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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 Institute Pamphlet 6: "Piping Systems for Dry 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 than1000 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 low temperature. Chlorine melting point is -101.5 °C (-150.7 °F).

Chlorine Uses

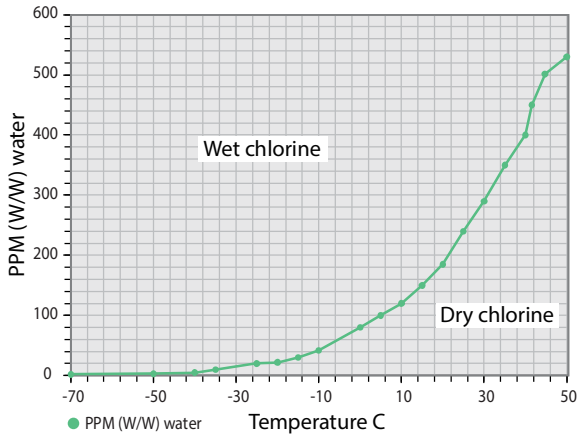
Chlorine is mainly used in manufacturing chemicals; including solvents, pesticides and herbicides, plastics and fibers, refrigerants and propellants. It is also an ingredient in bleach, deodorizer and disinfectant. In addition, chlorine is widely used in bleaching pulp, paper and textiles; disinfecting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

'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 relevant series ordering codes.

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 not require an upstream pressure relief hole.

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	Alloy C22 ball and Monel 400 stem
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

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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)	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	A352 LC1, A350 LF2, 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	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	PTFE, TFM
Seals	PTFE, Graphite	PTFE, Graphite	PTFE, Graphite

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

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.

Only lubricants compatible with chlorine are used.

- Valves are packed in open position with capped ends and plastic bagged
- Each valve is packed with a 'Silica-gel pack'
- A sticker on the plastic bag indicating "Chlorine Service"

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 do avoid unauthorized or unintentional valve operation.

For more information see Habonim Valve Accessories catalog.

Fail Close Assembly