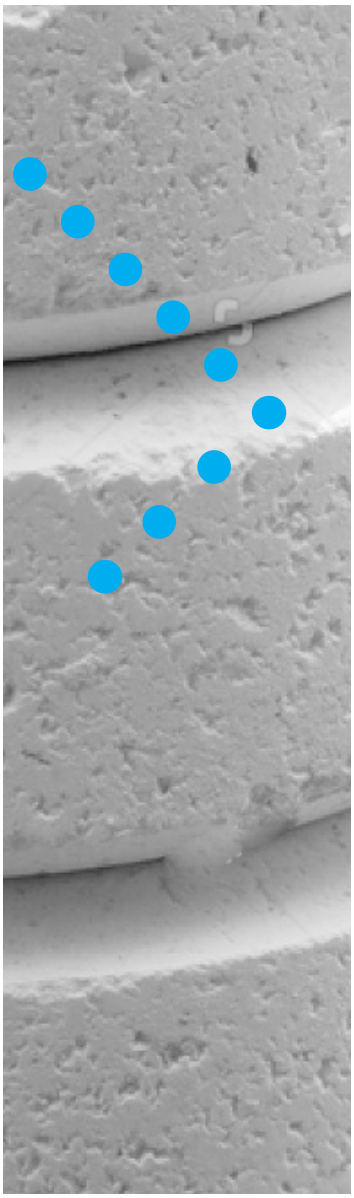
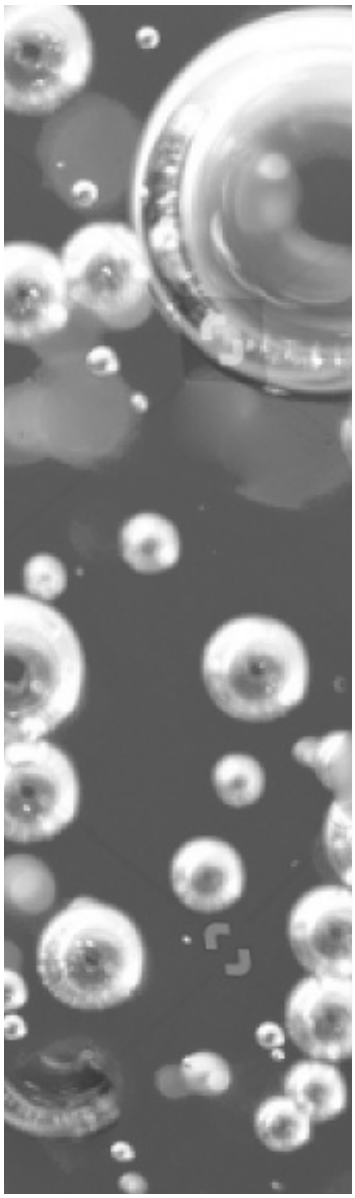
HABONIM
Industrial Valves & Actuators





SPECIAL SERVICES - Ammonia

Valves for Ammonia services - "M" series

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Habonim's ammonia service ball valves are ideally suited to provide optimal protection and functionality for use in severe ammonia service applications. All valves designated for ammonia service are expertly prepared and cleaned to standards required for the safe operation of ammonia service equipment and product purity.

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 is lighter than air, its density 0.73 kg/m3 (1.013 bar at 15 °C).

- Ammonia boiling point -33 °C (-28 °F) at a pressure of 1 atmosphere, the liquid must be stored under high pressure or at low temperature.
- Ammonia melting point -78 °C (-108 °F).

Ammonia Uses

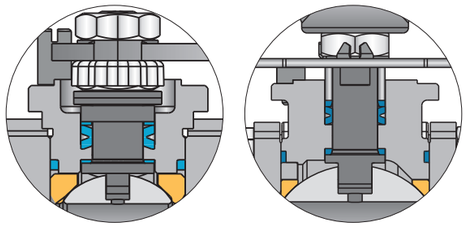
Manufactured by synthesis from nitrogen and hydrogen, ammonia has many uses in the production of fertilizers, plastics, explosives, pharmaceuticals, metal treating operations, refrigerant, cleaning agent and more.

Ammonia Hazards

Never permit oil, grease or other combustible substances to come in contact with ammonia service valves or components. Ammonia combined with these substances can result in explosions.

Design

Habonim ammonia service valves are available with screwed, socket weld, butt-weld, ANSI Class 150 and ANSI Class 300, EN 1092 PN16 and PN40 flanged ends. Flanged valves range from ½" to 8", and three piece valves from ¼" to 8". Body materials include 316 stainless steel or carbon steel. Standard ball and stem material is 316/316L stainless steel.



¼"- 2½"

3" - 6"

Valve Component Materials

Due to the extreme noxious nature of ammonia, it is crucial that all valve components are constructed with appropriate materials. Carbon steel is suitable for anhydrous ammonia applications, however if moisture is present, Stainless steel should be used.

TFM (code A), CF PTFE (code P) or glass filled PTFE (code R) seat material, and PTFE (code T) seal material, are used for anhydrous ammonia applications. The default stem seal include the Habonim unique HermetiX™ with CF PEEK thrust seal, CF PTFE stem seal, and anti-abrasion ring on top. The HermetiX™ stem seal assembly carries leak free warrantee of 500,000 cycles as a minimum condition.

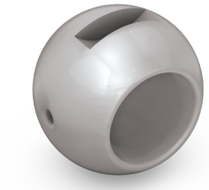
Bill of Materials	Wet Ammonia	Dry Ammonia
Body, ends, ball, stem	Stainless steel 316/316L CF8M/CF3M	Carbon Steel WCB (min. temp. -29 °C LCB min. -46 °C LF2, LC1 min. -60 °C
Seats	TFM (A), PTFE (T), CF PTFE (P), Glass filled PTFE (R), PEEK (K), CF PEEK	TFM (A), PTFE (T), CF PTFE (P), Glass filled PTFE (R), PEEK (K)
Seals	PTFE (T)	PTFE (T)

Valves designed for ammonia in a liquid state come equipped with an upstream pressure relief hole in the ball (Suffix - 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 P250 relief hole is uni-directional, the relief hole must positioned at the upstream, and otherwise an in-line leak will be evident.
For Bi-directional valve design in liquid ammonia a self-relief seats (SRS) should be used the seats material of construction in this case should be TFM or CF PTFE, a flex 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. Order code example:

10	M47X-4466AT/NPT	C.st valve code for gaseous ammonia.
10	M47X-6666AT/NPT-P250	Uni-directional S.st. valve for liquid ammonia.
10	M47X-6666AT/NPT-SRS	Bi-directional S.st. valve for liquid ammonia.

Cavity pressure relief (P250 Ball)



3 mm relief hole
face the upstream

Preparation

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 Valve assembly is carried out in a high quality 'clean room' by technicians using lint free gloves, to assure no ingress of grease or dust. Only lubricants compatible with ammonia are used. Valve seat and external leakage pressure tests are conducted in a 'clean room' environment, using pure Nitrogen. Only special 'clean tools' are used in the valve assembly.

Packing

After successful testing, valves are once again restored to the "open" position. Each valve is packed with a 'Silica-gel pack'. The valve is clearly labeled 'Prepared for Ammonia Service', and sealed in a polyethylene bag.

Accessories

Fugitive emission (FE) Bonnet - An important safety mechanism that Habonim offers for ammonia service is the Fugitive Emission (FE) bonnet. 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 matter of safety, it is advisable that valve for ammonia service should be equipped with spring loaded locking device do avoid unauthorized or unintentional valve operation. The

Habonim USA
Toll Free Phone: 1-866-261-8400
Toll Free Fax: 1-866-243-9959
sales_usa@habonim.com

Habonim EUROPE
Tel: +34 640 384 759
sales_eu@habonim.com
sales_international@habonim.com

Habonim UK
Tel: +44-1633-484554
Fax: +44-1633-482252
sales_uk@habonim.com

Habonim ISRAEL
Tel: +972-4-6914911
Fax: +972-4-6914935
sales_international@habonim.com

Habonim CHINA
Tel: + 86 21 64453190 *146
sales_china@habonim.com

Habonim AUSTRALIA
Tel: +61 3 9556 5428
sales_au@habonimau.com