Anhydrous Hydrazine (AH)

Anhydrous hydrazine (N_2H_4) is a clear, colorless, hygroscopic liquid with a distinct ammonia-like odor. It is a highly polar solvent, miscible with other polar solvents but immiscible with non-polar solvents. Anhydrous hydrazine is very hygroscopic and also will absorb carbon dioxide from the air.

Anhydrous hydrazine is available in monopropellant and standard grades. Monopropellant grade meets all requirements of the most recent version of Military Specification MIL-P-26536. Specifications for standard grade anhydrous hydrazine are given in Table 1.

Table 1
Specifications
Regular Grade

Component	% by Weight
Hydrazine, min	98
Iron, max	0.003
Water, max	1.5
Aniline, max	0.5

Physical properties of anhydrous hydrazine are given in Table 2. Anhydrous hydrazine is a strong reducing agent. Mixtures of hydrazine and very strong oxidizers are hypergolic. They also have other properties, such as high specific impulse, which make them valuable as aerospace fuels.

Table 2
Physical Properties

Density @ 25°C (g/ml)		1.004
	(lb/gal)	8.379
Viscosity @ 25°C (cp)		0.90
Boiling Point @ 760 mm Hg	(°C)	113.5
	(°F)	236.3
Freezing Point	(°C)	2.0
	(°F)	35.6
Flash Point, TCC	(°C)	37.8
	(°F)	100
Flammable Limits in Air (% by vol)		4.7 - 100

Applications

The major use for anhydrous hydrazine is as a propellant and an aerospace fuel. It is also recommended for applications requiring an intense, yet controllable, release of energy. For example, it is being used as a controlled explosive for fracturing underground rock formations in the secondary recovery of petroleum and natural gas. Anhydrous hydrazine may also be used in the preparation of derivatives or in reactions which require hydrazine, but which cannot tolerate the water of an aqueous solution.

Handling, Storage and Safety

The experience accumulated by the chemical and aerospace industries indicates that with rigid adherence to proper precautions, anhydrous hydrazine can be handled safely. Because anhydrous hydrazine vapors have no upper explosive limit and because anhydrous hydrazine liquid is extremely reactive with many materials, the safety precautions outlined are necessary to avoid fire or explosions. In addition, prolonged exposure to hydrazine vapor, contact with skin, or ingestion may produce harmful or fatal effects.

Storage: Anhydrous hydrazine may be stored in the DOT approved container in which it is shipped (See *Shipping Information* below). Store away from heat, sparks, open flame and oxidants. Store only in well ventilated areas. Do not contaminate.

Since it is stable, it can be stored without loss of purity. Keep the container closed securely. Vent the drums carefully when opening.

If you wish information on bulk storage, Arch Chemicals Technical Service is available. Contact the Arch Chemicals Sales Office.

Safety Precautions: Anhydrous hydrazine is insensitive to shock or friction. But both anhydrous hydrazine and its vapor can be flammable or explosive in the presence of heat, flame, sparks, contaminants and oxidizers, including air.

All containers and handling equipment for anhydrous hydrazine should be electrically grounded. And because of the rapid rate of oxidation, which may lead to a fire or

explosion, an inert atmosphere is necessary over anhydrous hydrazine at all times.

Nitrogen, which is inert and readily available, has been adopted as the padding material for anhydrous hydrazine storage and transfer. The lower explosive limit for anhydrous hydrazine vapor in air is 4.7%. This value increases significantly when a nitrogen atmosphere is used.

Avoid contact between anhydrous hydrazine and strong oxidizers such as hydrogen peroxide, nitrogen tetroxide, halogens and fuming nitric acid. Such contact will result in immediate ignition or explosion.

Avoid contact with metal oxides such as those of iron, copper, lead, manganese and molybdenum. Contact with such metallic oxide surfaces may lead to flaming decomposition. Avoid contact with organic materials having large surface areas, or porous surfaces. Absorption of anhydrous hydrazine by rags, cotton waste, sawdust or similar organic materials will eventually result in spontaneous ignition.

For additional details on handling and use of anhydrous hydrazine, contact the Arch Chemicals Sales Office.

Shipping Information

Anhydrous hydrazine is available in 30-gal (240 lbs net) and 55-gal (440 lbs net) stainless steel drums. Drums meet DOT Specification 1A1/X and are constructed of 304 stainless steel containing less than 0.2% molybdenum. Anhydrous hydrazine can be supplied in customer-provided pressure cylinders.

How to Order

To place orders for delivery in the U.S. or Canada and to get fast answers on order status or product availability, call our toll-free number: (800)-654-6018.

If you call evenings (after 4:30 p.m. eastern time) or on weekends or holidays, your message will be recorded and your Representative will contact you at the beginning of the next business day.

For written inquiries about orders, and to place confirmations, we have set up a special box number for you. Just address your envelope to Arch Chemicals, 960 I-10 Service Rd., Westlake, LA 70669.

Or visit our web site: **www.hydrazine.com**

Please refer to the Material Safety Data Sheet (MSDS) for complete information on Storage and Handling, Toxicological Properties, Personal Protection, First Aid, Spill and Leak Procedures, and Waste Disposal. To order an MSDS, call the Arch Chemicals sales office listed below or MSDS Control at (800) 511-MSDS. Before using or handling this product, the MSDS should be thoroughly reviewed.

Sales Headquarters
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