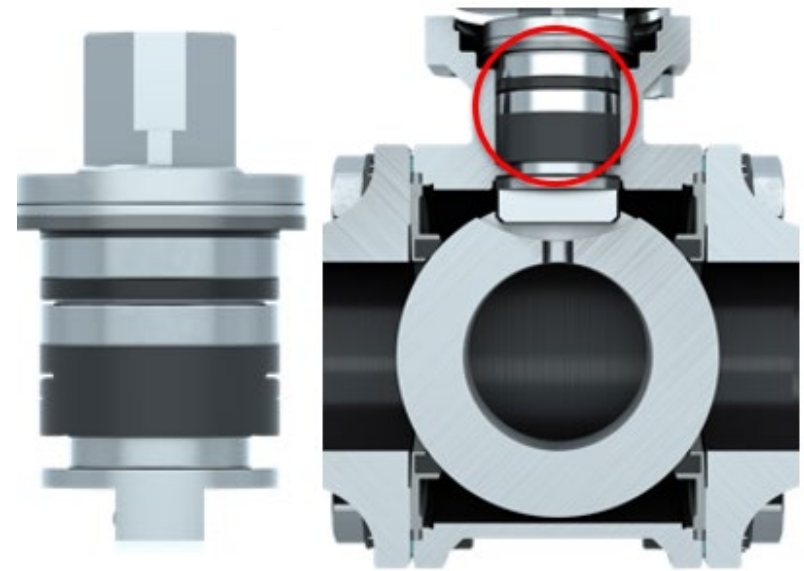
PTFE - 200°C



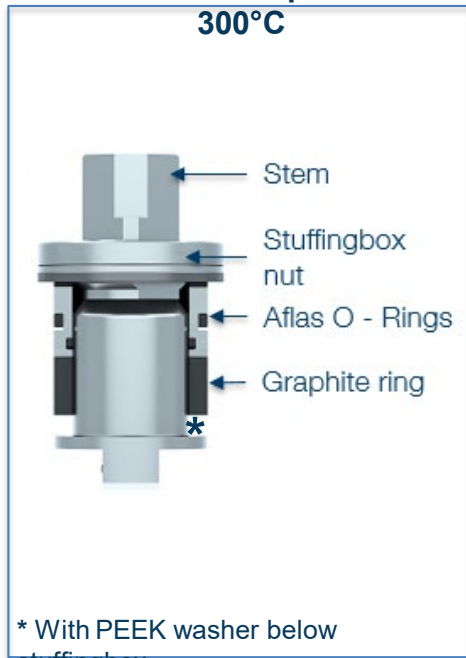
„HACO“ - 300°C



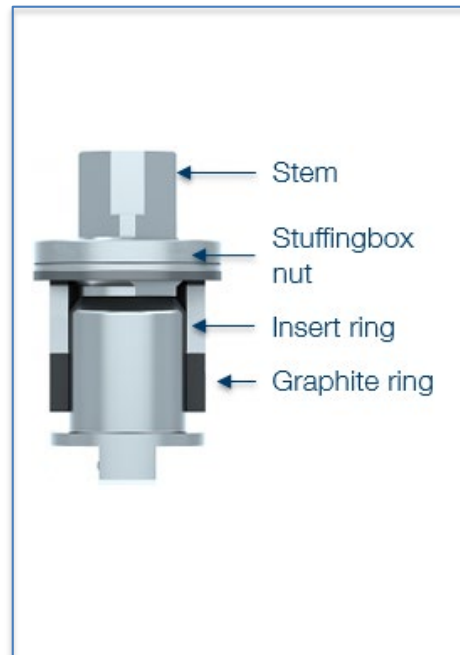
# DETAIL STUFFING BOXES



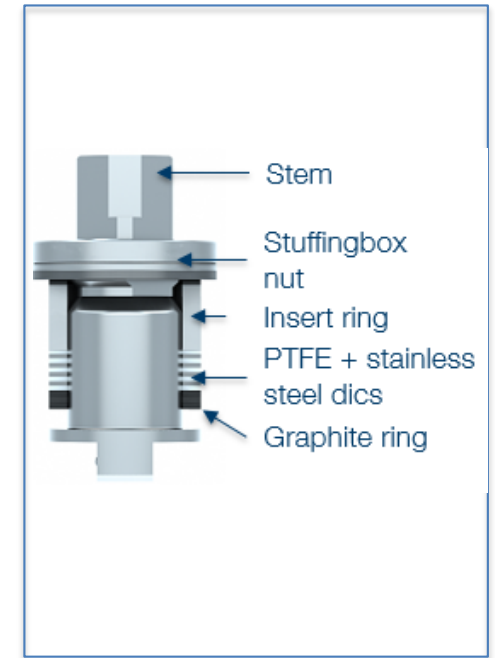
**Standard  
AFLAS/Graphite  
300°C**



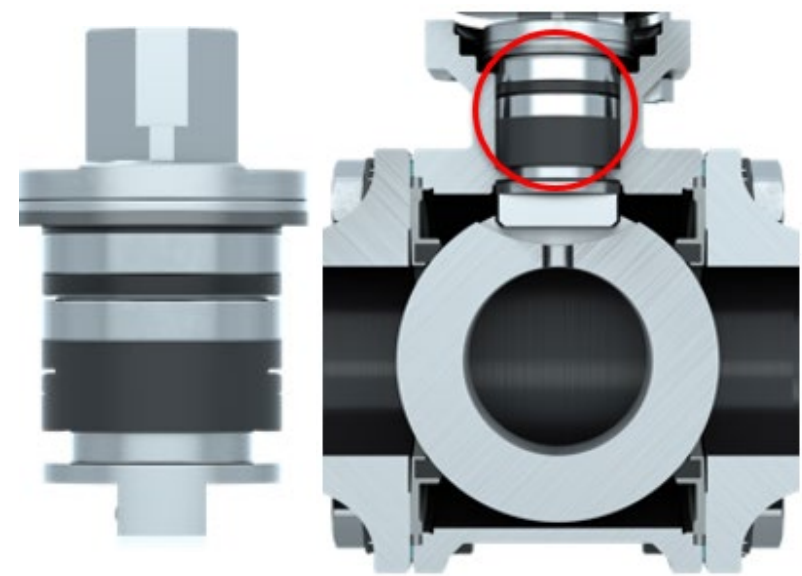
**Graphite  
400°C**



**Labyrinth PTFE  
300°C**



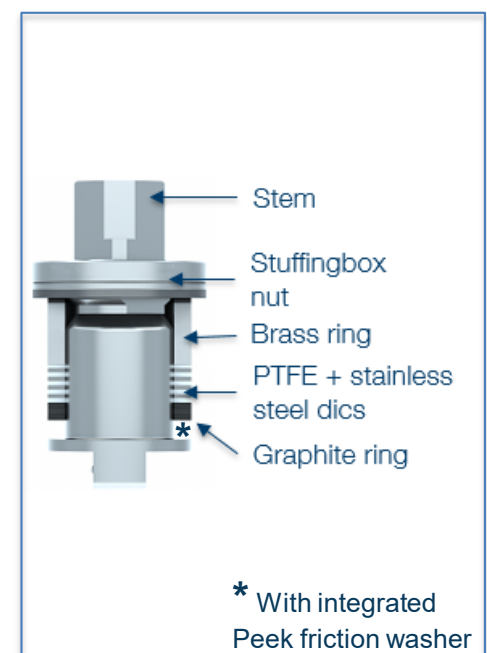
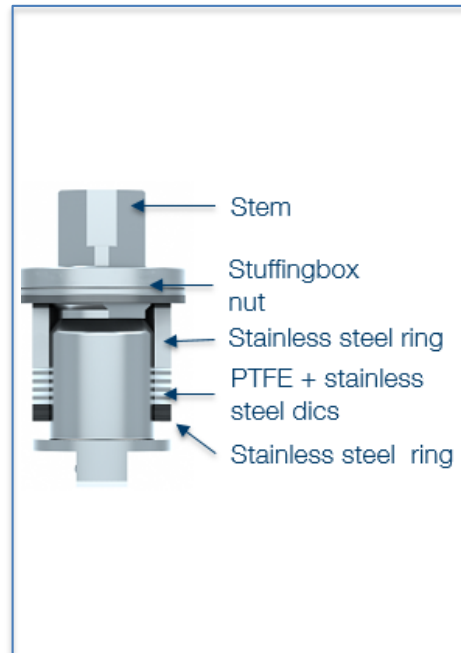
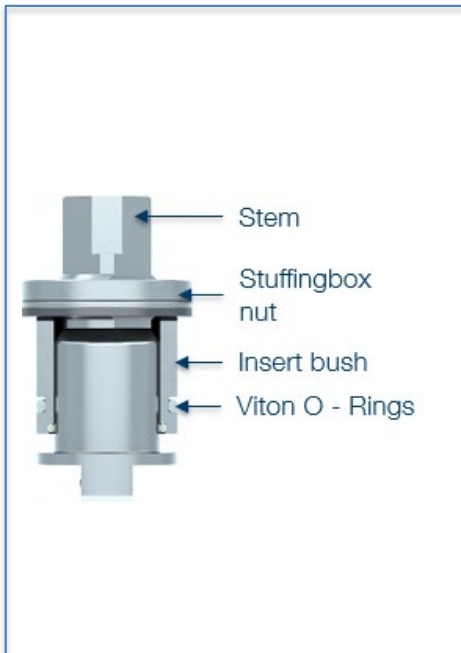
# DETAIL STUFFING BOXES



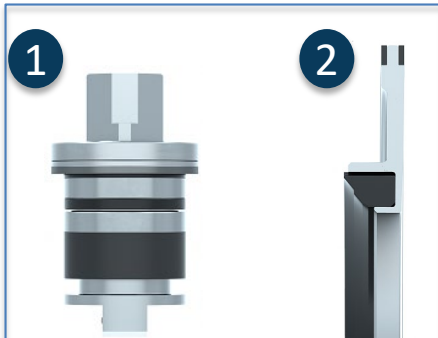
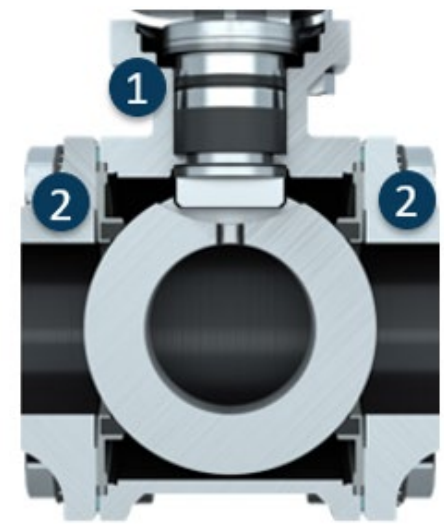
**Viton  
150°C**

**Pure PTFE  
200°C**

**HACO  
300°C**



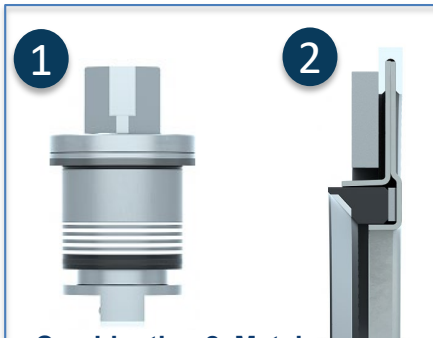
# APPLICATION & COMBINATION



## Combination 1, Standard FS:

Standard aflas /graphite stuffingbox and standard FS sealing elements + C4430 gasket:

- » Max. temperature 300°C
- » Fires safe acc. API607 & EN10497
- » ISO15848/TA Luft
- » Peek washer below stuffingbox ensures durability at high operating cycles
- » Leakage rate A



## Combination 2, Metal:

Labyrinth stuffingbox and metal sealing elements + C4430 gasket:

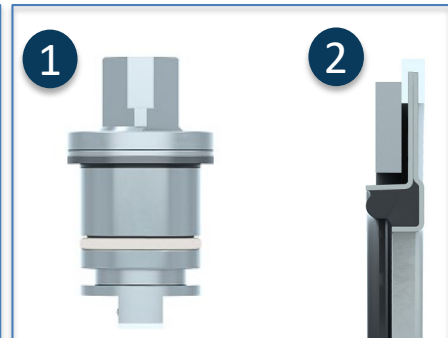
- » Max. temperature 300°C
- » For solid and particle containing media
- » Leakage rate  $10^{-5}$  of Kv value
- » Application examples: Waste water, river water, black liquor, blast furnace gas...



## Combination 3, Metal special:

Graphite stuffingbox and metal special sealing elements + C4430 gasket:

- » Max. temperature 400°C
- » For extreme hot media
- » Leakage rate  $10^{-5}$  of Kv value
- » Application examples: Superheated steam, heat transfer oil, transformer oil...

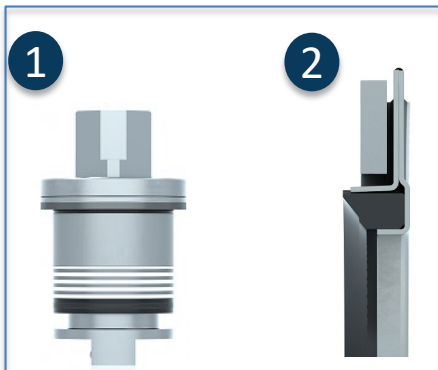
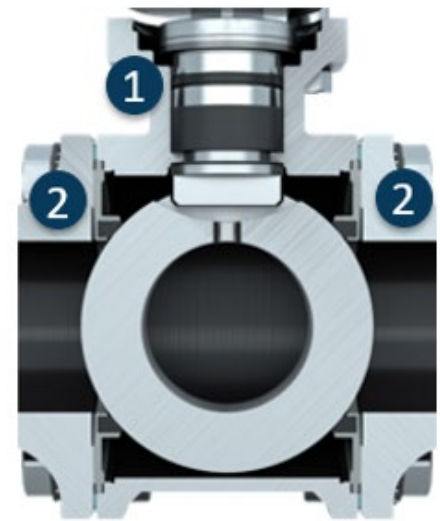


## Combination 4, Viton:

Viton stuffingbox and viton sealing elements + C4430 gasket:

- » Max. temperature 150°C
- » Leakage rate A
- » Application example: For very low vacuum applications

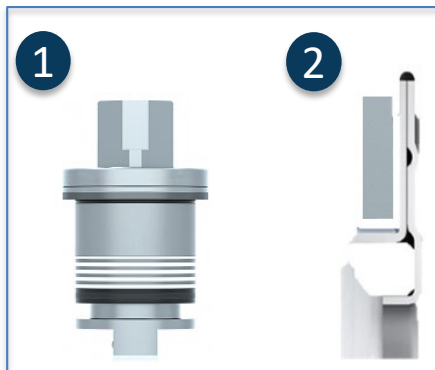
# APPLICATION & COMBINATION



## Combination 5, Standard:

Labyrinth stuffingbox and standard 2 – part KFC sealing elements + C4430 gasket:

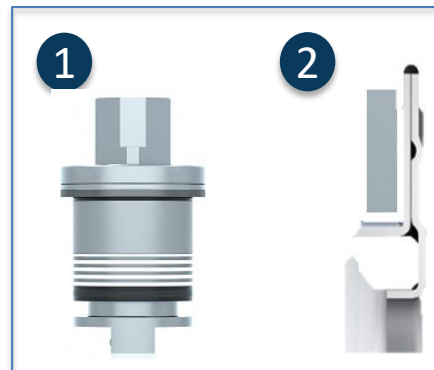
- » Max. temperature 300°C
- » Leakage rate A
- » For standard applications, clear liquids and gases without solids



## Combination 6, PTFE:

Labyrinth stuffingbox and PTFE sealing elements + C4430 gasket:

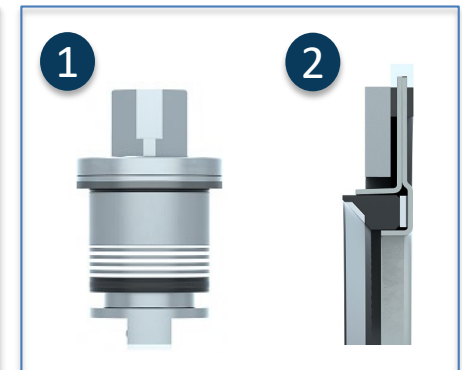
- » Max. temperature 200°C
- » Leakage rate A
- » For chemical applications



## Combination 7, PURE PTFE:

Pure PTFE stuffingbox and PTFE sealing elements + C4430 gasket:

- » Max. temperature 200°C
- » Leakage rate A
- » For applications where graphite material is not allowed

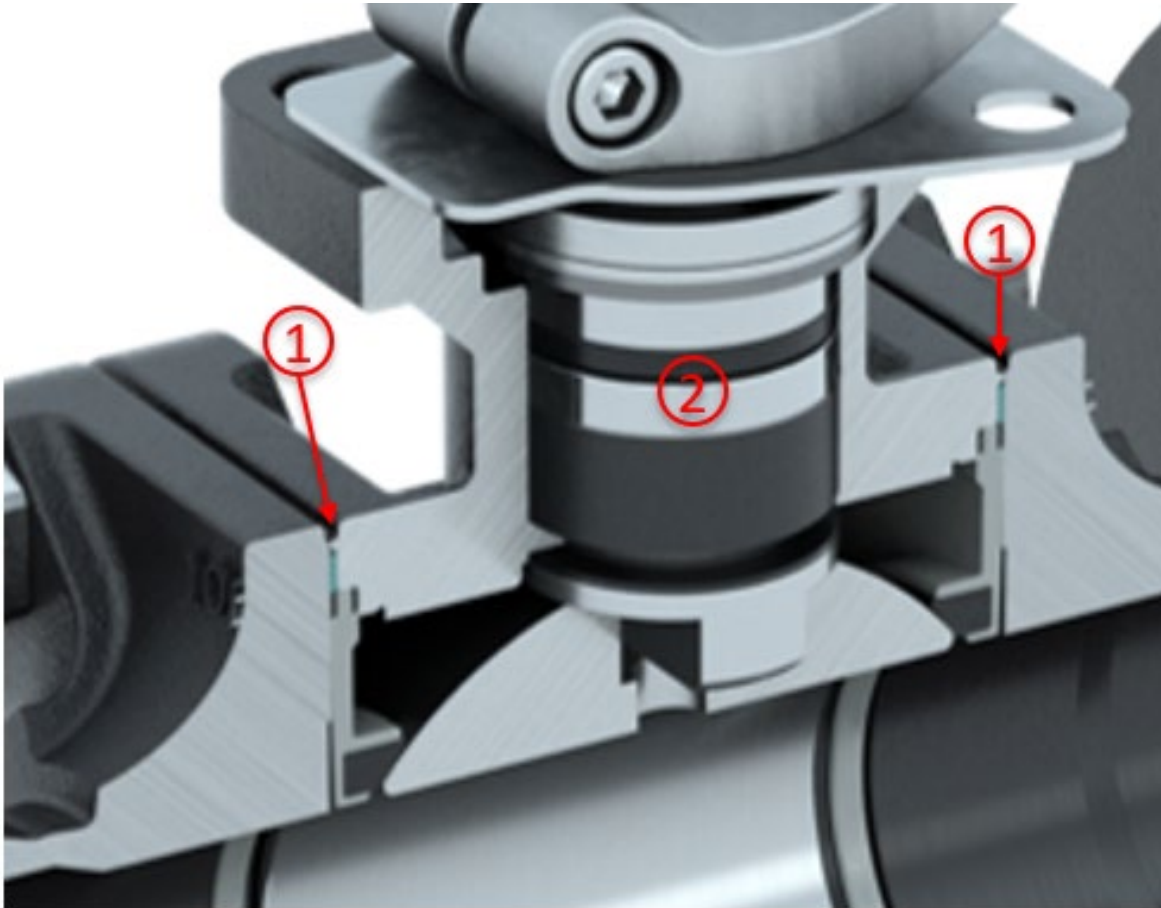


## Combination , „HACO“:

HACO stuffingbox and HACO sealing elements + C4430 gasket:

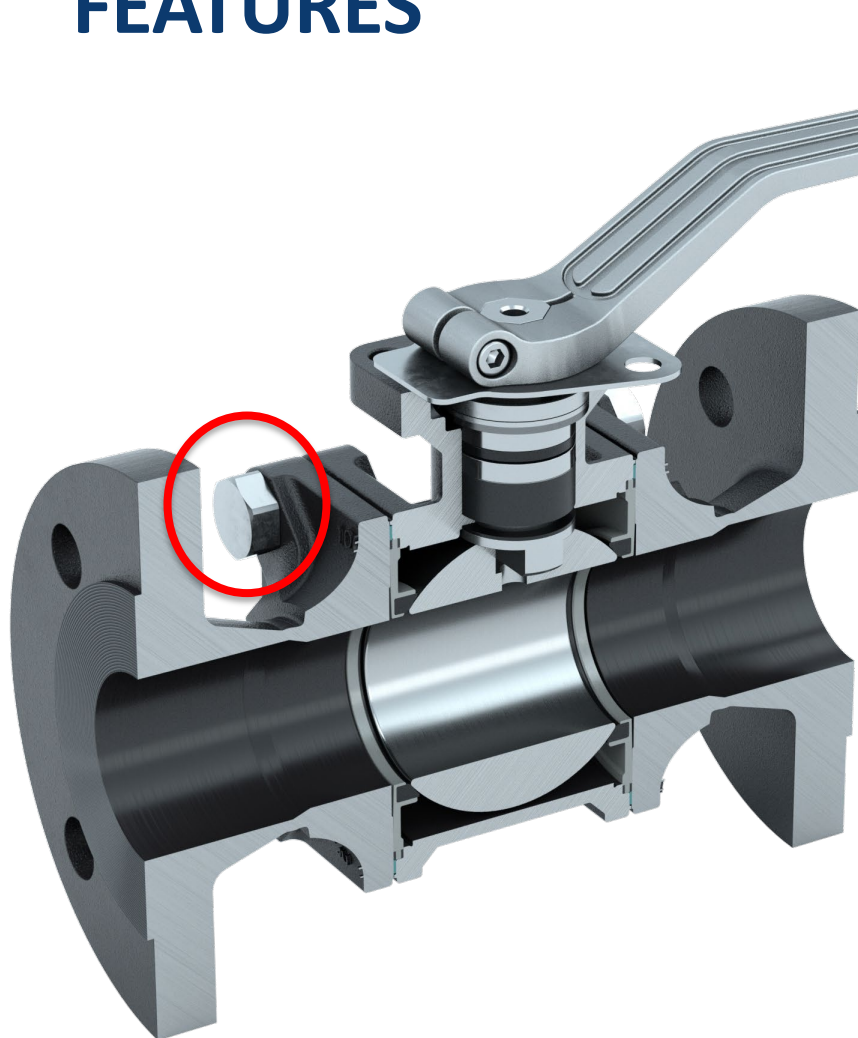
- » Max. temperature 300°C
- » For coffee applications (abrasive, solid containing media) with high operating cycles

## FEATURES



- » **(1)** Additional sealing (C-4430) for improved tightness on housing pitch
- » **(2)** Aflas /graphite combined stuffingbox for increased tightness to atmosphere
- » Standard version → Fugitive emission test acc. ISO15848, TA Luft, VDI2440
- » Standard version → Fire safe acc. API607 and EN10497

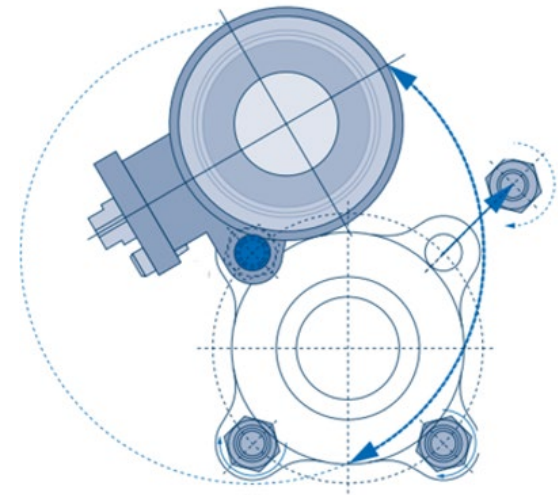
# FEATURES



- » Short body screws
- » Ensures high mechanical stability at thermal expansion due to temperature changes

## Weight optimization with FEM

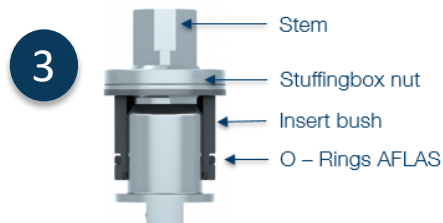
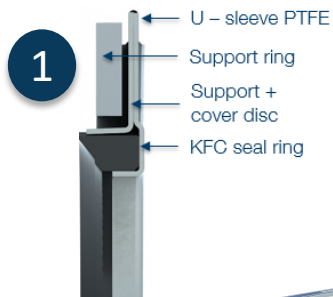
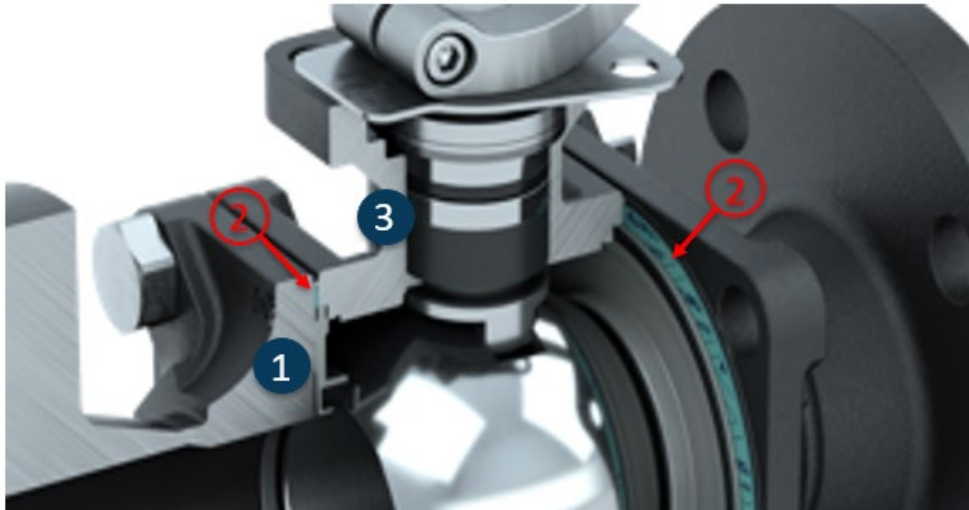
- » Optimized wall thicknesses and



- » The already known advantage of a service inline by clapping out the center piece of the valve to have access to the inner parts of the valve remain unchanged



# FEATURES



## DBB option for all sizes and models

- » DN15 to DN125
- » Trunnion mounted ball
- » **(1)** Two part sealing element KFC + **(2)** C4430 gasket on housing pitch
- » **(3)** Aflas stuffingbox
- » **(4)** With drain / test cock in different versions
- » Available housing materials 1.0619, 1.4408 and duplex
- » Available with all process connections: flanged, weld ends and threaded ends

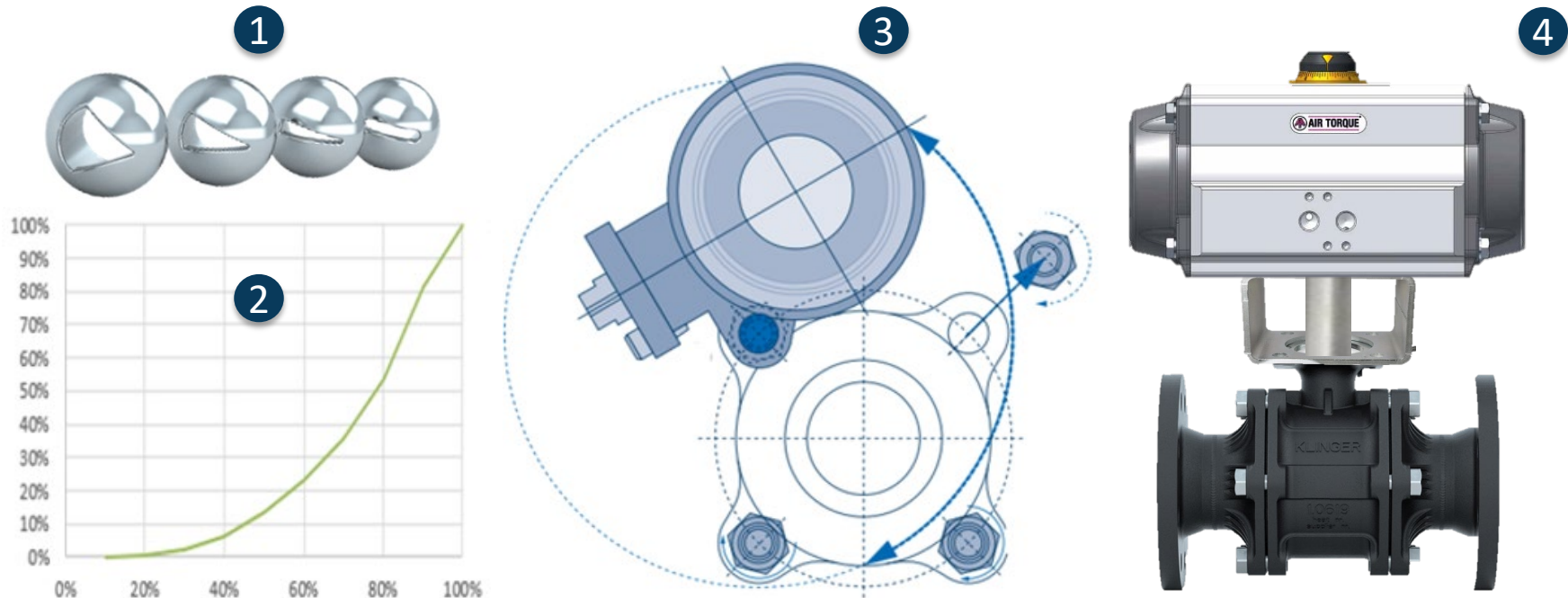
## Trunnion mounted option for all sizes and models

- » Trunnion mounted ball without drain / test cock
- » DN15 to DN125
- » Available housing materials 1.0619, 1.4408 and duplex
- » Available with all process connections: flanged, weld ends and threaded ends
- » Available for all sealing element and stuffingbox combinations

### Model code example of KHA flanged standard: KHA-F 50 V0 P3 M1 KK AF HA DBB

- » KHA-F → KHA with flanged ends
- » 50 → line size
- » V0 → ball material 1.4401
- » P3 → Pressure stage flanges PN40
- » M1 → Body material 1.0619
- » KK → 2 part sealing element KFC
- » AF → Stuffingbox with AFLAS O - Rings
- » HA → Hand lever
- » DBB → Double block and bleed version, trunnion mounted ball and drain / test cock

# FEATURES



## V – port balls:

- » (1) For flow control and regulating applications, the ball valve model KHA is available with different V – port balls and are applicable for clear (also abrasive and corrosive) and solid containing medias until 230°C. For clear media, KFC sealing elements and for solid containing, metal sealing elements are used. By using of metal sealing elements, the V-port ball is chrome coated.
- » V-Port ball versions are available with 10°, 30°, 60° angled and slotted cutting.
- » (2) The different ball cuttings are available for all line sizes and show different flow and regulation characteristics.
- » (3) The V-Port ball can be easily exchanged inline to get a different flow characteristic afterwards when flow requirements are changing on site.
- » (4) Combinable with pneumatic (single and double acting from AIR TPRQUE with positioner) or electric regulation actuators (24V, 230V, 380V, 400V from AUMA).

# FEATURES



**Klinger Advanced Corrosion Protection**  
Neutral salt spray test (ISO 9227)

phosphating

Stand. Paint.

**KACP**

20 h

100 h

**400 h**



Complete standard-compliant  
(EN19) laser marking of the valve

## STEM EXTENSION:



### **KHA stem extension:**

- » Without protection pipe, material 1.4021, length 150mm
- » With protection pipe, material 1.4404, length 150mm
- » Installation on already existing KHA afterwards possible
- » Version with protection pipe is equipped with ISO TOP flange for gear / actuator installation

# OPERATING TORQUES

Operating torques PTFE

| bar     | 0   | 5   | 10  | 16  | 20  | 25  | 30  | 40  | 50 | 63 | 100 |
|---------|-----|-----|-----|-----|-----|-----|-----|-----|----|----|-----|
| KHA-15  | 5   | 6   | 6   | 6   | 6   | 6   | 6   | 7   | 7  | 8  | 9   |
| KHA-20  | 11  | 11  | 11  | 12  | 12  | 12  | 13  | 13  | 14 | 15 | 17  |
| KHA-25  | 13  | 14  | 14  | 16  | 16  | 17  | 18  | 20  | 22 | 24 |     |
| KHA-32  | 15  | 17  | 18  | 19  | 20  | 22  | 23  | 26  | 28 | 32 |     |
| KHA-40  | 21  | 24  | 26  | 29  | 31  | 33  | 35  | 40  | 45 | 51 |     |
| KHA-50  | 30  | 33  | 36  | 40  | 42  | 45  | 48  | 54  |    |    |     |
| KHA-65  | 51  | 56  | 62  | 68  | 72  | 78  | 83  | 94  |    |    |     |
| KHA-80  | 72  | 86  | 99  | 115 | 126 | 140 | 153 | 180 |    |    |     |
| KHA-100 | 120 | 138 | 156 | 177 | 191 | 209 | 227 | 263 |    |    |     |
| KHA-125 | 203 | 238 | 274 | 317 | 345 | 381 | 416 | 488 |    |    |     |

Operating torques KFC

| bar     | 0   | 5   | 10  | 16  | 20  | 25  | 30  | 40  | 50 | 63 | 100 |
|---------|-----|-----|-----|-----|-----|-----|-----|-----|----|----|-----|
| KHA-15  | 6   | 6   | 6   | 7   | 7   | 7   | 7   | 8   | 8  | 9  | 10  |
| KHA-20  | 12  | 12  | 13  | 13  | 13  | 14  | 14  | 15  | 16 | 16 | 19  |
| KHA-25  | 14  | 15  | 16  | 17  | 18  | 19  | 20  | 22  | 24 | 27 |     |
| KHA-32  | 17  | 18  | 20  | 22  | 23  | 24  | 26  | 28  | 31 | 35 |     |
| KHA-40  | 25  | 28  | 31  | 34  | 36  | 39  | 42  | 47  | 53 | 60 |     |
| KHA-50  | 37  | 41  | 44  | 49  | 52  | 55  | 59  | 66  |    |    |     |
| KHA-65  | 60  | 66  | 73  | 80  | 85  | 91  | 98  | 110 |    |    |     |
| KHA-80  | 96  | 114 | 132 | 154 | 168 | 186 | 204 | 240 |    |    |     |
| KHA-100 | 160 | 184 | 208 | 236 | 255 | 279 | 303 | 350 |    |    |     |
| KHA-125 | 270 | 318 | 365 | 422 | 460 | 508 | 555 | 650 |    |    |     |

Operating torques Metal

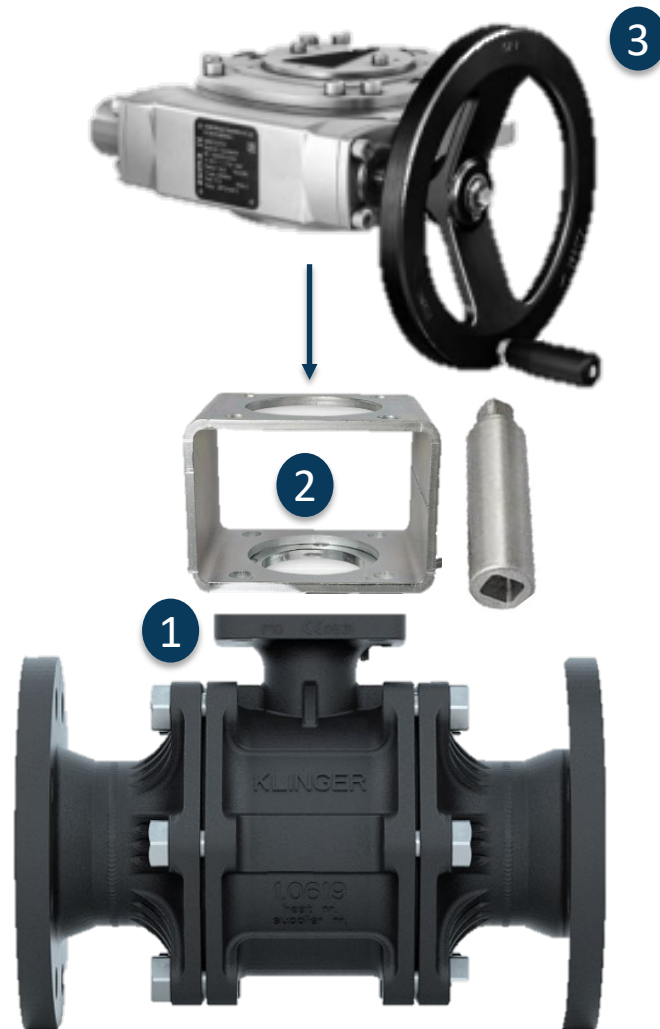
| bar     | 0   | 5   | 10  | 16  | 20  | 25   | 30  | 40  | 50 | 63  | 100 |
|---------|-----|-----|-----|-----|-----|------|-----|-----|----|-----|-----|
| KHA-15  | 8   | 8   | 8   | 9   | 9   | 9    | 9   | 10  | 11 | 12  | 14  |
| KHA-20  | 15  | 16  | 16  | 17  | 18  | 19   | 19  | 21  | 22 | 24  | 29  |
| KHA-25  | 18  | 19  | 21  | 23  | 24  | 25   | 27  | 29  | 32 | 36  |     |
| KHA-32  | 25  | 27  | 28  | 30  | 32  | 33   | 35  | 38  | 42 | 46  |     |
| KHA-40  | 40  | 45  | 50  | 55  | 59  | 64   | 69  | 78  | 88 | 100 |     |
| KHA-50  | 55  | 64  | 74  | 85  | 93  | 102  | 111 | 130 |    |     |     |
| KHA-65  | 85  | 102 | 119 | 139 | 153 | 169  | 186 | 220 |    |     |     |
| KHA-80  | 140 | 173 | 205 | 244 | 270 | 303  | 335 | 400 |    |     |     |
| KHA-100 | 250 | 294 | 338 | 390 | 425 | 469  | 513 | 600 |    |     |     |
| KHA-125 | 450 | 580 | 710 | 866 | 970 | 1100 |     |     |    |     |     |



## Safety factor:

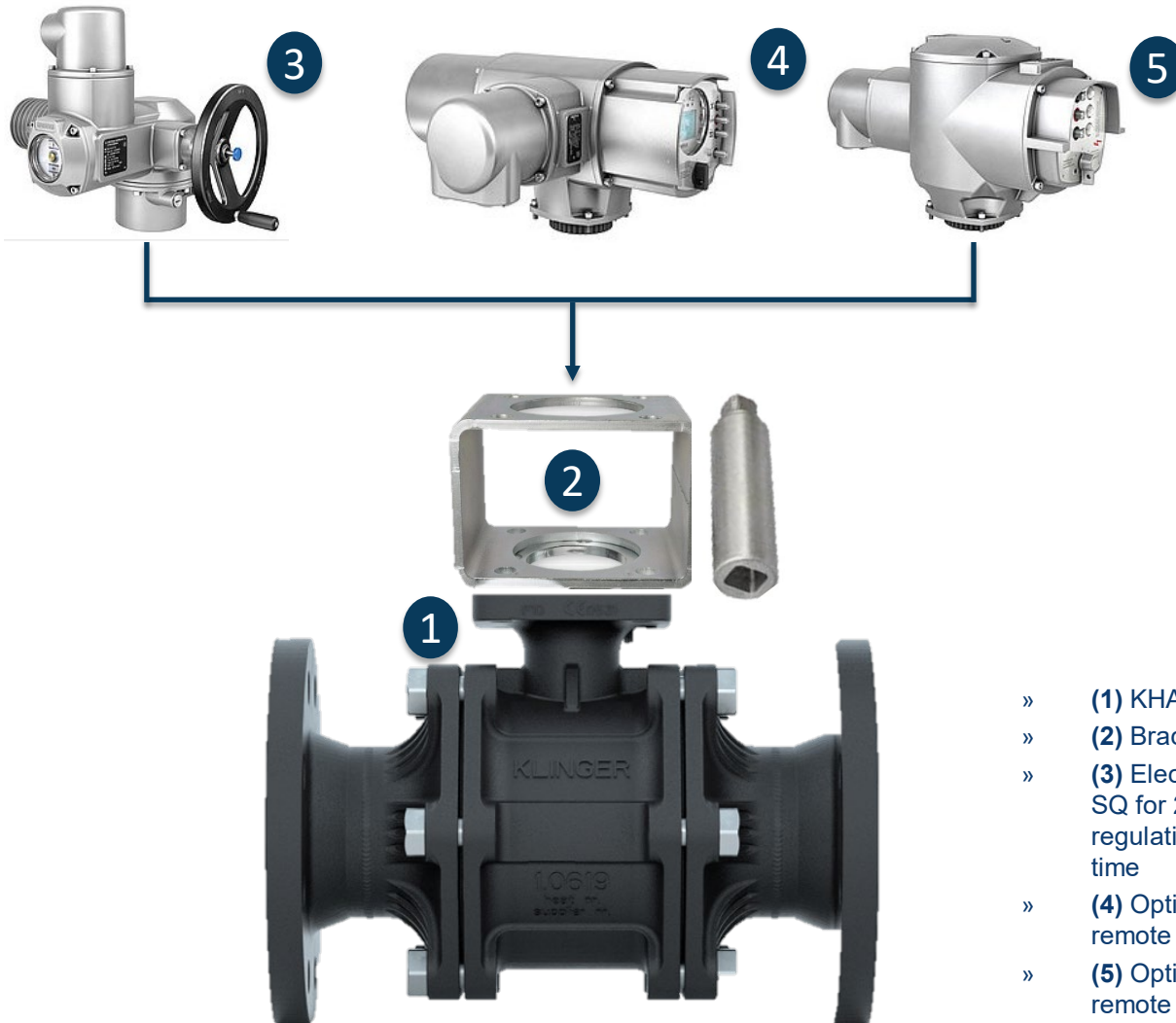
- » To size an actuator, first the operating torque at the expected differential pressure has to be selected out of the valve torque table and multiplied with a safety factor. The working differential pressure should be known by the end user.
- » The safety factor ensure, when the valve has an unexpected higher torque due to different reasons, that the actuator still have enough force reserve to open or close the valve.
- » Safety factors can be different and are media related but usually a factor **1,5** is used.

# MECHANICAL GEAR



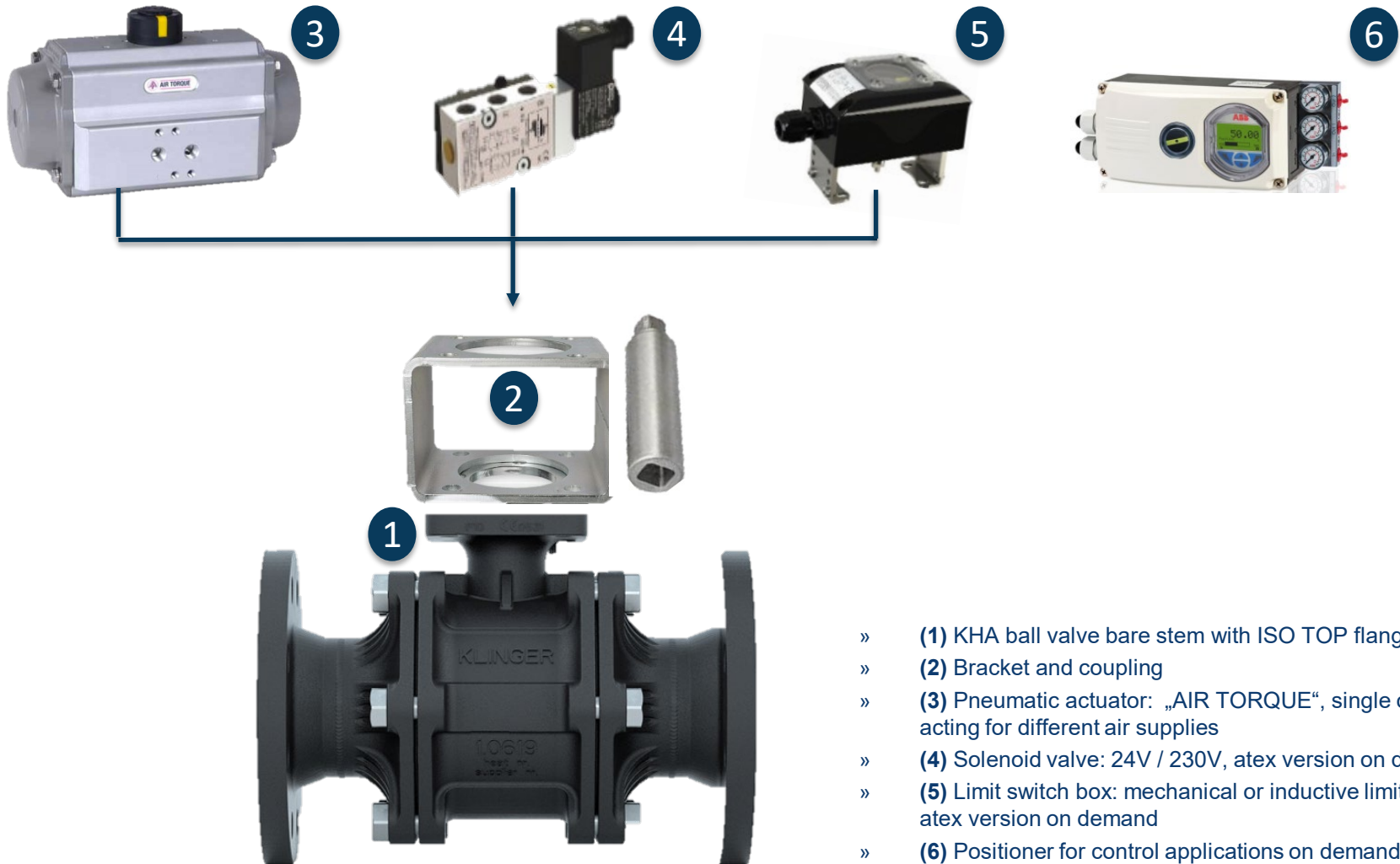
- » (1) KHA ball valve bare stem with ISO TOP flange
- » (2) Bracket and coupling
- » (3) Mechanical gears „AUMA“ for manual operation type „GS“ with hand wheel
- » (4) Option: WSG Limit switch unit for signalling of end positions, with mech. position indication

# AUTOMATION



- » (1) KHA ball valve bare stem with ISO TOP flange
- » (2) Bracket and coupling
- » (3) Electro mechanical actuators from „AUMA“ type SQ for 24, 230, 380 and 400V in standard, atex or regulation version with different options for closing time
- » (4) Option: local actuator control AUMATIC „AC“ , remote installation possible
- » (5) Option: local actuator control AUMAMATIC „AM“, remote installation possible

# AUTOMATION



- » (1) KHA ball valve bare stem with ISO TOP flange
- » (2) Bracket and coupling
- » (3) Pneumatic actuator: „AIR TORQUE“, single or double acting for different air supplies
- » (4) Solenoid valve: 24V / 230V, atex version on demand
- » (5) Limit switch box: mechanical or inductive limit switches, atex version on demand
- » (6) Positioner for control applications on demand



# ADVANTAGES

1



## (1) Sealing elements:

- » High temperature range  $-196^{\circ}\text{C} - 400^{\circ}\text{C}$  → achievable with different sealing element versions
- » Wide range of different sealing element types → easy adaptable for many different applications
- » Design is elastic, robust, reliable and insensitive to impurities and pressure shocks → high lifetime
- » Additional C4430 gaskets on housing pitch → improved tightness to atmosphere

2



## (2) Stuffingboxes:

- » Wide range of different stuffingbox types → easy adaptable for many different applications
- » Easy combinable with all types of sealing elements in one valve construction
- » New aflas / graphite stuffingbox → Fire safe and TA Luft / ISO15848 approved

3



## (3) Ball:

- » Standard ball made of stainless steel 1.4401 or 1.4408 → high resistance to chemical media and mechanical loads
- » By using of metal sealing elements, the ball is chrome coated → Insensitive for solids, no sticking of media particles on the surface
- » Cylindrical bore → No turbulences, laminar flow, low pressure drop
- » Different ball bearings → floating ball or trunnion mounted
- » V – port balls in  $10^{\circ}$ ,  $30^{\circ}$ ,  $60^{\circ}$  and slotted cutting on demand → for control applications with different flow characteristics

4



## (4) Body

- » Compact casted center piece → Insensitive to pipeline forces
- » Short housing screws → high mechanical stability at thermal expansion due to temperature changes
- » ISO TOP flange for every line size → Easy installation of additional equipment like gears and actuators
- » Valve could be installed in any position → easy handling
- » Modular valve construction → Max. flexibility to adopt the valve to many different applications

5



## (5) Quality

- » In standard version fire safe and TA Luft / ISO15848 approved
- » Inline service possible → service and cost efficient
- » Long service life → Reduction of maintenance costs
- » Spare parts are quick available
- » Double block & bleed version for all sizes → TÜV confirmed, max. safety for maintenance, drainage of the cavity in closed position

# NEW MODEL CODE:

| KHA S-F 50 V1 P1 M2 FF FS IV O2 |      |      |                 |                 |                         |              |                             |                       |                             |                                  |
|---------------------------------|------|------|-----------------|-----------------|-------------------------|--------------|-----------------------------|-----------------------|-----------------------------|----------------------------------|
| Type                            | Conn | DN   | Ball            | PN              | Body m.                 | Seats        | Stuffingb.                  | Version               | Special 1                   | Special 2                        |
| KHA                             | E    | 15   | V0 –full b. (1) | P1 –PN16        | M1-Viii (1.0619)<br>(2) | FF-FS (Std)  | FS-AF/graphite/Peek<br>(FS) | FW-bare stem          | AM- Ammonia KLN2414/8 (4)   | BL-Blue RAL5015                  |
|                                 | F    | 20   | V1 –10°         | P2 –PN25        | M2-Xc (1.4408)          | MM-Metal     | LAB-ST/PTFE/(LAB)           | HA-Lever              | BO- Vent drilling KLN2414/8 | C3-EN12944 C3 160µm<br>(5)       |
|                                 | G    | 25   | V3 –30°         | P3 –PN40        | M3-Xd (1.4462)          | SS-MES       | GRA-graphite                | IV- Isol.ext.FW       | DBB-trunnion w. drain (6)   | C4-EN12944 C4 200µm              |
|                                 | N    | 32   | V6 –60°         | P4 –PN63        |                         | PP-Pure PTFE | PTFE-pure PTFE              | IH- Isol.ext.HA       | GAS-ÖVGW/DVGW               | C5I-EN12944 240-280µm            |
|                                 | S*   | 40   | VS -slot        | P5 –PN100       |                         | VV- Viton    | VIT- Viton                  | IG - Isol.+ Gear      | PL-drain w. plug            | C5M-EN12944 240-280µm            |
|                                 | S-F  | 50   | C0 –full 30µm   | P6 –CL150       |                         | HH-HACO (3)  | HACO-ST/MS/Peek             | IA- Isol.<br>Actuator | TM-trunnion mounted         | GE-Yellow RAL1023                |
|                                 | F-S  | 65   | C1 –10°30µm     | P7 –CL300       |                         | KK-KFC       | C70M-C70M                   | KO- Console           | TT-Low temperature          | O2- Oxygen KLN840                |
|                                 | S-G  | 80   | C3 –30°30µm     | PX -<br>Special |                         | UU-UHWM      | AF- Aflas O-Rings           | GE-gear               | VL- Sk pipe ext./special BL | OF- oil and grease free          |
|                                 | G-S  | 100  | C6 –60°30µm     |                 |                         |              | UHWM-PE-UHWM                | AN- Actuator          | AT-Air Torque               | OFS- oil,grease,silicone<br>free |
|                                 | F-G  | 125  | CS – slot 30µm  |                 |                         |              |                             |                       | AU-AUMA (GS/SQ)             |                                  |
|                                 | G-F  | 1/2" | D0 -full        |                 |                         |              |                             |                       |                             |                                  |
|                                 | ...  | 3/4" | D1 –10°         |                 |                         |              |                             |                       | K1- Customer des. (CPCU)    |                                  |
|                                 | MST  | 1"   | D3 –30°         |                 |                         |              |                             |                       | To – Customer Ebner         |                                  |
|                                 |      | 5/4" | D6 –60°         |                 |                         |              |                             |                       | K99-Customer design         |                                  |
|                                 |      | 6/4" | DS -slot        |                 |                         |              |                             |                       | Marine/Lloyds               |                                  |
|                                 |      | 2"   |                 |                 |                         |              |                             |                       | BASF                        |                                  |
|                                 |      | 2.5" |                 |                 |                         |              |                             |                       | EN101                       |                                  |

\* S: weld end, F: flange, G: threaded end, S-F: weld end / flange, F-S: flange / weld end, S-G: weld end / threaded end, G-S: threaded end / weld end, F-G: flange / threaded end, G-F: threaded end / flange

(1) V0 = solid stainless steel ball, V1 = v- port ball 10°, V3 = v- port ball 30°, V6 = v- port ball 60°, VS = slotted ball, CR = chrome coated ball 30µm

(2) M1 = former VIII carbon steel, M2 = former Xc stainless steel, M3 = former XD duplex

(3) HACO = Labrinth stuffingbox with brass pressure ring and peek friction washer

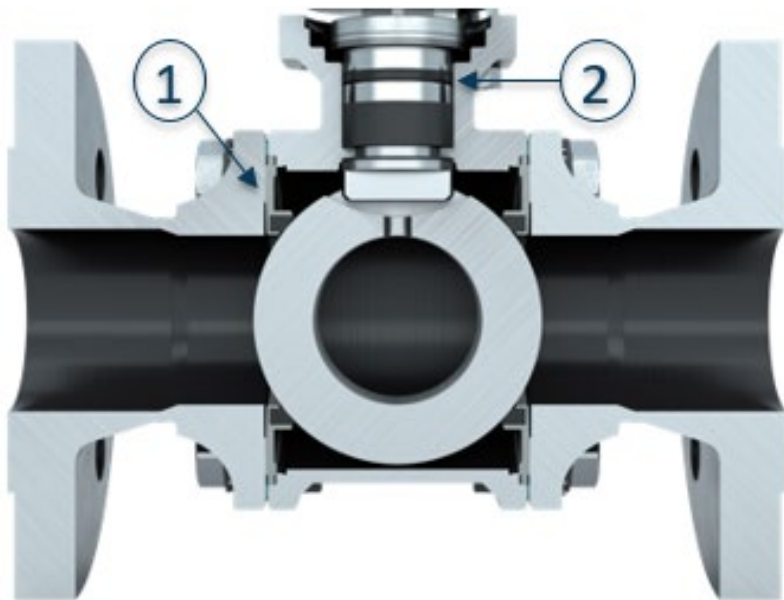
(4) AM – Ammonia version: KLN2414/8 with pressure relief drilling in upstream sealing element

(5) C3 = C3 coating acc. EN12944 middle µm160, C = C4 coating acc. EN12944 middle µm200, C5I = C5I coating acc. EN12944 middle 240-280µm,

C5M = C5M coating acc. EN12944 middle 240-280µm

(6) DBB = double block and bleed with trunnion mounted ball and drain / test cock

# CODE EXAMPLES:



### KHA OXYGEN VERSION

(1) Standard 2 part sealing elements KFC  
 (2) Stuffingbox Labyrinth ST/PTFE  
 The Valve is cleaned – oil and grease free for oxygen use. The valve is limited in pressure and temperature depending on the body material.

### Code example KHA flanged for oxygen:

**KHA-F 50 V0 P3 M1 KK LAB HA O2**  
 KHA-F → KHA with flanged ends  
 50 → line size  
 V0 → ball material 1.4401  
 P3 → Pressure stage flanges PN40  
 M1 → Body material 1.0619  
 KK → 2 part sealing element KFC  
 LAB → Stuffingbox Labyrinth ST/PTFE  
 HA → Hand lever  
 O2 → KLN840 Oil and grease free for oxygen

### KHA WITH METAL SEATS

(1) Standard 2 part sealing elements METAL  
 (2) Stuffingbox Labyrinth ST/PTFE  
 METAL seats will be used when solids or abrasive particles are present in the media.

### code example KHA flanged ,metal seats:

**KHA-F 50 C0 P3 M1 MM LAB HA**  
 KHA-F → KHA with flanged ends  
 50 → line size  
 C0 → ball material 1.4401, chrome coated  
 P3 → Pressure stage flanges PN40  
 M1 → Body material 1.0619  
 MM → 2 part sealing element METAL  
 LAB → Stuffingbox Labyrinth ST/PTFE  
 HA → Hand lever

### KHA HACO VERSION

(1) HACO 2 part sealing elements METAL with TOP CHEM washer  
 (2) HACO stuffingbox Labyrinth ST/MS with Peek washer and brass ring for high operating cycles  
 The HACO version will be especially used for coffee powder applications where the media is extremely abrasive and the valve is operated very often.

### Code example KHA flanged HACO version:

**KHA-F 50 C0 P3 M2 HH HACO HA**  
 KHA-F → KHA with flanged ends  
 50 → line size  
 C0 → ball material 1.4401, chrome coated  
 P3 → Pressure stage flanges PN40  
 M2 → Body material 1.4408  
 HH → HACO 2 part sealing element METAL with top chem washer  
 HACO → Stuffingbox HACO ST/MS/PEEK  
 HA → Hand lever