



U. S. Steel Canada
A Subsidiary of United States Steel

PRODUCT:

ANHYDROUS AMMONIA

MATERIAL SAFETY DATA SHEET

Manufacturer / Supplier: Hamilton Works 530 Gage Avenue North P. O. Box 450 Hamilton, Ontario, Canada L8L 7W9 Telephone: (905) 527-8335 Ext. 3119 (for updates & copies) Emergency: (905) 527-8335 Ext. 2268	and	Manufacturer / Supplier: Lake Erie Works General Delivery Nanticoke, Ontario, Canada N09A 1L0 Telephone: (905) 527-8335 Ext. 5083 (for updates & copies) Emergency: (519) 587-4541 Ext. 5060
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SECTION I – MATERIAL IDENTIFICATION AND USE

Material:	Anhydrous Ammonia
WHMIS Class:	A, E
Chemical Name:	Ammonia
Chemical Family:	Inorganic Nitrogen Compound
Chemical Formula Mixture:	NH ₃
Molecular Weight:	Not available
Trade Name and Synonyms:	Ammonia; Anhydrous Ammonia
Material Use:	Process chemical

SECTION II – HAZARDOUS INGREDIENTS OF MATERIAL

INGREDIENT	% WEIGHT	CAS NO.	TLV (ACGIH)	OEL (ONT)	LD ₅₀ (oral rat)	LC ₅₀ (rat)
Ammonia, Anhydrous	100	7664-41-7	25 ppm	25 ppm	350 mg/kg	2,419 ppm (inhalation rat)

SECTION III – PHYSICAL DATA

Physical State:	Gas
Odour and Appearance:	Sharp, irritating; colourless
Odour Threshold:	0.7 - 5 ppm
Specific Gravity:	0.68 @ -33.4°C (water = 1)
Vapour Pressure (mm) :	6612 (@ 20°C)
Vapour Density (Air = 1):	0.71 g/l (@ 25°C)
Evaporation Rate:	Not available
Boiling Point (°C):	-33.4°C
Freezing / Melting Point (°C):	-42°C (@ 76 mm Hg)
Solubility in Water (20°C):	Very
% Volatile (by volume):	100%
pH:	Not applicable for gas (11.5 for 1N aqueous solution)
Coefficient of Water / Oil Distribution:	Not available

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SECTION IV – FIRE AND EXPLOSION HAZARD OF MATERIAL

Flammability:	Combustible when very hot. Ammonia gas is capable of forming flammable and explosive mixtures, at high concentrations and when being preheated.
Means of Extinction:	Water fog, dry chemical, carbon dioxide.
Special Procedures:	Contact Fire Department. Ensure proper protective equipment is used - protective clothing, self-contained breathing apparatus (e.g. Scott Air Pak). If area surrounding ammonia storage is on fire, use a water fog to cool storage tank.
Flashpoint (°C) and Method:	Not applicable
Upper Explosion Limit (% by volume):	25%
Lower Explosion Limit (% by volume):	16%
Auto Ignition Temperature (°C):	651°C
Hazardous Combustion Products:	Oxides of Nitrogen
Explosion Data – Sensitivity to Mechanical Impact:	No
Sensitivity to Static Discharge:	No

SECTION V – REACTIVITY DATA

Chemical Stability:	Yes
Incompatibility to Other Substances:	Acids, Oxidizers, Metal Halides, Silver compounds (e.g. Oxides, Chloride, Nitrite), Mercury, Halogens (e.g. Chlorine, Bromine)
Conditions to Avoid:	Acids - violent reaction; Oxidizing agents (Permanganates, etc.) - violent reaction; Metal Halides, Silver compounds or Mercury - may form explosive mixtures; Halogens - violent reaction to form explosive products; Ammonia releases heat when contacting water.
Hazardous Decomposition Products:	Oxides of Nitrogen

SECTION VI – TOXICOLOGICAL PROPERTIES OF PRODUCT

Effects of Acute Exposure to Product:	Vapours are extremely corrosive. Severe respiratory tract irritant. Brief exposures at 5000 ppm may cause rapid death due to suffocation or fluid in lungs. Eye contact with liquid may cause severe irritation, swollen eyelids and/or partial or total blindness, if not treated immediately. Skin contact may cause chemical burns and/or frostbite.
Effects of Chronic Exposure to Product:	Irritation of eyes, nose and upper respiratory tract.
Sensitization to Product:	Not applicable
Synergistic Materials:	Not applicable
Carcinogenicity:	Not applicable
Reproductive Effects:	Not applicable
Teratogenicity:	Not applicable
Mutagenicity:	Not applicable

SECTION VII – PREVENTATIVE MEASURES

Personal Protective Equipment:	Ensure personal protective equipment is readily available
Gloves:	Neoprene
Eye (specify):	Chemical goggles and faceshield
Footwear (specify):	Rubber boots in emergency situations
Other (specify):	Clothing - neoprene rubber (during transfer of material). Ensure employees are trained in hazards and handling of ammonia.
Respiratory:	NIOSH-approved chemical cartridge respirator with ammonia cartridge for concentrations up to 10 times the exposure limit. Due to irritancy, a full-facepiece respirator may be required
Storage:	Restrict access to storage area. Post appropriate warning signs. Inspect storage areas periodically. Ensure storage containers are properly labelled, ventilated and filled to proper levels.
Engineering Controls, e.g. ventilation, enclosed process (specify):	Local or general ventilation or work practices to reduce airborne concentration of ammonia to below the exposure limit. Ensure eyewash station and deluge shower are at transfer stations.
Leak and Spill Procedure:	Restrict access to area until cleanup complete. Ensure trained personnel use proper protective equipment. Extinguish or remove all ignition sources. Provide ventilation to area. Use water spray or fog to reduce gas cloud. DO NOT direct water at source of leak. Stop source of leak if possible. Contact plant personnel responsible for environmental matters for disposal instructions (e.g. Utilities, Environmental Control, as appropriate).
Waste Disposal:	Ensure proper Federal, Provincial and/or Local government requirements are followed.
TDG Classification:	UN1005, Class 2.2 (8)

SECTION VIII – FIRST-AID MEASURES

Skin:	Flush affected area with water for at least 15 minutes. Obtain medical attention immediately.
Eye:	Flush affected area with water for at least 15 minutes while holding eyelids open. Obtain medical attention immediately.

Inhalation: Move to fresh air. If breathing has stopped, provide artificial respiration. Obtain medical attention immediately.

Ingestion: Not normal for Ammonia gas or Anhydrous Ammonia.

SECTION IX – PREPARATION DATE OF MSDS

Prepared by:	Phone Number:	Date:	Revision No.:
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