

## **Resilient seated gate valves**



**Renowned for superior quality**



AVK INTERNATIONAL A/S

## AVK is renowned worldwide



### In business for more than 40 years

In 1969 AVK introduced the very first gate valve for water, and eight years later we obtained our first DVGW approval for gas valves. We have built a complete range of valves and accessories and have acquired quality approvals for our gate valves from all the leading national and international testing institutes. Our dedication to high quality and continuous product development is widely recognized by a large number of customers around the world. More than 3,000 people in the AVK group are doing their utmost to ensure that AVK remains one of the world's leading valve manufacturers of valves for water, gas, wastewater treatment and fire protection applications.





## Quality valves for vital systems



### Advanced technology in products and processes

For more than four decades, AVK has successfully been meeting the strict safety demands from water and gas companies. AVK valves are manufactured in modern factories characterized by streamlined flows and a high degree of automation. We are entirely committed to ensuring that quality remains a naturally integrated part of our production flow.

AVK's quality assurance system is certified according to ISO 9001. Moreover, we are certified to ISO 14001, the international standard for environmental management, and OHSAS 18001, the international Occupational Health and Safety Standard.



### Part of vital infrastructures

90 % of our gate valves are installed underground and must therefore be maintenance free and remain fully functional for many years. All our gate valves are part of vital infrastructures securing clean drinking water, safe distribution of natural gas, efficient handling of wastewater as well as crucial fire protection systems. Compromise on quality is thus not an option.

We offer a wealth of valve end configurations and AVK valves can be used for all pipe materials. We also offer a comprehensive range of extension spindles and street covers for easy operation of valves installed below ground.



## The wedge is the heart of a gate valve



### Unique features and benefits

- Fixed, integral wedge nut sealed with rubber prevents corrosion (1).
- Double bonding vulcanization process ensures maximum adhesion of the rubber.
- Guide rails with integrated wedge shoes ensure low friction and smooth operation (2).
- Rubber vulcanized to the core with min. 1.5 mm on all pressure bearing surfaces and 4 mm on all sealing surfaces gives optimum corrosion protection.
- Large rubber volume in the sealing area provides optimum sealing (3).
- Large plain and conical stem hole (4) prevents stagnant water and accumulation of impurities.
- AVK's rubber compound features an outstanding compression set value, resistance to water treatment chemicals and ensures minimised biofilm formation.





## Designed for a long lifespan



### Fixed, integral wedge nut prevents corrosion

AVK's wedge nut design is superior to the traditional loose wedge nut design as it prevents vibration and thus also corrosion, malfunction and water hammer. The wedge nut is made of dezincification resistant brass with lubricating abilities.

### Integrated wedge shoes for smooth operation

The fixed wedge nut, combined with the guide rails with integrated wedge shoes, secure a smooth operation of the valve and low operating torques. The wedge shoes protect the rubber against wear which otherwise would arise caused by the friction during operation.

### Efficient bonding is the key to durability

The wedge core is immersed in two different baths providing:

- a primer to prevent corrosion
- bonding between rubber and ductile iron core

Even if a sharp object penetrates the rubber the bonding is so strong that there is no risk of creeping corrosion underneath the rubber. As a result, we can offer the best rubber adhesion and corrosion protection on the market.



*DN 40-400: Integrated wedge shoes in internal guide rails*



*DN 450-600: External wedge shoes on reversed guide rails*

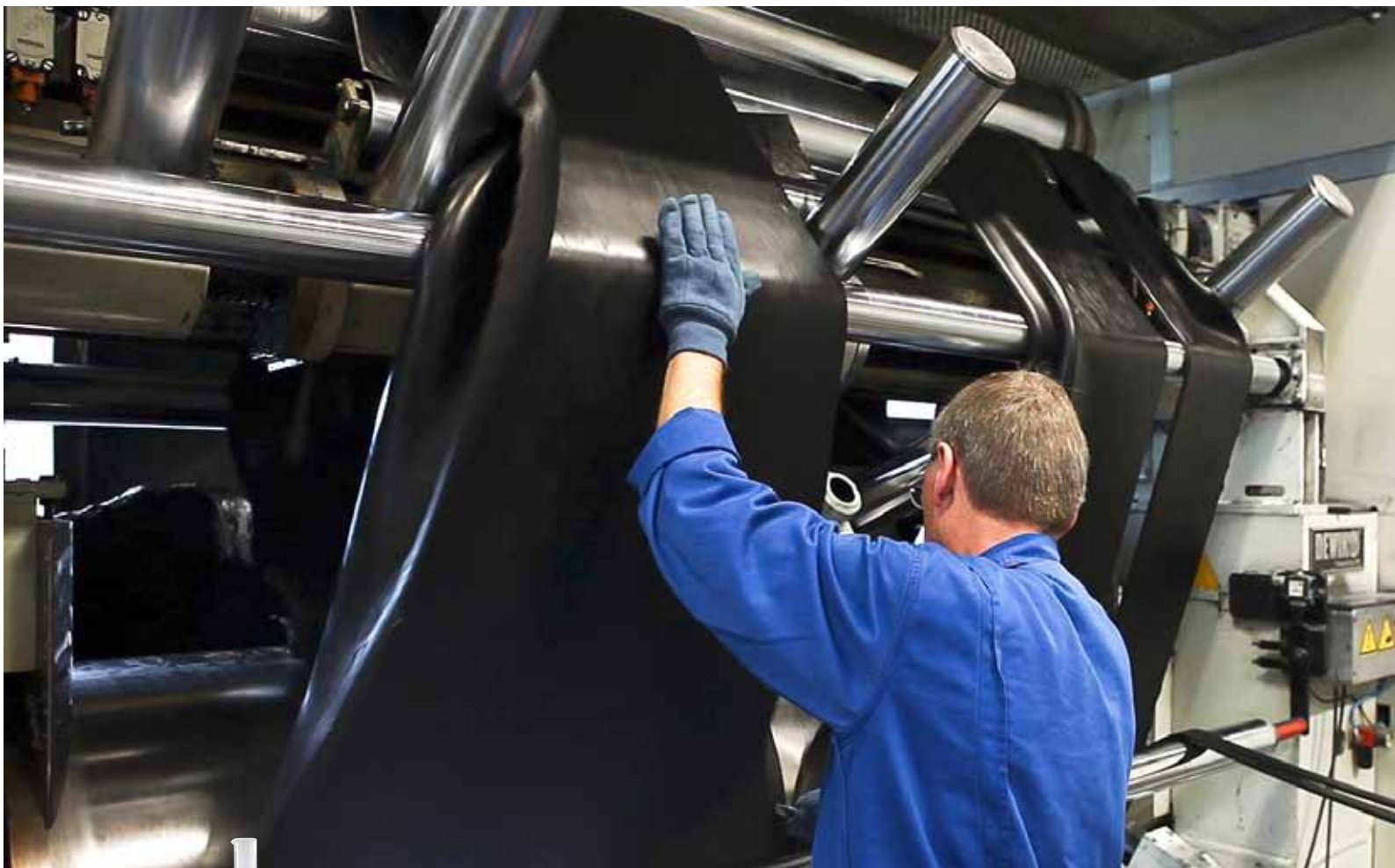


*The double bonding process prevents creeping corrosion*



*A thin layer of rubber must remain after the peeling test*

## State-of-the-art rubber technology



### AVK's rubber compounds

AVK GUMMI A/S develops and manufactures the rubber compound for wedges and gaskets using highly advanced technologies. Data is collected throughout the entire manufacturing process which secures traceability of every individual ingredient, each compound and the finalized components. AVK GUMMI makes a number of tests to ensure that the compression set values, the adhesion and the tensile strength meet the predefined requirements.



AVK GUMMI A/S has produced valve rubber parts since 1975



The automated mixing process ensures a uniform quality



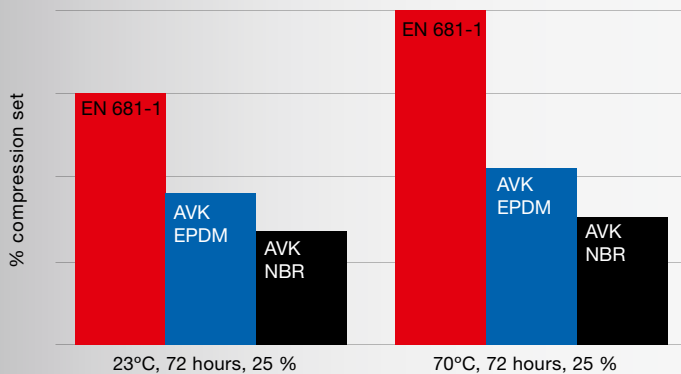
## Outstanding rubber characteristics



### Excellent ability to regain original shape

AVK GUMMI A/S has a profound knowledge of a rubber's compression set, meaning its ability to regain original shape. Even after many years of service where the wedge rubber has been compressed numerous times, the rubber will regain its original shape and ensure a tight sealing.

Impurities will not affect the rubber surface or the tightness of the valve, as they will be absorbed in the rubber when the valve is in closed position. When the valve is reopened, the impurities will be flushed away, and the rubber will regain its shape.



EN 681-1 states the minimum requirements for the compression set value. The smaller the permanent deformation, the better the compression set.

### No contamination of drinking water

The EPDM rubber recipes are composed with focus on minimising the formation of biofilm. The rubber will therefore not provide breeding ground for bacteria.

### High resistance

The drinking water approved EPDM compounds are resistant to ozone and water treatment chemicals such as sodium hypochlorite solutions, and are of course taste, smell and colour neutral. The NBR rubber is resistant to oil and gas, and holds an approval according to EN 682.



*The formation of biofilm complies with W270*



*The rubber is deformed by 25 % at the compression set test*

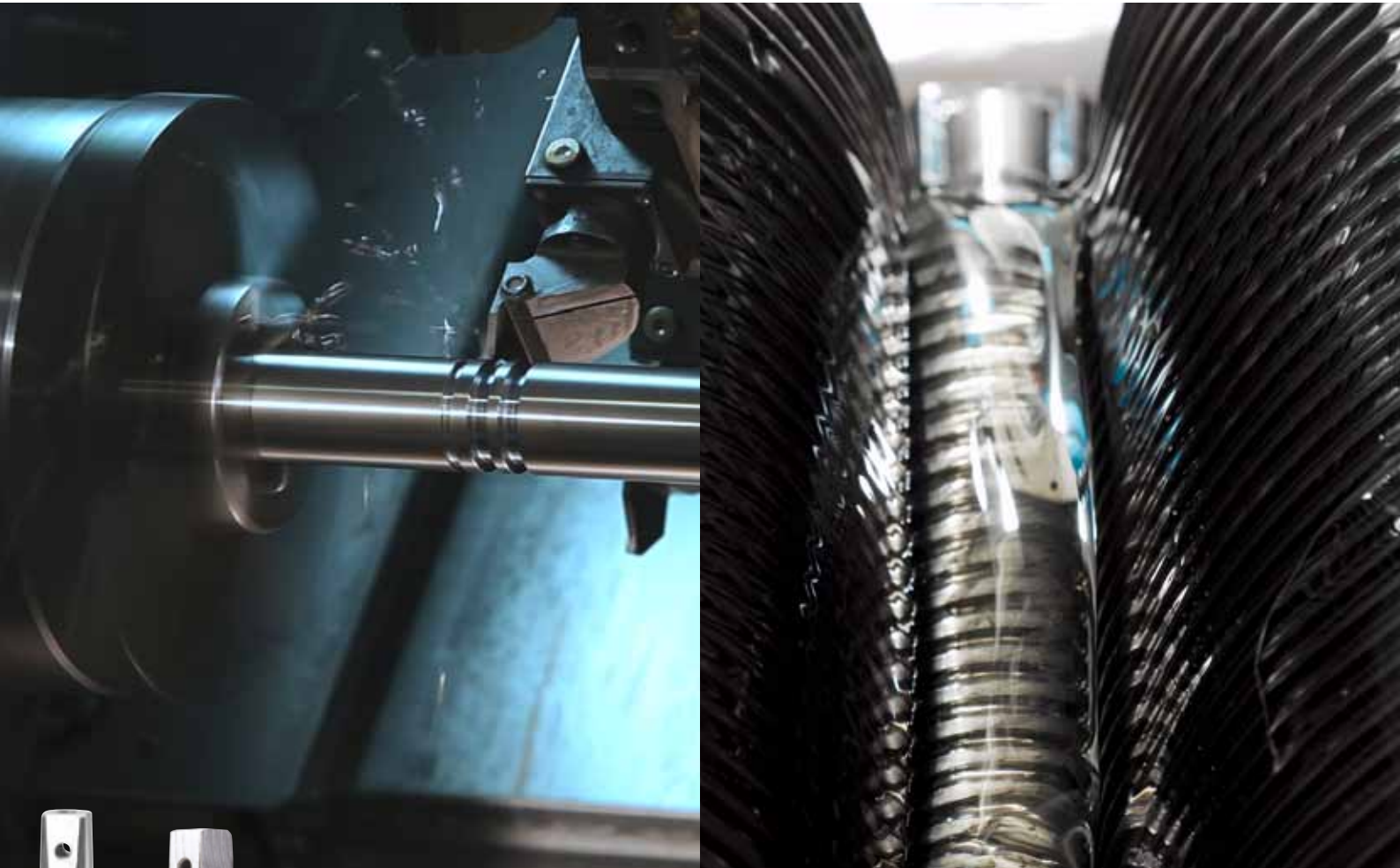


*Resistance to water treatment chemicals is crucial*



*Wedges are vulcanized with min. 4 mm on all sealing surfaces*

## High strength and low operating torques

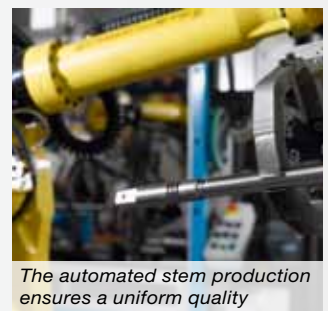


### Stainless steel stems with wedge stop and rolled threads

- The wedge stop (1) provides a firm stop against the wedge nut when opening the valve. This prevents the wedge from compressing the stem seals and from damaging the coating inside the bonnet resulting in prolonged durability of the valve.
- The stem threads (2) are rolled in a cold pressing process which maintains the steel structure and therefore increases the strength of the stem. This method results in smooth thread surfaces and brings about low operating torques and prolonged durability.



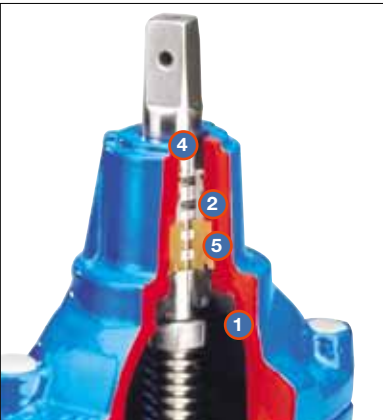
Stems for gas valves (3) are polished to ensure tightness



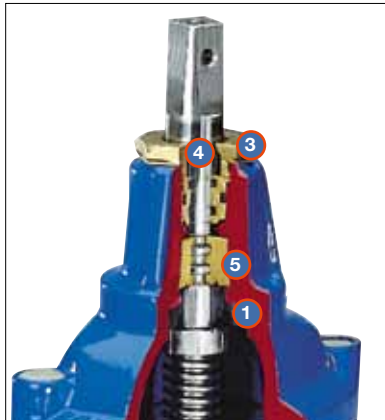
The automated stem production ensures a uniform quality



## No compromises on tightness



Stem sealing with polyamide bearing - for water and waste water



Replaceable stem sealing with brass stem seal nut - for water and gas



Series 06 DN 450-600 and 800 - roller bearings give low torques



The recessed bonnet gasket encircles the bonnet bolts

### Triple safety stem sealing system

- A manchette (1) is the main seal to the flow.
- Four NBR O-rings in a polyamide bearing (2) provide tightness around the stem. Alternatively, in a brass stem seal nut (3) replaceable under pressure.
- An NBR wiper ring (4) protects against impurities from the outside.

The full circle thrust collar (5) of dezincification resistant brass provides a low free running torque.

Our gate valves in DN 450-600 and 800 are designed with two roller bearings (6) and a thrust collar of stainless steel offering low operating torques.

### Tight assembly of valve body and bonnet

A round bonnet gasket fits into a recess between the valve body and the bonnet, which prevents it from being blown out at pressure surges. The stainless steel bonnet bolts are encircled by the bonnet gasket, countersunk in the bonnet and finally sealed to prevent corrosion.

### 100 % pressure test

Every single valve is pressure tested before leaving the factory. Gas valves are tested according to DIN 3230-5, PG 3 / EN 13774 class 2 and water valves according to EN 1074-1 and 2 / EN 12266.



Every single valve is pressure tested



An infrared eye controls the pressure test automatically



Date and serial no. are stamped on the stems of gas valves



Pressure test reports ensure full traceability of gas valves

## Superior corrosion protection



### Three strong coatings

AVK gate valves are as standard with internal and external epoxy coating according to DIN 30677-2 and GSK. The epoxy is applied electrostatically in a closed booth, either manually or in our automatic fluidized bed system. AVK also offers gate valves with an external PUR coating. The PUR coating is developed for use in steel gas pipelines with cathodic protection, but is also a good choice for installation in aggressive soils. Furthermore, we offer gate valves with a highly wear-resistant internal enamel lining. Enamelled valves offer excellent protection against creeping corrosion due to the chemical fusion of the lining and the ductile iron.



*AVK valves are blast-cleaned according to ISO 12944-4*



*Epoxy coating according to DIN 30677-2 and GSK requirements*



## Careful control and packaging



### Thorough control of the coating

We control each batch of epoxy coated components to ensure a layer thickness of minimum 250  $\mu$  and a pore-free surface. The impact resistance is tested by dropping a steel cylinder on the coating surface through a one meter long tube. The curing of the epoxy coating is checked in an MIB test. In addition to our own tests, the independent GSK authorities control the adhesion and cathodic disbonding of the epoxy coating six times a year.

Every single PUR coated valve is controlled. Our approval criterion is zero pinholes and a layer thickness of minimum 1.5 mm.

Enamelled bonnets and bodies are controlled for a layer thickness of min. 200  $\mu$  and a pore-free surface.

### Efficient packaging

Our dedication to superior corrosion protection is taken a step further by ensuring a very efficient packaging. We do whatever it takes to ensure that the great finish is intact when our products reach our customers.

As an optional extra we offer special protection collars covering the bonnet and body assembly and the flanges, which are the areas most vulnerable to damages during handling and transportation.



*The epoxy layer thickness must be min. 250  $\mu$  on all surfaces*



*Each valve is pinhole tested*

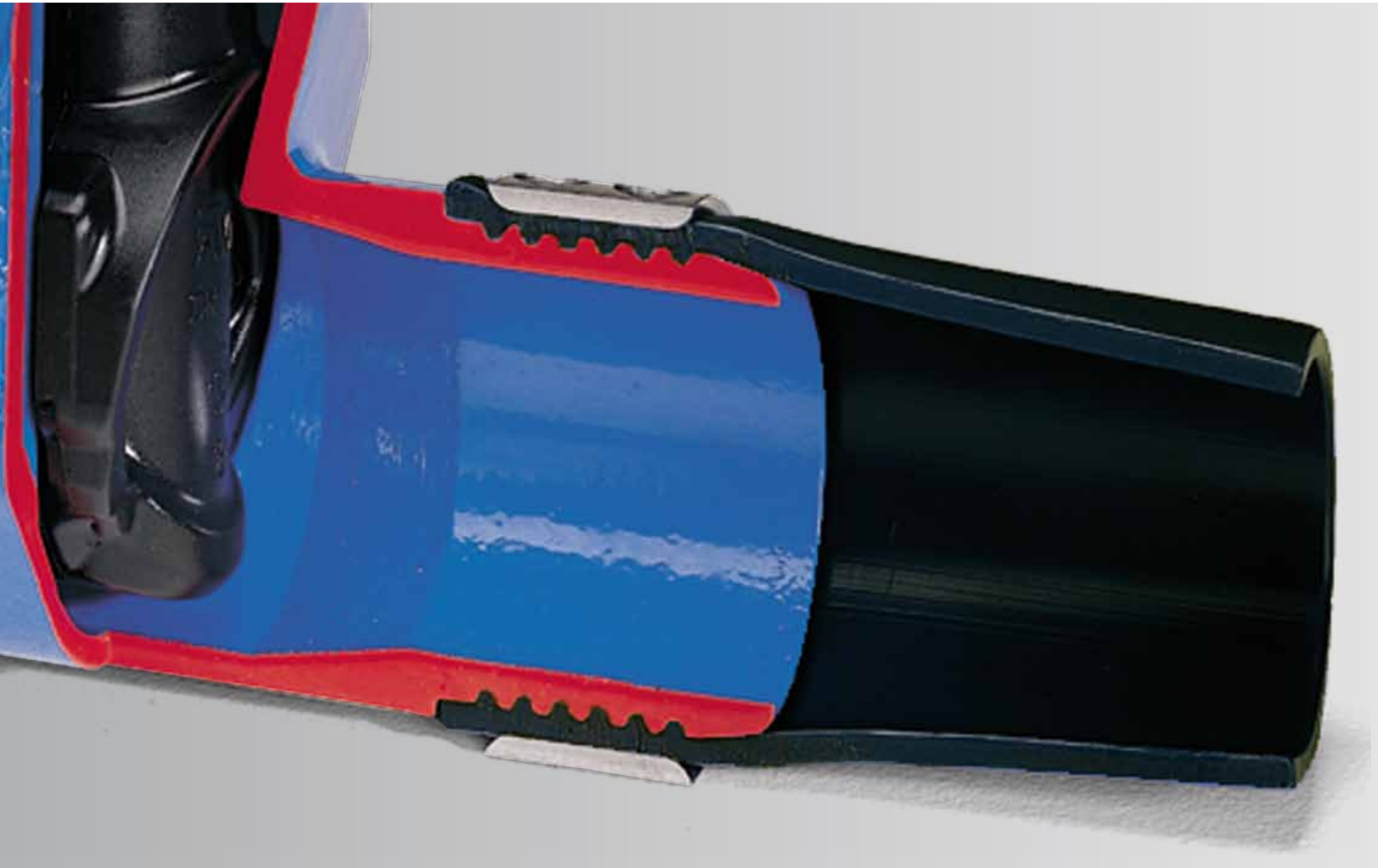


*The impact resistance is tested with a steel cylinder*



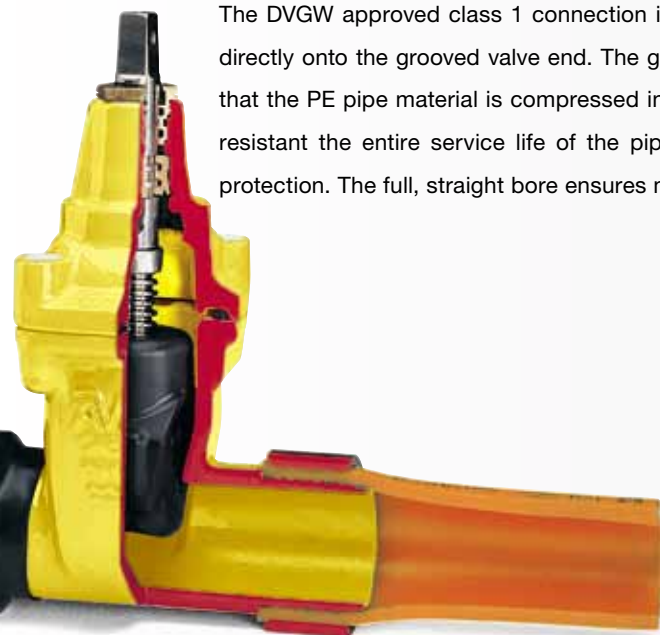
*In the MIB test no colour smudging is allowed*

## Unique PE end connection



### Stronger than the PE pipe itself

The DVGW approved class 1 connection is stronger than the PE pipe itself. A piece of standard PE pipe is pressed directly onto the grooved valve end. The grooving combined with a sleeve around the valve/pipe connection ensures that the PE pipe material is compressed into the grooves. This ensures that the connection remains tight and tensile resistant the entire service life of the pipeline. The connection is sealed with a shrink hose to provide corrosion protection. The full, straight bore ensures minimum pressure loss and makes underpressure drilling possible.



Welding into PE pipes using socket fusion



Welding into PE pipes using butt welding



## A wealth of valve end configurations



### Valves for welding into pipelines

Gate valves for welding into pipelines offer a very secure connection. Gate valves with PE pipe ends for water or gas pipes as well as gate valves with steel spigot ends for gas steel pipes are part of our range.

### Flanged ends

Our flanged gate valves are available with short DIN F4 and long DIN F5 face to face in numerous material combinations and with various bonnet executions. Furthermore, we offer combi-T and combi-cross valves.



### Socket ends

Socket connections are a cost-effective alternative to flanged connections. AVK offers Supa Plus™ valves, socket valves for PE and uPVC pipes and valves with tyton sockets for cast iron pipes.

### Grooved and BLS ends

We offer two special end connections; Grooved ends for steel pipes used in fire protection and irrigation systems, and BLS ends for Buderus and standard cast iron pipes.

### Spigot ends

After removal of an old valve the ends of the pipes may be offset. A spigot end valve plus a flange adaptor or a coupling with deflection ability is a flexible solution for repairs.



## Flanged gate valves for water

### Series 02/20-003 Flanged, BS 5150



EPDM wedge  
Epoxy internally and externally  
Standard stem sealing  
DN 50 - 400

### Series 02/60-003 Flanged, DIN F5



EPDM wedge  
Epoxy internally and externally  
Standard stem sealing  
DN 40 - 500

#### Options:

- CTO, 02/60-004
- Drilling to DIN 1882, 02/60-015
- DVGW W270 approved wedge, 02/60-020

### Series 02/75-003 Flanged, DIN F5, replaceable sealing



EPDM wedge  
Epoxy internally and externally  
Replaceable stem sealing  
DN 40 - 500

#### Options:

- CTO, 02/75-004

### Series 02/67-030 Flanged, DIN F5, PN 25



EPDM wedge  
Epoxy internally and externally  
Standard stem sealing  
DN 50 - 300

#### Options:

- CTO, 02/67-031

### Series 02/68-030 Flanged, DIN F5, PN 25, replaceable sealing



EPDM wedge  
Epoxy internally and externally  
Replaceable stem sealing  
DN 50 - 300



## Flanged gate valves for water

**Series 20/30-003**  
Flanged, DIN F5, enamelled



EPDM wedge with DVGW W270 approval  
Epoxy externally and enamel internally  
Standard stem sealing  
DN 40 - 400

Options:

- AISI 316 stem, 20/35-003

**Series 43/60-003**  
Flanged, SABS standard



EPDM wedge  
Epoxy internally and externally  
Standard stem sealing  
DN 80 - 300

**Series 50/60-003**  
Flanged, GOST standard



EPDM wedge  
Epoxy internally and externally  
Standard stem sealing  
DN 80 and 200

**Series 15/72-003**  
Flanged, DIN F5, ISO top flange



ISO top flange prepared for actuator  
EPDM wedge  
Epoxy internally and externally  
Standard stem sealing  
DN 50 - 500

**Series 55/30-005**  
Flanged, DIN F5



EPDM wedge  
Epoxy internally and externally  
Replaceable stem sealing  
DN 450 - 600

Options:

- DVGW W270 approved wedge, 55/30-007
- With bypass, 55/30-003

**Series 55/35-003**  
Flanged, DIN F5, w/PowerSaver™



PowerSaver™ torque reduction  
EPDM wedge  
Epoxy internally and externally  
Replaceable stem sealing  
DN 450 - 600

Options:

- With bypass, 55/35-005

## Flanged gate valves for water

### Series 06/30-003

Flanged, DIN F4



EPDM wedge  
Epoxy internally and externally  
Standard stem sealing  
DN 40 - 600 and 800

Options:

- DVGW W270 approved wedge, 06/30-009
- AISI 316 stem, 06/34-003
- RG5 wedge nut, 06/85-003

### Series 06/75-003

Flanged, DIN F4, replaceable sealing



EPDM wedge  
Epoxy internally and externally  
Replaceable stem sealing  
DN 40 - 400

Options:

- CTO, 06/75-004
- Drilling to ABNT NBR 7675, 06/75-013

### Series 26/00-009

Flanged, DIN F4, enamelled



EPDM wedge with DVGW W270 approval  
Epoxy externally and enamel internally  
Standard stem sealing  
DN 40 - 400

### Series 06/35-003

Flanged, DIN F4, position indicator



With position indicator and handwheel  
EPDM wedge  
Epoxy internally and externally  
Standard stem sealing  
DN 50 - 400

### Series 15/42-003

Flanged, DIN F4, ISO top flange



ISO top flange prepared for actuator  
EPDM wedge  
Epoxy internally and externally  
Standard stem sealing  
DN 40 - 400

### Series 18/70-003

Flanged combi-cross



With 4 outlets and DN 100 center outlet  
EPDM wedge  
Epoxy internally and externally  
Standard stem sealing  
DN 100 - 300

Options:

- 4 outlets, CTO, 18/70-004
- 3 outlets, 18/80-003
- 3 outlets, CTO, 18/80-004

## Gate valves with PE and socket ends for water

### Series 36/80-116 PE pipe ends



### Series 38/80-116 PE pipe end x flange



### Series 01/70-010 Supa Plus™ socket ends



### Series 01/80-003 Euro socket ends



### Series 33/00-011 Tyton socket ends





## BLS, Victaulic and spigot end gate valves for water

### Series 33/50-011 Socket/spigot ends (BLS)



For BLS system  
EPDM wedge with DVGW W270 approval  
Epoxy internally and externally  
Standard stem sealing  
For cast iron pipes to ISO 28603  
DN 80 - 300

### Series 06/38-003 Grooved ends



To AWWA C606  
EPDM wedge  
Epoxy internally and externally  
Standard stem sealing  
DN 50 - 300

### Series 32/60-010 Short spigot ends for AC pipes



EPDM wedge  
AISI 316 stem  
Epoxy internally and externally  
Standard stem sealing  
For AC pipes to ISO class 18  
DN 80 - 400

### Series 32/40-010 Long spigot ends for cast iron pipes



EPDM wedge  
Epoxy internally and externally  
Standard stem sealing  
For cast iron pipes to ISO 2531 class 18  
DN 80 - 300

Options:  
• AISI 316 stem, 32/40-020

### Series 32/70-003 Short spigot ends for cast iron pipes



EPDM wedge  
Epoxy internally and externally  
Standard stem sealing  
For cast iron pipes to ISO 2531 class 18  
DN 50 - 300

### Series 12/51-005 Spigot end for cast iron pipes x flange



EPDM wedge  
Epoxy internally and externally  
Standard stem sealing  
DN 50 - 300

## Gate valves for gas

**Series 02/70-003**  
Flanged, DIN F5



NBR wedge  
Epoxy internally and externally  
Replaceable stem sealing  
DN 50 - 400

**Series 06/70-003**  
Flanged, DIN F4



NBR wedge  
Epoxy internally and externally  
Replaceable stem sealing  
DN 50 - 400

Options:

- ISO top flange, epoxy, 15/78-003
- ISO top flange, PUR, 15/78-010

**Series 36/90-170**  
PE pipe ends



NBR wedge  
Epoxy internally and externally  
Replaceable stem sealing  
PE 100/PN 10 pipes, SDR 11  
DN 80 - 300

Options:

- PE 100 PN 10/4 pipes (SDR 17), 36/90-171
- External PUR, 36/90-185

**Series 38/90-118**  
PE pipe end x flange



NBR wedge  
Epoxy internally and externally  
Replaceable stem sealing  
PE 100/PN 10 pipes, SDR 11  
DN 50 - 200

**Series 46/64-010**  
Short spigot ends for steel pipes



NBR wedge  
Epoxy internally and PUR externally  
Replaceable stem sealing  
For steel pipes  
DN 50 - 300

Options:

- External epoxy, 46/64-005

**Series 46/70-010**  
Long spigot ends for steel pipes



NBR wedge  
Epoxy internally and PUR externally  
Replaceable stem sealing  
For steel pipes  
DN 50 - 600

Options:

- External epoxy, 46/70-005
- ISO top flange, epoxy, 46/78-003
- ISO top flange, PUR, 46/78-010



## Gate valves for wastewater treatment

**Series 06/35-003**  
**Flanged, DIN F4, position indicator**



With position indicator and handwheel  
EPDM wedge  
Epoxy internally and externally  
Standard stem sealing  
DN 50 - 400

**Series 06/34-003**  
**Flanged, DIN F4, acid resistant stem**



EPDM wedge  
AISI 316 stem  
Epoxy internally and externally  
Standard stem sealing  
DN 40 - 600 and 800

**Series 06/80-003**  
**Flanged, DIN F4, NBR wedge**



NBR wedge  
Epoxy internally and externally  
Standard stem sealing  
DN 40 - 600 and 800

Options:  
• AISI 316 stem, 06/84-003

**Series 06/89-003**  
**Flanged, DIN F4, OS&Y**



With rising stem and handwheel  
EPDM wedge  
Epoxy internally and externally  
DN 50 - 400

**Series 15/42-003**  
**Flanged, DIN F4, ISO top flange**



ISO top flange prepared for actuator  
EPDM wedge  
Epoxy internally and externally  
DN 40 - 400

Options:  
• NBR wedge, 15/42-006  
• Long DIN F5, 15/72

**Series 715/30-004**  
**Flanged, DIN F4, pneumatic actuator**



With pneumatic actuator  
NBR wedge  
Epoxy internally and externally  
DN 65 - 300

Options:  
• Solenoid valve kit and proximity switches, 715/30-003

## Gate valves for fire protection

**Series 06/35-013**  
**Flanged, DIN F4, position indicator**



With pin indicator and handwheel  
VdS approved  
EPDM wedge  
Epoxy internally and externally  
Standard stem sealing  
DN 50 - 400

**Series 06/37-003**  
**Grooved ends**



To AWWA C606  
With pin indicator and handwheel  
VdS approved  
EPDM wedge  
Epoxy internally and externally  
Standard stem sealing  
DN 50 - 300

**Series 25/46-010**  
**Flanged, AWWA C509, OS&Y**



With rising stem and handwheel  
UL/FM approved  
EPDM wedge  
Epoxy internally and externally  
DN 65 - 300

**Series 25/49-010**  
**Flanged, AWWA C509, with post indicator flange**



With post indicator flange  
UL/FM approved  
EPDM wedge  
Epoxy internally and externally  
DN 80 - 300

**Series 36/00-116**  
**PE ends and post indicator flange**



With post indicator flange  
EPDM wedge  
Epoxy internally and externally  
PE 100/PN 16 pipes (SDR 11)  
DN 80 - 300

**Series 25/49-020**  
**Flanged, AWWA C509, with wrench nut**



With wrench nut  
UL/FM approved  
EPDM wedge  
Epoxy internally and externally  
DN 65 - 300



## User friendly extension spindles



### Telescopic design facilitates on-site adjustments

Telescopic extension spindles are used when the distance between the valve and the ground surface is unknown and when an adjustment of the extension spindle is required after the installation.

The top adaptor is designed with a defrosting hole intended for insertion of a heating element to prevent freezing of possible ground water inside. The two fixation lugs can be attached to AVK surface boxes and support tiles. A lock spring prevents the telescopic part from collapsing during installation, as it creates friction inside the inner square tube. The blue center sleeve protects against penetration of impurities between the two outer PE pipes.



#### **Lengths:**

450- 750 mm  
650-1100 mm  
1050-1750 mm  
1450-2350 mm  
1700-2900 mm  
2850-5250 mm

## Durable design and a uniform quality



### Two main types in a modular design

Extension spindles are used for easy access to operation of valves installed below ground. AVK extension spindles are produced on fully automated state-of-the-art production equipment to ensure a uniform quality.

The extension spindles are made of corrosion-resistant materials to ensure long service life. The conical key adaptor fits most standard T-keys. The bottom cover protects the valve spindle from impurities and enables it to rotate freely.

AVK offers a large standard range of telescopic and fixed length extension spindles. Furthermore, our modular design makes it possible to make dedicated executions in larger quantities.

### Fixed length design features easy shortening

Fixed length extension spindles are used when the distance between the valve and the ground surface is known so that adjustment of the length after installation is required to a limited extent or not at all.

The patented AVK design facilitates fast and easy shortening of the extension spindle. The complete adjustment of the length can be done by mere use of a hacksaw.

The extension spindles are available with a pipe cover measured from the pipe surface of 800-1000-1250-1500-2000-3000 mm.



*The top spanner and the inner tube are press fit*



*Expanding bolt design facilitates easy height adjustment*



*Telescopic inner tubes with lock spring secure accurate friction*



*The bottom adaptor and the inner tube are press fit*



## Surface boxes for your choice



### Cast iron, ductile iron, composite or synthetic

- AVK offers a very comprehensive range of surface boxes in various material combinations:
- Synthetic with synthetic lids
- Synthetic with cast iron lids
- Synthetic body and ductile iron surface plate/lid
- Cast iron/ductile iron body and lid.

The cast iron surface boxes are height adjustable using ductile iron distance rings of 10-50 mm height. The lids are available with blue epoxy coating for water and yellow for gas.

The ductile iron surface boxes for water are available in a floating design and a fixed/floating reversible design. The reversible surface box allows for deflection and internal fixation of telescopic extension spindles from both ends.

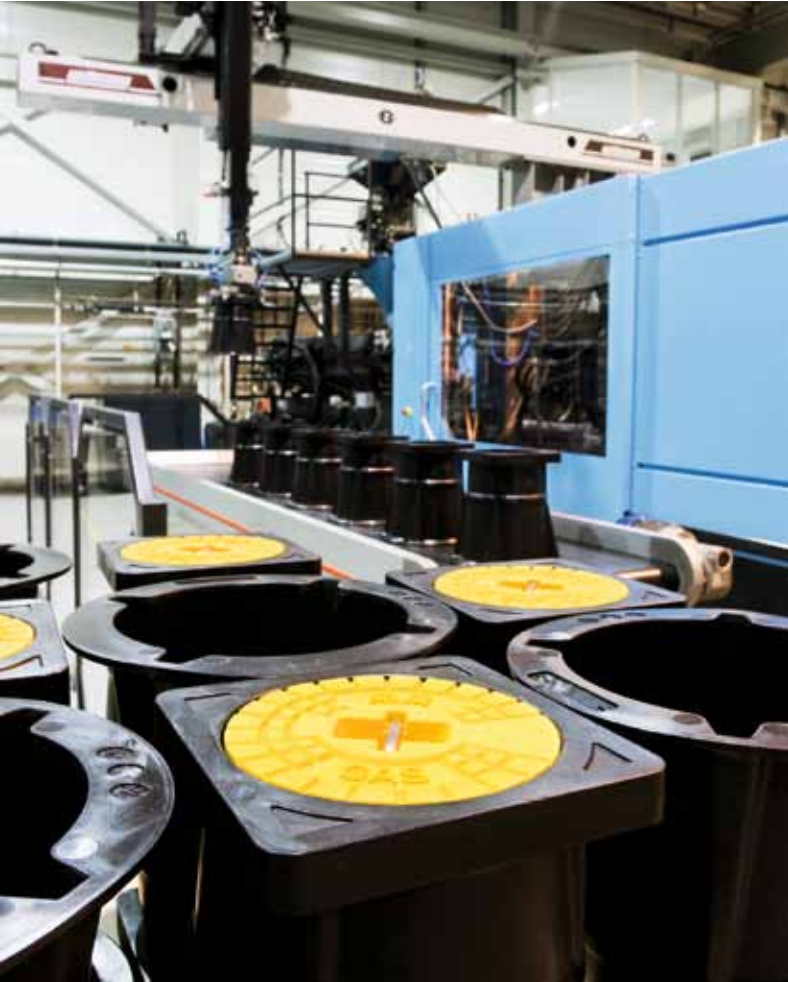
### Floating surface boxes with great flexibility

The deflection ability secures optimal fit on sloped surfaces. The internal fixation of telescopic extension spindles enables height adjustment after installation. The large chamber provides easy access for mounting and demounting of the extension spindle, and the closed design protects the extension spindle against impurities.

- Square or round surface plate
- Body of polyamide PA-6
- Surface plate and lid of ductile iron with black primer or blue epoxy coating. The lids are also available with yellow epoxy for gas.



## Lightweight recyclable surface boxes



### Our Classic range - fixed or height adjustable

Classic surface boxes are DVGW approved and withstand traffic loads according to DIN 1072.

- Body of PA and lid of cast iron with various inscriptions
- Fixed height and height adjustable designs
- Optionally lockable or with locking clip on bolt for installation in places with fast heavy traffic.

A height adjustable surface box is very easy to install. The 5° angle adjustment enables adaptation to the slope of the road, and the positioning of the top part is flexible by means of the O-ring. There are no expensive corrections after installation.

### Support tiles for Classic and Futura surface boxes

A support tile increases the support surface in weak soils, secures center location of the extension spindle and prevents telescopic extension spindles from being pushed back.

### Our Futura range - featuring synthetic lids

The Futura surface boxes feature a slim design with fixed height and a locking clip on the bolt to prevent the lid from being lifted off unintentionally.

- Round or square tops
- Optionally lockable by a special key
- Black cast iron lid, black synthetic lid or coloured synthetic lid - blue for water and yellow for gas.

The synthetic lids are 100 % corrosion-resistant and will look nice even after years of use.





## Complete range of flange adaptors



### AVK combi-flange system

The range comprises tensile combi-flanges for PE/PVC and ductile iron pipes in DN 50-300 as well as non-tensile for PVC and ductile iron pipes in DN 50-600.

- The design features a flexible positioning and chamfering of the pipe
- Up to  $\pm 3.5^\circ$  deflection of the pipe is possible even in tensile executions
- The pipe will not move inwards during installation securing a tight connection
- The EPDM rubber sealings are approved for drinking water applications
- Coated according to DIN 30677-2





## Dedicated and universal solutions



### Supa Maxi™ universal tensile flange adaptors

The Supa Maxi™ range in DN 50-300 sets a new standard with its unique features:

- Fully universal and tensile on all pipe materials
- Patented SupaGrip™ sealing support system with flexible bracket
- PN 16 in all dimensions for water and sewage (WP -0,9 to 16 bar), PN 10 for gas
- $\pm 4^\circ$  ( $8^\circ$ ) angular deflection on each side
- Permanent protection caps protect during handling and installation
- No re-tightening of bolts
- Lifting eye on DN 100-300
- Epoxy coating to DIN 30677-2, GSK approved
- Gasket of EPDM approved for drinking water/NBR approved for gas
- Temperature range  $-30^\circ\text{C}$  to  $+70^\circ\text{C}$

### Four additional types complete the range

- Universal non-tensile Supa® flange adaptors in DN 40-400
- Dedicated tensile Supa Plus™ flange adaptors for PE and uPVC pipes in DN 40-300
- Fabricated non-tensile flange adaptors dedicated for cast iron, ductile iron, steel/uPVC and AC pipes respectively in DN 350-1200
- Dismantling joints in DN 50-2200



## Technical appendix - coating

### Blast cleaning

All cast components are blast cleaned according to ISO 12944-4, SA 2½.

The components are cleaned in a shot-blasting plant. The cleaned parts are held with fibre-free gloves and are transported to the oven without delay according to GSK specifications.

When viewed, the surface shall be visibly free from oil, grease, dirt, mill scale, rust, paint and foreign objects. Any remaining traces of contamination shall show only as slight stains in the form of spots or stripes. The surface shall have a uniform metallic colour, visually and compared with test plates. The process ensures an optimum bonding of the coating, which is essential for corrosion resistance.

### Epoxy coating

The valve bodies and bonnets are epoxy coated according to DIN 30677-2 and GSK requirements.

The epoxy coating is electrostatically applied in a closed coating booth, max. 4 hours after the valve components were blast cleaned. The epoxy powder melts between 200-230°C, and cures when in contact with the cleaned and preheated component, ensuring an optimal bonding.

#### Test procedure:

- Coating thickness

The layer thickness shall be no less than 250 µ.

- Pore-free coating

The coating must be completely free of penetrating pores to avoid subsequent corrosion of the casting underneath. A 3V holiday detector with a brush electrode is used to electrically reveal and locate any pores in the coating.

- Impact resistance

The impact resistance test is carried out at least 24 hours after the coating process by means of a stainless steel cylinder dropped on the coating surface through a one meter long tube corresponding to an impact energy of 5 Nm. After each impact the component is electrically tested, and no electrical breakthrough shall occur.

- Cross linkage (MIB test)

Several drops of methyl isobutyl ketone are put on a horizontal epoxy resin coated surface of the test piece at room temperature. After 30 seconds the test area is wiped with a clean white cloth. It is checked that the test surface has not become neither matt nor smeared, and that the cloth remains clean. The test is carried out 24 hours after the coating process.

- Adhesion

The adhesion of the powder coating on one of each type of component is tested at least four times a year using the punch separation method according to DIN 24624. The coating thickness over a dispersed area of the test item shall be within the range 250 µ to 400 µ. The test pieces are immersed for seven days in deionised water at 90°C, and then dried in an oven for 3 hours. A conditioning phase of 3 to 5 days in normal atmosphere is then allowed to elapse. No blisters may arise during the period immersed in the water bath. The surface of the test piece is degreased and then roughened with abrasive paper. The roughened surface is cleaned from dust with oil-free compressed air and recleaned. The adhesion on both the core and the moulding sand sides is tested with a minimum pulling force of >12 N/mm².

## Technical appendix - coating

- Cathodic disbonding

Cathodic disbonding tests are carried out on one of each type of component at least twice a year.

No bubbles in the coating may develop during the test for cathodic disbonding.

For this test, the coating thickness over a dispersed area of the test item shall be within the range 250  $\mu$  to 400  $\mu$ .

### Approvals:

The coating is approved for use in drinking water systems, meeting all specified toxicological conditions, by the following institutes:

- Hygiene-Institute, Germany
- KIWA, the Netherlands
- WRC, UK
- CRECEP, France

### Internal enamel

Internal enamel is an alternative to internal epoxy, when extra protection against aggressive fluids is needed. Enamel is a ceramic coating with a completely smooth surface, and a durability and resistance like glass against aggressive fluids making it resistant to abrasive, corrosive and chemical media.

At high temperatures the enamel is applied on the valve surface, and the valves are put in the furnace. A chemical fusion of the enamel and the ductile iron takes place offering an excellent protection against creeping corrosion. The smooth surface makes it difficult for impurities and microorganisms to root.

The layer thickness is 200 - 600  $\mu$  according to DEV.

### Approvals:

Meeting all specified toxicological conditions the coating is approved for use in drinking water systems by the following institutes:

- Hygiene-Institute, Germany
- KIWA, the Netherlands



## Technical appendix - rubber

### Rubber specifications:

Rubber quality	EUW-70	EUW-75	EUW-80	EAW-70	EAW-75	EDK-55	EDK-70	EDK-80
Rubber type	EPDM	EPDM	EPDM	EPDM	EPDM	EPDM	EPDM	EPDM
Hardness (ShA)	70	76	80	70	76	56	70	80
Tensile strength (Mpa)	14.0	15.0	13.0	12.0	10.1	10.0	13.0	13.0
Elongation at break (%)	370	353	350	400	361	500	300	290
Density (g/cm <sup>3</sup> )	1.10	1.18	1.21	1.23	1.31	1.19	1.12	1.17
Temperature range in dry atmospheric air:								
Minimum temperature (°C) *)	-40	- 40	-40	-40	-40	-40	-40	-40
Maximum temperature (°C) *)	+120	+120	+120	+120	+120	+120	+120	+120
Compression set DIN 53517, 24 hours /70°C (%)	15.0	12.0	15.0	15.0	12.5	12.0	8.0	17.0
<u>Characteristics:</u>								
Wear resistance	3	3	3	2	2	2	3	3
Tear resistance	4	4	4	3	3	2	3	3
Resistance to weather and ozone	4	4	4	4	4	4	4	4
Resistance to hydrolysis (water and steam)	4	4	4	4	4	4	4	4
Resistance to chemicals (acids/bases)	3	3	3	3	3	3	3	3
Resistance to mineral oil and gas	0	0	0	0	0	0	0	0
Permeability	1	1	1	1	1	1	1	1

0: Low 1: Limited 2: Medium 3: Considerable 4: High

Rubber quality	NDG-80	NGW-70	SAK-70
Rubber type	NBR	NBR	SBR
Hardness (ShA)	80	70	70
Tensile strength (Mpa)	18.0	15.0	15.0
Elongation at break (%)	220	320	300
Density (g/cm <sup>3</sup> )	1.26	1.23	1.17
Temperature range in dry atmospheric air:			
Minimum temperature (°C) *)	-35	-40	-50
Maximum temperature (°C) *)	+110	+110	+100
Compression set DIN 53517, 24 hours /70°C (%)	8.0	8.0	13.0
<u>Characteristics:</u>			
Wear resistance	3	3	4
Tear resistance	3	3	3
Resistance to weather and ozone	3	3	3
Resistance to hydrolysis - water/steam	3	3	3
Resistance to chemicals - acids/bases	2-3	2-3	2
Resistance to mineral oil and gas	4	4	0
Permeability	4	4	2

0: Low 1: Limited 2: Medium 3: Considerable 4: High

### Approvals/remarks:

EUW-70: KTW D1/D2, W270, WRAS (60°C), ACS XP P 41-250, AS/NZS 4020, NSF-61, EN 681-1, AS 1646-2007, Önorm B5014  
 EUW-75: KTW D1/D2, W270, WRAS (50°C), ACS XP P 41-250, EN 681-1  
 EUW-80: KTW D1/D2, W270, WRAS, ACS XP P 41-250, EN 681-1  
 EAW-70: KTW D1/D2 (warm 60°C), W270  
 EAW-75: KTW D1/D2, W270  
 EDK-55: ACS XP P41-250  
 EDK-70: KTW D1/D2 (60°C), ACS XP P 41-250, CSN 75 7111, NBN S 29003, Hydrochek  
 EDK-80: KTW D1/D2  
 NGW-70: EN 682 type GBL, KTW D2  
 SAK-70: UL-listed 22.06.1993

Above mentioned results are based on laboratory tests and must be evaluated for specific articles and applications.

Fire may create small amounts of hydrogen sulphide, and carbon dioxide. Disposal by incineration in compliance with local regulations.

\*) Different temperature restrictions may apply to valves due to bonding between metal and rubber

# Technical appendix - Pressure test and flange drillings

## Pressure tests:

### Gate valves/Fire hydrants for water

Hydraulic test according to EN 1074-1 and 2 / EN 12266

Shell test with water: Valves PN 10 tested at 17 Bar  
Valves PN 16 tested at 25 Bar  
Valves PN 25 tested at 37.5 Bar

Shell test for AWWA valves: 2 x PN

Seat test with water: Valve PN x 1.1

Seat test for AWWA valves: 1.0 x PN

Seat tests are done from both sides and with one end open.

### Gate valves for gas

According to EN 13774, class 2

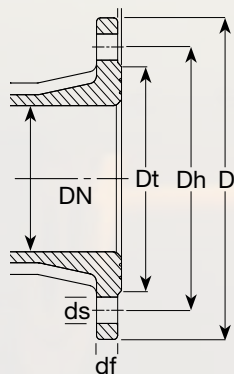
The product shall pass the above specified test for water first.

Shell test: 1.5 x PN water  
1.1 x PN air

Seat test: 0.5 bar air  
1.1 x PN air

Seat tests are done from both sides and with one end open.

## Standard flange drillings:

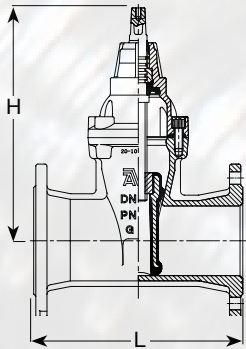


DN	D	Dt mm	Dh mm		df mm	dr mm	ds mm		Number of holes		Bolt size	
			PN10	PN16			PN10	PN16	PN10	PN16	PN10	PN 16
40	150	83		110	16	3		19		4		M16
50	165	102		125	16	3		19		4		M16
65	185	122		145	16	3		19		4		M16
80	200	138		160	16	3		19		8		M16
100	220	158		180	16	3		19		8		M16
125	250	188		210	16	3		19		8		M16
150	285	212		240	16	3		23		8		M20
200	340	268	295	295	17	3	23	23	8	12		M20
250	400	320	350	355	19	3	23	28	12	12	M20	M24
300	455	370	400	410	21	4	23	28	12	12	M20	M24
350	520	430	460	470	23	4	23	28	16	16	M20	M24
400	575	482	515	525	28	4	28	31	16	16	M24	M27
450	640	535	565	585	28	4	28	31	20	20	M24	M27
500	715	590	620	650	28	4	28	34	20	20	M24	M30
600	840	685/725*	725	770	29	5	34	37	20	20	M27	M33

\*Series 55/30 / series 06

## Technical appendix - dimensions

### Face to face dimensions and heights above center line:



#### Valves to EN 1074-1 & 2

##### Type A (DIN 3352 part 4)

##### Type B (BS 5163)

DN	Face to face dim. to EN 558-F14	Face to face dim. to EN 558-F15	Height above center line	Face to face dim. to EN 558-F3	Height above center line
40	140	240	241	-	-
50	150	250	241	178	279
65	170	270	271	190	279
80	180	280	297	203	294
100	190	300	334	229	324
125	200	325	376	254	324
150	210	350	448	267	429
200	230	400	562	292	531
250	250	450	664	330	614
300	270	500	740	356	690
350	290	550	940/930	381	867
400	310	600	940/960	406	867
450	330	650	951*/1170**/1130***	-	-
500	350	700	951*/1140**/1130***	-	-
600	390	-	- /1280**/1270***	-	-

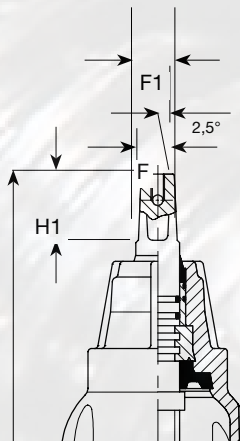
\* series 02 and 20 \*\* series 06 \*\*\*series 55

### Stem dimensions:

#### Valves to EN 1074-1 & 2,

##### Type A (DIN 3352 part 4)

##### Type B (BS 5163)



DN	H1 mm	F mm	F1 mm	H1 mm	F mm	F1 mm
40	29	14	16.6	-	-	-
50	29	14	16.6	38	19	22.4
65	34	17	20.0	38	19	22.4
80	34	17	20.0	38	19	22.4
100	38	19	22.4	38	19	22.4
125	38	19	22.4	38	19	22.4
150	38	19	22.4	42	24	27.7
200	42	24	27.7	47	27	31.2
250	47	27	31.2	47	27	31.2
300	47	27	31.2	47	27	31.2
350	55	32	36.9	55	32	36.9
400	55	32	36.9	55	32	36.9
450 *	55	32	36.9	-	-	-
500 *	55	32	36.9	-	-	-
450 **	84	Ø30**/Ø40***	Ø30**/Ø40***	-	-	-
500 **	84	Ø30**/Ø40***	Ø30**/Ø40***	-	-	-
600 **	84	Ø30**/Ø40***	Ø30**/Ø40***	-	-	-

\* series 02 and 20 \*\* series 06 \*\*\*series 55



## Technical appendix - flow data

### Definitions / formulas:

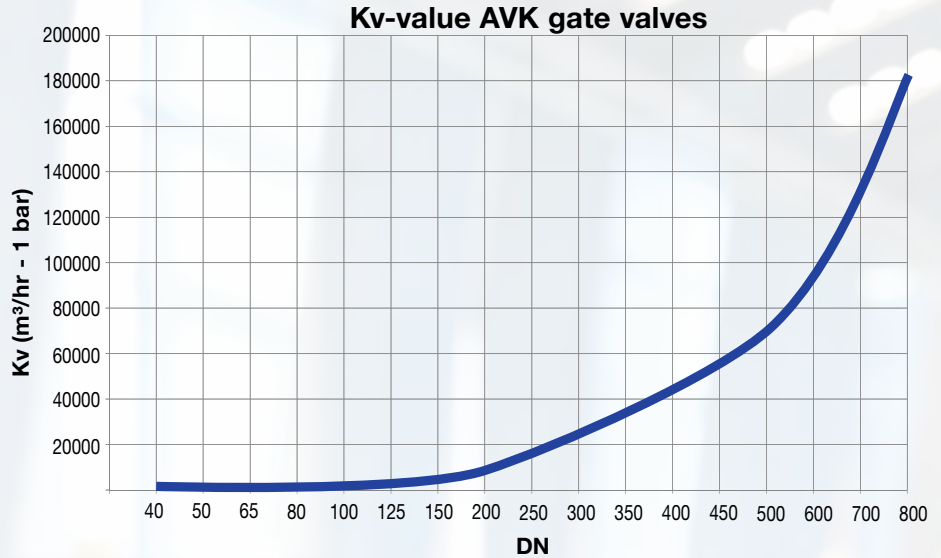
**Kv-value:** Actual flow of water (m<sup>3</sup>/hr) creating pressure loss of 1 bar.

Pressure loss coefficient **Zeta (K) value:** Ratio of static and dynamic pressure loss.

Pressure loss coefficient,  
**Zeta (K-value) = Diff pressure / (500 X V<sup>2</sup>)**  
Diff pressure (Pa)  
V: Water flow velocity (m/sec)  
Actual diff pressure (bar) = (Q / Kv)<sup>2</sup>  
Q: Actual water flow (m<sup>3</sup>/hr)

#### Zeta values:

DN 40-125: 0.06  
DN 150-250: 0.04  
DN 300-800: 0.02



Flow velocity (m/sec)	Q m³/h							
	DN 40	DN 50	DN 65	DN 80	DN 100	DN 125	DN 150	DN 200
1.0	4.5	7.1	11.9	18.1	28.3	44.2	63.6	113.1
1.5	6.8	10.6	17.9	27.1	42.4	66.3	95.4	169.6
2.0	9.0	14.1	23.9	36.2	56.5	88.4	127.2	226.2
2.5	11.3	17.7	29.9	45.2	70.7	110.4	159.0	282.7
3.0	13.6	21.2	35.8	54.3	84.8	132.5	190.9	339.3
3.5	15.8	24.7	41.8	63.3	99.0	154.6	222.7	395.8
4.0	18.1	28.3	47.8	72.4	113.1	176.7	254.5	452.4
4.5	20.4	31.8	53.8	81.4	127.2	198.8	286.3	508.9
5.0	22.6	35.3	59.7	90.5	141.4	220.9	318.1	565.5

Flow velocity (m/sec)	Q m³/h								
	DN 250	DN 300	DN 350	DN 400	DN 450	DN 500	DN 600	DN 700	DN 800
1.0	176.7	254.5	346.4	452.4	572.6	706.9	1,017.9	6,267.6	12,791.0
1.5	265.1	381.7	519.5	678.6	858.8	1,060.3	1,526.8	9,401.4	19,186.5
2.0	353.4	508.9	692.7	904.8	1,145.1	1,413.7	2,035.8	12,535.2	25,582.0
2.5	441.8	636.2	865.9	1,131.0	1,431.4	1,767.1	2,544.7	15,669.0	31,977.5
3.0	530.1	763.4	1,039.1	1,357.2	1,717.7	2,120.6	3,053.6	18,802.8	38,373.0
3.5	618.5	890.6	1,212.3	1,583.4	2,003.9	2,474.0	3,562.6	21,936.6	44,768.5
4.0	706.9	1,017.9	1,385.4	1,809.6	2,290.2	2,827.4	4,071.5	25,070.4	51,164.0
4.5	795.2	1,145.1	1,558.6	2,035.8	2,576.5	3,180.9	4,580.4	28,204.2	57,559.5
5.0	883.6	1,272.3	1,731.8	2,261.9	2,862.8	3,534.3	5,089.4	31,338.0	63,955.0

Calculated flow (m³/hr) going through a nominal valve-size (DN40= inside dia of Ø40), at different flow velocities

Opening %	Kv							
	DN 40	DN 50	DN 65	DN 80	DN 100	DN 125	DN 150	DN 200
10%	20	15	22	36	64	122	135	293
20%	41	40	53	96	159	238	273	549
30%	63	60	83	148	247	366	461	850
40%	86	85	129	219	359	530	688	1244
50%	118	133	204	351	549	741	1024	1729
75%	240	314	431	722	1094	1527	2335	4033
100%	291	520	606	984	1819	2588	5339	7246

Opening %	Kv								
	DN 250	DN 300	DN 350	DN 400	DN 450	DN 500	DN 600	DN 700	DN 800
10%	383	498	678	886	1121	1384	1994	2713	3544
20%	773	1103	1502	1962	2483	3065	4413	6007	7846
30%	1247	1722	2344	3061	3874	4783	6888	9375	12245
40%	1869	2523	3433	4485	5676	7007	10090	13734	17938
50%	2731	3424	4660	6086	7703	9510	13694	18639	24345
75%	5325	7082	9640	12591	15935	19673	28329	38559	50363
100%	14395	25508	34719	45348	57393	70856	102032	138877	181390

DN 40-300 are all measured values. DN 350-800 are all calculated, based on results from measured values.

## Technical appendix - operation

### Field of application:

Fields of application are stated in the data sheet of each valve series.

If the solids of the medium make up more than 10 % the AVK knife gate valve is recommended.

If the medium contains special substances, information of the chemical designation, concentration, and the temperature of the medium must be given on inquiry of the valves.

### Operation:

To avoid a seizure of the internal parts, it is recommended to operate the valves with the following minimum intervals, which at the same time ensures a long durability:

- valves for water and gas: every year
- valves for sewage and industry: every third month

After operation the valve must be:

- fully open and the stem released from stress or
- closed with the closing torque stated in the table

Max. temperature: For water and waste water max. 70°C, for gas max. 60°C. For valves with PE ends max. 20°C. The valve must not be exposed to low temperatures, causing the medium to freeze.

### Torques and number of turns to open:

Valve dimension DN mm	Valves according to EN 1074-1 and 2 / EN 1171, Type A (DIN 3352 part 4)					Valves according to EN 1074-1 and 2 / EN 1171, Type B (BS 5163)			Actuated valves Series 15, 06 and 55 Electric actuator	
	Closing torque Nm	Free running torque Nm		Rupture torque Nm	Turns to open	Closing torque Nm	Rupture torque Nm	Turns to open	Closing torque Nm	Turns to open Nm
		Water	Gas							
40	40	6	9	250	11	90	500	4	40	11
50	40	6	9	250	11	90	550	5	40	11
65	60	6	9	250	14	90	625	7	60	14
80	60	6	9	400	17	120	700	8	60	17
100	80	6	9	400	21	135	800	9	80	21
125	80	6	9	400	26	155	925	12	80	26
150	80	12	18	500	26	180	1050	14	80	26
200	120	12	18	600	35	210	1300	18	100	35
250	180	12	18	750	37	210	1550	22	180	37
300	200	16	18	1050	44	210	1800	26	200	44
350	300	24	24	1050	51	300	2050	31	300	59
400	300	24	24	1050	59	450	2300	35	300	59
450	300*/450**	25	25	1050	59*/43**	500***	2550	39	450**/500***	43**/39***
500	300*/450**	25	25	1050	59*/43**	500***	2800	43	450**/500***	43**/43***
600	500**	25	25	3200	59*/52**	700***	3300	53	500**/700***	52**/53***

\*Series 02 and 20, \*\*Series 06, \*\*\*Series 55/30



## We care about the environment



AVK products form part of the infrastructure around the world and as such they are important in environmental considerations.

As a large-scale valve manufacturer we are aware of the harmful effects industrial processes can have. Therefore, we are constantly looking for ways to minimising our environmental impact, seeking to identify areas of improvement in our manufacturing processes and in the environmental precautions of our sub-suppliers.

We systematically work on:

- Complying with existing environmental legislation and applicable work environmental legislation.
- Reducing the amount of waste within the company. Whenever possible we recycle waste materials. Alternatively we use the most environmentally friendly waste disposal methods.
- Minimising our consumption of energy and raw materials.
- Minimising our use of materials and processes that can put the environment at risk.
- Educating our employees and thus enabling them to act in accordance with our environmental objectives.
- Taking environmental factors into consideration when we assess and build our supplier network.







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