



**** SECTION 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION ****

MSDS Name: Ammonium Hydroxide

Catalog Numbers:

A470-250, A512-500, A564-200L, A564-20L, A564-212L, A564-500, A667-212,
A669-212, A669-385LB, A669-500, A669-612GAL, A669C-2.5, A669C-212,
A669FP500, A669S-2.5, A669S-212, A669S-500, A669S212E, A669S212EA,
A669S212LC, A699P500, S70663MF, S70665, S70665-1, S70665MF, S75029, SCH1143

Synonyms:

Ammonium Hydrate; Ammonia Solution; Ammonia Water; Aqueous Ammonia.

Company Identification: Fisher Scientific

1 Reagent Lane
Fairlawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

**** SECTION 2 - COMPOSITION, INFORMATION ON INGREDIENTS ****

CAS#	Chemical Name	%	EINECS#
1336-21-6	Ammonium hydroxide	57.0	215-647-6
7664-41-7	Ammonia	22-30	231-635-3
7732-18-5	Water	43.0	231-791-2

Hazard Symbols: T C

Risk Phrases: 25 34

**** SECTION 3 - HAZARDS IDENTIFICATION ****

EMERGENCY OVERVIEW

Appearance: colourless.

Danger! Corrosive. Toxic. Lachrymator (substance which increases the flow of tears). Harmful if swallowed. Causes eye and skin burns.

Causes digestive and respiratory tract burns.

Target Organs: Eyes, skin, mucous membranes.

Potential Health Effects

Eye:

Contact with liquid or vapor causes severe burns and possible irreversible eye damage.

Skin:

Causes severe skin irritation. Causes skin burns. May cause deep, penetrating ulcers of the skin. Contact with the skin may cause staining, inflammation, and thickening of the skin.

Ingestion:

Harmful if swallowed. May cause severe and permanent damage to the digestive tract. Causes gastrointestinal tract burns. Causes throat constriction, vomiting, convulsions, and shock.

Inhalation:

Effects may be delayed. Causes severe irritation of upper respiratory tract with coughing, burns, breathing difficulty, and possible coma.

Chronic:

Chronic ingestion may cause effects similar to those of acute ingestion. Prolonged or repeated exposure may cause corneal damage and the development of cataracts and glaucoma.

**** SECTION 4 - FIRST AID MEASURES ****

Eyes:

Get medical aid immediately. Do NOT allow victim to rub or keep eyes closed. Extensive irrigation with water is required (at least 30 minutes).

Skin:

In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid immediately. Wash clothing before reuse.

Ingestion:

If swallowed, do NOT induce vomiting. Get medical aid immediately. If victim is fully conscious, give a cupful of water. Never give anything by mouth to an unconscious person.

Inhalation:

If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician:

After inhalation exposure, observe for 24 to 72 hours as pulmonary edema may be delayed.

**** SECTION 5 - FIRE FIGHTING MEASURES ****

General Information:

As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Use water spray to keep fire-exposed containers cool. Vapors may be heavier than air. They can spread along the ground and collect in low or confined areas. Contact with metals may evolve flammable hydrogen gas. Containers may explode when heated. Non-combustible, substance itself does not burn but may decompose upon heating to produce corrosive and/or toxic fumes.

Extinguishing Media:

For small fires, use water spray, dry chemical, carbon dioxide or chemical foam. Do NOT get water inside containers. For large fires, use dry chemical, carbon dioxide, alcohol-resistant foam, or water spray. Cool containers with flooding quantities of water until well after fire is out.

Autoignition Temperature: Not applicable.

Flash Point: Not applicable.

Explosion Limits, lower: 16.0

Explosion Limits, upper: 27.0

NFPA Rating: (estimated) Health: 3; Flammability: 1; Reactivity: 0

**** SECTION 6 - ACCIDENTAL RELEASE MEASURES ****

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks:

Absorb spill with inert material (e.g. vermiculite, sand or earth), then place in suitable container. Neutralize spill with a weak acid such as vinegar or acetic acid. Avoid runoff into storm sewers and ditches which lead to waterways. Clean up spills immediately, observing precautions in the Protective Equipment section. Provide ventilation.

**** SECTION 7 - HANDLING and STORAGE ****

Handling:

Wash thoroughly after handling. Remove contaminated clothing and

wash before reuse. Use only in a well-ventilated area. Do not get in eyes, on skin, or on clothing. Keep container tightly closed. Do not ingest or inhale. Discard contaminated shoes.

Storage:

Do not store in direct sunlight. Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Corrosives area.

**** SECTION 8 - EXPOSURE CONTROLS, PERSONAL PROTECTION ****

Engineering Controls:

Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Ammonium hydroxide	none listed	none listed	none listed
Ammonia	25 ppm; 35 ppm STEL	25 ppm TWA; 18 mg/m3 TWA 300 ppm IDLH	50 ppm TWA; 35 mg/m3 TWA
Water	none listed	none listed	none listed

OSHA Vacated PELs:

Ammonium hydroxide:

No OSHA Vacated PELs are listed for this chemical.

Ammonia:

35 ppm STEL; 27 mg/m3 STEL

Water:

No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes:

Wear chemical goggles.

Skin:

Wear appropriate protective gloves to prevent skin exposure.

Clothing:

Wear appropriate protective clothing to prevent skin exposure.

Respirators:

Follow the OSHA respirator regulations found in 29CFR 1910.134 or European Standard EN 149. Always use a NIOSH or European Standard EN 149 approved respirator when necessary.

**** SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES ****

Physical State: Liquid
 Appearance: colourless
 Odor: strong odor - ammonia-like
 pH: 13.6 at 32F.
 Vapor Pressure: 115 mm Hg @20C
 Vapor Density: 1.2 (Air=1)
 Evaporation Rate: 1 (Water=1)
 Viscosity: Not available.
 Boiling Point: 36 deg C
 Freezing/Melting Point: -77 deg C
 Decomposition Temperature: Not available.
 Solubility in water: Completely soluble in water.

Specific Gravity/Density: 0.9
Molecular Formula: Not applicable.
Molecular Weight:

**** SECTION 10 - STABILITY AND REACTIVITY ****

Chemical Stability:

Stable under normal temperatures and pressures.

Conditions to Avoid:

High temperatures, incompatible materials.

Incompatibilities with Other Materials:

Acrolein, acrylic acid, chlorosulfonic acid, dimethyl sulfate, fluorine, gold + aqua regia, hydrochloric acid, hydrofluoric acid, iodine, nitric acid, oleum, propiolactone, propylene oxide, silver nitrate, silver oxide, silver oxide + ethyl alcohol, nitromethane, silver permanganate, sulfuric acid, halogens. Forms explosive compounds with many heavy metals and halide salts.

Hazardous Decomposition Products:

Nitrogen oxides (NOx) and ammonia (NH3).

Hazardous Polymerization: Has not been reported.

**** SECTION 11 - TOXICOLOGICAL INFORMATION ****

RTECS#:

CAS# 1336-21-6: BQ9625000

CAS# 7664-41-7: BO0875000

CAS# 7732-18-5: ZC0110000

LD50/LC50:

CAS# 1336-21-6: Draize test, rabbit, eye: 250 ug Severe; Draize test, rabbit, eye: 44 ug Severe; Oral, rat: LD50 = 350 mg/kg.

CAS# 7664-41-7: Inhalation, mouse: LC50 = 4230 ppm/1H; Inhalation, rabbit: LC50 = 7 gm/m³/1H; Inhalation, rat: LC50 = 2000 ppm/4H.

CAS# 7732-18-5: Oral, rat: LD50 = >90 mL/kg.

Carcinogenicity:

Ammonium hydroxide -

Not listed by ACGIH, IARC, NIOSH, NTP, or OSHA.

Ammonia -

Not listed by ACGIH, IARC, NIOSH, NTP, or OSHA.

Water -

Not listed by ACGIH, IARC, NIOSH, NTP, or OSHA.

Epidemiology:

No information available.

Teratogenicity:

No information available.

Reproductive Effects:

No information available.

Neurotoxicity:

No information available.

Mutagenicity:

No information available.

Other Studies:

Standard Draize Test: Administration into the eye (rabbit) = 250 ug (Severe).

**** SECTION 12 - ECOLOGICAL INFORMATION ****

Ecotoxicity:

Bluegill LC50=0.024 to 0.093 mg/L/48H Goldfish TLm=2.0 to 2.5 mg/L/24-96H

**** SECTION 13 - DISPOSAL CONSIDERATIONS ****

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste.

US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state

and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

**** SECTION 14 - TRANSPORT INFORMATION ****

US DOT

Shipping Name: AMMONIA SOLUTIONS

Hazard Class: 8

UN Number: UN2672

Packing Group: III

Canadian TDG

Shipping Name: AMMONIUM HYDROXIDE

Hazard Class: 8(9.2)

UN Number: UN2672

**** SECTION 15 - REGULATORY INFORMATION ****

US FEDERAL

TSCA

CAS# 1336-21-6 is listed on the TSCA inventory.

CAS# 7664-41-7 is listed on the TSCA inventory.

CAS# 7732-18-5 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

SARA

Section 302 (RQ)

CAS# 1336-21-6: final RQ = 1000 pounds (454 kg)

CAS# 7664-41-7: final RQ = 100 pounds (45.4 kg)

Section 302 (TPQ)

CAS# 7664-41-7: TPQ = 500 pounds; RQ = 100 pounds (does not meet toxicity criteria but because of high production volume and recognized toxicity is considered a chemical of concern)

SARA Codes

CAS # 1336-21-6: acute, chronic.

Section 313

This material contains Ammonia (CAS# 7664-41-7, 22 30%), which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 372.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depleters.

This material does not contain any Class 2 Ozone depleters.

Clean Water Act:

CAS# 1336-21-6 is listed as a Hazardous Substance under the CWA.

CAS# 7664-41-7 is listed as a Hazardous Substance under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

CAS# 7664-41-7 is considered highly hazardous by OSHA.

STATE

Ammonium hydroxide can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Massachusetts.

Ammonia can be found on the following state right to know lists: California, New Jersey, Florida, Pennsylvania, Minnesota, Massachusetts.

Water is not present on state lists from CA, PA, MN, MA, FL, or NJ.
California No Significant Risk Level:

None of the chemicals in this product are listed.
European/International Regulations
European Labeling in Accordance with EC Directives
Hazard Symbols: T C
Risk Phrases:

R 25 Toxic if swallowed.
R 34 Causes burns.

Safety Phrases:

S 24/25 Avoid contact with skin and eyes.
S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

WGK (Water Danger/Protection)

CAS# 1336-21-6: 2
CAS# 7664-41-7: 2
CAS# 7732-18-5: No information available.

United Kingdom Occupational Exposure Limits

CAS# 7664-41-7: OES-United Kingdom, TWA 25 ppm TWA; 18 mg/m3 TWA
CAS# 7664-41-7: OES-United Kingdom, STEL 35 ppm STEL; 25 mg/m3 STEL
CAS# 7664-41-7: OES-United Kingdom, STEL 35 ppm STEL; 25 mg/m3 STEL

Canada

CAS# 1336-21-6 is listed on Canada's DSL List.
CAS# 7664-41-7 is listed on Canada's DSL List.
CAS# 7732-18-5 is listed on Canada's DSL List.
This product has a WHMIS classification of D1B, E.

CAS# 1336-21-6 is listed on Canada's Ingredient Disclosure List.
CAS# 7664-41-7 is listed on Canada's Ingredient Disclosure List.
CAS# 7732-18-5 is not listed on Canada's Ingredient Disclosure List.

Exposure Limits

CAS# 7664-41-7: OEL-ARAB Republic of Egypt:TWA 25 ppm (18 mg/m3)
OEL-AUSTRALIA:TWA 25 ppm (18 mg/m3);STEL 35 ppm (27 mg/m3)
OEL-AUSTRIA:TWA 50 ppm (35 mg/m3)
OEL-BELGIUM:TWA 25 ppm (17 mg/m3);STEL 35 ppm (24 mg/m3)
OEL-CZECHOSLOVAKIA:TWA 20 mg/m3;STEL 40 mg/m3
OEL-DENMARK:TWA 25 ppm (18 mg/m3)
OEL-FINLAND:TWA 25 ppm (18 mg/m3);STEL 40 ppm (30 mg/m3)
OEL-FRANCE:TWA 25 ppm (18 mg/m3);STEL 50 ppm (36 mg/m3)
OEL-GERMANY:TWA 50 ppm (35 mg/m3)
OEL-HUNGARY:TWA 18 mg/m3;STEL 27 mg/m3
OEL-INDIA:TWA 25 ppm (18 mg/m3);STEL 35 ppm (27 mg/m3)
OEL-JAPAN:TWA 25 ppm (17 mg/m3)
OEL-THE NETHERLANDS:TWA 25 ppm (18 mg/m3)
OEL-THE PHILIPPINES:TWA 50 ppm (30 mg/m3)
OEL-POLAND:TWA 20 mg/m3;STEL 20 mg/m3
OEL-RUSSIA:TWA 25 ppm;STEL 20 mg/m3
OEL-SWEDEN:TWA 25 ppm (18 mg/m3);STEL 50 ppm (35 mg/m3)
OEL-SWITZERLAND:TWA 25 ppm (18 mg/m3);STEL 50 ppm (36 mg/m3)
OEL-THAILAND:TWA 50 ppm (35 mg/m3)
OEL-TURKEY:TWA 25 ppm (35 mg/m3)
OEL-UNITED KINGDOM:TWA 25 ppm (18 mg/m3);STEL 35 ppm (27 mg/m3)
OEL IN BULGARIA, COLOMBIA, JORDAN, KOREA check ACGIH TLV
OEL IN NEW ZEALAND, SINGAPORE, VIETNAM check ACGI TLV

**** SECTION 16 - ADDITIONAL INFORMATION ****

MSDS Creation Date: 6/22/1999 Revision #4 Date: 7/20/2001

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no way shall the company be liable for any claims, losses, or damages of any third party or for lost

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