



SPECIAL USE VALVES

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SPECIAL USE VALVES



Habonim's Special Use product line valves are subject to the general Habonim valves design, materials, practices, methodologies and certifications – for more information, see Valves General chapter.



Habonim Special Use valves are equipped with the Total HermetiX integrity package for superior sealing, safety and environmental care.

Special use valves are Habonim valves that are specially adapted to be used and serve in applications that have unique requirements on one or more of the valve designs, materials in use, assembly, packing, testing or even certificating. Information on such applications and the valve adaptations are in the following pages. The full valve information is available on each valve series catalog chapter.

Disclaimer & Warning:

It is always the system designer and the end-user responsibility to verify all equipment use in their system is properly selected to ensure safety and integrity of their systems. Habonim offers only general information based on common market knowledge and standard market adaptations for its valves. For each system and use, the system designer and end-user must consider the particular operations conditions, media parameters and any other implication of their system for the proper selection of valves to be used on their solely responsibility.



Ammonia Service 12" Double Block and Bleed trunnion valve



Ball Valve Style		Design Type		Ammonia service	Chlorin service	Oxygen service	Flush tank	Side Entry	Diverter	Control	High Temp. (MTM)	Cryogenic	Series	Dual Safe (DB&B)	Total HermetiX	Valve Size (Inches) MWP (ASME Class / DIN PN)																																	
		M	K	O	R	S	D	N	Z	C		DS		1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	4	6	8	10	12	14	16																			
Flouting Ball	Top Entry 3 Piece	M	K	O						C																																							
		M	K	O																																													
		M	K	O						Z	C																																						
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ASME Class	150		300	600	900	1500	2500	6000	
Pressure Bar	-1	0	16	50	100	150	250	400	1000
Pressure psi	-14	0	290	725	1450	2175	3600	5800	15000

Ammonia Services Ball Valve (M)

Habonim's ammonia service ball valves are suited to provide optimal protection and functionality for use in severe ammonia service applications. valves designated for ammonia service are specially prepared and cleaned to meet requirements for the safe operation of ammonia service

Ammonia

Ammonia is a compound of nitrogen and hydrogen with the formula NH_3 , at atmospheric conditions, ammonia is a colorless gas lighter than air with a pungent, suffocating odor. It is a highly caustic irritant that is both toxic and flammable. Ammonia is soluble in water to provide an alkaline solution.

- Ammonia boiling point is $-33\text{ }^{\circ}\text{C}$ ($-28\text{ }^{\circ}\text{F}$) at a pressure of 1 atmosphere, a liquid ammonia
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Ammonia Uses

Manufactured by synthesis from nitrogen and hydrogen, ammonia has many uses in the production of fertilizers, plastics, explosives, pharmaceuticals, metal treating operations, refrigerant, cleaning agent and more. Ammonia is developing to be a major renewable fuel

Ammonia Hazards

Ammonia combined with oil, grease or other combustible substances can result in explosions.

General

Ammonia Service feature is available for part of Habonim's valves series – check series ordering codes for availability. Available valve sizes, types and variety of end connections are per each

Design

Valves designed for ammonia in a liquid state should be equipped with an upstream pressure relief hole in the ball (Ordering code -P250).

The relief hole avoids trapped cavities in the valve closed position and pressure buildup due to thermal expansion during liquid ammonia boil off. A valve with relief hole in the ball is uni-directional, the relief hole must be positioned at the upstream flow direction for complete in-line sealing.

For Bi-directional valve design for liquid ammonia a Self-Relief Seats (Ordering code -SRS) should be used with seats material of TFM or CF PTFE, the SRS seat design dynamically release cavity pressure buildup and return to shutoff position once the over pressure is relieved. Valves designed for ammonia in the gaseous state do not require an upstream pressure relief hole.



Self-Relieving-Seat (SRS)



Cavity pressure relief (P250 Ball)

3 mm relief hole face the upstream

Valve Component Materials

Due to the extreme noxious nature of ammonia, it is crucial that all valve components are constructed with appropriate materials.

Bill of Materials	Wet Ammonia	Dry Ammonia
Body, ends, ball, stem	Stainless steel 316/316L, CF8M/CF3M	
Seats	TFM (A), PTFE (T), CF PTFE (P), Glass filled PTFE (R), PEEK (K), CF PEEK	TFM (A), PTFE (T), CF PTFE (P), Glass filled PTFE (R), PEEK (K)
Seals	PTFE (T)	PTFE (T)

Cleaning, Assembling and Packing

All valve components used for ammonia service, in gaseous or liquid state, are de-burred to a high standard and specifically cleaned to remove any traces of oil, grease or hydrocarbon materials prior to assembly.

Ammonia service valves are assembled in an oil-free restricted area by personnel who are specially equipped and trained to perform this task. The assembling area, work surfaces, equipment and tools are specially maintained to ensure cleanliness requirements are met.

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Optional Accessories

Fugitive Emission Bonnet (FE)

An important safety mechanism that Habonim offers for ammonia service is the Fugitive Emission bonnet (FE). A stainless-steel pressure chamber bolted on and sealed against the valve ISO 5211 top platform. The FE bonnet will accumulate ammonia leak, if occurred, and contain it in a confined space until a maintenance operation is scheduled.

A readily made purge ports at the FE bonnet top allow the site technician to connect pressure gauge, pressure transducer or ammonia sniffer to alert for ammonia leak through the valve stem seal. The FE bonnet allows stem seal redundancy, a simple design, yet crucial to enhance site safety in terms of ammonia leak through the atmosphere.

Locking Device (LD)

As a safety measure, it is advisable that valve for ammonia service should be equipped with spring loaded locking device to avoid unauthorized or unintentional valve operation.

For more information see Habonim Valve Accessories catalog.



Oxygen Services Ball Valve (O)

HABONIM ball valves for oxygen service are suited to be used with both liquid and gaseous oxygen, cleaned and assembled with required measures for a safe use in oxygen service equipment and avoid valve contamination to the media purity.

Note: Habonim oxygen service valves (O) are not following any medical-use or breathing

Oxygen

Oxygen, chemical element with symbol O₂, content in air is approximately 21% by volume. Oxygen is an odorless, colorless gas, with many industrial uses, mainly in the manufacture of steel and chemicals. Oxygen itself is nonflammable, however materials that are flammable in air, burn far more vigorously mixed with oxygen. Oxygen is shipped as a non-liquefied gas at pressures of 2000 psig (138 bar) and above, also as a cryogenic liquid at pressures and temperatures below 13.8 bar (200 psi) and -146.5 °C (-232 °F). Air separation plants produce pure oxygen via liquefaction of atmospheric air and separation of the oxygen by fractionation. Also minute quantities of Oxygen can be produced by electrolysis of water.

Oxygen density is 1.429 kg/m³ (1.013 bar at 0 °C) Oxygen boiling point -182.95 °C (-297.31 °F) at a pressure of 1 atmosphere, the liquid oxygen usually stored under high pressure or at

Oxygen Uses

Oxygen is used extensively in medicine, high altitude flying, deep sea diving and as rocket fuel. Industrial applications include utilization with acetylene, propane, hydrogen and other fuel gases for metal cutting, welding, hardening and scarfing. In steel and iron manufacturing, oxygen helps increase the capacity and efficiency of furnaces. Another major use of oxygen is in the making of 'Synthesis Gas' for production of gasoline, methanol and ammonia. Oxygen is

Oxygen Hazards

Oil, grease or other combustible substances should not be allowed to come in contact with oxygen service valves or components. Oxygen combined with these substances can result in explosions.



General

Oxygen Service feature is available for part of Habonim's valves series – check series ordering codes for availability. Available valve sizes, types and variety of end connections are per each

Valve Component Materials

Gaseous oxygen is non corrosive and may be contained in systems constructed of any common metal. Stainless steel, Monel, Bronze and Brass are sometimes the preferred materials for metal components coming into contact with gaseous Oxygen. In the extreme low temperatures of cryogenic liquid oxygen, stainless steel of 3xx series is often the preferred material. TFM, PTFE or glass filled PTFE are inert in oxygen and are considered standard seat and seal materials for oxygen service.

Warning! Delrin (Acetal resin) seats and Nylatron stem thrust seals MUST NOT BE USED IN OXYGEN SERVICE.

Habonim oxygen service valves may be used with both liquid and gaseous oxygen. For



Cleaning, Assembling and Packing

A meticulous cleaning and assembly procedure minimize the ignition hazards that can be caused by the presence of hydrocarbon oil, grease, and metal chips.

Our process of cleaning, assembling and packing refers to international standards in partial or in full:

ASTM A380 | CGA G 4.1 | EN 12300

Habonim uses an environment friendly, alkaline-based degreasing process with controlled parameters. Valves are assembled in an oil-free restricted area by personnel who are specially equipped and trained to perform this task. The assembling area, work surfaces, equipment

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Optional Accessories

Locking Device (LD)

As a safety measure, it is advisable that valve for ammonia service should be equipped with spring loaded locking device to avoid unauthorized or unintentional valve operation.

For more information see Habonim Valve Accessories catalog.



Fail Close Assembly

Chlorine Services Ball Valve (K)

HABONIM ball valves for chlorine service are designed for use with chlorine, cleaned and assembled with required measures for a safe use in chlorine service equipment and avoid valve contamination to the media purity. Some of the designs comply with the Chlorine

Chlorine

Chlorine is a hazardous and toxic material that irritates the respiratory, with a distinctive pungent odor. Chlorine, chemical element symbol Cl, is nonflammable in both gaseous and liquid states however; chlorine gas is a strong oxidizer, which may react with flammable materials, and can support combustion when combined with other substances.

The Chlorine gas has an irritating odor that many people can detect with as little as 3.5ppm (parts per million) chlorine present. Breathing air containing more than 1000 ppm of chlorine might be fatal.

Chlorine density is 3.2 kg/m³ (1.013 bar at 0 °C), because it is heavier than air, it tends to accumulate at the bottom of poorly ventilated spaces. Chlorine boiling point -34.04 °C (-29.27 °F) at a pressure of 1 atmosphere, the liquid must be stored under high pressure or at

Chlorine Uses

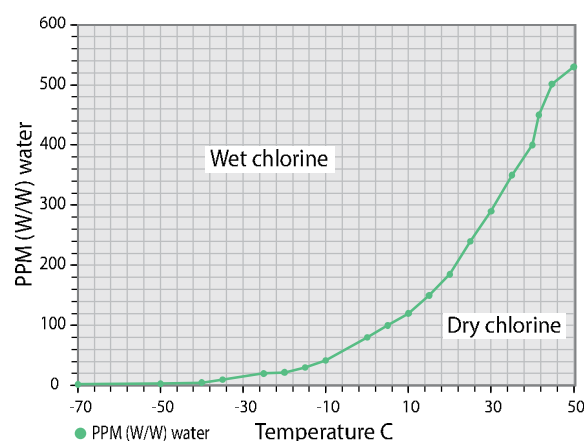
Chlorine is mainly used in manufacturing chemicals; including solvents, pesticides and herbicides, plastics and fibers, refrigerants and propellants. It is also an ingredient in bleach, deodorizer and disinfectant. In addition, chlorine is widely used in bleaching pulp, paper and textiles; disinfecting drinking water and swimming pool purification; plus in sanitation of

'Chlorine' term

Gas and liquid refer to the physical state of chlorine itself; dry and wet refer to the content of moisture within the gas or liquid. **Dry chlorine is either gaseous or liquid chlorine with less than 150 ppm of water by weight.** Chlorine containing more than 150 ppm is considered as wet chlorine, gas or liquid.

Note: HABONIM offers metallic valves only for dry chlorine!

Solubility of Water in Liquid Chlorine



General

Chlorine Service feature is available for part of Habonim's valves series – check series ordering codes for availability. Available valve sizes, types and variety of end connections are per each

Design

Valves designed for chlorine in a liquid state should be equipped with an upstream pressure relief hole in the ball (Ordering code -P250). The relief hole avoids trapped cavities in the valve closed position and pressure buildup due to thermal expansion during liquid ammonia boil off. A valve with relief hole in the ball is uni-directional, the relief hole must be positioned at the upstream flow direction for complete in-line sealing. For Bi-directional valve design for liquid chlorine a Self-Relief Seats (Ordering code -SRS) should be used with seats material of TFM or CF PTFE, the SRS seat design dynamically release cavity pressure buildup and return to shutoff position once the over pressure is relieved. Valves designed for chlorine in the gaseous state do



Self-Relieving-Seat (SRS)

Valve Materials for dry chlorine

Valves for dry Chlorine Systems are used with chlorine in gas or liquid state, usually at temperatures between -101 °C (-150 °F) and +149 °C (+300 °F). Steel piping is commonly used for handling dry chlorine, defined as containing no more than 150 PPM of water by weight. Stainless steels of types 3xx might fail due to chloride stress cracking, particularly in presence of moisture at ambient and elevated temperatures. Monel 400 and Alloy C22, or Alloy C276 are the recommended materials for ball and stem, with TFM or CF PTFE seats. Body and stem seals can be PTFE, CF PTFE or graphite for fire-safe valves.

Moisture Level	Recommended Material
0 - 20 PPM	
20 - 50 PPM	Alloy C22 ball and stem
0 - 50 PPM	Alloy C22 ball and stem (for end of line service)

Note: For higher moisture levels up to 150 PPM, Alloy C22 is the recommended material of construction for all metal parts.



Cavity pressure relief (P250 Ball)

3 mm relief hole face the upstream

The following material of construction are recommended for dry chlorine service by the Chlorine Institute, Pamphlet #6:

Temperature	-29 °C (-20 °F) to 149 °C (300 °F)	-46 °C (-50 °F) to 149 °C (300 °F)	-60 °C (-76 °F) to 149 °C (300 °F)
Fluid State	Gas or Liquid (<150ppm water)	Gas or Liquid (<150ppm water)	
Ends	Threaded, Welded, Flanged	Threaded, Welded, Flanged	Threaded, Welded, Flanged
Body/Ends	A216 WCB, Alloy C22, Alloy C276	A352 LCB, Alloy C22, Alloy C276	
Ball/Stem	Alloy C22, Alloy C276	Alloy C22, Alloy C276	Alloy C22, Alloy C276
Bolts	ASTM A193 Grade B7, B7M (Ferritic Steels)	ASTM A320 Grade L7	
Nuts	ASTM A194 Grade 2H, 2HM (Carbon Steel)	ASTM A194 Grade 4 (Carbon-Molybdenum steel)	ASTM A194 Grade 4 (Carbon-Molybdenum steel)
Seats	PTFE, TFM	PTFE, TFM	
Seals	PTFE, Graphite	PTFE, Graphite	PTFE, Graphite

Warning: The HermetiX™ stem seal valve for chlorine service include different material

Cleaning, Assembling and Packing

All valve components used for chlorine service, in gaseous or liquid state, are de-burred to a high standard and specifically cleaned to remove any traces of oil, grease or hydrocarbon materials prior to assembly.

Chlorine service valves are assembled in an oil-free restricted area by personnel who are specially equipped and trained to perform this task. The assembling area, work surfaces, equipment and tools are specially maintained to ensure cleanliness requirements are met.

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Optional Accessories

Locking Device (LD)

As a safety measure, it is advisable that valve for ammonia service should be equipped with spring loaded locking device to avoid unauthorized or unintentional valve operation.

For more information see Habonim Valve Accessories catalog.



Fail Close Assembly