

## ANHYDROUS AMMONIA FITTINGS AND ANCILLARY EQUIPMENT

Whether estimating costs for a proposed anhydrous ammonia installation or purchasing equipment for a specific application, it is necessary to have a thorough understanding of the types of equipment and fittings that are suitable for anhydrous ammonia service. Some ammonia service equipment is shipped by the manufacturer with all ammonia controls and fittings installed. With other equipment the user is expected to supply the additional items required to put the equipment into service. The information contained in the following paragraphs describes ammonia equipment and ammonia pipe fittings in general.

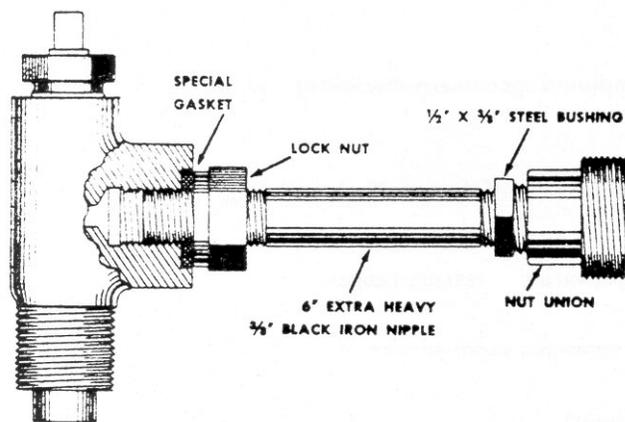
LaRoche industries can design, supply, install and service your ammonia equipment or can recommend a source for such services.

Ammonia corrodes copper, copper alloys such as brass and bronze, and zinc. Iron, steel and stainless steels are compatible with ammonia. Therefore, the usual types of pressure regulators, pressure gauges, brass valves, bronze-seated unions, and galvanized pipe and fittings will not be satisfactory. The following general specifications for ammonia fittings and ancillary equipment are given as a guide. On request, we can recommend specific manufacturers or suppliers and indicate the proper material specifications for equipment items.

Requirements for anhydrous ammonia equipment can be found in OSHA 29CFR Part 1910.111. Recommendations for anhydrous ammonia equipment can be found in ANSI (American National Standards Institute) Booklet K61.1 (1989).

### CYLINDER VALVE CONNECTION

A cylinder yoke or locknut/nipple/bushing/union combination is used to connect a flexible hose to an ammonia cylinder.



**Figure 1:** Cylinder Valve Connector - Locknut and Nipple Type

The height of a cylinder varies up to 1/2", requiring the use of a flexible connection to prevent strain on attached equipment. The use of an ammonia hose is the most satisfactory method of providing this flexibility.

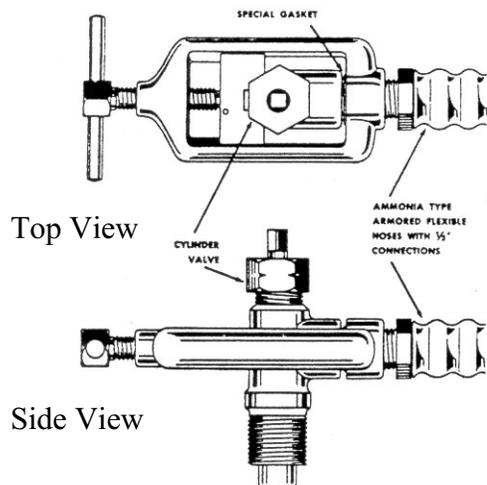
A 3/8" nipple and locknut connection is shown in Figure 1. The composition gasket ensures a leak-proof joint. These gaskets are supplied by LaRoche Industries.

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**Figure 2 - Cylinder Valve Connector - Yoke Type**

A cylinder yoke connection is shown in Figure 2. The connecting operation is simplified with the use of a yoke, since it may be tightened by hand. The alternative locknut and nipple type connection requires the use of wrenches for tightening. The same gasket is used to ensure a leakproof connection. the yoke is permanently attached to the 1/2" flexible hose.

**FITTINGS**

Elbows, tees, crosses - 2000# Forged Steel.  
 Couplings, caps - 3000# Forged Steel  
 Bushings, plugs - Forged Steel

**FLEXIBLE HOSE**

Stamped for anhydrous ammonia service, with steel ferruled couplings attached, stainless steel braid reinforced, 350 PSI working pressure, 1750 PSI minimum burst pressure.

**HYDROSTATIC RELIEF VALVE**

Stamped for anydrous ammonia service, spring loaded. designed to protect hose piping from excessive hydrostatic pressure.

**METERING DEVICES**

Vapor Ammonia service - Flow rate indicator.  
 Liquid Ammonia Service - Magnetic liquid level gauge - Flow rate indicator - Weighing Device - Sight glass - Turbine meter - Positive displacement meter.

**PIPE**

Schedule 80 (Extra Heavy) black iron.

**PIPE JOINT COMPOUND**

XPando, teflon (tape or paste) or any compound specifically recommended for ammonia service.

**PIPE JOINTS**

Threaded or welded depending on the requirement of the specific installation.

**PRESSURE GAUGES**

Stainless steel Bourdon tube, ammonia type, various pressure ranges.

**PRESSURE REGULATOR**

Aluminum, iron, or steel construction for ammonia vapor service.

**UNIONS**

3000# AAR Type (Ground steel-to-steel joint).

**VALVES**

Steel, specified by manufacturer as suitable for anhydrous ammonia service (check valves, excess flow valves, angle valves, globe valves, bar stock valves, bleed valves solenoid valves).

**VAPOR RELIEF VALVES**

Stamped for ammonia service, spring loaded. designed to protect storage containers from excessive vapor pressure.