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MATERIAL SAFETY DATA SHEET

Revision No.: 2

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IDENTIFICATION OF MATERIAL AND SUPPLIER

PRODUCT NAME(S): MULTIFLOC 8100

CHEMICAL NAME: Aluminium Chlorohydrate, Polyaluminium Chloride (high basicity),
 [AKA : Aluminium Hydroxy Chloride, Aluminium Chloride Hydroxide]

Product Uses: coagulant in the treatment of water and wastewater

SUPPLIER AND MANUFACTURER: HARDMAN AUSTRALIA PTY. LTD.

EMERGENCY CONTACT INFORMATION:

Telephone	61 2 9624 1333 (all hours — message on after hours) Emergency after-hours contact: Mr. John Bradley (0418 974 332)
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HAZARDS IDENTIFICATION

Classified as a Hazardous Substance according to the criteria of Office of the Australian Safety and Compensation Council (previously NOHSC, the National Occupational Health and Safety Council).

Risk phrases: R36/38; Irritating to eyes and skin

Additional risk: spilt product may render surface very slippery.

Safety phrases: S36: Wear suitable protective clothing, S37: Wear suitable gloves, S39: Wear eye/face protection, S24/25: Avoid contact with skin and eyes.

COMPOSITION/INFORMATION ON INGREDIENTS

Reference in AICS: YES

Name	CAS Number	Proportion
Aluminium hydroxychloride	1324-41-9	40 to 60%
Water	7732-18-5	40 to 60%

FIRST AID MEASURES

Eyes (contact): Flush with water for 15 minutes. Seek medical attention.

Skin (contact):	Remove contaminated clothing — flush affected areas with soap and water.
Inhalation (breathing):	No vapour, can only be inhaled as mist or aerosol and any dose will bring on unpleasant reaction, dry mouth taste. Remove from source of mist, allow patient to stabilise breathing in fresh air. If problem or symptoms persist seek medical attention.
Ingestion (swallowing):	Give water to drink. Induce vomiting. Note: Opinion varies regarding the induction of vomiting, in small doses the induction of vomiting is questionable and the decision should be taken on a case by case basis. This material will cause difficulty in swallowing and it is unlikely that any significant dose could be ingested. If in doubt seek medical advice.

FIRE FIGHTING MEASURES

Flash point (°C):	Material is non-flammable and non-combustible.
Auto ignition point (°C):	Not applicable.
Explosion Limits In Air (% by volume)	
Lower:	Not applicable.
Upper:	Not applicable.
Extinguishing media:	Compatible with water, foam, CO ₂ and dry chemical. Fires can be attacked with extinguishers to suit local flammable/combustible materials.
Special Procedures:	None.
Unusual hazards:	None known.
Conditions to avoid:	None known.
Materials to avoid:	May emit some chlorine gas when in contact with very strong oxidising agents; some heat liberated when in contact with strong acids.
Decomposition products:	Severe overheating may produce hydrogen chloride gas and aluminium oxide once water has been driven off.
Hazardous polymerisation:	Will not occur.

ACCIDENTAL RELEASE MEASURES

Steps to be taken in case material is released or spilled: Prevent drain or sewer contamination with absorbent such as sand or sawdust etc. Collect for disposal, hose final trace residues to drain. Spillage into waterways will result in some lowering of the pH and the formation of aluminium hydroxide, which has a very low toxicity

HANDLING & STORAGE

Do not store in metal drums other than stainless steel, and then only if stored at room temperature.

EXPOSURE CONTROLS/PERSONAL PROTECTION

EFFECTS OF EXPOSURE

Eyes (Contact):	Irritation and redness.
Skin (Contact & absorption):	May cause skin irritation with prolonged contact. A mild human skin irritant.
Inhalation (breathing):	No vapour, product is not volatile. Mist or aerosol could cause irritation to mucous tissue.
Ingestion (swallowing):	Nausea vomiting, could have systemic effects.

SPECIAL PROTECTION INFORMATION

Respiratory protection:	None required in normal operations. Fit respirator if application generates mist.
Ventilation:	Local exhaust recommended.
Protective gloves:	PVC or rubber.
Eye protection:	Chemical goggles or safety glasses.
Other protective equipment:	Not required, aprons and rubber boots can be used in wet conditions but mainly as protection from the water.
Safety profile:	A mild human skin irritant.

PHYSICAL AND CHEMICAL PROPERTIES

Appearance & odour:	Clear to slightly hazy aqueous solution
Molecular weight:	174.45
Boiling point (°C):	100
Melting point (°C):	Not available
Specific Gravity (H ₂ O = 1):	1.33 - 1.35 at 25°C
pH (7 = neutral):	3.5 to 4.0 (undiluted)
Vapour pressure (kPa):	Not available or applicable
Relative vapour density (air = 1):	Not available or applicable
Volatile by weight (%):	Roughly 50 (prolonged drying leads to product change)
Solubility in water:	Completely miscible
Evaporation rate:	Not relevant (n-butyl acetate = 100)

STABILITY AND REACTIVITY

Reactivity:	This product is unlikely to react or decompose under normal conditions of storage.
Incompatibilities:	None known
Conditions to avoid:	Material may decompose at high temperatures to evolve hydrogen chloride vapour after water has evaporated and product has dried and reached calcination temperatures.

Decomposition products: Severe overheating may produce hydrogen chloride gas and aluminium oxide once water has been driven off.

Hazardous polymerisation: Will not occur.

TOXICOLOGICAL INFORMATION

Toxicology data (ex "Sax's, Dangerous Properties of Industrial Materials" Ed. 8):

With reference to aqueous solutions of aluminium salts in general, but not necessarily aluminium chlorohydrate:

skn-hmn 7500 µg/3D-I MLD
 dnd-mam:lym 40 mmol/L
 ivn-mus TDLo:483 g/kg
 orl-rat LD50:3311 mg/kg
 ipr-rat LD50:728 mg/kg
 orl-mus LD50:1990 mg/kg
 ipr-mus LD50:940 mg/kg

With specific reference to aluminium chlorhydrate solution: skn-hmn 150 mg/3D-I (mild)

The Registry of Toxic Effects of Chemical Substances (RTECS) listed the following additional effects associated specifically with aluminium chlorhydrate:

Effects	Route	Organism	Dose	Duration
Lungs, thorax or respiration: other changes Lungs, thorax or respiration: changes in lung weight	Inhalation	Rat	TCLo: 25 mg/m ³	6H/2Y-I
Lungs, thorax or respiration: fibrosis, focal (pneumoconiosis) Lungs, thorax or respiration: changes in lung weight Nutritional & gross metabolic: weight loss or decreased weight gain	Inhalation	Rat	TCLo: 25 mg/m ³	6H/26W-I
Lungs, thorax or respiration: other changes Lungs, thorax or respiration: changes in lung weight	Inhalation	Guinea pig	TCLo: 25 mg/m ³	6H/2Y-I
Lungs, thorax or respiration: fibrosis, focal (pneumoconiosis) Lungs, thorax or respiration: changes in lung weight	Inhalation	Guinea pig	TCLo: 25 mg/m ³	6H/26W-I

Note: TCLo = Lowest published toxic concentration.

Toxicity profile:

This material is not a persistent poison, and neither this material, nor aluminium salts in general, are listed in the Standard for the Uniform Scheduling of Drugs and Poisons (Vol. 20). Aluminium chlorhydrate would be expected to hydrolyse on contact with water to form aluminium hydroxide, which has a very low toxicity and

would eventually becoming a part of the eco-system.
Some reduction in pH may occur on hydrolysis.

Threshold limit value: 2 mg/m³ based on Al (roughly 0.25 mg/m³ based on actual product (Ref.: ACGIH, soluble Aluminium salts)

ECOLOGICAL INFORMATION

Environmental fate and distribution:

Not a persistent pollutant; can cause coagulation of solids in aqueous suspension, especially when highly diluted by the water in which the solids are suspended. Aluminium compounds are common in most soils and are the principle components of Bauxite and Gibbsite, which are common, naturally occurring minerals. When diluted by copious quantities of water (for example, to the point that the concentration is less than about 100 grams per cubic meter), this product will hydrolyse rapidly to form aluminium hydroxide, which can be expected to become a part of the natural soil profile if not recovered. When not highly diluted with water, this product may be slow to hydrolyse and may form a mixture of partially soluble aluminium species and heavy floc of aluminium hydroxide. Until further diluted, this mixture could affect marine life by clogging sensitive respiratory mechanisms in a similar fashion to muds and clays and possibly by toxic effects that are not yet well understood.

Effect on effluent treatment:

This product is used as a coagulant in water treatment and may cause finely divided solids to settle out rapidly from aqueous streams, depending on other factors such as pH and ionic strength. It may influence pH control as this material in the raw state has a pH of roughly 4, and it may also add to solids loading in filter cakes and present as a compressible cake. In large quantity this product is likely to make filter cakes "slimey" and wet. This can also cause "blinding of filter cloths" but these will normally respond to hosing or rinsing off.

DISPOSAL CONSIDERATIONS

Waste disposal method: Refer to local waste disposal authority. This product can be neutralised with alkali to form a mixture of aluminium hydroxide and the chloride salt of the alkali. The resulting mixture is non-hazardous providing the resulting pH is between roughly 5 and 10.

TRANSPORT INFORMATION

This product does not carry a Dangerous Goods classification as corrosion tests have verified that it is not corrosive to either skin or to metals.

UN No.: None	HAZCHEM: None	DG CLASS: None
Poison Schedule: None	Packaging Group: None	EPG: None

REGULATORY INFORMATION

This product is to be found in the public AICS database.

OTHER INFORMATION

References cited:

American Conference of Governmental Industrial Hygienists (ACGIH), Documentation of the Threshold Limit Values and Biological Exposure Indices, 6th Edition, ACGIH, Cincinnati, Ohio, 1991.

Adopted National Exposure Standards for Atmospheric Contaminants in the Occupational Environment [NOHSC:1003(1995)]

Registry of Toxic Effects of Chemical Substances (RTECS)

Sax's, Dangerous Properties of Industrial Materials, Edition 8, Ed. RJ Lewis Sr., van Nostrand Reinhold.

Changes since previous issue:

Adoption of 16-point format

Further toxicological information added

Further references cited

Further ecological information cited

[This MSDS consists of 6 pages, please advise if your document does not contain the same number of pages as it will not be complete]

This MSDS summarises our best knowledge of health and safety hazard information of the product and how to safely handle and use the product in the workplace. Each user should read this MSDS and consider the information in the context of how the product will be handled and used in the workplace including in conjunction with other products.

Please contact the company if any further information is required.