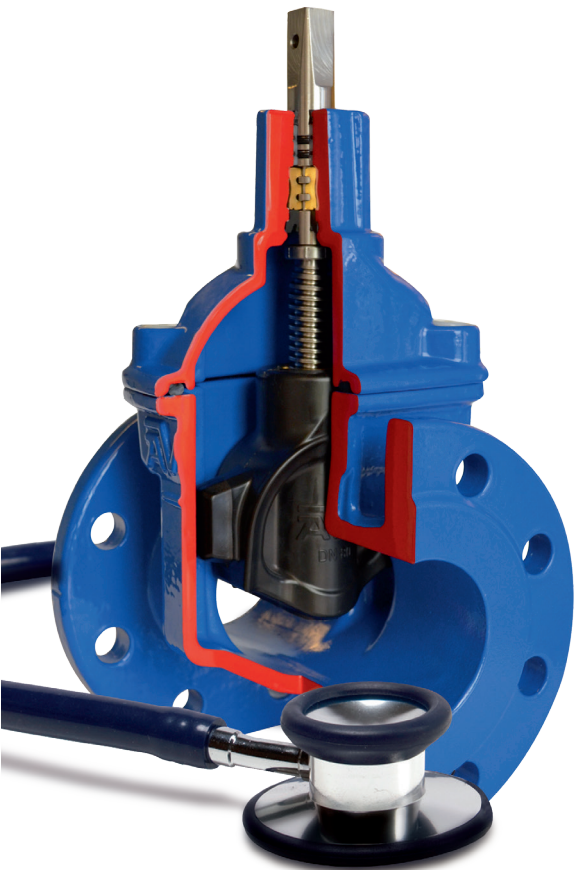




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|--|---|-------------------------------|--|
|  |  | <h1>GATE VALVE SOLUTIONS</h1> |  Expect... الشركة السعودية لصناعة الصمامات المحدودة SAUDI VALVES MANUFACTURING CO. LTD. |
|  |  | | |

WHAT IF AT BIRTH, YOU WERE ABLE TO CHOOSE?



Would you choose a cheap heart which breaks down - sending you in and out of hospitals - or would you choose a quality heart that remains healthy and strong throughout your entire life?

Just like you - a valve has a long life span

Throughout their youth, all valves do well - but with time, wear and tear takes its toll, and the differences between good and bad quality become apparent. The healthy quality valve will continue performing effortlessly, whilst the cheap valve will require more and more maintenance - at a very high cost!

The wedge constitutes the heart of the valve. It must travel easily and remain 100 % tight for half a century. Don't compromise with something as important as the heart of the valve.

Get to know the differences between the healthy strong valves and those that are not - and let us tell you why your choice should be an AVK valve.

More than meets the eye

When you choose a valve from AVK you get 60 years of dedication and experience, you get research and development on the highest level, and you get products made from the best raw materials and produced under supervised and well-documented production processes. You also get a number of international approvals and certifications. This guarantees that our products live up to our promises!

With an AVK wedge, you give heart to a long and healthy life for your network with minimum maintenance and long-term savings.



Long durability



Short durability

THE WEDGE IS THE HEART OF A GATE VALVE

AVK fixed, integral wedge nut sealed with EPDM rubber prevents corrosion.

UNIQUE FEATURES AND BENEFITS OF THE AVK WEDGE

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. 1.5mm on all pressure bearing surfaces and 4mm 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 prevents stagnant water and accumulation of impurities. (4)

AVK's rubber compound features an outstanding compression set value, resistance to water treatment chemicals and ensures minimised biofilm formation.

FIXED INTEGRAL WEDGE NUT PREVENTS CORROSION

AVK's wedge nut design is superior to the traditional loose wedge nut design as it prevents vibration, 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, secures 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

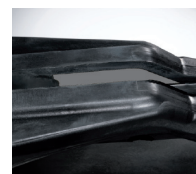
WE OFFER THE BEST RUBBER ADHESION AND CORROSION PROTECTION ON THE MARKET.



DN450-600: External wedge shoes on reversed guide rails.



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



DN40-400: Integrated wedge shoes in internal guide rails.



The double bonding process prevents creeping corrosion.

STATE-OF-THE-ART RUBBER TECHNOLOGY



AVK Gummi develops and manufactures the rubber compound for wedges and gaskets using highly advanced technology.

Unlike most manufacturers of resilient seat gate valves, AVK has its own in-house manufacturer of rubber components, AVK GUMMI A/S. AVK Gummi develops and manufactures the rubber compound for wedges and gaskets using highly advanced technology. Data is collected throughout the entire manufacturing process which provides traceability of every individual ingredient, each compound and the finalised components. AVK GUMMI carries out a number of tests to ensure that the compression set values, the adhesion and the tensile strength meet the predefined requirements.

EXCELLENT ABILITY TO REGAIN ORIGINAL SHAPE

AVK GUMMI A/S has an extensive knowledge of a rubber's compression set (its ability to regain its 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 in the medium being carried 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 the closed position. When the valve is reopened the impurities will be flushed away and the rubber will regain its shape.

NO CONTAMINATION OF DRINKING WATER

The EPDM rubber composition is designed to minimise the formation of biofilm. The rubber will therefore not provide a 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 taste, smell and colour neutral. The NBR rubber is resistant to oil and gas and holds an approval according to EN 682.

THE COST OF GETTING IT WRONG...

Competitor wedges - totally destroyed due to lack of bonding and incorrect vulcanisation.



DOUBLE BONDING SECURES EXCELLENT RUBBER ADHESION

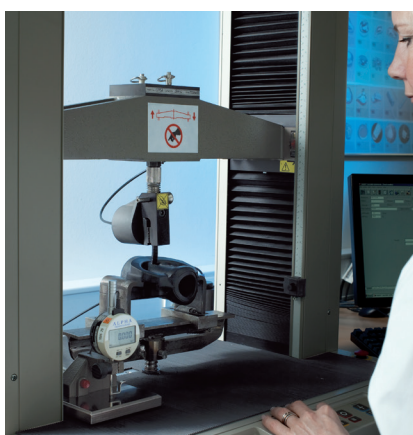


The quality of the bonding between the rubber and the wedge core is of vital importance. AVK uses a unique double bonding system that ensures optimum adhesion.

The wedge core is immersed in two different baths - the first to prepare the ductile iron core and the second to vulcanize the rubber to the core.

The rubber is vulcanized to the metal wedge core with a process that fully bonds the two materials. 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.

Since no international bonding standard is available, AVK has developed its own harsh test method to ensure that the adhesion also withstands a worst-case scenario. Testing is done both during production and after immersion in 90°C water for 3 weeks. When peeling off rubber from the core, the core must still be covered with rubber.



INFERIOR BONDING RESULTS IN CORROSION AND MALFUNCTION



A bonding test shows poor adhesion on a competitor wedge (#1). This could be induced by wrong choice of bonding method or wrong processing.

Rubber is peeled off the metal core due to insufficient bonding on a competitor wedge (#2).

A competitor wedge that is totally destroyed due to insufficient bonding and incorrect vulcanization (#3).



COMPRESSION SET ABILITY TO REGAIN ORIGINAL SHAPE



AVK's rubber compounds have an excellent compression set, which means the ability to recover the original shape after having been compressed.



Excellent ability to regain original shape

Even after many years of operation, tiny pebbles, sand and other impurities will not affect the rubber surface or the tightness of the valve. Unique AVK rubber compounds are applied to ensure that the wedge can absorb the impurities in closed position and is able to regain its original shape when it is opened again.

Test method for permanent deformation

The rubber is deformed by 25% of its original thickness at a constant temperature for a specific time. The pressure on the rubber is relieved and the layer thickness is measured after half an hour. The smaller the deformation, the better the memory effect.

$$\text{Compression set (S)} = \frac{d_0 - d_1}{d_0 - d_2}$$

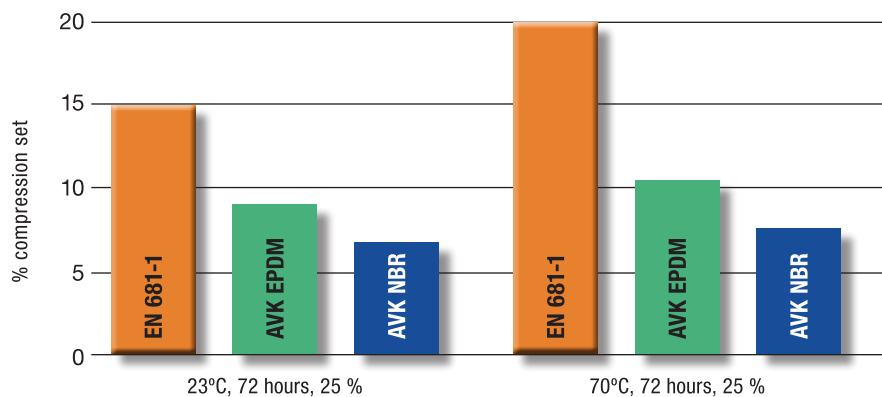
d_0 = original thickness of the test specimen

d_1 = thickness of test specimen after test

d_2 = thickness of test specimen in compressed condition

EN 681-1 states the minimum requirements for the compression set value.

The smaller the permanent deformation, the better the compression set.



The picture shows a competitor wedge which has been damaged because of its failure to resist the closing torque. It can no longer close tightly, and the drinking water now has free access to the wedge core resulting in corrosion attack.



RESISTANCE TO WATER TREATMENT CHEMICALS



Chlorine and other chemicals are commonly used to clean new pipelines or disinfect old ones. Ozone and chlorine may also be added in low concentrations to make the water drinkable. AVK has developed an EPDM rubber resistant to such water treatment chemicals.

Thoroughly tested rubber compounds

The rubber which is a complex formulation of many ingredients is developed and tested by AVK's own R&D scientists. For third party verification and approvals, we work only with recognized test institutes. AVK has the most advanced state of the art mixing facility which ensures repeatability and high performance materials.

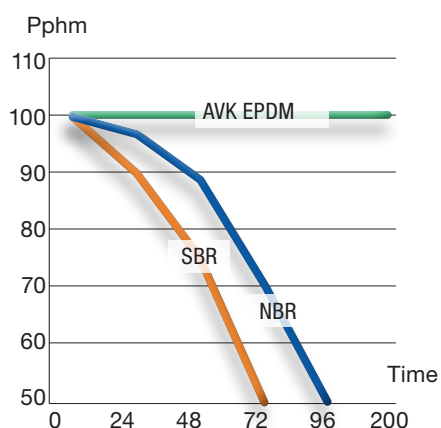
Tests are continuously carried out to ensure that the correct rubber compound is applied for the right area of use, and that rubber used in drinking water does not give off taste, smell or colour. The rubber compounds are also ozone tested as exposure to ozone tends to have a negative effect on NBR as an example.

Ozone resistance:

Ozonation is commonly used to reduce smell and taste or to reduce bacterial activity. The chemical reaction will also cause degradation of rubber materials, if such materials are not adequately formulated to encounter highly reactive chemicals such as ozone.

AVK's own compound EPDM is superior to any other material, including many other EPDM materials. The unique structure can withstand an extremely high concentration of ozone.

After 200 hours of exposure in 200 ppm the properties of AVK's EPDM have not changed, while both the SBR and NBR grade are suffering.



A competitor NBR wedge with ozone cracks. After one month, distinct cracks occur in the rubber. If these cracks occur in the sealing surface, it may result in creeping corrosion in the wedge core.

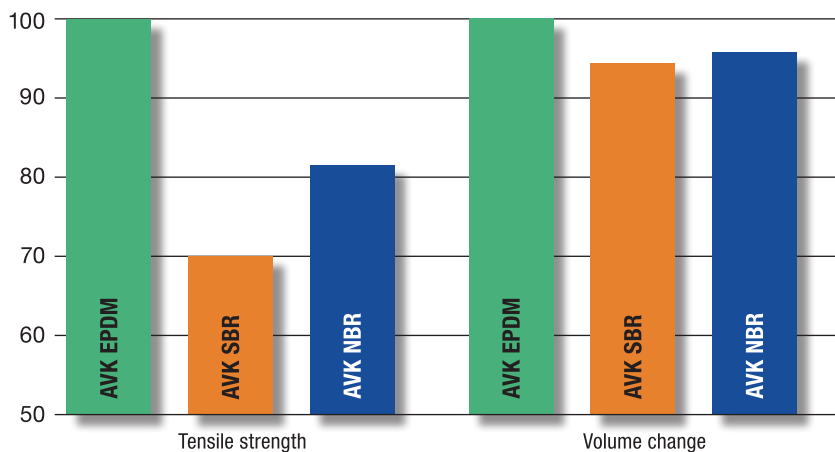




Chlorination

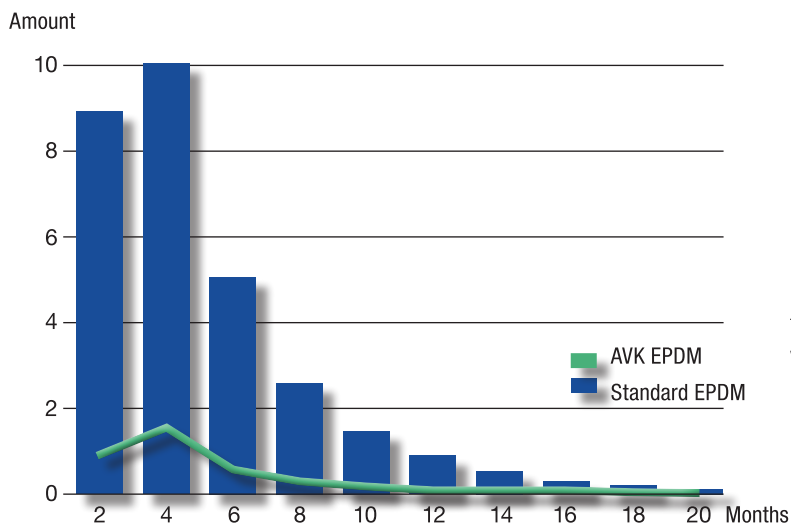
As chlorination of drinking water is common in most places it is important that the rubber is not affected by long time exposure. AVK has developed a series of EPDM compounds - here illustrated by AVK EPDM which is literally unaffected by even extreme concentration of sodiumhypochlorite (NaOCl) - a commonly used source for chlorination.

In the past, SBR was often used for wedges, as this material is tough and cost efficient. However, SBR is inferior to AVK's EPDM not least due to the poor resistance towards chlorination. NBR is often requested since this rubber type may be used for both water and gas applications, provided that the compound has been approved accordingly. However, a compromise must be accepted as NBR - in this case AVK NBR - will also suffer.



AVOID CONTAMINATION MINIMIZE FORMATION OF BIOFILM

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



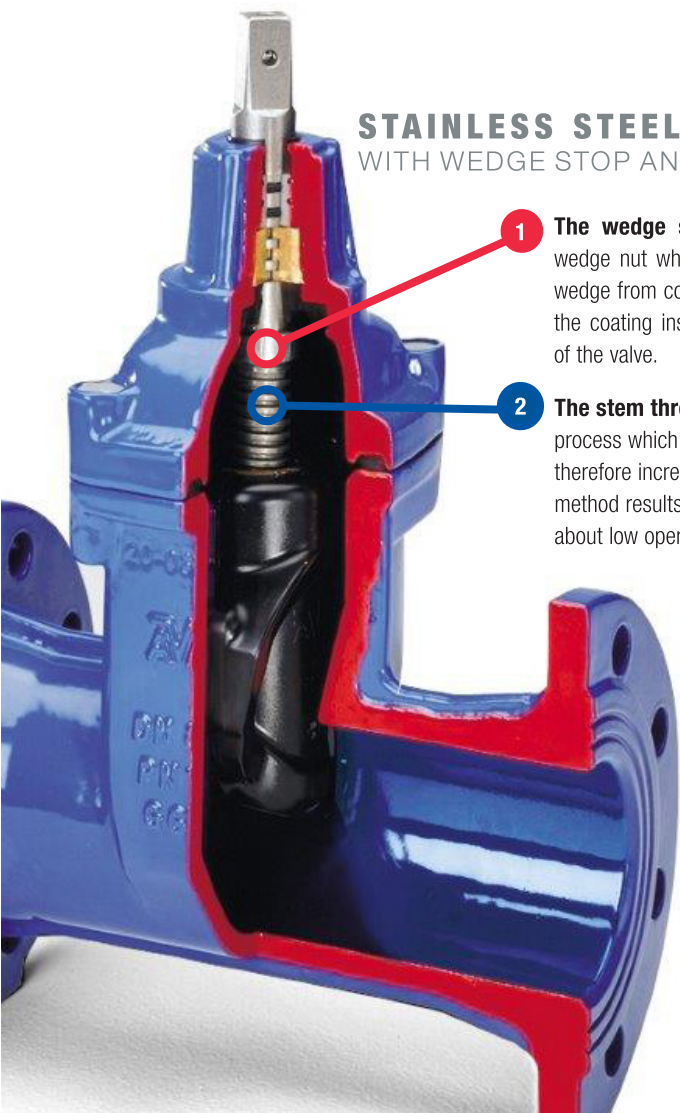
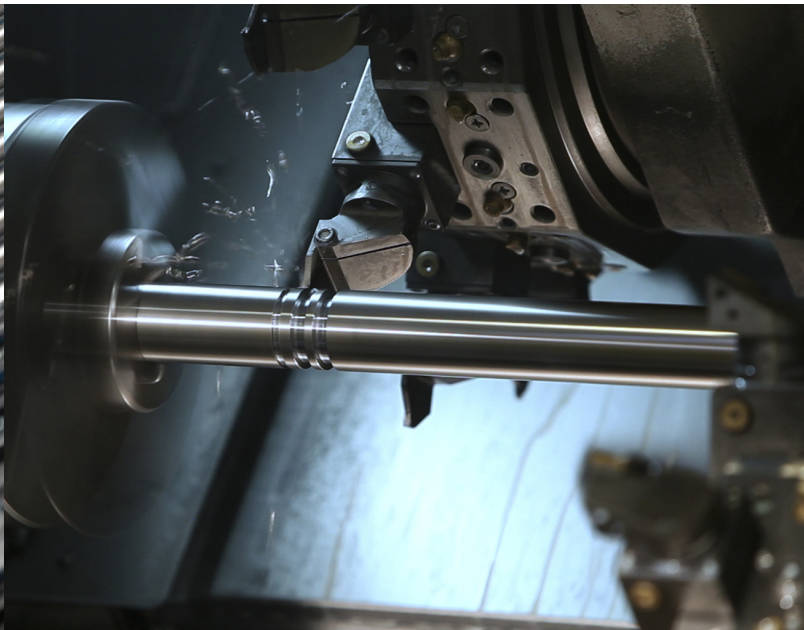
Formation of biofilm

Organic substances such as medicinal paraffinic oils and waxes migrate from the rubber compound. They act as nutrients for microorganisms, which will then start forming biofilm. In the course of time, however, there will be fewer nutrients available, and the biofilm will decompose.



Competitor EPDM wedge after six months of operation - an example of microbiological growth on an improperly formulated rubber compound.

HIGH STRENGTH AND LOW OPERATING TORQUES

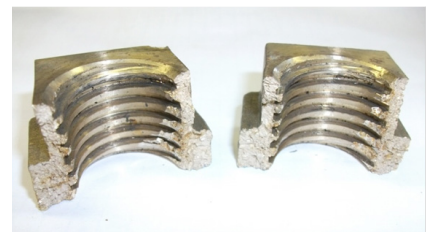


STAINLESS STEEL STEMS WITH WEDGE STOP AND ROLLED THREADS

- 1 The wedge stop** provides a firm stop against the wedge nut when opening the valve. This prevents the wedge from compressing the stem seals and damaging the coating inside the bonnet prolonging the durability of the valve.
- 2 The stem threads** 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.

THE COST OF GETTING IT WRONG...

Competitor's spindles and wedge nut damaged due to low quality materials and processes.



Broken wedge nut



Damaged spindle thread and O-ring

NO COMPROMISE ON LEAKAGE

TRIPLE SAFETY STEM SEALING SYSTEM

Four NBR O-rings in a polyamide bearing provide tightness around the stem

NBR wiper ring protects against impurities from the outside.

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

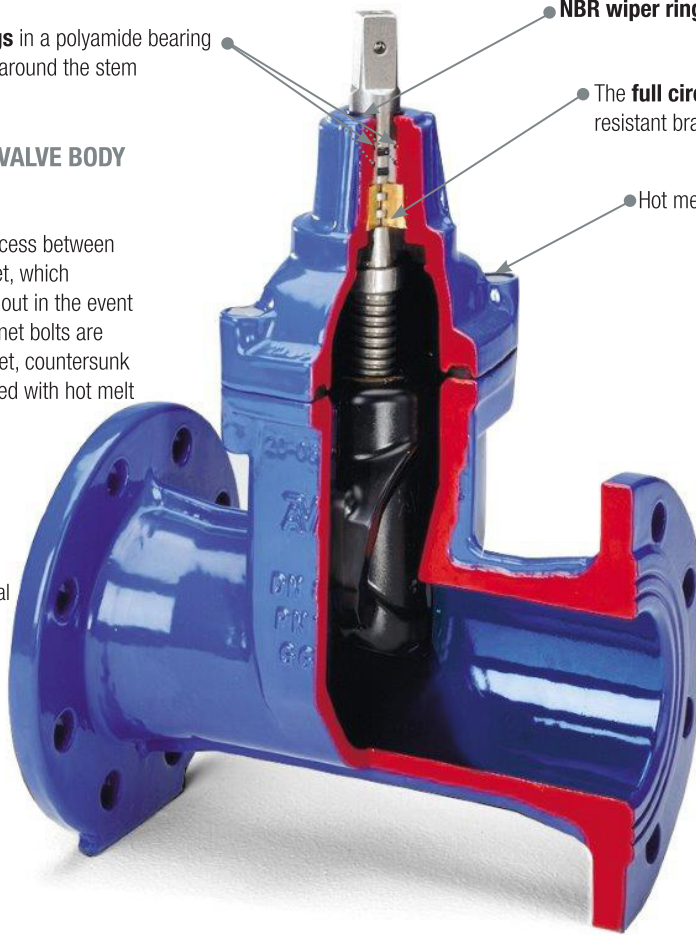
Hot melt seal.

SECURE ASSEMBLY OF VALVE BODY AND BONNET

A bonnet gasket fits into a recess between the valve body and the bonnet, which prevents it from being blown out in the event of a pressure surge. The bonnet bolts are encircled by the bonnet gasket, countersunk in the bonnet and finally sealed with hot melt to prevent corrosion.

100% PRESSURE TEST

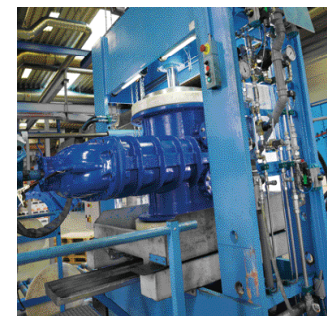
Every single valve is pressure tested according to International standards based on the design of the valve before leaving the factory



The recessed bonnet gasket encircles the bonnet bolts ensuring no fluid contact with bolts.



Every single valve is pressure tested



THE COST OF GETTING IT WRONG...

Competitor valves completely destroyed due to the low quality castings used and poor corrosion resistance.

Competitors valve on arrival at site.



Pressure test reports ensure full traceability of valves



VALVES COATING



STRONG COATINGS

The standard corrosion protection is an internal and external epoxy coating according to DIN 30677-2 and AVK guidelines. We control each batch of epoxy coated components to ensure a layer thickness of minimum 250 μ , a pore-free surface, high impact resistance and adequate curing.

Furthermore, AVK provides a variety of coating colors, types and schemes that suits different water services and environments. Whether the valve going to be installed underground or aboveground, in a clean water or in harsh water application, our experienced technical team can assist in selecting the right coating for the right application. The different schemes of Fusion Bonded Epoxy and Wet Epoxy coatings offered by AVK for potable, treated, raw and oily water applications will assure the durability and long life time of your valve.



PRODUCTS RANGE



SERIES 01 Gate Valve with Supa Plus Coupling, For PE and uPVC pipes,
Meeting EN 1074 part 1&2 and EN 1171
Body: Ductile Iron
Size: 1.5" to 12" (DN40-300)
Wedge: EPDM/NBR vulcanized
Stem: Stainless steel
Valve type: NRS (Non-Rising Stem)
Coating: Fusion bonded epoxy
Working pressure: 16 bar



SERIES 01 Socket Gate Valve, For uPVC pipes
Meeting EN 1074 part 1&2 and EN 1171
Body: Ductile Iron
Size: 1.5" to 16" (DN40-400)
Wedge: EPDM/NBR vulcanized
Stem: Stainless steel
Valve type: NRS (Non-Rising Stem)
Coating: Fusion bonded epoxy
Working pressure: 16 bar



SERIES 02 Flanged Gate Valve
Meeting EN 1074 part 1&2
Body: Ductile Iron
Flanges: EN1092-2 PN10/16 drilling
Size: 2" to 16" (DN50-400)
Wedge: EPDM/NBR vulcanized
Stem: Stainless steel
Face to face: EN 558 series 3
Valve type: NRS (Non-Rising Stem)
Coating: Fusion bonded epoxy
Working pressure: 16 bar



SERIES 02 Flanged Gate Valve, with Long Body
Meeting EN 1074 part 1&2
Body: Ductile Iron
Flanges: EN1092-2 PN10/16 drilling
drilling Size: 1.5" to 17" (DN40-500)
Wedge: EPDM/NBR vulcanized
Stem: Stainless steel
Face to face: EN 558 series 15
Valve type: NRS (Non-Rising Stem)
Coating: Fusion bonded epoxy
Working pressure: 16 bar



SERIES 06 Flanged Gate Valve
Meeting EN 1074 part 1&2 and EN 1171
Body: Ductile Iron
Flanges: EN1092-2 PN10/16 drilling
Size: 1.5" to 24" (DN40-600)
Wedge: EPDM/NBR vulcanized
Stem: Stainless steel
Face to face: EN 558 series 14
Valve type: NRS (Non-Rising Stem)
Coating: Fusion bonded epoxy
Working pressure: 16 bar



SERIES 15 Gate Valve Prepared for actuator
Meeting EN 1074 part 1&2 and EN 1171
Body: Ductile Iron
Flanges: EN1092-2 PN10/16/25 drilling
Size: 1.5" to 16" (DN40-400)
Wedge: EPDM/NBR vulcanized
Stem: Stainless steel
Face to face: EN 558 series 14
Valve type: NRS (Non-Rising Stem)
Coating: Fusion bonded epoxy
Working pressure: 16 bar



SERIES 15 Gate Valve Prepared for actuator, with Long Body
Meeting EN 1074 part 1&2 and EN 1171
Body: Ductile Iron
Flanges: EN1092-2 PN10/16 drilling
Size: 1.5" to 17" (DN40-500)
Wedge: EPDM/NBR vulcanized
Stem: Stainless steel
Face to face: EN 558 series 15
Valve type: NRS (Non-Rising Stem)
Coating: Fusion bonded epoxy
Working pressure: 16 bar



SERIES 21 Flanged Gate Valve, with Stem sealing exchangeable under pressure
Meeting EN 1074 part 1&2
Body: Ductile Iron
Flanges: EN1092-2 PN10/16/25 drilling
Size: 2" to 16" (DN50-400)
Wedge: EPDM/NBR vulcanized
Stem: Stainless steel
Face to face: EN 558 series 3
Valve type: NRS (Non-Rising Stem)
Coating: Fusion bonded epoxy
Working pressure: 16 bar

PRODUCTS RANGE



SERIES 21 Flanged Gate Valve, with stem sealing exchangeable under pressure
Meeting EN 1074 part 1&2 (BS 5163 type B)
Body: Ductile Iron
Flanges: EN1092-2 PN 25 drilling
Size: 2" to 16" (DN50-400)
Wedge: EPDM/NBR vulcanized
Stem: Stainless steel
Face to face: EN 558 series 3
Valve type: NRS (Non-Rising Stem)
Coating: Fusion bonded epoxy
Working pressure: 25 bar



SERIES 45 Flanged Gate Valve
Meeting AWWA C509
Body: Ductile iron
Face to face: ANSI B16.10
Size: 2" – 16" (DN50-400)
Wedge: EPDM/NBR vulcanized
Stem: Aluminum bronze/Stainless steel
Flanges: ANSI B16.42 Class 150 or EN1092-2 PN10/16 drilling
Valve types:
-NRS (Non-Rising Stem)
-OS&Y (Rising Stem)
-PIV (Post Indicator Valve)
Coating: Fusion bonded epoxy
Working pressure: 250 psi
UL listed, FM approved



SERIES 54 Flanged Gate Valve
Meeting EN1074 part 1&2
Body: Ductile Iron
Flanges: EN1092-2 PN10/16 drilling
Size: 28" to 48" (DN700-1200)
Wedge: Ductile Iron
Stem: Stainless steel
Face to face: EN 558 series 3
Valve type: NRS (Non-Rising Stem)
Coating: Fusion bonded epoxy
Working pressure: 16 bar



SERIES 55 Flanged Gate Valve
Meeting EN1074 part 1&2
Body: Ductile Iron
Flanges: EN1092-2 PN10/16 drilling
Size: 18" to 24" (DN450-600)
Wedge: EPDM/NBR vulcanized
Stem: Stainless steel
Face to face: EN 558 series 15
Valve type: NRS (Non-Rising Stem)
Coating: Fusion bonded epoxy
Working pressure: 16 bar



SERIES 55 Flanged Gate Valve
Meeting AWWA C515
Body: Ductile Iron
Flanges: ANSI B16.42 Class 150 or EN1092-2 PN10/16 drilling
Size: 18" to 24" (DN450-600)
Wedge: EPDM/NBR vulcanized
Stem: Aluminum bronze/Stainless steel
Face to face: ANSI B16.10
Valve types:
-NRS (Non-Rising Stem)
-OS&Y (Rising Stem)
-PIV (Post Indicator Valve)
Coating: Fusion bonded epoxy
Working pressure: 250 psi



SERIES 716 Flanged Gate Valve
Body: Ductile iron
Face to face: ASME B16.10
Size: 2" – 16" (DN50-400)
Wedge: EPDM vulcanized
Stem: Stainless steel
Flanges: ANSI B16.42 Class 150 drilling
Valve type: NRS (Non-Rising Stem)
Coating: Fusion bonded epoxy
Working pressure: 250 psi



SERIES 145 Flanged Gate Valve
Meeting FM 1120/1130 and UL 262
Body: Ductile iron
Face to face: ASME B16.10
Size: 2.5" – 8" (DN65-200)
Wedge: EPDM vulcanized
Stem: Aluminum bronze/Stainless steel
Flanges: ANSI B16.42 Class 150-EN1092-2 PN10/16 drilling
Valve types: -
NRS (Non-Rising Stem)
-OS&Y (Rising Stem)
Coating: Fusion bonded epoxy
Working pressure: 250 psi
UL listed, FM approved

Notes:

Material Options:

Stem Material: (Aluminum bronze, Stainless steel AISI 420, Stainless steel AISI 430F, Stainless steel AISI 304 or Stainless steel AISI 316)

Bolt / Nut / Pin Material: (Stainless steel 304 A2 or Stainless steel 316 A4)

Wedge Rubber: (EPDM / NBR) -

Coating: (Fusion Bonded Epoxy - (blue or red) or Wet epoxy with different colors)

For more details, please refer to product datasheet.

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Saudi Arabia
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Jeddah 21443
avksvmc.com

Expect... **AVR**