

Material Safety Data Sheet

Dyno Nobel Inc.

2650 Decker Lake Boulevard, Suite 300
Salt Lake City, Utah 84119
Phone: 801-364-4800 Fax: 801-321-6703
E-Mail: dna.hse@am.dynonobel.com

FOR 24 HOUR EMERGENCY, CALL **CHEMTREC (USA) 800-424-9300**
CANUTEC (CANADA) 613-996-6666

MSDS # 1021
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SECTION I - PRODUCT IDENTIFICATION

Trade Name(s): Ammonium Nitrate Liquor, 83%
DYNO NAL

Chemical Name: Ammonium Nitrate, NH₄NO₃

Product Class: Ammonium Nitrate Solutions

Synonyms: Strong Ammonium Nitrate Solution, AN Solution, AN Liquor, Nitrate of Ammonia Liquor (NAL)

Product Appearance & Odor: Clear, colorless liquid. Slight ammonia odor.

DOT Hazard Shipping Description: Hazard labeling needed if 35% or less water.

UN2426 Ammonium Nitrate, Liquid 5.1

NOTE: If shipped at or above 100°C, the word "HOT" must precede the proper shipping name on shipping papers. A Special Permit from DOT must be obtained to ship at a temperature exceeding 240°F (116°C).

Label: Oxidizer

NFPA Hazard Classification:

Health (Blue)	2
Flammability (Red)	0
Reactivity (Yellow)	3
Specific Hazard (White)	Oxidizer

HMIS (III) Classification:

Health	1
Flammability	1
Physical Hazard	3
PPE	E

SECTION II - HAZARDOUS INGREDIENTS

Ingredients:	CAS#	% (Range)	Occupational Exposure Limits	
			ACGIH TLV-TWA	OSHA PEL-TWA
Ammonium Nitrate	6484-52-2	80 – 90%	Not Established	Not Established

Ingredients, other than those mentioned above, as used in this product are not hazardous as defined under current Department of Labor regulations, or are present in de minimus concentrations (less than 0.1% for carcinogens, less than 1.0% for other hazardous materials).

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SECTION III - PHYSICAL DATA

Boiling Point: 128 – 146°C (263 – 295°F)
Decomposes between 179-210°C (350-410°F)

Vapor Pressure: 182 mm Hg (85% AN @ 200°F)

Melting Point: 85% AN solidifies below 75°C (167°F)

Density: 1.33 – 1.42 g/cc

Percent Volatile by Volume: 10 – 20% (Water)

Solubility in Water: 192 g (dry) / 100 ml @ 20°C

Evaporation Rate (Butyl Acetate = 1): Not Applicable

pH: 4.0 – 6.0

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

Flash Point: Not Applicable

Flammable Limits: Not Applicable

Extinguishing Media: Use water only. Do not attempt to smother. Do not use salt water, dry chemical, carbon dioxide, steam or foam.

Special Fire Fighting Procedures: Fight only small fires in initial stages when not confined. Immediately ventilate structures and transport containers to minimize confinement and prevent pressure buildup that increases the possibility of explosion. In advanced stage, or for any large fire or fire engulfing confining containers, abandon fire-fighting efforts and quickly evacuate all personnel to a safe distance of at least 2,500 feet. Use large quantities of water to cool. If possible, plug drains or dike channels to prevent either molten material or water runoff from entering storm drains or surface waters. Firefighters should wear self-contained breathing apparatus (SCBA) and full turnout gear.

Unusual Fire and Explosion Hazards: May explode or detonate under confinement and high temperatures. Ammonium nitrate emits toxic nitrogen oxides when heated to decomposition and will release ammonia to air upon reaction with strong alkalis. Explodes more readily if contaminated with organic materials or other fuels.

SECTION V - HEALTH HAZARD DATA

Carcinogenicity: NTP: No IARC Monographs: No OSHA Regulated: No

Effects of Overexposure

Not found to be toxic by oral, dermal and inhalation exposure as defined by OSHA.

Eyes: Hot solution will cause thermal tissue damage. Dried salt or vapors may cause irritation, redness and tearing.

Skin: Contact with hot solution will cause thermal burns. Dried salt may irritate skin.

Ingestion: Hot solution will cause thermal tissue damage. May cause gastric irritation, abdominal spasms, nausea, pain and faintness. Large amounts may be harmful if swallowed, potentially causing systemic acidosis and methemoglobinemia.

Inhalation: Dust or vapor may be irritating to mucous membranes and respiratory tract, and may cause sore throat, coughing, difficult breathing and severe lung congestion, and may also aggravate pre-existing lung conditions. Inhalation of dust may also lead to ingestion effects. Delayed reactions may result in pulmonary edema and chemical pneumonitis.

Systemic or Other Effects: Decomposition of AN solution at high temperatures produces highly toxic Nitrogen Oxides (NO_x). High level exposure to NO_x can cause serious injury or death. Chronic exposure to NO_x can produce respiratory and/or kidney damage.

Emergency and First Aid Procedures

Eyes: Immediately irrigate with running water for at least fifteen minutes, including under the eyelids. Cool burned area with ice. Seek prompt medical attention.

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Skin: Immediately stop thermal damage with water rinse. Remove contaminated clothing and flush area with copious amounts of water and treat as appropriate for thermal burns. Seek prompt medical attention for severe or large burns.

Ingestion: Do not induce vomiting. Seek medical attention. Treat for methemoglobinemia.

Inhalation: Remove to fresh air. If symptoms persist or worsen, seek prompt medical attention.

Special Considerations: If an exposure to toxic NO_x vapors occurs, restore or support breathing as necessary, seek medical attention. Observe for delayed reactions to NO_x exposure that may involve pulmonary edema.

SECTION VI - REACTIVITY DATA

Stability: Stable under normal conditions.

Conditions to Avoid: Keep away from excessive heat, flame and ignition sources.

Materials to Avoid (Incompatibility): Flammable liquids, organic solvents and materials, explosives, metal powders and other combustible materials. Reducing agents, chlorides, phosphorus and sulfur. Corrosives (strong acids and bases).

Hazardous Decomposition Products: Nitrogen Oxides (NO_x), Ammonia (NH₃), Nitric Acid (HNO₃).

Hazardous Polymerization: Does not occur.

SECTION VII - SPILL OR LEAK PROCEDURES

Steps to be taken in Case Material is Released or Spilled: Evacuate unnecessary personnel. Dike and contain spill. Notify authorities in accordance with emergency response procedures. Only personnel trained in emergency response should respond. Follow applicable federal, state, and local spill reporting requirements. Contact of this product with water may result in a reportable release.

Waste Disposal Method: Disposal must comply with Federal, State and local regulations. Ammonium Nitrate is used as a fertilizer and, in some cases, recovered material may be put to beneficial use. If product becomes a waste, it is potentially regulated as a hazardous waste as defined under the Resource Conservation and Recovery Act (RCRA) 40 CFR, part 261. Review disposal requirements with a person knowledgeable with applicable environmental law (RCRA) before disposing of any hazardous material.

SECTION VIII - SPECIAL PROTECTION INFORMATION

Ventilation: General room ventilation is normally adequate.

Respiratory Protection: None normally required.

Protective Clothing: Hot AN solution can cause severe tissue damage. Chemical resistant gloves and work clothing that reduce skin contact (preferably tightly woven, non-porous or splash resistant) are recommended. Additional insulation in gloves and clothing is recommended for temperatures exceeding about 90°C (194°F).

Eye Protection: Safety glasses with side shields and/or face shield. Eye baths should be provided when direct eye contact is likely.

Other Precautions Required: Ammonium Nitrate solution is normally handled at temperatures exceeding 80°C (176°F). Personal protective equipment should always reflect a thermal burn hazard.

SECTION IX - SPECIAL PRECAUTIONS

Precautions to be Taken in Handling and Storage: Keep separate from other chemicals and combustible material. Empty containers may contain residue and can be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind or expose such containers to heat, flames, sparks or other sources of ignition without first thoroughly decontaminating the containers; they may evolve poisonous gas and cause injury or death.

Other Precautions: AN solution is normally handled at 176°F (80°C) or above. AN is corrosive to carbon steel and some other materials. Stainless steel or aluminum is preferred construction. Avoid mixing with basic materials that cause evolution of ammonia vapors.

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SECTION X - SPECIAL INFORMATION

EPCRA Section 311/312 Hazard Categorization

Acute	Chronic	Fire	Pressure	Reactive
X		X		

This product contains the following substances that are subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372.

<u>Chemical Name</u>	<u>CAS Number</u> (Use Toxic Chemical Category Code)	<u>% By Weight</u>
Nitrate Compounds	N511 (Water dissociable reportable only when in aqueous solution)	62 – 70%
Ammonia	7664-41-7 (Aqueous from dissociable salts)	17 – 19%

Slightly toxic to aquatic organisms as defined by USEPA.

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