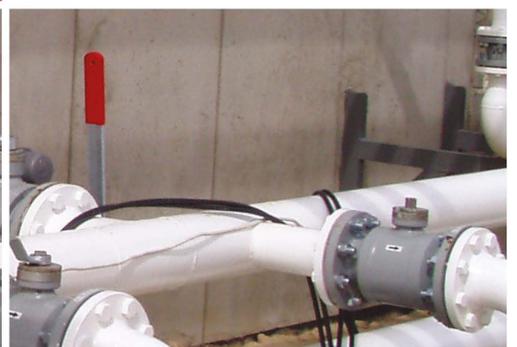




BALL VALVES

FOR LPG, OIL & FUEL

BROEN
VALVE TECHNOLOGIES



BROEN

Rely on intelligent flow sectioning

BROEN OIL & GAS manufactures ball valves and accessories for production, processing, transmission and distribution in the gas, oil, petrochemical, chemical, heating and other industries and for a wide range of fluids, such as gas, oils and fuels. BROEN is certified according to ISO 9001. Broen's Quality Management System meets also the requirements of ISO 3834-2, PED 97/23/EC and API 6D, covering all the processes of production flow and customer service – from the very first product idea, through drawings, materials, manufacturing as well as inspection and testing procedures, packaging and shipping, staff training, contracts and technical documentation, as well as maintenance and claim handling.





BROEN - A global company with local knowledge

Even though BROEN is an international company exporting to more than 50 countries we are always close to you through our comprehensive sales network and local partners. This assures you easy access to our services and profound knowledge of local conditions.

We have more than 600 staff members as well as companies and cooperation partners all over the world. Our staff members create strong relations across business areas and borders and provide BROEN with a flexible and loyal foundation for the best possible service to our customers. At BROEN we are always focusing on innovation and integrated solutions, for the benefit of people in daily life. We cherish knowledge and experience and use it to create new initiatives and products. Our annual production exceeds 1 million ball valves covering a wide range of sizes and pressures.

Focus on quality

BROEN is more than a world famous brand within the district heating and cooling systems, as well as gas, oils and fuels applications. Our products offer the important qualities required for the optimal systems operation. Safety is one of the concepts designed into all BROEN ball valves - all components of BROEN products have been approved according to industry quality and safety standards. Long life is a very important feature of our ball valves. We know that the replacement of a defective valve involves great inconvenience and costs, and when you choose our products you are beyond

that. We manufacture under the highest quality standards of the market in modern production facilities.

Bearing in mind the BROEN values – Straightforward, Insight, Initiative and Development – it is natural for us to be in constant motion and in close dialogue with our customers. BROEN solutions always incorporate the values of the company as well as of the product.

BROEN and Aalberts Industries

BROEN is part of Aalberts Industries, N.V., the Dutch industrial group listed on the Amsterdam Stock Exchange. For further information go to www.broen.com and www.aalberts.com.

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LPG, oil & fuel ball valves

Ball valves designed for crude oil derivatives constitute an important element of our product portfolio. We have vast experience in delivering shut-off ball valves for various oils, fuels and LPG applications. We are especially renowned for LPG valves due to technical features that set us apart from the competition. Our fully-welded valves are maintenance-free, therefore, they do not generate any additional costs during utilization.

Most important technical features for ball valves dedicated to crude oil derivatives

Standard	Size range (DN)	Pressure class (PN/CL)	Features	Temperature range °C
EN-ISO	15-80	16/25/40	floating ball, stainless steel body, volumetric compensation system, Fire Safe, NACE	Standard: -40 +100 Optional: -20 +150, -10 +200, -48 +100, -60 + 100
	15-150	16/25/40	floating ball, CS body, volumetric compensation system, Fire Safe, NACE	
	100-1400	16/25/40	trunnion ball, CS body, DBB, SPE/DPE, Fire Safe, NACE	
API 6D	Fully welded body			Standard: -40 +100 Optional: -20 +150, -10 +200, -48 +100, -60 + 100
	1/2" - 3"	150/300	floating ball, stainless steel body, volumetric compensation system, Fire Safe, NACE, API Monogram	
	1/2" - 6"	150	floating ball, volumetric compensation system, Fire Safe, NACE, API Monogram	
	1/2" - 4"	300	floating ball, volumetric compensation system, Fire Safe, NACE, API Monogram	
	4" - 24"	150/300	trunnion ball, DBB, injection system (>8"), SPE/DPE, Fire Safe, NACE, API Monogram	
	Split-body (bolted)			Standard: -40 +100 Optional: -20 +150, -10 +200, -48 +100, -60 + 100, +350
	1/2" - 6"	150/300	floating ball, stainless steel/CS body, Fire Safe, NACE, API Monogram	
	4" - 32"	150/300	trunnion ball, DBB, injection system, SPE/DPE, Fire Safe, NACE, API Monogram	

Linear and volumetric compensation

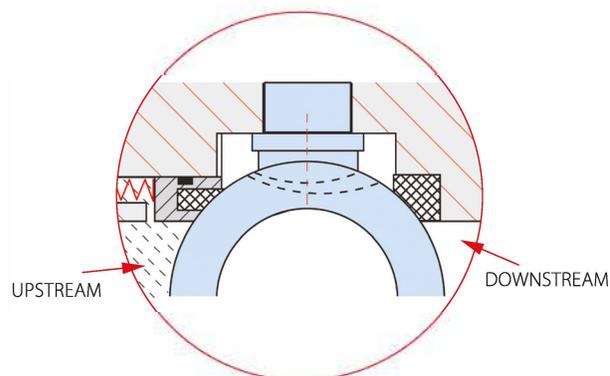
A linear and volumetric compensation system prevents a build-up of excessive pressure which may result from an increase of the valve elements and an increase of the volume of the captured medium in the valve, caused by heat supplied from the outside. We thereby avoid this phenomenon, which may cause higher opening torque, a shorter operational period due to decreased tightness of the valve, or even cause the ball to become stuck in between seats.

Liquid captured in a fixed volume can considerably increase in pressure through increased temperature caused by heat supplied from the outside. Pressure created this way becomes very dangerous especially for oils and fuels where a Δt 1°C may cause a $\Delta p=7$ bar in the cavity.

The linear and volumetric compensation solution based on spiral springs is a standard solution for all our floating ball type products. The system compensates all linear changes of the

materials which the valve is made of, as well as the volumetric changes of the medium which flows through or is captured in the valve.

For a trunnion mounted ball compensation is provided by the back-up ring sealing from both sides of the ball.





LPG, oil and fuel ball valves

Antistatic

One of the most important functions for valves that are used in installation for flammable liquids and gas media, is the antistatic protection. The antistatic design protects against static electric discharge that may result in ignition of the flammable media in the installation.

Stainless steel valves

In the certain conditions fully stainless steel valves have to be utilized to survive very sour conditions, both with regard to medium and outside environment. We can offer fully stainless steel construction for dimensions up to DN80 as standard line of our fully welded valves. On special request we can also deliver split-body fully stainless steel ball valves up to DN250. In both cases of either NACE certified or fully stainless steel valves, sealing system offered is always adjusted to the type of medium to guarantee resistance and tightness and long-life operations.

NACE

NACE MR-0175 (ISO 15156) – „Petroleum and natural gas industries — Materials for use in H₂S-containing environments in oil and gas production,“ is the “standard for materials to be used in “sour” applications (H₂S - hydrogen sulfide). This standard indicates materials, mechanical properties and heat treatments for metals used in hydrocarbon service.

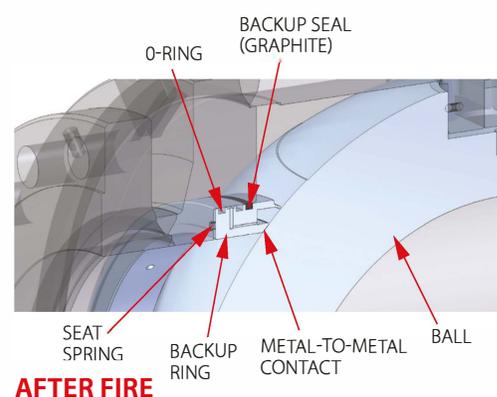
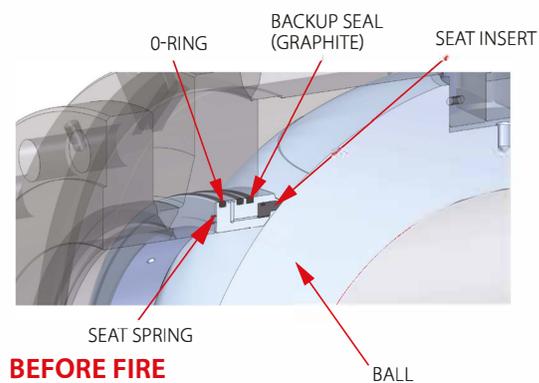
NACE is a material standard—not a design standard. We can offer NACE certification on request of our customers securing the possibility to use our valves in “sour environment” with conditions that could result in SSC (Sulfide Stress Cracking – type of corrosion process).

Fire Safe

Our valves for oils and fuels are available also with a Fire-Safe option certified according to EN ISO 10497:2010 (API 607) “Testing of valves - Fire type-testing requirements” standard

for both floating and trunnion mounted ball designs, which means that our valves can constitute elements of transmission and technological pipelines for hazardous flammable liquids and gas media. The standard covered by ISO 10497 certification is equivalent to API 6FA guidelines for ball valves up to 16” – some minor differences occur in the qualification processes for valves sizes above 24”.

The Fire Safe design constitutes a set of sealing parts based on metal and graphite materials, which during a fire on an installation enables the tightness of the valve according to relevant standards to be kept. In other words, the certification confirms that, with the valve closed, whatever is upstream of the valve, it will not significantly add to the fuel for the fire, either through the valve body joints, seals and weld or across the valve seats, whilst the site is being evacuated or initial attempts to extinguish the fire are made.



We have also in our offer, Ballomax ball valves which are designed for fuel applications. These valves do not have a linear and volumetric compensation system, however, they can be utilized with all types of fuels in low pressure installations, including diesel, petrol, heating oil and other liquid oil derivatives. All of the Ballomax fuel valves are equipped with an antistatic design and are fully compliant with PED 97/23/EC directive certified by Bureau Veritas.



BROEN

Ballomax valves for fuel applications



BROEN

Renowed brand

With over 60 years' experience in manufacturing ball valves, we have a wealth of expertise in delivering high-quality products to customers in Europe and other parts of the world.

Our valves are utilized on large installations at fuel storages, refineries, transloading terminals for oils and fuels. BROEN valves for LPG are utilized in large storages, transmission pipes, border, sea and inland LPG terminals and form a standard component of most of the LPG tanks used in both industrial and residential applications in many countries.

Among our customers we can find companies like: Orlen, Orlen Gaz, Gaspol, Amerigas, BP Gas, Lotos, Lukoil, Rosneft,

Ventspils Nafta, UkrNafta, Novatek. There is also a great number of additional customers that can confirm the durability and high quality of our solutions – most of our valves do not need replacement even after 15 years of operation.



BROEN OIL & GAS

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