

# Anhydrous Ammonia

SDS: P-16 Version: 2

## Safety Data Sheet

Revision Date: 11/07/2016



### SECTION 1: IDENTIFICATION

**Product Identifier:** Anhydrous Ammonia  
**Product Names and Synonyms:** Ammonia  
**Intended Use:** Manufacture of fertilizer, explosive, chemicals, synthetic fibers, Refrigerant, Cleaning solutions, Pollution Control  
**Intended Users:** For use only under strictly controlled conditions and only by qualified personnel who are fully trained in the handling and use of this product.

**Name, Address, and Telephone of the Responsible Party:**

Austin Powder Company  
25800 Science Park Dr.  
Cleveland, OH 44122  
216-464-2400 during normal business hours  
877-836-8286 Toll Free 24/7  
www.austinpowder.com

**In Case of Emergency Call CHEMTREC – TOLL FREE 24/7**  
**800-424-9300 DOMESTIC**  
**1-703-527-3887 INTERNATIONAL AND MARINE**

### SECTION 2: HAZARDS IDENTIFICATION

**Classification of the Substance or Mixture:**

Code	Hazard Class	Hazard Category
H221	Flammable gas	2
H280	Gases under pressure, liquefied gas	Liquefied gas
H314	Skin corrosion/irritation	1B
H332	Acute Toxicity, inhalation	4
H335	Specific target organ toxicity, single exposure. Respiratory tract irritation	3
H400	Aquatic Toxicity (acute)	1

**Label Elements**

**Danger**



**Hazard Statements**

Flammable gas  
Contains gas under pressure; may explode if heated  
Causes severe skin burns and eye damage  
Harmful if inhaled  
May cause respiratory irritation  
Very toxic to aquatic life



### Precautionary Statements

Keep away from heat, hot surfaces, open flames, sparks. No smoking.  
 Do not breathe mist, spray, vapors, gas.  
 Wash hands, forearms, and exposed areas thoroughly after handling.  
 Use only outdoors or in a well-ventilated area.  
 Avoid release to the environment.  
 Wear eye protection, protective clothing, and protective gloves.

IF SWALLOWED: Rinse mouth. DO NOT induce vomiting. Immediately call a poison center or doctor.  
 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.  
 IF INHALED: Remove person to fresh air. Keep at rest in a position comfortable for breathing.  
 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

Wash contaminated clothing before reuse.  
 Leaking gas fire: Do not extinguish, unless leak can be stopped safely.  
 Eliminate all ignition sources if safe to do so.  
 Collect spillage.  
 Store in a well-ventilated place. Keep container tightly closed.  
 Store locked up.  
 Protect from sunlight. Store in a well-ventilated place. Wear protective gloves/ protective clothing/ eye protection/ face protection.

### Other Hazards:

Ammonia vapor, in concentrations of 16-25% volume by weight in air, is flammable, toxic by inhalation and corrosive. Take all appropriate precautions.

**Unknown Acute Toxicity:** Not available

## SECTION 3: COMPOSITION / INFORMATION ON INGREDIENTS

Name	Product Identifier	% (w/w)
Anhydrous Ammonia	CAS No. 7664-41-7	99 - 100

## SECTION 4: FIRST AID MEASURES

**General:** Never give anything by mouth to an unconscious person. If you feel unwell, seek medical advice (show the label where possible). If frostbite or freezing occurs, immediately flush with plenty of lukewarm water to GENTLY warm the affected area. Do not use hot water. Do not rub affected area. Get immediate medical attention.

**Inhalation:** When symptoms occur: go into open air and ventilate suspected area. Immediately call a POISON CENTER or doctor/physician.

**Skin Contact:** FROSTBITE: Immediately flush skin with plenty of water for at least 60 minutes. Remove contaminated clothing. Immediately call a POISON CENTER or doctor/physician. Wash contaminated clothing before reuse.

**Eye Contact:** FROSTBITE: Rinse cautiously with water for at least 60 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Obtain medical attention.

**Ingestion:** Rinse mouth. Do NOT induce vomiting. Immediately call a POISON CENTER or doctor/physician.

### Most Important Symptoms and Effects both Acute and Delayed

The most important known symptoms and effects are described in the labeling (see section 2) and/or in section 11.



## **SECTION 5: FIRE FIGHTING MEASURES**

### **Extinguishing Media**

**Suitable Extinguishing Media:** Water spray, fog.

**Unsuitable Extinguishing Media:** Do not use a heavy water stream. Use of heavy stream of water may spread fire. Do not use water directly on liquid ammonia as this will increase formation of ammonia vapors.

### **Special Hazards Arising From the Substance or Mixture**

**Fire Hazard:** Flammable gas. Ammonia concentrations in the range of 16-25% by volume in air can be ignited if heated to the auto-ignition temperature. Oil or other combustible materials increases the fire hazard.

**Explosion Hazard:** Forms explosive compounds with calcium hypochlorite, bleaches, gold, mercury, silver, chlorine and other halogens. Contact with strong oxidizers can result in fires and explosions.

**Reactivity:** Corrosive to copper, brass, silver, zinc and galvanized steel.

### **Advice for Firefighters**

**Precautionary Measures Fire:** Exercise caution when fighting any chemical fire. Do not allow ammonia vapors to accumulate in confined areas where ignition may occur.

**Firefighting Instructions:** Stop leak if safe to do so. For a serious leak, use fire hose with fog nozzle and plenty of water to absorb ammonia vapors. Isolate immediate hazard area and keep unauthorized personnel out. Stop spill/release if it can be done with minimal risk. Move undamaged containers from immediate hazard area if it can be done with minimal risk. Water spray may be useful in minimizing or dispersing vapors and to protect persons shutting off flow. Cool equipment exposed to fire with water, if it can be done with minimal risk. In case of major fire and large quantities: Evacuate area. Fight fire remotely due to the risk of explosion.

**Protection during Firefighting:** Do not enter fire area without proper protective equipment, including respiratory protection. Firefighters must use full bunker gear including NIOSH-approved positive-pressure self-contained breathing apparatus to protect against potential hazardous combustion and decomposition products.

**Hazardous Combustion Products:** Nitrogen oxides.

**Other Information:** Compressed gas or refrigerated liquid. Intense heating particularly in contact with hot metallic surfaces may cause decomposition of ammonia generating hydrogen, a flammable gas. Note that many materials, particularly plastics, become brittle upon contact with liquid ammonia.

## **SECTION 6: ACCIDENTAL RELEASE MEASURES**

### **Personal Precautions, Protective Equipment and Emergency Procedures**

**General Measures:** Cleanup workers should stay upwind and keep out of low areas where ammonia vapors can accumulate. Keep away from open flames, hot surfaces and sources of ignition. Use special care to avoid static electric charges. No smoking. Do not get in eyes, on skin, or on clothing. Do not breathe gas. If small spill, allow to vaporize or absorb vapor in water. For a large spill refer to section 5.3 for advice. Neutralization with acid is NOT recommended.



**For Non-Emergency Personnel  
Protective Equipment:**

Use appropriate personal protection equipment (PPE). Persons without proper PPE should be restricted from the spill area until cleanup has been completed.

**Emergency Procedures:**

Evacuate unnecessary personnel. Eliminate ignition sources.

**For Emergency Personnel**

**Protective Equipment:**

Equip cleanup crew with proper protection.

**Emergency Procedures:**

Stop leak if safe to do so. Ventilate area.

**Environmental Precautions:**

Prevent entry to sewers and public waters.

**Methods and Material for Containment and Cleaning Up**

**For Containment:**

Stop the flow of material, if this is without risk. Ventilate area.

**Methods for Cleaning Up:**

Clean up spills immediately and dispose of waste safely. Allow to vaporize or absorb the vapor in water. Use only non-sparking tools.

**SECTION 7: HANDLING AND STORAGE**

**Precautions for Safe Handling**

**Additional Hazards When Processed:** Do NOT enter storage areas unless adequately ventilated. Emits ammonia vapors. Flammable gas. Ammonium hydroxide reacts with many heavy metals and their salts forming explosive compounds. It may attack metals forming flammable/explosive gas. The solution in water is a strong base, it reacts violently with acids.

**Hygiene Measures:**

Handle in accordance with good industrial hygiene and safety procedures. Wash hands and other exposed areas with mild soap and water before eating, drinking, or smoking and again when leaving work.

**Conditions for Safe Storage, Including Any Incompatibilities**

**Technical Measures:**

Contents under pressure. The use of explosion proof equipment is recommended. Anhydrous ammonia is a product which must be handled in approved equipment and by trained personnel. Any proposed use of this product in elevated-temperature processes should be thoroughly evaluated to assure that safe operating conditions are established and maintained. Ensure adequate ventilation. Proper grounding procedures to avoid static electricity should be followed. System design and training programs must comply with applicable regulations and in addition to good engineering practices. Pressure vessels, piping and appurtenances should be regularly inspected and tested using methods designed to reveal external and internal deterioration or defects that may impair integrity of the equipment such that an unintended release of anhydrous ammonia may result. Consult with State Department of Agriculture and other experts, as applicable, concerning methods that would be appropriate given the particular circumstances. Refer to 29 CFR 1910.111 Storage and Handling of Anhydrous Ammonia, 29 CFR 1910.119 Process Safety Management of Highly Hazardous Materials and the current ANSI/CGA G-2.1-2014 standard, *Requirements for the Storage and Handling of Anhydrous Ammonia* for additional information.



**Storage Conditions:**

Store in a dry, cool and well-ventilated place. Keep in fireproof place. Store locked up. Storage containers should have safety relief valves. Note that many materials, particularly plastics, become brittle upon contact with liquid ammonia.

**Incompatible Materials:**

Forms explosive compounds with calcium hypochlorite, bleaches, gold, mercury, silver, chlorine and other halogens. Contact with strong oxidizers can result in fires and explosions. Corrosive to copper, brass, silver, zinc and galvanized steel.

**Storage Area:**

Post readily visible warning signs in the storage area listing emergency measures. Water hoses should be readily available to disperse vapors in case of a spill.

**SECTION 8: EXPOSURE CONTROLS / PERSONAL PROTECTION**

**Occupational exposure limits:**

Anhydrous ammonia, CAS No. 7664-41-7		
USA ACGIH	ACGIH TLV/STEL	25 ppm/35 ppm (15 minutes)
USA OSHA	OSHA PEL (TWA)	50 ppm

**Exposure Controls**

**Appropriate Engineering Controls:** Gas detectors should be used when flammable gases/vapors may be released. Gas detectors should be used when toxic gases may be released. Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure. Use explosion-proof equipment. Ensure all national/local regulations are observed.

**Personal Protective Equipment:** Protective goggles. Gloves. Protective clothing. Insufficient ventilation: wear respiratory protection. Face shield.

**Materials for Protective Clothing:** Chemically resistant materials and fabrics.

**Hand Protection:** Wear chemically resistant protective gloves.

**Eye Protection:** Chemical safety goggles.

**Skin and Body Protection:** Wear suitable protective clothing.

**Respiratory Protection:** If exposure limits are exceeded or irritation is experienced, approved respiratory protection should be worn.

**Thermal Hazard Protection:** Wear cold insulating gloves.

**Other Information:** When using, do not eat, drink or smoke.



## **SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES**

### **Information on Physical and Chemical Properties:**

Appearance:	Colorless liquid or gas
Upper/Lower Flammability/Explosive Limits:	Flammability limits: 16-25% (vol/vol)
Odor:	Pungent odor considered suffocating
Vapor Pressure:	756 kPa at 68 °F
Odor threshold:	5 – 50 ppm in humans
Vapor density:	Relative vapor density (air=1): 0.77
pH:	>12 (10% solution) 10.6 – 11.6 (0.02-1.7% solution)
Relative Density:	Specific gravity liquid: 0.682 (water=1); Specific gravity of gas: 0.770 (air=1)
Evaporation Rate:	Not available
Melting Point/Freezing Point:	-108 °F
Solubility:	in water: 51 g at 68 °F
Flash point:	Not applicable
Auto-ignition Temperature:	1,204 °F
Decomposition Temperature:	Not available
Flammability (solid, gas):	Not available
Vapor Pressure:	8.5 atm at 68 °F
Specific Gravity:	Specific gravity liquid: 0.682 (water=1); Specific gravity of gas: 0.770 (air=1)
Partition Coefficient: n-Octanol/water:	Not applicable
Viscosity:	0.475 cP at -92 °F
Explosion Data – Sensitivity to Mechanical Impact:	Not sensitive to mechanical impact
Explosion Data – Sensitivity to Static Discharge:	Not sensitive to static discharge

## **SECTION 10: STABILITY AND REACTIVITY**

**Reactivity and Chemical Stability:** Forms explosive compounds with calcium hypochlorite, bleaches, gold, mercury, silver, chlorine and other halogens. Contact with strong oxidizers can result in fires and explosions. Corrosive to copper, brass, silver, zinc, and galvanized steel.

**Possibility of Hazardous Reactions:** Polymerization will not occur.

**Conditions to Avoid:** Extremely high or low temperatures. Open flame. Overheating. Heat. Sparks.

**Incompatible Materials:** Strong acids. Strong bases. Strong oxidizers. Hypochlorites.

**Hazardous Decomposition Products:** Nitrogen oxides.



## SECTION 11: TOXICOLOGY INFORMATION

<b>Acute Toxicity:</b>	Inhalation
<b>LD50 and LC50 Data:</b>	see table below
<b>Skin Corrosion/Irritation:</b>	Causes severe skin burns and eye damage
<b>Serious Eye Damage/Irritation:</b>	Causes serious eye damage.
<b>Respiratory or Skin Sensitization:</b>	Not classified
<b>Germ Cell Mutagenicity:</b>	Not classified
<b>Teratogenicity:</b>	Not available
<b>Carcinogenicity:</b>	Not classified
<b>Reproductive Toxicity:</b>	Not classified
<b>Specific Target Organ Toxicity (Single Exposure):</b>	May cause respiratory irritation.
<b>Aspiration Hazard:</b>	Not classified
<b>Specific Target Organ Toxicity (Repeated Exposure):</b>	Not classified.
<b>Aspiration Hazard:</b>	Not classified
<b>Symptoms/Injuries after Inhalation:</b>	Harmful if inhaled.
<b>Symptoms/Injuries after Skin Contact:</b>	Corrosive. Causes burns. Symptoms may include: Redness. Pain. Serious skin burns. Blisters.
<b>Symptoms/Injuries after Eye Contact:</b>	Causes serious eye damage. Symptoms may include: Redness. Pain. Blurred vision. Severe burns. Causes permanent damage to the cornea, iris, or conjunctiva.
<b>Symptoms/Injuries after Ingestion:</b>	Ingestion is an unlikely route of exposure for a gas.

### **LD50 and LC50 Data:**

Anhydrous Ammonia, CAS No. 7664-41-7	
LC50 Inhalation Rat	7338 - 16600 / 60 min exposure
LC50 Inhalation Rat	3669 - 8300 / 4h exposure
LD50 oral Rat	350 mg/kg

## SECTION 12: ECOLOGY INFORMATION

### **Toxicity**

**Ecology - General:** Toxic to aquatic life with long lasting effects. Very toxic to aquatic life.

Anhydrous Ammonia, CAS No. 7664-41-7	
LC50 Daphnia magna (water flea)	25.4 mg/l in 48 h
LC50 rainbow trout	Adults: 0.097 mg/l in 24 h



**Persistence and Degradability:** Not established

**Bioaccumulative Potential:** Not established

**Mobility in Soil:** Not available

**Other Adverse Effects:** Avoid release to the environment.

**SECTION 13: DISPOSAL CONSIDERATIONS**

**Waste treatment methods**

**Waste Disposal Recommendations:** Dispose of waste material in accordance with all local, regional, national, provincial, territorial and international regulations.

**Additional Information:** Handle empty containers with care because residual vapors are flammable. Prevent runoff from entering drains, sewers or waterways.

**Ecology – Waste Materials:** This material is hazardous to the aquatic environment. Keep out of sewers and waterways.

**SECTION 14: TRANSPORTATION INFORMATION**

Agency	UN Number	UN Proper Shipping Name	Hazard Class	Marine Pollutant
TDG	UN1005	Ammonia, Anhydrous	2.3	Yes*
US DOT	UN1005	Ammonia, Anhydrous	2.2	Yes*
IMDG	UN1005	Ammonia, Anhydrous	2.3	Yes

\*The marine pollutant mark is not required when transported by road or rail

\*\* This product is not regulated as a marine pollutant when transported on inland waterways in sizes of ≤5 L or ≤5 kg or by road, rail, or inland air in non-bulk sizes, provided the packaging meet the general provisions of §§ 173.24 and 173.24a.

**SECTION 15: REGULATORY INFORMATION**

**US Federal Regulations:**

Emergency Planning and Community Right-To-Know Act (EPCRA), a/k/a Superfund Amendments and Reauthorization Act (SARA) Title III  
 Toxic Substances Control Act (TSCA)  
 TSCA Section 8

Listed on the United States TSCA (Toxic Substances Control Act) inventory Listed on the United States SARA Section 302 Listed on United States SARA Section 313	
SARA Section 302 Threshold Planning Quantity (TPQ)	500
SARA Section 311/312 Hazard Classes	Fire hazard Immediate (acute) health hazard Sudden release of pressure hazard
SARA Section 313 – Emission Reporting	1.0% (includes anhydrous Ammonia and aqueous Ammonia from water dissociable Ammonium salts and other sources, 10% of total aqueous Ammonia is reportable under this listing)





**SECTION 16: OTHER INFORMATION, INCLUDING DATE OF LAST REVISION**

This SDS was prepared in accordance with US (29 CFR 1900.1200) requirements.

SDS: P-16

Initial Issue Date: 05/01/2015

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Version: 2

**Party Responsible for the Preparation of this Document:**

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This information is based on Austin Powder Company's current knowledge and is intended to describe the product for the purposes of health and safety requirements only. It should not be construed as guaranteeing any specific property of the product.