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Pioneering Water Treatment for 40 YEARS

Ammonia Sources Comparison for Water Treatment

When it comes to chloramination you have options. There are many methods of chloramination and each utility has many factors to consider when deciding whether to use chloramination as a disinfection method and what type of ammonia product to enlist. This chart compares your ammonia source options so you can choose the best solution for your needs.

	LIQUID AMMONIUM SULFATE	AQUEOUS AMMONIA	ANHYDROUS AMMONIA
Potency (Nitrogen Content)	**Lowest** (~10% nitrogen by weight in 40% solution)	**Moderate** (Typically 19-25% ammonia solution)	**Highest** (>99% pure ammonia, ~82% nitrogen)
Safety Profile	**Safest** Non-toxic, non-irritating and odorless No risk of toxic gas release EPA reporting not required	**Moderate** Hazardous liquid with splash and vapor risks Lower pressure than anhydrous ammonia	**Highly Hazardous** Toxic Gas, Flammable Can cause severe chemical burns/frostbite Requires annual Tier II reporting, Risk Management Plan, and Release reporting to the National Response Center
Handling & Storage	Classified as non-hazardous Does not require special handling or storage Stable with indefinite shelf life Stored in atmospheric polyethylene tanks	Requires closed tanks rated for 30 psi, equipped with safety relief valves and vacuum breakers Tanks should be equipped with vapor recovery systems to manage ammonia fumes	Requires high-pressure tanks Subject to OSHA/EPA and ASME boiler and pressure vessel codes
Application	Easily metered liquid Slightly acidic (lowers pH) No risk of pipe scaling	Direct liquid feed Basic (raises pH) Can cause precipitation/scaling in hard water	Injected as gas or dissolved in-line Most efficient treatment per unit of active reagent
Maintenance	Lowest maintenance requirements Regular inspections and periodic cleaning	Due to precipitate (scale) clogging, ammonia injectors and feed pipes require cleaning every 90 days to 2-to-4 months	Operational reliability requires active management. Issues include aggressive cleaning due to precipitation and scale buildup
Water Quality Impact	Forms **stable monochloramines** Adds sulfate ions to the water	Forms chloramines Can significantly increase effluent pH	Highly efficient for large-scale chloramination at the lowest chemical cost Can significantly increase effluent pH

	PROS	CONS
Liquid Ammonium Sulfate (LAS)	Exceptional safety profile Odorless and easy to store Highly precise metering for small-to-medium facilities	Lower potency means more volume must be delivered and stored compared to concentrated ammonia
Aqueous Ammonia	Safer than anhydrous gas while maintaining a relatively high nitrogen concentration	Can be corrosive to equipment May cause pH-related scaling at injection point
Anhydrous Ammonia	Lowest cost per unit of nitrogen Smallest storage footprint for high-demand operations	Extreme safety risks and high regulatory compliance costs (e.g., Risk Management Plans) due to its toxicity Highly corrosive

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