SAFETY DATA SHEET

1. Identification

Product identifier **Aluminum Sulphate Solution (Liquid Alum)**

Other means of identification None.

Recommended use Water treatment / Industrial applications

Recommended restrictions None known.

Manufacturer/Importer/Supplier/Distributor information

Supplier

Company name PVS Benson

Address 1012 Gore Road
Freelton, ON L0R1K0
Canada

Telephone 1-800-265-0014

e-mail pvsbensoninfo@pvschemicals.com

Emergency phone number 24 hours/7 days: 1-519-821-0215

Supplier See above.

2. Hazard identification

Physical hazards	Corrosive to metals	Category 1
Health hazards	Acute toxicity, oral	Category 4
	Acute toxicity, dermal	Category 4
	Acute toxicity, inhalation	Category 4
	Serious eye damage/eye irritation	Category 1

Environmental hazards Not classified.

Label elements

Signal word Danger

Hazard statement May be corrosive to metals. Causes serious eye damage. Harmful if swallowed. Harmful in contact with skin. Harmful if inhaled.

Precautionary statement

Prevention Keep only in original packaging. Wear eye protection/face protection. Wear protective gloves/protective clothing. Wash thoroughly after handling. Do not eat, drink or smoke when using this product. Avoid breathing vapours. Use only outdoors or in a well-ventilated area.

Response Absorb spillage to prevent material-damage.
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTRE/doctor.
IF SWALLOWED: Call a POISON CENTRE/doctor if you feel unwell. Rinse mouth.
IF ON SKIN: Wash with plenty of water. Specific treatment (see information on this label). Take off contaminated clothing and wash it before reuse. IF INHALED: remove person to fresh air and keep comfortable for breathing. Call a POISON CENTRE/doctor if you feel unwell.

Storage Store in a corrosion resistant container with a resistant inner liner.

Disposal Dispose of contents/container in accordance with local/regional/national/international regulations.

Other hazards None known.

Supplemental information 51.5 % of the mixture consists of component(s) of unknown acute dermal toxicity. 51.5 % of the mixture consists of component(s) of unknown acute inhalation toxicity.

3. Composition/information on ingredients

Mixtures

Chemical name	Common name and synonyms	CAS number	%
Aluminium sulphate		10043-01-3	48.5

All concentrations are in percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

4. First-aid measures

Inhalation	IF INHALED: remove person to fresh air and keep comfortable for breathing. Call a POISON CENTRE/doctor if you feel unwell.
Skin contact	IF ON SKIN: Wash with plenty of water. Specific treatment (see information on this label). Take off contaminated clothing and wash it before reuse. Call a POISON CENTRE or doctor/physician if you feel unwell.
Eye contact	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTRE/doctor.
Ingestion	IF SWALLOWED: Call a POISON CENTRE/doctor if you feel unwell. Rinse mouth.
Most important symptoms/effects, acute and delayed	Severe eye irritation. Symptoms may include stinging, tearing, redness, swelling, and blurred vision. Permanent eye damage including blindness could result.
Indication of immediate medical attention and special treatment needed	Provide general supportive measures and treat symptomatically.
General information	If you feel unwell, seek medical advice (show the label where possible). Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves. Show this safety data sheet to the doctor in attendance. Avoid contact with eyes, skin and clothing. Wear rubber gloves and chemical splash goggles. Keep out of reach of children. Avoid contact with eyes and skin.

5. Fire-fighting measures

Suitable extinguishing media	Treat for surrounding material.
Unsuitable extinguishing media	Do not use water jet as an extinguisher, as this will spread the fire.
Specific hazards arising from the chemical	Firefighters should wear a self-contained breathing apparatus.
Hazardous combustion products	May include and are not limited to: Oxides of sulphur. Oxides of aluminium. Sulfuric acid.
Special protective equipment and precautions for firefighters	Firefighters should wear full protective clothing including self contained breathing apparatus.
Fire fighting equipment/instructions	Move containers from fire area if you can do so without risk.
Specific methods	Use standard firefighting procedures and consider the hazards of other involved materials.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures	Keep unnecessary personnel away. Keep people away from and upwind of spill/leak. Wear appropriate protective equipment and clothing during clean-up. Avoid inhalation of vapours and spray mists. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Ensure adequate ventilation. Local authorities should be advised if significant spillages cannot be contained. For personal protection, see section 8 of the SDS.
Methods and materials for containment and cleaning up	Stop leak if you can do so without risk. Prevent entry into waterways, sewer, basements or confined areas. Large Spills: Dike the spilled material, where this is possible. Cover with plastic sheet to prevent spreading. Absorb spillage to prevent material damage. Use a non-combustible material like vermiculite, sand or earth to soak up the product and place into a container for later disposal. Following product recovery, flush area with water. Small Spills: Wipe up with absorbent material (e.g. cloth, fleece). Clean surface thoroughly to remove residual contamination. Never return spills to original containers for re-use. For waste disposal, see section 13 of the SDS.
Environmental precautions	Avoid discharge into drains, water courses or onto the ground. Do not discharge into lakes, streams, ponds or public waters.

7. Handling and storage

Precautions for safe handling	Do not taste or swallow. Avoid inhalation of vapours and spray mists. Avoid contact with eyes, skin, and clothing. When using, do not eat, drink or smoke. Use only outdoors or in a well-ventilated area. Avoid prolonged exposure. Wear appropriate personal protective equipment. Wash thoroughly after handling. Wash contaminated clothing before reuse. Use good industrial hygiene practices in handling this material.
Conditions for safe storage, including any incompatibilities	Store in a corrosion resistant container with a resistant inner liner. Store in a cool, dry place out of direct sunlight. Store in a closed container away from incompatible materials. Store in a well-ventilated place. Keep out of reach of children.

8. Exposure controls/Personal protection

Occupational exposure limits

US. ACGIH Threshold Limit Values

Components	Type	Value	Form
Aluminium sulphate (CAS 10043-01-3)	TWA	1 mg/m3	Respirable fraction.

Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2)

Components	Type	Value
Aluminium sulphate (CAS 10043-01-3)	TWA	2 mg/m3

Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended)

Components	Type	Value	Form
Aluminium sulphate (CAS 10043-01-3)	TWA	1 mg/m3	Respirable.

Canada. Manitoba OELs (Reg. 217/2006, The Workplace Safety And Health Act)

Components	Type	Value	Form
Aluminium sulphate (CAS 10043-01-3)	TWA	1 mg/m3	Respirable fraction.

Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents)

Components	Type	Value	Form
Aluminium sulphate (CAS 10043-01-3)	TWA	1 mg/m3	Respirable fraction.

Canada. Quebec OELs. (Ministry of Labour - Regulation Respecting the Quality of the Work Environment)

Components	Type	Value
Aluminium sulphate (CAS 10043-01-3)	TWA	2 mg/m3

Biological limit values No biological exposure limits noted for the ingredient(s).

Exposure guidelines See above

Appropriate engineering controls Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level.

Individual protection measures, such as personal protective equipment

Eye/face protection Wear safety glasses with side shields (or goggles) and a face shield.

Skin protection

Hand protection Rubber gloves. Confirm with a reputable supplier first.

Other Wear appropriate chemical resistant clothing. As required by employer code.

Respiratory protection Where exposure guideline levels may be exceeded, use an approved NIOSH respirator. Respirator should be selected by and used under the direction of a trained health and safety professional following requirements found in OSHA's respirator standard (29 CFR 1910.134), CAN/CSA-Z94.4 and ANSI's standard for respiratory protection (Z88.2).

Thermal hazards Not applicable.

General hygiene considerations Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. When using do not eat or drink.

9. Physical and chemical properties

Appearance Clear

Physical state Liquid.

Form Liquid.

Colour Colourless / Light green / Amber

Odour Odourless

Odour threshold Not available.

pH 3.5 (1% solution)

Melting point/freezing point -16 °C (3.2 °F)

Initial boiling point and boiling range	101 °C (213.8 °F)
Flash point	Not flammable
Evaporation rate	not determined
Flammability (solid, gas)	Not applicable.
Upper/lower flammability or explosive limits	
Flammability limit - lower (%)	Not available.
Flammability limit - upper (%)	Not available.
Explosive limit - lower (%)	Not available.
Explosive limit – upper (%)	Not available.
Vapour pressure	Not applicable
Vapour density	Not available.
Relative density	Not available.
Solubility(ies)	
Solubility (Water)	Not available.
Partition coefficient (n-octanol/water)	Not available.
Auto-ignition temperature	Not applicable
Decomposition temperature	Not available.
Viscosity	Not available.
Other information	
Explosive properties	Not explosive.
Oxidising properties	Not oxidising.
Specific gravity	1.34

10. Stability and reactivity

Reactivity	May be corrosive to metals. This product may react with strong oxidising agents.
Chemical stability	Stable under recommended storage conditions.
Possibility of hazardous reactions	Hazardous polymerisation does not occur.
Conditions to avoid	Excessive heat. Do not mix with other chemicals.
Incompatible materials	Metals. Caustics. Oxidizers.
Hazardous decomposition products	May include and are not limited to: Sulfuric acid. Oxides of sulphur. Oxides of aluminium.

11. Toxicological information

Information on likely routes of exposure

Inhalation	Harmful if inhaled.
Skin contact	Harmful in contact with skin.
Eye contact	Causes serious eye damage.
Ingestion	Harmful if swallowed. May cause stomach distress, nausea or vomiting.
Symptoms related to the physical, chemical and toxicological characteristics	Severe eye irritation. Symptoms may include stinging, tearing, redness, swelling, and blurred vision. Permanent eye damage including blindness could result.

Information on toxicological effects

Acute toxicity Harmful if inhaled. Harmful in contact with skin. Harmful if swallowed.

Components	**Species**	**Test results**
Aluminium sulphate (CAS 10043-01-3)		
Acute		
Dermal		
LD50	Mouse	> 1167.5 mg/kg, 5 Days, ECHA
	Pig	> 1167.5 mg/kg, 5 Days, ECHA
	Rabbit	> 5000 mg/kg, 24 Hours, ECHA

Components	Species	Test results
Inhalation		
LC50	Rat	200 mg/m3, 5 Days, ECHA
		50 mg/m3, 5 Days, ECHA
		5 mg/L, 4 Hours, ECHA
Oral		
LD50	Guinea pig	490 mg/kg, HSDB
	Mouse	> 730 mg/kg, HSDB
	Rat	> 2000 mg/kg

Skin corrosion/irritation Prolonged skin contact may cause temporary irritation.

Exposure minutes Not available.

Erythema value Not available.

Oedema value Not available.

Serious eye damage/eye irritation Causes serious eye damage.

Corneal opacity value Not available.

Iris lesion value Not available.

Conjunctival reddening value Not available.

Conjunctival oedema value Not available.

Recover days Not available.

Respiratory or skin sensitisation

Canada - Alberta OELs: Irritant

Aluminium sulphate (CAS 10043-01-3) Irritant

Respiratory sensitisation Not a respiratory sensitizer.

Skin sensitisation This product is not expected to cause skin sensitisation.

Germ cell mutagenicity Non-hazardous by WHMIS criteria.

Carcinogenicity Non-hazardous by WHMIS criteria. See below.

ACGIH Carcinogens

Aluminium sulphate (CAS 10043-01-3) A4 Not classifiable as a human carcinogen.

Canada - Manitoba OELs: carcinogenicity

ALUMINUM METAL AND INSOLUBLE COMPOUNDS, RESPIRABLE FRACTION (CAS 10043-01-3) Not classifiable as a human carcinogen.

Reproductive toxicity This product is not expected to cause reproductive or developmental effects.

Specific target organ toxicity - single exposure Not classified.

Specific target organ toxicity - repeated exposure Not classified.

Aspiration hazard Not an aspiration hazard.

Chronic effects Prolonged inhalation may be harmful.

Further information Not available.

12. Ecological information

Ecotoxicity See below

Ecotoxicological data

Components		Species	Test results
Aluminium sulphate (CAS 10043-01-3)			
Aquatic			
Crustacea	EC50	Amphipod (Crangonyx pseudogracilis)	11.8 - 14 mg/L, 48 hours
Fish	LC50	Fathead minnow (Pimephales promelas)	3.4 - 5.6 mg/L, 96 hours

Persistence and degradability No data is available on the degradability of this product.

Bioaccumulative potential No data available.

Mobility in soil No data available.

Mobility in general Not available.

Other adverse effects No other adverse environmental effects (e.g. ozone depletion, photochemical ozone creation potential, endocrine disruption, global warming potential) are expected from this component.

13. Disposal considerations

Disposal instructions Collect and reclaim or dispose in sealed containers at licensed waste disposal site. Dispose of contents/container in accordance with local/regional/national/international regulations. Review federal, provincial, and local government requirements prior to disposal.

Local disposal regulations Dispose in accordance with all applicable regulations.

Hazardous waste code The waste code should be assigned in discussion between the user, the producer and the waste disposal company.

Waste from residues / unused products Dispose of in accordance with local regulations. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner (see: Disposal instructions).

Contaminated packaging Since emptied containers may retain product residue, follow label warnings even after container is emptied. Empty containers should be taken to an approved waste handling site for recycling or disposal.

14. Transport information

General Canada: TDG Proof of Classification: In accordance with Part 2.2.1 (SOR/2014-152) of the Transportation of Dangerous Goods Regulations, we certify that the classification of this product is correct as of the SDS date of issue. If applicable, the technical name and the classification of the product will appear below.
IMDG Regulated Marine Pollutant.

Transportation of Dangerous Goods (TDG - Canada)

Basic shipping requirements:

UN number	UN3264
Proper shipping name	CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S.
Technical name	Aluminium sulphate
Hazard class	8
Packing group	III
Special provisions	16

TDG

15. Regulatory information

Canadian federal regulations This product has been classified in accordance with the hazard criteria of the HPR and the SDS contains all the information required by the HPR.

Canada Priority Substances List (Second List): Listed substance

Aluminium sulphate (CAS 10043-01-3) Listed.

Export Control List (CEPA 1999, Schedule 3)

Not listed.

Greenhouse Gases

Not listed.

Precursor Control Regulations

Not regulated.

WHMIS status Controlled

International regulations

Inventory status

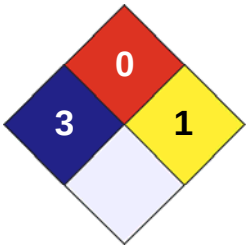
Country(s) or region	Inventory Name	On Inventory (Yes/No)*
Canada	Domestic Substances List (DSL)	Yes
Canada	Non-Domestic Substances List (NDSL)	No

*A "Yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s)

16. Other information

LEGEND	
Severe	4
Serious	3
Moderate	2
Slight	1
Minimal	0

HEALTH	/ 3
FLAMMABILITY	0
PHYSICAL HAZARD	1
PERSONAL PROTECTION	X



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Other information For an updated SDS, please contact the supplier/manufacturer listed on the first page of the document.

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