



## SAFETY DATA SHEET

### Section 1. Identification

Product Name: **Ammonia, Anhydrous**  
Synonyms: Ammonia  
CAS REGISTRY NO: 7664-41-7  
Supplier: Tanner Industries, Inc.  
735 Davisville Road, Third Floor  
Southampton, PA 18966  
Website: [www.tannerind.com](http://www.tannerind.com)  
Telephone (General): 215-322-1238  
**Corporate Emergency Telephone Number: 800-643-6226**  
**Emergency Telephone Number: Chemtrec: 800-424-9300**  
Recommended Use: Various Industrial / Agricultural

### Section 2. Hazard(s) Identification

Hazard: Acute Toxicity, Corrosive, Gases Under Pressure, Flammable Gas, Acute Aquatic Toxicity  
Classification: Acute Toxicity, Inhalation (Category 4) Note: (1 - Most Severe / 4 - Least Severe)  
Skin Corrosion / Irritation (Category 1B)  
Serious Eye Damage / Irritation (Category 1)  
Gases Under Pressure (Liquefied gas)  
Flammable Gases (Category 2)  
Acute Aquatic Toxicity (Category 1)

Pictogram:



Signal word: **Danger**

Hazard statements: Harmful if inhaled.  
Causes severe skin burns and serious eye damage.  
Flammable gas.  
Contains gas under pressure; may explode if heated.  
Very toxic to aquatic life.

Precautionary statements: Avoid breathing gas/vapors.  
Use only outdoors or in well-ventilated area.  
Wear protective gloves, protective clothing, eye protection, face protection.  
Keep away from heat, sparks, open flames and other ignition sources. No smoking.

Precautionary statements  
(continued):

IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a doctor/physician and seek medical attention for severe exposure or if symptoms persist. Specific treatment, see supplemental first aid instructions in Section 4 (First Aid Measures).

IF ON SKIN: Rinse immediately with plenty of water before removing clothes. Contaminated clothing could possibly be frozen to skin. Rinse skin with water or shower (minimum of 20 minutes). Specific treatment, see supplemental first aid instructions in Section 4 (First Aid Measures).

IF IN EYES: Immediately call a doctor/physician and seek medical attention. Rinse continuously with water for several minutes (minimum of 20 minutes). Specific treatment, see supplemental first aid instructions in Section 4 (First Aid Measures).

Wash contaminated clothing before reuse.

Store in a well-ventilated place. Keep container tightly closed. Protect from sunlight. Store locked up.

In case of leakage: Eliminate all ignition sources, if safe to do so.

In case of leaking gas fire: Stop flow of gas before extinguishing.

Dispose of contents/container in accordance with local, regional, national, international regulations as applicable. See section 13 (Disposal Considerations).

**NFPA Rating:**

Health (Blue) - 3

Flammability (Red) - 1

Instability (Yellow) - 0

Special Hazards (White) - NA



Note: The degree of hazard for flammability may be 3 in a confined space.

**NFPA Numbering System:**

0 = Least Hazardous / 4 = Most Hazardous

**HMIS Rating:**

ANHYDROUS AMMONIA		
HEALTH	-	3
FLAMMABILITY		1
PHYSICAL HAZARD		0
PERSONAL PROTECTION		H

See note in Section 16 regarding the Hazardous Materials Identification System (HMIS).

**HMIS Hazard Index:**

0 = Minimal, 1 = Slight, 2 = Moderate, 3 = Serious, 4 = Severe

**Section 3. Composition / Information on Ingredients**

**CHEMICAL NAME:** Ammonia, Anhydrous

**CAS REGISTRY NO:** 7664-41-7

**SYNONYMS:** Ammonia

**CHEMICAL FAMILY:** Inorganic nitrogen compounds

**COMPOSITION:** 99+% Ammonia

## Section 4. First Aid Measures

**IF INHALED:** Immediately remove person to fresh air and keep comfortable for breathing. In case of severe exposure or if irritation persists, breathing difficulties or respiratory symptoms arise, seek medical attention. If not breathing, administer artificial respiration. If trained to do so, administer supplemental oxygen, if required.

**IF ON SKIN:** Immediately rinse skin and contaminated clothing with plenty of water before removing clothes. Clothing that has been contacted by liquid ammonia may freeze to the skin. Thaw frozen clothing from skin before removing. Flush skin with copious amounts of tepid water for a minimum of 20 minutes. Do not rub or apply topical, occlusive compounds, such as ointments, certain creams, etc., on affected area. For liquid ammonia contact, seek immediate medical attention. For severe vapor contact or if irritation persists, seek medical attention.

**IF IN EYES:** Immediately rinse continuously with copious amounts of tepid water for a minimum of 20 minutes. Eyelids should be held apart and away from eyeball for thorough rinsing. Do not rub or apply topical, occlusive compounds, such as ointments, certain creams, etc., on affected area. Seek medical attention.

**IF SWALLOWED:** Rinse mouth. Do not induce vomiting. If conscious, give large amounts of water to drink. May drink orange juice, citrus juice or diluted vinegar (1:4) to counteract ammonia. If unconscious, do not give anything by mouth. Seek medical attention.

**NOTE TO PHYSICIAN:** Respiratory injury may appear as a delayed phenomenon. Pulmonary edema may follow chemical bronchitis. Supportive treatment with necessary ventilation actions, including oxygen, may warrant consideration.

## Section 5. Fire Fighting Measures

### **EXTINGUISHING MEDIA:**

Water Spray, Water Fog, Dry Chemical, Carbon Dioxide (CO<sub>2</sub>) or foam.

### **SPECIAL FIRE FIGHTING PROCEDURES:**

Must wear protective clothing and a positive pressure SCBA.

Stop flow of gas or liquid if possible.

Approach fire upwind and evacuate area downwind if needed.

Use water spray to keep fire-exposed containers cool and control vapors.

If a portable container (such as a cylinder or trailer) can be moved from the fire area without risk to the individual, do so to prevent the pressure relief valve of the trailer or portable container from discharging or the cylinder from rupturing. If relief valves are inoperative, heat exposed storage containers may become explosion hazards due to over pressurization.

Stay upwind when containers are threatened.

### **UNUSUAL FIRE AND EXPLOSION HAZARDS:**

Outdoors, ammonia is not generally a fire hazard. Indoors, in confined areas, ammonia may be a fire hazard, especially if oil or other combustible materials are present.

Combustion may form toxic nitrogen oxides (NO<sub>x</sub>).

## Section 6. Accidental Release Measures

### **GENERAL:**

Only properly trained and equipped persons should respond to an ammonia release.

Wear eye, hand and respiratory protection and protective clothing; see Section 8, Exposure Controls / Personal Protection.

Stop source of leak if possible, provided it can be done in a safe manner.

Leave the area of a spill by moving laterally and upwind.

Isolate the affected area. Non-responders should evacuate the area, or shelter in place.

### **SPECIFIC STEPS TO BE TAKEN:**

For a hazardous material release response, Level A and/or Level B ensemble including positive-pressure SCBA should be used. A positive pressure SCBA is required for entry into ammonia atmospheres at or above 300 ppm (IDLH).

Stay upwind and use water spray downwind of container to absorb the evolved gas.

Do not apply water directly to container, unless there is heat impingement, as ammonia boils at -28 °F (direct water will heat container), and more vapors will be released.

**Caution:** Adding water directly to liquid spills will increase volatilization of ammonia, thus increasing the possibility of exposure. Contain spill and runoff from entering drains, sewers, streams, lakes and water systems by utilizing methods such as diking, containment, and absorption.

## Section 7. Handling and Storage

### **SPECIAL PRECAUTIONS:**

Only trained persons should handle anhydrous ammonia. Store in well-ventilated areas, with containers tightly closed. Protect from temperatures exceeding 120 °F (48.8 °C). Protect containers from physical damage. Keep away from ignition sources, especially in indoor spaces. Do not use plastic. Do not use any non-ferrous metals such as copper, brass, bronze, tin, zinc or galvanized metals. Use only stainless steel, carbon steel or black iron for anhydrous ammonia containers or piping.

OSHA 29 CFR 1910.111 prescribes handling and storage requirements for anhydrous ammonia.

Refer to Compressed Gas Association (CGA) G-2.1 for the recommendations for the storage and handling of anhydrous ammonia.

### **VENTILATION:**

Local exhaust should be sufficient to keep ammonia vapor below applicable exposure standards.

### **WORKPLACE PROTECTIVE EQUIPMENT:**

Protective equipment should be stored near, but outside of anhydrous ammonia area. Water for first aid, such as an eyewash station and safety shower, should be kept available in the immediate vicinity. See 29 CFR 1910.111 for workplace requirements.

### **DISPOSAL:**

See Section 13, Disposal Considerations. Classified as Resource Conservation and Recovery Act (RCRA) Hazardous Waste due to corrosivity with designation D002, if disposed of in original form.

## Section 8. Exposure Controls / Personal Protection

### **EXPOSURE LIMITS FOR AMMONIA:** (Vapor)

Ammonia		
USA ACGIH	ACGIH TWA	25 ppm
USA ACGIH	ACGIH STEL	35 ppm
USA NIOSH IDLH	NIOSH IDLH	300 ppm
USA NIOSH	NIOSH REL (TWA)	18 mg/m <sup>3</sup> ; 25 ppm
USA NIOSH	NIOSH REL (STEL)	27 mg/m <sup>3</sup> ; 35 ppm
USA OSHA	OSHA PEL (TWA)	35 mg/m <sup>3</sup> ; 50 ppm
Alberta	TWA / STEL	25 ppm (TWA), 35 ppm (STEL)
British Columbia	TWA / STEL	25 ppm (TWA), 35 ppm (STEL)
Manitoba	TWA / STEL	25 ppm (TWA), 35 ppm (STEL)
New Brunswick	TWA / STEL	25 ppm (TWA), 35 ppm (STEL)
Newfoundland & Labrador	TWA / STEL	25 ppm (TWA), 35 ppm (STEL)
Northwest Territories	TWA / STEL	25 ppm (TWA), 35 ppm (STEL)
Nova Scotia	TWA / STEL	25 ppm (TWA), 35 ppm (STEL)
Nunavut	TWA / STEL	25 ppm (TWA), 35 ppm (STEL)
Ontario	TWA / STEL	25 ppm (TWA), 35 ppm (STEL)
Prince Edward Island	TWA / STEL	25 ppm (TWA), 35 ppm (STEL)
Quebec	TWAEV / STEV	25 ppm (TWAEV), 35 ppm (STEV)
Saskatchewan	TWA / STEL	25 ppm (TWA), 35 ppm (STEL)
Yukon	TWA / STEL	25 ppm (TWA), 40 ppm (STEL)

Mexico	OEL TWA (mg/m3)	18 mg/m3
Mexico	OEL TWA (ppm)	25 ppm
Mexico	OEL STEL (mg/m3)	27 mg/m <sup>3</sup>
Mexico	OEL STEL (ppm)	35 ppm

#### **PROTECTIVE EQUIPMENT:**

**EYE/FACE PROTECTION:** Chemical splash goggles should be worn when handling anhydrous ammonia. A face shield can be worn over chemical splash goggles as additional protection. Do not wear contact lenses when handling anhydrous ammonia. Refer to 29 CFR 1910.133 for OSHA eye protection requirements.

**SKIN PROTECTION:** Ammonia impervious gloves and clothing (such as neoprene, butyl and Teflon) should be worn to prevent contact during normal operations, such as loading/unloading and transfers. Chemical boots can be worn as additional protection.

**RESPIRATORY PROTECTION:** Respiratory protection approved by NIOSH for ammonia must be used when applicable safety and health exposure limits are exceeded. For escape in emergencies, NIOSH approved respiratory protection should be used, such as a full-face gas mask and canisters/cartridges approved for ammonia or SCBA. A positive pressure SCBA is required for entry into ammonia atmospheres at or above 300 ppm (IDLH).

Refer to 29 CFR 1910.134 and ANSI: Z88.2 for OSHA respiratory protection requirements. Also refer to 29 CFR 1910.111 for respiratory protection requirements at bulk installations.

**VENTILATION:** Local exhaust should be sufficient to keep ammonia vapor below applicable exposure standards.

**FOR A HAZARDOUS MATERIAL RELEASE RESPONSE:** Level A and/or Level B ensemble including positive-pressure SCBA should be used. A positive pressure SCBA is required for entry into ammonia atmospheres at or above 300 ppm (IDLH).

#### **Section 9. Physical and Chemical Properties**

<b>APPEARANCE AND ODOR:</b>	Colorless liquid or gas with a pungent odor. Odor threshold 2 - 5 ppm.
<b>SOLUBILITY IN WATER:</b>	(per 100 pounds of water): 86.9 pounds at 32 °F, 51 pounds at 68 °F
<b>SPECIFIC GRAVITY OF GAS (air = 1):</b>	0.596 at 32 °F
<b>SPECIFIC GRAVITY OF LIQUID (water = 1):</b>	0.682 at -28 °F (Compared to water at 39 °F).
<b>WEIGHT (per gallon):</b>	5.15 pounds at 60 °F
<b>PH:</b>	Not applicable (Highly alkaline/base).
<b>BOILING POINT:</b>	-28 °F at 1 Atm.
<b>FORMULA:</b>	NH <sub>3</sub>
<b>MOLECULAR WEIGHT:</b>	17.03 (NH <sub>3</sub> )
<b>FLAMMABILITY</b>	
<b>FLASHPOINT:</b>	None
<b>FLAMMABLE LIMITS OF VAPOR IN AIR:</b>	LEL/UEL 16% to 25% (Listed in the <i>NIOSH Pocket Guide to Chemical Hazards</i> at 15% to 28%).
<b>AUTO IGNITION TEMPERATURE:</b>	1,204 °F (If catalyzed). 1,570 °F (If un-catalyzed).
<b>CRITICAL TEMPERATURE:</b>	271.4 °F
<b>DECOMPOSITION TEMPERATURE:</b>	-108.4 °F
<b>GAS SPECIFIC VOLUME:</b>	20.78 Ft <sup>3</sup> /Lb at 32 °F and 1 Atm.
<b>VAPOR DENSITY:</b>	0.0481 Lb/Ft <sup>3</sup> at 32 °F
<b>LIQUID DENSITY:</b>	38.00 Lb/Ft <sup>3</sup> at 70 °F
<b>VISCOSITY:</b>	0.00982 cP at 68 °F
<b>EVAPORATION RATE:</b>	Not applicable
<b>APPROXIMATE FREEZING POINT:</b>	-108 °F
<b>VAPOR PRESSURE:</b>	114 psig at 70 °F
<b>SURFACE TENSION:</b>	23.4 Dynes / cm at 52 °F
<b>CRITICAL PRESSURE:</b>	111.5 Atm
<b>PARTITION COEFFICIENT:</b>	-114 at 77 °F

## Section 10. Stability and Reactivity

### **REACTIVITY:**

Anhydrous ammonia has potentially explosive reactions with strong oxidizers. Anhydrous ammonia forms explosive mixtures in air with hydrocarbons, chlorine, fluorine and silver nitrate. Anhydrous ammonia reacts to form explosive products, mixtures or compounds with mercury, gold, silver, iodine, bromine, silver oxide and silver chloride.

### **CHEMICAL STABILITY:**

Stable under normal ambient conditions of temperature and pressure. Heating a closed container causes vapor pressure to increase. Will not polymerize.

### **POSSIBILITY OF HAZARDOUS REACTIONS:**

Will react exothermically with acids and water.

### **CONDITIONS TO AVOID:**

Avoid anhydrous ammonia contact with chlorine, which forms a chloramine gas, which is a primary skin irritant and sensitizer. Avoid contact with galvanized surfaces, copper, brass, bronze, mercury, gold and silver. A corrosive reaction will occur.

### **INCOMPATIBLE MATERIALS:**

Anhydrous ammonia is incompatible with acetaldehyde, acrolein, boron, chloric acid, chlorine monoxide, chlorites, nitrogen tetroxide, perchlorate, sulfur, tin and strong acids.

### **HAZARDOUS DECOMPOSITION PRODUCTS:**

Anhydrous ammonia decomposes to hydrogen and nitrogen gases above 450 °C (842 °F). Decomposition temperatures may be lowered by contact with certain metals, such as iron, nickel and zinc and by catalytic surfaces such as porcelain and pumice.

## Section 11. Toxicological Information

**Potential health effects:** Ammonia is an irritant and corrosive to the skin, eyes, respiratory tract and mucous membranes. Exposure to liquid or rapidly expanding gases may cause severe chemical burns and frostbite to the eyes, lungs and skin. Skin and respiratory related diseases could be aggravated by exposure. The extent of injury produced by exposure to ammonia depends on the duration of the exposure, the concentration of the liquid, gas or vapor and the depth of inhalation.

### **Exposure Routes:**

Inhalation (vapors, gas), skin and/or eye contact (vapors, liquid, gas).

### **Symptoms of acute exposure:**

**Inhalation:** Exposure may result in severe irritation and/or burns of the nose, throat and respiratory tract. May cause dyspnea (breathing difficulty), wheezing, chest pain, bronchospasm, pink frothy sputum, pulmonary edema or respiratory arrest. Extreme exposure may result in death from spasm, inflammation or edema. Respiratory injury may appear as a delayed phenomenon. Pulmonary edema may follow chemical bronchitis. Brief inhalation exposure to 5,000 ppm may be fatal.

**Skin:** Irritation, corrosive burns, blister formation (vesiculation) may result. Contact with liquid may produce freeze burns (frostbite) and caustic burns.

**Eyes:** Vapors may cause severe irritation. Tearing, eye burns, permanent eye damage or blindness may occur. Effects of direct contact may range from irritation and lacrimation to severe injury and blindness.

**Ingestion:** Ingestion is unlikely since the material is a gas under normal atmospheric conditions. If ingested, it may cause burns and corrosion, severe pain of the mouth, throat, esophagus and stomach or may be fatal

### **Chronic Exposure:**

Repeated exposure to ammonia may cause chronic irritation of the eyes and respiratory tract.

### **Toxicity:**

LC<sub>50</sub> - 5131 mg/m<sup>3</sup> (7338 ppm) to 11,592 mg/m<sup>3</sup> (16,600 ppm), 60 minute exposure, Rat.

LD<sub>50</sub> - 350 mg / kg (Oral / Rat).

Not listed in the National Toxicology Program (NTP).

Not recognized by OSHA as a carcinogen.

Not listed as a carcinogen by the International Agency for Research on Cancer (IARC monograph).

Germ cell mutagenicity information is not available. Reproductive toxicity information is not available.

## Section 12. Ecological Information

Ammonia is harmful to aquatic life at very low concentrations. Notify local health and wildlife officials and operators of any nearby water intakes upon contamination of surface water.

### Toxicity:

Terrestrial plants: LOEC = 3-250 ppm NH<sub>3</sub>.

Aquatic plants: LOEC = 0.5-500 mg NH<sub>3</sub>-N/L.

Acute toxicity to invertebrates: 48 h LC50 = 2.94 mg un-ionized NH<sub>3</sub>-N/L.

Chronic toxicity to invertebrates: NOEC = 0.163- 0.42 mg un-ionized NH<sub>3</sub>/L.

Acute toxicity to fish: 96-h: LC50 = 0.09 – 3.51 mg un-ionized NH<sub>3</sub>/L.

Chronic toxicity to fish: NOEC = 0.025-1.2 mg un-ionized NH<sub>3</sub>/L.

**Environmental Fate Information:** Ammonia dissipates relatively quickly in ambient air and rapidly returns to the soil via combination with sulfate ions or washout by rainfall. Ammonia strongly adsorbs to soil, sediment particles and colloids in water under aerobic conditions. Biodegradation of ammonia to nitrate occurs in water under aerobic conditions resulting in a biological oxygen demand (BOD).

### Persistence/Degradability:

Biodegradable in soil. Ozonation in the air. Soluble in water.

### Bioaccumulative Potential:

Not applicable.

### Mobility in Soil:

No additional information available.

### Other Adverse Effects:

No additional information available.

## Section 13. Disposal Considerations

Dispose of unused contents/container in accordance with local/regional/national/international regulations as applicable.

Listed as hazardous substance under the Clean Water Act (CWA) (40 CFR 116.4 and 40 CFR 117.3).

Classified as hazardous waste under the Resource Conservation and Recovery Act (RCRA) (40 CFR 261.22 Corrosive #D002).

Comply with all regulations.

Suitably diluted product may be utilized as fertilizer on agricultural land.

For hazardous waste regulations information call the RCRA Hotline (800) 424-9346, or visit the US EPA website.

## Section 14. Transport Information

### 14.1

#### US Department of Transportation (US Domestic)

HAZARD CLASS: 2.2, Non-Flammable Gas. (49 CFR 173.115)

PROPER SHIPPING NAME: Ammonia, Anhydrous

IDENTIFICATION NUMBER: UN 1005

LABEL / PLACARD: 2.2, Non-Flammable Gas



(Only as required by 49 CFR 172.322)

#### PACKAGE MARKINGS:

Refer to 49 CFR 172.302, General marking requirements for bulk packagings.  
Refer to 49 CFR 172.301, General marking requirements for non-bulk packagings.  
Refer to 49 CFR 172.328, Cargo Tanks for additional marking requirements.

#### ADDITIONAL INFORMATION:

Marine Pollutant Requirements: Subject to the requirements of 49 CFR 172.322.  
The words "Inhalation Hazard" shall be entered on each shipping paper in association with the shipping description, shall be marked on each non-bulk package in association with the proper shipping name and identification number, and shall be marked on two opposing sides of each bulk package.

## 14.2

### International

HAZARD CLASS: 2.3 (Poison Gas), Subsidiary 8 (Corrosive)  
PROPER SHIPPING NAME: Ammonia, Anhydrous  
LABEL / PLACARD: 2.3, 8 / Poison Gas, Corrosive (Subsidiary)  
IDENTIFICATION NUMBER: UN 1005  
ADDITIONAL INFORMATION: Marine pollutant



### ENVIRONMENTAL HAZARDS:

IMDG, Known Marine Pollutant: Yes

United Nations Model Regulations, Environmentally Hazardous: Yes

## Section 15. Regulatory Information

Subject to the reporting requirements of Section 302, Section 304, Section 312 and Section 313, Title III of the Superfund Amendments and Reauthorization Act (SARA) of 1986 and 40 CFR 372.

Under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), Section 103, any environmental release of this chemical equal to or over the reportable quantity of 100 pounds must be reported promptly to the National Response Center, Washington, D.C. (1-800-424-8802).

Emergency Planning & Community Right to Know Act, (EPCRA) extremely hazardous substance, 40 CFR 355, Title III, Section 302 – Ammonia, Threshold Planning Quantity (TPQ) 500 pounds.

Listed on the US EPA Toxic Substances Control Act (TSCA) Chemical Substance Inventory.

EPA Hazard Categories – Immediate: Yes; Delayed: No; Fire: No; Sudden Release: Yes; Reactive: No

Clean Air Act – Section 112(r): Listed under EPA's Risk Management Program (RMP), 40 CFR Part 68, at storage/process amounts greater than the Threshold Quantity (TQ) of 10,000 pounds (ammonia, anhydrous).

Anhydrous ammonia is listed under Department of Homeland Security regulation 6 CFR Part 27, Chemical Facility Anti-Terrorism Standards (CFATS) at storage / process amounts greater than the threshold quantity of 10,000 pounds (ammonia, anhydrous).

Occupational Safety & Health Administration (OSHA): This material is considered to be hazardous as defined by the OSHA Hazard Communication Standard 29 CFR 1910.1200. This material is subject to Process Safety Management requirements of 29 CFR 1910.119 if maintained on-site, including storage / process, in quantities of 10,000 pounds (ammonia, anhydrous) or greater.

## Section 16. Other Information

Preparation Information: Revision Date November 1, 2018.  
Replaces Revision Date May 1, 2015.

Revised by: HJS

### Revisions to this Safety Data Sheet

Section 2: Added note regarding the degree of hazard for flammability in a confined space.  
Added note regarding the Hazardous Materials Identification System (HMIS).  
Section 8: Reformatted and added information for Canada and Mexico.  
Section 14.1: Updated information for Package Markings and added "Additional Information."  
Section 14.2: Updated "Additional Information" and "Environmental Hazards."

HMIS Rating: The American Coatings Association's (ACA) *Hazardous Materials Identification System (HMIS®)* and corresponding *HMIS® Implementation Manual*, aid employers with the development and implementation of a comprehensive Hazard Communication Program. The program and manual address hazard assessment, labeling, Safety Data Sheets (SDS), and employee training. ACA's HMIS® hazard rating scheme is designed to be compatible with workplace labeling requirements of the U.S. Occupational Safety and Health Administration's (OSHA) revised Hazard Communication Standard (HCS). It is constructed to communicate hazard information to employees through training and the use of colors, numbers, letters of the alphabet, and symbols of types of personnel protective equipment (PPE).  
HMIS® ratings are to be used with a fully implemented HMIS® program. It is the responsibility of the employer to determine the appropriate hazard classification and personnel protective equipment (PPE) code for this material.



For more information on HMIS® consult the HMIS® Implementation Manual.  
HMIS® is a registered trademark and service mark of the American Coatings Association, Inc.

Acronyms:

ACGIH: American Conference of Governmental Industrial Hygienists  
ANSI: American National Standards Institute  
CAS: Chemical Abstracts Service  
CFR: Code of Federal Regulations  
DHS: Department of Homeland Security  
DOT: Department of Transportation  
EPA: Environmental Protection Agency  
HMIS: Hazardous Materials Identification System  
IARC: International Agency for Research on Cancer  
IDLH: Immediately Dangerous to Life or Health  
IMDG: International Maritime Dangerous Goods  
NFPA: National Fire Protection Association  
NIOSH: National Institute for Occupational Safety and Health  
NTP: National Toxicology Program  
OSHA: Occupational Safety and Health Administration  
PEL: Permissible Exposure Limit  
PPM: Parts Per Million  
RCRA: Resource Conservation and Recovery Act  
REL: Recommended Exposure Limit  
SCBA: Self Contained Breathing Apparatus  
STEL: Short Term Exposure Limit  
TLV: Threshold Limit Value  
TWA: Time Weighted Average

Disclaimer:

The information, data, and recommendations in this safety data sheet relate only to the specific material designated herein and do not relate to use in combination with any other material or in any process. To the best of our knowledge, the information, data, and recommendations set forth herein are believed to be accurate. We make no warranties, either expressed or implied, with respect thereto and assume no liability in connection with any use of such information, data, and recommendations. Judgements as to the suitability of the information contained herein for the party's own use or purposes are solely the responsibility of that party. Any party handling, transferring, transporting, storing, applying or otherwise using this product should review thoroughly all applicable laws, rules, regulations, standards and good engineering practices. Such thorough review should occur before the party handles, transfers, transports, stores, applies or otherwise uses this product.