

# Material Safety Data Sheet

## Dry Alum

### 1. Product and company identification

<b>Product name</b>	: Dry Alum
<b>Material uses</b>	: Alum is used as a coagulating agent in municipal and industrial water and wastewater treatment and as an additive in papermaking.
<b>Headquarters</b>	: Marsulex Inc. 111 Gordon Baker Road Suite 300 North York, ON M2H 3R1 (416) 496-9655 www.marsulex.com
<b>MSDS authored by</b>	: KMK Regulatory Services inc.
<b>In case of emergency</b>	: Canada: CANUTEC +1-613-996-6666 US: CHEMTREC +1-800-424-9300
<b>Product type</b>	: Solid.

### 2. Hazards identification

#### Emergency overview

<b>Color</b>	: White to off-white.
<b>Physical state</b>	: Solid. (Granules or powder.)
<b>Odor</b>	: Odorless.
<b>Signal word</b>	: WARNING!
<b>Hazard statements</b>	: CAUSES EYE AND SKIN IRRITATION. MAY CAUSE ALLERGIC SKIN REACTION.
<b>Precautions</b>	: Avoid contact with eyes, skin and clothing. Wash thoroughly after handling.
<b>OSHA/HCS status</b>	: This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).
<b>Routes of entry</b>	: Eye contact. Inhalation. Ingestion.

#### Potential acute health effects

<b>Inhalation</b>	: Dusts of aluminum sulfate hydrate probably cause irritation of the nose, throat and respiratory tract based on pH. The dust becomes acidic following contact with moisture in the air or tissues of the respiratory tract.
<b>Ingestion</b>	: May cause irritation of the lining of the stomach. Ingestion is not a typical route of occupational exposure.
<b>Skin</b>	: The dust becomes acidic following contact with moisture on the skin and mild to moderate irritation can occur. Aluminum is very poorly absorbed through the skin and toxic effects would not be expected following short-term skin contact. Prolonged and repeated exposure to dilute solutions may cause irritation, redness, pain and drying and cracking of the skin.
<b>Eyes</b>	: The dust becomes acidic following contact with moisture in the eye and may result in moderate to severe irritation to eyes.

#### Potential chronic health effects

<b>Chronic effects</b>	: No known significant effects or critical hazards.
<b>Carcinogenicity</b>	: No known significant effects or critical hazards.
<b>Mutagenicity</b>	: No known significant effects or critical hazards.
<b>Teratogenicity</b>	: No known significant effects or critical hazards.
<b>Developmental effects</b>	: No known significant effects or critical hazards.
<b>Fertility effects</b>	: No known significant effects or critical hazards.

#### Over-exposure signs/symptoms

<b>Inhalation</b>	: No specific data.
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## 2. Hazards identification

- Ingestion** : No specific data.
- Skin** : Prolonged or repeated contact with dust may cause redness, dryness and itching of the skin (dermatitis).
- Eyes** : Adverse symptoms may include the following:  
pain or irritation  
watering  
redness
- Medical conditions aggravated by over-exposure** : Skin irritation may be aggravated in individuals with existing skin lesions. Breathing of dust may aggravate acute or chronic asthma and chronic pulmonary disease such as emphysema and bronchitis.

See toxicological information (section 11)

## 3. Composition/information on ingredients

### United States

Name	CAS number	%
Aluminum Sulfate Hydrate	16828-12-9	99

### Canada

Name	CAS number	%
Aluminum Sulfate Hydrate	16828-12-9	99

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

## 4. First aid measures

- Eye contact** : Immediately flush eyes with lukewarm, gently running water for a minimum of 20 minutes or until the chemical is removed. Hold eyelids open during flushing. If irritation persists, repeat flushing. Obtain medical attention IMMEDIATELY. Do not transport victim until the recommended flushing period is completed unless flushing can be continued during transport.
- Skin contact** : Flush skin with lukewarm running water for a minimum of 20 minutes or until the chemical is removed. Start flushing while removing contaminated clothing. If irritation persists, repeat flushing and obtain medical attention. Do not transport victim unless the recommended flushing period is completed or flushing can be continued during transport. Discard heavily contaminated clothing and shoes in a manner, which limits further exposure. Otherwise, wash clothing separately before reuse.
- Inhalation** : Move victim to fresh air. If irritation persists, obtain medical attention immediately. Give artificial respiration ONLY if breathing has stopped. Give Cardiopulmonary Resuscitation (CPR) if there is no breathing AND no pulse. Obtain medical attention IMMEDIATELY.
- Ingestion** : Do not induce vomiting, give water or milk and seek medical attention immediately.
- Protection of first-aiders** : No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.
- Notes to physician** : No specific treatment. Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

## 5. Fire-fighting measures

- Flammability of the product** : No specific fire or explosion hazard.
- Extinguishing media**
- Suitable** : Use an extinguishing agent suitable for the surrounding fire.
- Not suitable** : None known.
- Hazardous thermal decomposition products** : Forms aluminum oxide, sulfur dioxide and/or sulfur trioxide at temperatures above 760°C (1400°F) or when dry alum is encompassed in a fire involving other burning materials.

## 5. Fire-fighting measures

- Special protective equipment for fire-fighters** : The decomposition products are corrosive and hazardous to health. Wear a NIOSH/MSHA approved self-contained breathing apparatus and full protective clothing if vapors or mists are present. For fighting fires in close proximity to spill or vapors, use acidresistant personal protective equipment.
- Fire-fighting measures** : Evacuate residents who are downwind of fire. Prevent unauthorized entry to fire area. Dike area to contain runoff and prevent contamination of water sources. Neutralize runoff with lime, soda ash or other suitable neutralizing agents (see Deactivating Chemicals, Section 6). Cool containers that are exposed to flame with streams of water until fire is out. Take care not to get water inside container.
- Special remarks on fire hazards** : Non-flammable in the presence of the following materials or conditions: open flames, sparks and static discharge and heat.
- Special remarks on explosion hazards** : No additional remark.

## 6. Accidental release measures

- Personal precautions** : Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment (see section 8).
- Environmental precautions** : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).
- Small spill** : Shovel into clean, dry, labelled containers and cover.
- Large spill** : Prevent solids from entering sewers or waterways. Shovel into clean, dry, labelled containers and cover. If liquid is present, dike with inert material (sand, earth, etc.). Consider in situ neutralization and disposal. Neutralization can generate carbon dioxide. Adequate ventilation must be provided. Ensure adequate decontamination of tools and equipment following clean up. Comply with Federal, Provincial/State and local regulations on reporting releases.
- Deactivating Chemicals:** Lime, limestone, soda ash, sodium bicarbonate, dilute sodium hydroxide, dilute aqua ammonia.

## 7. Handling and storage

- Handling** : Dry Alum is an irritating solid. Avoid generating dusts. Do not breathe dusts. Do not ingest. Do not get in eyes, on skin or on clothing. Use proper tools when opening containers. Keep containers closed when not in use. Empty containers may contain hazardous residues. When there is a large-scale use, do not use in areas equipped with sprinkler systems. Post "DO NOT USE WATER" signs. Good housekeeping is important to prevent accumulations of dust. Dry sweeping is not recommended.
- Storage** : Keep container tightly closed. Keep container in a cool, dry, well-ventilated area. Store away from incompatible materials such as strong bases. Post warning signs. Keep away from alkalis. Absorbs moisture on long-term storage under high humidity conditions. Aluminum powder or crystals when in the presence of moisture can solidify into a single mass. Protect aluminum sulfate from moisture.

## 8. Exposure controls/personal protection

### United States

Ingredient	Exposure limits
Aluminum Sulfate Hydrate	<b>ACGIH TLV (United States).</b> TWA: 1 mg/m <sup>3</sup> 8 hour(s). Form: Inhalable dust. <b>OSHA PEL (United States).</b> TWA: 2 mg/m <sup>3</sup> 8 hour(s). Form: Inhalable dust.

### Canada

## 8. Exposure controls/personal protection

Occupational exposure limits		TWA (8 hours)			STEL (15 mins)			Ceiling			
Ingredient	List name	ppm	mg/m <sup>3</sup>	Other	ppm	mg/m <sup>3</sup>	Other	ppm	mg/m <sup>3</sup>	Other	Notations
Aluminum Sulfate Hydrate	BC	-	1	-	-	-	-	-	-	-	[a]
	SK	-	2	-	-	-	-	-	-	-	[a]

Form: [a]Inhalable dust.

**Consult local authorities for acceptable exposure limits.**

**Recommended monitoring procedures** : Personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment.

**Engineering measures** : Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits. The engineering controls also need to keep gas, vapor or dust concentrations below any lower explosive limits.

**Hygiene measures** : Ensure that eyewash stations and safety showers are close to the workstation location. Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period.

### Personal protection

#### **Respiratory**

: NIOSH/MSHA approved air-purifying respirator for particulates, for dust concentrations of up to 10 mg/m<sup>3</sup>. Airpurifying respirator equipped with acid gas/fume, dust, mist cartridges for concentrations up to 20 mg/m<sup>3</sup>. An air-supplied respirator if concentrations are higher or unknown.

#### **Hands**

: Use protective gloves. In wet conditions, use an impervious material that is resistant to weak sulphuric acid, such as PVC (or vinyl), neoprene or rubber.

#### **Eyes**

: Safety glasses for normal handling. Use goggles in dusty conditions.

#### **Skin**

: Wear overalls or long-sleeved shirt and long trousers. Wear appropriate industrial protective footwear. In wet conditions, use an impervious boot such as one made from PVC or rubber.

#### **Environmental exposure controls**

: Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

## 9. Physical and chemical properties

<b>Physical state</b>	: Solid. (Granules or powder.)
<b>Color</b>	: White to off-white.
<b>Odor</b>	: Odorless.
<b>Molecular weight</b>	: 594.4 g/mole
<b>Molecular formula</b>	: H <sub>2</sub> O <sub>4</sub> S
<b>pH</b>	: > 2.9 @ 5%.
<b>Boiling/condensation point</b>	: 117°C (242.6°F)
<b>Melting/freezing point</b>	: 86°C (186.8°F)
<b>Solubility</b>	: Completely soluble..

## 10. Stability and reactivity

<b>Chemical stability</b>	: The product is stable.
<b>Conditions to avoid</b>	: No specific data.
<b>Materials to avoid</b>	: Strong bases such as sodium hydroxide. Reaction may be violent.
<b>Hazardous decomposition products</b>	: Under normal conditions of storage and use, hazardous decomposition products should not be produced.

## 10. Stability and reactivity

**Possibility of hazardous reactions** : Under normal conditions of storage and use, hazardous reactions will not occur.

**Hazardous polymerization** : Under normal conditions of storage and use, hazardous polymerization will not occur.

## 11. Toxicological information

### Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
Aluminum Sulfate Hydrate	LD50 Oral	Rat	>9000 mg/kg	-

**Special remarks on toxicity to animals** : Not available.

**Chronic toxicity** : No specific data.

## 12. Ecological information

**Environmental effects** : Not established

### Aquatic ecotoxicity

Product/ingredient name	Result	Species	Exposure
Aluminum Sulfate Hydrate	Acute LC50 100 mg/l	Fish	96 hours

**Toxicity of the products of biodegradation** : The products of biodegradation are more toxic than the original product.

**Products of degradation** : Decomposition products may include the following materials: carbon and sulfur oxides (CO<sub>2</sub>, CO, SO<sub>3</sub> & SO<sub>4</sub>). Toxicity is primarily associated with acidic pH. Acidic soil conditions can develop with the material present leading to release of some trace metals.


## 13. Disposal considerations

**Waste disposal** : The generation of waste should be avoided or minimized wherever possible. This material and its container must be disposed of in a safe way. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Empty containers or liners may retain some product residues. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor.


Disposal should be in accordance with applicable regional, national and local laws and regulations.

Refer to Section 7: HANDLING AND STORAGE and Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION for additional handling information and protection of employees.

## 14. Transport information

Regulatory information	UN number	Proper shipping name	Classes	PG*	Label	Additional information
<b>DOT Classification</b>	UN3077	Environmentally hazardous substance, liquid, n.o.s. (Aluminum Sulfate Hydrate)	9	III		<b>Reportable quantity</b> 5000 lbs. (2270 kg)
<b>TDG Classification</b>	Not regulated.	-	-	-	-	-
<b>IMDG Class</b>	Not regulated.	-	-	-	-	-

## 14 . Transport information

<b>IATA-DGR Class</b>	UN3077	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Aluminum Sulfate Hydrate)	9	-		-
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PG\* : Packing group

**AERG** : 171

Exemption to the above classification may apply.

## 15 . Regulatory information

### United States

**HCS Classification** : Irritating material

**U.S. Federal regulations** : **United States inventory (TSCA 8b)**: All components are listed or exempted.

**SARA 302/304/311/312 extremely hazardous substances**: No products were found.

**SARA 302/304 emergency planning and notification**: No products were found.

**SARA 302/304/311/312 hazardous chemicals**: No products were found.

**SARA 311/312 MSDS distribution - chemical inventory - hazard identification**: No products were found.

**Clean Water Act (CWA) 307**: No products were found.

**Clean Water Act (CWA) 311**: No products were found.

**Clean Air Act (CAA) 112 accidental release prevention**: No products were found.

**Clean Air Act (CAA) 112 regulated flammable substances**: No products were found.

**Clean Air Act (CAA) 112 regulated toxic substances**: No products were found.

**Clean Air Act Section 112(b) Hazardous Air Pollutants (HAPs)** : Not listed

**Clean Air Act Section 602 Class I Substances** : Not listed

**Clean Air Act Section 602 Class II Substances** : Not listed

**DEA List I Chemicals (Precursor Chemicals)** : Not listed

**DEA List II Chemicals (Essential Chemicals)** : Not listed

**State regulations** :

- Connecticut Carcinogen Reporting**: This material is not listed.
- Connecticut Hazardous Material Survey**: This material is not listed.
- Florida substances**: This material is not listed.
- Illinois Chemical Safety Act**: This material is not listed.
- Illinois Toxic Substances Disclosure to Employee Act**: This material is not listed.
- Louisiana Reporting**: This material is not listed.
- Louisiana Spill**: This material is not listed.
- Massachusetts Spill**: This material is not listed.
- Massachusetts Substances**: This material is not listed.
- Michigan Critical Material**: This material is not listed.
- Minnesota Hazardous Substances**: This material is not listed.
- New Jersey Hazardous Substances**: This material is not listed.
- New Jersey Spill**: This material is not listed.
- New Jersey Toxic Catastrophe Prevention Act**: This material is not listed.
- New York Acutely Hazardous Substances**: This material is not listed.
- New York Toxic Chemical Release Reporting**: This material is not listed.
- Pennsylvania RTK Hazardous Substances**: This material is not listed.
- Rhode Island Hazardous Substances**: This material is not listed.

### California Prop. 65

No products were found.

## 15 . Regulatory information

### Canada

- WHMIS (Canada)** : Class D-2B: Material causing other toxic effects (Toxic).  
**Canadian lists** : **CEPA Toxic substances**: This material is not listed.  
**Canadian ARET**: This material is not listed.  
**Canadian NPRI**: This material is not listed.  
**Alberta Designated Substances**: This material is not listed.  
**Ontario Designated Substances**: This material is not listed.  
**Quebec Designated Substances**: This material is not listed.
- Canada inventory** : All components are listed or exempted.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations.

### International regulations

- International lists** : **Australia inventory (AICS)**: This material is listed or exempted.  
**China inventory (IECSC)**: This material is listed or exempted.  
**Japan inventory**: This material is listed or exempted.  
**Korea inventory**: This material is listed or exempted.  
**New Zealand Inventory of Chemicals (NZIoC)**: This material is listed or exempted.  
**Philippines inventory (PICCS)**: This material is listed or exempted.
- Chemical Weapons Convention List Schedule I Chemicals** : Not listed  
**Chemical Weapons Convention List Schedule II Chemicals** : Not listed  
**Chemical Weapons Convention List Schedule III Chemicals** : Not listed

## 16 . Other information

### United States

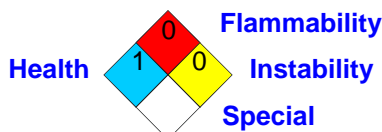
- Label requirements** : CAUSES EYE AND SKIN IRRITATION. MAY CAUSE ALLERGIC SKIN REACTION.
- Hazardous Material Information System (U.S.A.)** :

Health	1
Flammability	0
Physical hazards	0

Caution: HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. Although HMIS® ratings are not required on MSDSs under 29 CFR 1910.1200, the preparer may choose to provide them. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered mark of the National Paint & Coatings Association (NPCA). HMIS® materials may be purchased exclusively from J. J. Keller (800) 327-6868.

The customer is responsible for determining the PPE code for this material.

- National Fire Protection Association (U.S.A.)** :



## 16 . Other information

### Canada

WHMIS (Canada)

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### References

: - 29CFR Part1910.1200 OSHA MSDS Requirements. - 49CFR Table List of Hazardous Materials, UN#, Proper Shipping Names, PG. ANSI Z400.1, MSDS Standard, 2004. - Canada Gazette Part II, Vol. 122, No. 2. Registration SOR/88-64, 31 December 1987. Hazardous Products Act "Ingredient Disclosure List" - Canadian Transport of Dangerous Goods, Regulations and Schedules, Clear Language version 2005. - Manufacturer's Material Safety Data Sheet.

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### Notice to reader

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein.

Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

