EMERGENCY PREPAREDNESS - POLLUTION INCIDENT RESPONSE PROGRAM: Dross storage Loxford

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1. PURPOSE

Tomago Aluminium (TAC) holds an Environment Protection Licence (Number 21770) for the storage of aluminium dross with the NSW Environment Protection Authority (EPA). As per the *Protection of the Environment Operations Act 1997* (the POEO Act), the holder of an Environment Protection Licence must prepare, keep, test and implement a pollution incident response management plan (PIRMP) that complies with Part 5.7A of the POEO Act in relation to the activity to which the licence relates.

If a pollution incident occurs in the course of an activity so that material harm to the environment (within the meaning of section 147 of the POEO Act) is caused or threatened, the person carrying out the activity must **immediately** implement this plan in relation to the activity required by Part 5.7A of the POEO Act.

A copy of this plan must be kept at the premises, and be made available on request by an authorised EPA officer and to any person who is responsible for implementing this plan.

Parts of the plan must also be available on the website (www.tomago.com.au/health-safety/emergency-response).

As such this program defines Tomago Aluminium's approach to emergency preparedness and response to HSE incidents at the Loxford Dross Storage Facility. The objective of the program is to ensure:

- Emergency situations that may occur at the facility are managed to reduce the severity of incident and impact on site personnel and neighbouring premises.
- Ensure comprehensive and timely communication to applicable staff, relevant authorities, property owners and people outside the facility that may be impacted.
- Ensure that key personnel responsible for the implementation and maintenance of the plan are identified and staff are trained and experienced to deal with emergency situations.
- Compliance with statutory requirements such as *Protection of the Environment Legislation Amendment Act 2011*

2. SCOPE

This program applies to all activities at the Loxford Dross Storage Facility at the Hydro Aluminium Kurri Kurri site, Hart Road Loxford New South Wales.

Name of licensee: (including ABN)	Tomago Aluminium Company Pty Ltd ABN 68 001 862 228	
EPL number:	21770	
Premises name and address:	"TAC SHEDS" WITHIN THE HYDRO ALUMINIUM KURRI KURRI PREMISES (see map Appendix 3) HART ROAD LOXFORD NSW 2327	
Company contact / PIRMP activation details	**Name:** Robyn Parker **Position or title:** Environment Superintendent **Business hours contact number/s:** 0249669329 or 0409913473 **After hours contact number/s:** 0409913473 **Email:** robyn.parker@tomago.com.au **Name:** Danny Oakley **Position or title:** Senior Environment & Sustainability Advisor **Business hours contact number/s:** 0400 482663 **After hours contact number/s:** 0400 482663 **Email:** danny.oakley@tomago.com.au	
Website address:	www.tomago.com.au	
Scheduled activity/fee-based activity on EPL	Waste Storage	Waste storage – hazardous, restricted solid, liquid, clinical and related waste and asbestos waste

3. REFERENCES

OHS.MP.011	Records & Record Management	110000000176
	Notification of EHS Incidents	110000000298

4. RESPONSIBILITIES

Task/Details	HSE Manager	Safety Services	Superintendent Environment
Development and Maintenance of Pollution Incident, Emergency Preparedness and Response Programs	X		X
Development and Facilitation of Emergency Simulations if required		X	
Notification of statutory authorities of a pollution emergency	X		X
Liaison representative with External Services and Development and Facilitation of Emergency Simulations if required		X	

5. BACKGROUND TO LOXFORD STORAGE FACILITY

The dross storage facility is an area of the Hydro Aluminium Kurri Kurri premises that is leased to Tomago Aluminium for the purpose of the temporary storage of aluminium dross. The site currently operates in accordance with a licence issued under the Protection of the Environment Operations Act (Licence # 21770).

6. WASTE DESCRIPTION

Aluminium production at TAC creates a solid by-product called dross during the casting stage of the smelting process. The dross is separated from the aluminium by scraping the material off the top of the casting furnace prior to the casting of the metal. Dross contains a significant proportion of aluminium, the bulk of which is screened out before the remainder is managed as a waste product.

7. HEALTH AND SAFETY RISKS

Aluminium dross is classified as a hazardous waste under the NSW EPA Waste Classification Guidelines. It holds dangerous goods class 4.3 and emits flammable gases in contact with water. The SDS is attached as APPENDIX 2 – DROSS SDS.

8. MONITORING AND ONGOING MANAGEMENT

Access to the site is closely managed to prevent unauthorised access to the waste and sheds are maintained appropriately to prevent any hazard and the escape of waste and/or leachate. Loading and unloading operations are all carried out inside the sheds.

The movement of dross to and from the storage area is tracked via the NSW EPA online waste tracking system.

9. IDENTIFICATION OF POTENTIAL EMERGENCY SITUATIONS AND PREVENTATIVE CONTROLS

Due to the scale and operational status of the facility potential emergency scenarios are identified to include:

Fire

1) External to storage buildings. A 200mm branch main off the Hunter Water supply main to Kurri Kurri brings water to the site in the form of a hydrant located adjacent to Building 55C.
2) Within storage buildings. **DO NOT USE WATER** as aluminium dross emits flammable gases when wet. Consult specialist advice and refer to SDS in APPENDIX 2 – DROSS SDS.

Major ingress of water to the sheds

The following approach would be followed in the event that either a major ingress of water has occurred and/or a catastrophic failure of the building has occurred

CONTAIN AND PREVENT SPREAD OF CONTAMINATION. RE-ESTABLISH BUILDING INTEGRITY AND/OR REMOVE DROSS TO SUITABLE LOCATION

↓

DETERMINE EXTENT OF THE CONTAMINATION PLUME AND CONCENTRATION OF CONTAMINANTS

↓

INSTIGATE A RISK ASSESSMENT AND IDENTIFY KEY STAKEHOLDERS

↓

LIAISE WITH KEY STAKEHOLDERS

↓

IMPLEMENT REMEDIATION PROGRAM IF REQUIRED

10. COMMUNICATIONS OF EMERGENCY SITUATIONS

The Security gatehouse at the Tomago Aluminium Smelter is the Site's Communication and Fire Control Centre. In the event of an emergency, injury or pollution incident the Environment Superintendent will be notified and is responsible for notification of authorities in accordance with TAC procedure:

Notification of EHS Incidents *110000000298*

The security gatehouse is manned on a 7 day/24-hour basis and all external calls should be directed to security on (02) 49669669

In the event that the emergency or pollution incident occurs that has potential to impact on neighbouring properties and/or local communities communication mechanisms are detailed in the Hydro Aluminium Kurri Kurri Pty Ltd Pollution Incident and Emergency Response Management Plan

https://regrowthkurrikurri.com.au/files/2021/02/2021-HYDRO-PIREMP-1.pdf

11. TESTING

This plan is to be tested / reviewed within every 12 months or within one month following its activation. Records of the activation / testing / review of this plan are to be logged in APPENDIX 1 - RECORDS OF TESTING / REVIEW / ACTIVATION OF THIS PLAN of this document.

APPENDIX 1 - RECORDS OF TESTING / REVIEW / ACTIVATION OF THIS PLAN

Date of review/test/activation	Reason	Reviewers	New version number
08/11/23	Desktop review/test	R Parker	3
10/12/24	Desktop review/test	R Parker	4

APPENDIX 2 – DROSS SDS

Chemwatch

Tomago Dross Ex Casthouse To Refiner

Tomago Aluminium

Chemwatch Hazard Alert Code: 3

Chemwatch: 7502-26
Version No: 3.1.1.1
Safety Data Sheet according to WHS and ADG requirements

Issue Date: 27/06/2017
Print Date: 25/07/2019
S.GHS.AUS.EN

SECTION 1 IDENTIFICATION OF THE SUBSTANCE / MIXTURE AND OF THE COMPANY / UNDERTAKING

Product Identifier

Product name	Tomago Dross Ex Casthouse To Refiner
Synonyms	Casthouse dross aluminium alloy smelting dross residue dross fines; aluminium skimmings pot skimmings
Proper shipping name	ALUMINIUM SMELTING BY-PRODUCTS or ALUMINIUM REMELTING BY-PRODUCTS
Other means of identification	Not Available

Relevant identified uses of the substance or mixture and uses advised against

Relevant identified uses	Exported from the casthouse to Refiner.

Details of the supplier of the safety data sheet

Registered company name	**Tomago Aluminium**
Address	Tomago Road Tomago NSW 2322 Australia
Telephone	+61 2 4966 9669
Fax	+61 2 4966 9711
Website	Not Available
Email	Not Available

Emergency telephone number

Association / Organisation	**Not Available**
Emergency telephone numbers	Not Available
Other emergency telephone numbers	Not Available

SECTION 2 HAZARDS IDENTIFICATION

Classification of the substance or mixture

HAZARDOUS CHEMICAL. DANGEROUS GOODS. According to the WHS Regulations and the ADG Code.

CHEMWATCH HAZARD RATINGS

	Min	Max
Flammability	1	
Toxicity	1	
Body Contact	1	
Reactivity	1	
Chronic	3	

0 = Minimum
1 = Low
2 = Moderate
3 = High
4 = Extreme

Poisons Schedule	Not Applicable
Classification [1]	Emit Flammable Gases with Water Category 2, Carcinogenicity Category 1A, Specific target organ toxicity - repeated exposure Category 2
Legend:	*1. Classified by Chemwatch; 2. Classification drawn from HCIS; 3. Classification drawn from Regulation (EU) No 1272/2008 - Annex VI*

Label elements

Hazard pictogram(s)	
SIGNAL WORD	DANGER

Hazard statement(s)

H261	In contact with water releases flammable gases.
H350	May cause cancer.
H373	May cause damage to organs through prolonged or repeated exposure.

Continued...

APPENDIX 2 – DROSS SDS

Precautionary statement(s) Prevention

P201	Obtain special instructions before use.
P231+P232	Handle under inert gas. Protect from moisture.
P260	Do not breathe dust/fume/gas/mist/vapours/spray.
P281	Use personal protective equipment as required.

Precautionary statement(s) Response

P308+P313	IF exposed or concerned: Get medical advice/attention.
P335+P334	Brush off loose particles from skin. Immerse in cool water/wrap in wet bandages.
P370+P378	In case of fire: Use dry agent for extinction.
P314	Get medical advice/attention if you feel unwell.

Precautionary statement(s) Storage

P405	Store locked up.
P402+P404	Store in a dry place. Store in a closed container.

Precautionary statement(s) Disposal

P501	Dispose of contents/container in accordance with local regulations.

SECTION 3 COMPOSITION / INFORMATION ON INGREDIENTS

Substances

See section below for composition of Mixtures

Mixtures

CAS No	%[weight]	Name
Not Available		mixture of variable composition
7429-90-5	20-70	aluminium
1344-28-1	28-78	fresh alumina
24304-00-5	<0.1	aluminium nitride
Not Available		total fluorides as
15096-52-3	1-2	sodium aluminium fluoride
7447-40-7	<0.1	potassium chloride
Not Available	<0.1	magnesium aluminate
Not Available		Reacts with water or moisture to produce
1333-74-0		hydrogen

SECTION 4 FIRST AID MEASURES

Description of first aid measures

Eye Contact	If this product comes in contact with the eyes: ▸ Immediately hold eyelids apart and flush the eye continuously with running water. ▸ Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids. ▸ Continue flushing until advised to stop by the Poisons Information Centre or a doctor, or for at least 15 minutes. ▸ Transport to hospital or doctor without delay. ▸ Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.
Skin Contact	If skin or hair contact occurs: ▸ Flush skin and hair with running water (and soap if available). ▸ Seek medical attention in event of irritation.
Inhalation	▸ If fumes or combustion products are inhaled remove from contaminated area. ▸ Lay patient down. Keep warm and rested. ▸ Prostheses such as false teeth, which may block airway, should be removed, where possible, prior to initiating first aid procedures. ▸ Apply artificial respiration if not breathing, preferably with a demand valve resuscitator, bag-valve mask device, or pocket mask as trained. Perform CPR if necessary. ▸ Transport to hospital, or doctor.
Ingestion	Rinse mouth out with plenty of water. If poisoning occurs, contact a doctor or Poisons Information Centre. ▸ If swallowed do **NOT** induce vomiting. ▸ If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain open airway and prevent aspiration. ▸ Observe the patient carefully. ▸ Never give liquid to a person showing signs of being sleepy or with reduced awareness; i.e. becoming unconscious. ▸ Give water to rinse out mouth, then provide liquid slowly and as much as casualty can comfortably drink. ▸ Seek medical advice.

Indication of any immediate medical attention and special treatment needed

▸ Manifestation of aluminium toxicity include hypercalcaemia, anaemia, Vitamin D refractory osteodystrophy and a progressive encephalopathy (mixed dysarthria-apraxia of speech, asterixis, tremulousness, myoclonus, dementia, focal seizures). Bone pain, pathological fractures and proximal myopathy can occur.
▸ Symptoms usually develop insidiously over months to years (in chronic renal failure patients) unless dietary aluminium loads are excessive.

Continued...

APPENDIX 2 – DROSS SDS

- Serum aluminium levels above 60 ug/ml indicate increased absorption. Potential toxicity occurs above 100 ug/ml and clinical symptoms are present when levels exceed 200 ug/ml.
- Deferoxamine has been used to treat dialysis encephalopathy and osteomalacia. CaNa2EDTA is less effective in chelating aluminium.

[Ellenhorn and Barceloux: Medical Toxicology]

SECTION 5 FIREFIGHTING MEASURES

Extinguishing media

- Dry sand.

or

- Dry chemical powder.
- **DO NOT** use halogenated fire extinguishing agents.
- **DO NOT** use water or halogens on dust fires.

Special hazards arising from the substrate or mixture

Fire Incompatibility	Reacts violently with rust, certain metal oxides (eg. oxides of copper, iron (rust) and lead), and nitrates (eg., ammonium nitrate and fertilizers containing ammonium nitrate) and can lead to a violent explosion. Avoid reaction with halogens, organic compounds, strong acids and strong alkalies.

Advice for firefighters

Fire Fighting	Alert Fire Brigade and tell them location and nature of hazard. May be violently or explosively reactive. Wear self-contained breathing apparatus and full body protective clothing including boots. • Use extinguishing media suitable for surrounding area. Fight fire from a safe distance, with adequate cover. If safe to do so, remove containers from path of fire.
Fire/Explosion Hazard	Particle size, coating and dispersion in air determine reactivity. Bulk aluminium is not combustible but at high temperatures, molten aluminium can be ignited and burn. Molten aluminium may react violently if it comes into contact with water. Finely divided aluminium can readily burn or explode if ignited and reacts with moisture to produce hydrogen. Dust clouds may be explosive. Aluminium is rapidly oxidised by water at 180C.
HAZCHEM	4W

SECTION 6 ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

See section 8

Environmental precautions

See section 12

Methods and material for containment and cleaning up

Minor Spills	Refer to major spills.
Major Spills	DO NOT wet with water. For larger lumps: Use dry clean-up procedures. Collect in suitable containers for disposal. For Spills containing a significant proportion of fines: Clean up all spills immediately. May be violently or explosively reactive. Wear breathing apparatus plus protective gloves. Shut off all possible sources of ignition and increase ventilation. No smoking or naked lights within area. Stop leak if safe to do so. Use dry clean up procedures and avoid generating dust. Collect spilled material using spark free tools (scoops and natural bristle soft brushes, final clean-up. Place in dry containers for disposal.

Personal Protective Equipment advice is contained in Section 8 of the SDS.

SECTION 7 HANDLING AND STORAGE

Precautions for safe handling

Safe handling	Avoid contact with moisture. Avoid generating and breathing dust. Avoid contact with skin and eyes. Avoid sources of heat. • Avoid smoking, naked lights or ignition sources. Avoid physical damage to containers. • Handle and open container with care Use spark-free tools when handling. Keep containers securely sealed when not in use. Local exhaust ventilation may be required for safe working, i.e. to keep exposures below required standards, otherwise PPE is required. Wash hands with soap and water after handling.
Other information	• Keep dry. • Store under cover. • Store in a well ventilated area. • Store away from sources of heat or ignition.

Conditions for safe storage, including any incompatibilities

Suitable container	• Check that containers are clearly labelled • Packaging as recommended by manufacturer.

Continued...

APPENDIX 2 – DROSS SDS

Storage incompatibility	▸ Keep dry ▸ Contact with water liberates highly flammable gases Segregate from: strong alkalis and strong acids

SECTION 8 EXPOSURE CONTROLS / PERSONAL PROTECTION

Control parameters

OCCUPATIONAL EXPOSURE LIMITS (OEL)

INGREDIENT DATA

Source	Ingredient	Material name	TWA	STEL	Peak	Notes
Australia Exposure Standards	aluminium	Aluminium (welding fumes) (as Al)	5 mg/m3	Not Available	Not Available	Not Available
Australia Exposure Standards	aluminium	Aluminium, pyro powders (as Al)	5 mg/m3	Not Available	Not Available	Not Available
Australia Exposure Standards	aluminium	Aluminium (metal dust)	10 mg/m3	Not Available	Not Available	Not Available
Australia Exposure Standards	aluminium oxide	Aluminium oxide	10 mg/m3	Not Available	Not Available	(a) This value is for inhalable dust containing no asbestos and < 1% crystalline silica.

EMERGENCY LIMITS

Ingredient	Material name	TEEL-1	TEEL-2	TEEL-3
fresh alumina	Aluminum oxide; (Alumina)	5.7 mg/m3	15 mg/m3	25 mg/m3
potassium chloride	Potassium chloride	7.5 mg/m3	86 mg/m3	510 mg/m3
hydrogen	Hydrogen	65000 ppm	230000 ppm	400000 ppm

Ingredient	Original IDLH	Revised IDLH
aluminium	Not Available	Not Available
fresh alumina	Not Available	Not Available
aluminium nitride	Not Available	Not Available
sodium aluminium fluoride	Not Available	Not Available
potassium chloride	Not Available	Not Available
hydrogen	Not Available	Not Available

Exposure controls

Appropriate engineering controls	General exhaust is adequate under normal operating conditions. If risk of overexposure exists, wear SAA approved respirator.
Personal protection	
Eye and face protection	▸ Safety glasses with side shields ▸ Full face shield ▸ Eyewash unit.
Skin protection	See Hand protection below
Hands/feet protection	▸ DO NOT handle directly. Wear gloves and use scoop / tongs / tools ▸ Welding gloves conforming to Standards such as EN 12477:2001, ANSI Z49.1, AS/NZS 2161:2008 produced from leather, rubber, treated cotton,or alumininised ▸ These gloves protect against mechanical risk caused by abrasion, blade cut, tear and puncture ▸ Other gloves which protect against thermal risks (heat and fire) might also be considered - these comply with different standards to those mentioned above. ▸ One pair of gloves may not be suitable for all processes. For example, gloves that are suitable for low current Gas Tungsten Arc Welding (GTAW) (thin and flexible) would not be proper for high-current Air Carbon Arc Cutting (CAC-A) (Insulated, tough, and durable) or ▸ PVC gloves ▸ Safety footwear
Body protection	See Other protection below
Other protection	Use tight-weave non-static protective clothing (no metallic fasteners, cuffs or pockets). Ensure there is ready access to an emergency shower

Respiratory protection

Particulate. (AS/NZS 1716 & 1715, EN 143:2000 & 149:001, ANSI Z88 or national equivalent)

Required Minimum Protection Factor	Half-Face Respirator	Full-Face Respirator	Powered Air Respirator
up to 10 x ES	P1 Air-line*	- -	PAPR-P1 -
up to 50 x ES	Air-line**	P2	PAPR-P2

Continued...

APPENDIX 2 – DROSS SDS

up to 100 x ES	-	P3	-
		Air-line*	-
100+ x ES	-	Air-line**	PAPR-P3

* - Negative pressure demand ** - Continuous flow
A(All classes) = Organic vapours, B AUS or B1 = Acid gasses, B2 = Acid gas or hydrogen cyanide(HCN), B3 = Acid gas or hydrogen cyanide(HCN), E = Sulfur dioxide(SO2), G = Agricultural chemicals, K = Ammonia(NH3), Hg = Mercury, NO = Oxides of nitrogen, MB = Methyl bromide, AX = Low boiling point organic compounds(below 65 deg C)

76-p3

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Appearance	Silvery - grey divided solid. Insoluble in water but reacts to give flammable gases. Faint ammonia odour. A byproduct of the aluminium smelting process. It is a mixture of principally, aluminium metal and it oxide, with other metals/oxides, flux residues and chlorides and small amounts of nitrides, carbides and trace phosphides. If wet with water gives off a highly flammable gas mixture of hydrogen, ammonia, acetylene, and phosphine gas.

Physical state	Divided Solid	**Relative density (Water = 1)**	approx. 2.2
Odour	Not Available	**Partition coefficient n-octanol / water**	Not Available
Odour threshold	Not Available	**Auto-ignition temperature (°C)**	Not available.
pH (as supplied)	Not Applicable	**Decomposition temperature**	CAS#:
Melting point / freezing point (°C)	482-649 solid.	**Viscosity (cSt)**	Not Available
Initial boiling point and boiling range (°C)	Not Available	**Molecular weight (g/mol)**	Not Applicable
Flash point (°C)	Not Applicable	**Taste**	Not Available
Evaporation rate	Not Applicable	**Explosive properties**	Not Available
Flammability	Not Applicable	**Oxidising properties**	Not Available
Upper Explosive Limit (%)	Not Applicable	**Surface Tension (dyn/cm or mN/m)**	Not Applicable
Lower Explosive Limit (%)	Not Applicable	**Volatile Component (%vol)**	Negligible
Vapour pressure (kPa)	Not Applicable	**Gas group**	Not Available
Solubility in water	Immiscible	**pH as a solution (1%)**	Not Applicable
Vapour density (Air = 1)	Not Applicable	**VOC g/L**	Not Available

SECTION 10 STABILITY AND REACTIVITY

Reactivity	See section 7
Chemical stability	▸ Contact with water liberates highly flammable gases Presence of water and ▸ Presence of heat source and ignition source · Unstable in the presence of incompatible materials Hazardous polymerisation will not occur.
Possibility of hazardous reactions	See section 7
Conditions to avoid	See section 7
Incompatible materials	See section 7
Hazardous decomposition products	See section 5

SECTION 11 TOXICOLOGICAL INFORMATION

Information on toxicological effects

Inhaled	The dust may be highly discomforting to the upper respiratory tract and harmful if inhaled Persons with impaired respiratory function, airway diseases and conditions such as emphysema or chronic bronchitis, may incur further disability if excessive concentrations of particulate are inhaled. If prior damage to the circulatory or nervous systems has occured or if kidney damage has been sustained, proper screenings should be conducted on individuals who may be exposed to further risk if handling and use of the material result in excessive exposures. The vapour from material which is wet is highly discomforting . highly hazardous and may be toxic if inhaled

Continued...

APPENDIX 2 – DROSS SDS

	Acute effects of fluoride inhalation include irritation of nose and throat, coughing and chest discomfort. A single acute over-exposure may even cause nose bleed. Aluminium dust is poorly absorbed through the lungs.
Ingestion	Considered an unlikely route of entry in commercial/industrial environments The material is highly discomforting to the gastro-intestinal tract and is harmful if swallowed and may be toxic if swallowed in large quantity Ingestion may result in nausea, abdominal irritation, pain and vomiting
Skin Contact	The material may be mildly discomforting and abrasive to the skin and may cause drying of the skin, which may lead to dermatitis
Eye	The dust may produce eye discomfort causing smarting, pain and redness. and is capable of causing a mild, temporary redness of the conjunctiva (similar to wind-burn), temporary impairment of vision and/ or other transient eye damage/ ulceration
Chronic	Principal routes of exposure are usually by inhalation of generated dust and skin contact with the material As with any chemical product, contact with unprotected bare skin; inhalation of vapour, mist or dust in work place atmosphere; or ingestion in any form, should be avoided by observing good occupational work practice. Long term exposure to high dust concentrations may cause changes in lung function i.e. pneumoconiosis, caused by particles less than 0.5 micron penetrating and remaining in the lung. Extended exposure to inorganic fluorides causes fluorosis, which includes signs of joint pain and stiffness, tooth discolouration, nausea and vomiting, loss of appetite, diarrhoea or constipation, weight loss, anaemia, weakness and general unwellness. There may also be frequent urination and thirst.

	TOXICITY	IRRITATION
Tomago Dross Ex Casthouse To Refiner	Not Available	Not Available
aluminium	Oral (rat) LD50: >2000 mg/kg[1]	Eye: no adverse effect observed (not irritating)[1] Skin: no adverse effect observed (not irritating)[1]
fresh alumina	Oral (rat) LD50: >2000 mg/kg[1]	Eye: no adverse effect observed (not irritating)[1] Skin: no adverse effect observed (not irritating)[1]
aluminium nitride	Not Available	Eye: no adverse effect observed (not irritating)[1] Skin: no adverse effect observed (not irritating)[1]
sodium aluminium fluoride	Dermal (rabbit) LD50: >2100 mg/kg[1] Oral (rat) LD50: >5000 mg/kg[2]	Not Available
potassium chloride	Oral (rat) LD50: 2600 mg/kg[2]	Eye (rabbit): 500 mg/24h - mild
hydrogen	Not Available	Not Available

Legend: *1. Value obtained from Europe ECHA Registered Substances - Acute toxicity 2.* * Value obtained from manufacturer's SDS. Unless otherwise specified data extracted from RTECS - Register of Toxic Effect of chemical Substances*

ALUMINIUM NITRIDE	Asthma-like symptoms may continue for months or even years after exposure to the material ends. This may be due to a non-allergic condition known as reactive airways dysfunction syndrome (RADS) which can occur after exposure to high levels of highly irritating compound. Main criteria for diagnosing RADS include the absence of previous airways disease in a non-atopic individual, with sudden onset of persistent asthma-like symptoms within minutes to hours of a documented exposure to the irritant. Other criteria for diagnosis of RADS include a reversible airflow pattern on lung function tests, moderate to severe bronchial hyperreactivity on methacholine challenge testing, and the lack of minimal lymphocytic inflammation, without eosinophilia.
POTASSIUM CHLORIDE	The material may be irritating to the eye, with prolonged contact causing inflammation. Repeated or prolonged exposure to irritants may produce conjunctivitis.
ALUMINIUM & FRESH ALUMINA & ALUMINIUM NITRIDE & SODIUM ALUMINIUM FLUORIDE & HYDROGEN	No significant acute toxicological data identified in literature search.

Continued...

APPENDIX 2 – DROSS SDS

Acute Toxicity	✗	Carcinogenicity	✓
Skin Irritation/Corrosion	✗	Reproductivity	✗
Serious Eye Damage/Irritation	✗	STOT - Single Exposure	✗
Respiratory or Skin sensitisation	✗	STOT - Repeated Exposure	✓
Mutagenicity	✗	Aspiration Hazard	✗

Legend: ✗ – Data either not available or does not fill the criteria for classification
✓ – Data available to make classification

SECTION 12 ECOLOGICAL INFORMATION

Toxicity

Tomago Dross Ex Casthouse To Refiner

ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
Not Available	Not Available	Not Available	Not Available	Not Available

aluminium

ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
LC50	96	Fish	0.001-0.134mg/L	2
EC50	48	Crustacea	0.7364mg/L	2
EC50	72	Algae or other aquatic plants	0.001-0.799mg/L	2
BCF	360	Algae or other aquatic plants	9mg/L	4
NOEC	168	Crustacea	0.001-mg/L	2

fresh alumina

ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
LC50	96	Fish	0.001-0.134mg/L	2
EC50	48	Crustacea	0.7364mg/L	2
EC50	72	Algae or other aquatic plants	0.001-0.799mg/L	2
NOEC	240	Crustacea	0.001-0.1002mg/L	2

aluminium nitride

ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
LC50	96	Fish	ca.0.57mg/L	2
EC50	72	Algae or other aquatic plants	>=10.02mg/L	2
NOEC	1464	Fish	0.0012mg/L	2

sodium aluminium fluoride

ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
LC50	96	Fish	42.5mg/L	4
EC50	48	Crustacea	5mg/L	4
EC50	72	Algae or other aquatic plants	3.2mg/L	2
NOEC	72	Algae or other aquatic plants	1mg/L	2

potassium chloride

ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
LC50	96	Fish	2-10mg/L	2
EC50	48	Crustacea	83mg/L	4
EC50	72	Algae or other aquatic plants	2-500mg/L	2
NOEC	72	Algae or other aquatic plants	>=100mg/L	2

hydrogen

ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
Not Available	Not Available	Not Available	Not Available	Not Available

Legend: *Extracted from 1. IUCLID Toxicity Data 2. Europe ECHA Registered Substances - Ecotoxicological Information - Aquatic Toxicity 3. EPIWIN Suite V3.12 (QSAR) - Aquatic Toxicity Data (Estimated) 4. US EPA, Ecotox database - Aquatic Toxicity Data 5. ECETOC Aquatic Hazard Assessment Data 6. NITE (Japan) - Bioconcentration Data 7. METI (Japan) - Bioconcentration Data 8. Vendor Data*

No data.

Persistence and degradability

Ingredient	Persistence: Water/Soil	Persistence: Air
potassium chloride	HIGH	HIGH

Bioaccumulative potential

Ingredient	Bioaccumulation
potassium chloride	LOW (LogKOW = -0.4608)

Continued...

APPENDIX 2 – DROSS SDS

Acute Toxicity	✗	Carcinogenicity	✓
Skin Irritation/Corrosion	✗	Reproductivity	✗
Serious Eye Damage/Irritation	✗	STOT - Single Exposure	✗
Respiratory or Skin sensitisation	✗	STOT - Repeated Exposure	✓
Mutagenicity	✗	Aspiration Hazard	✗

Legend: ✗ – Data either not available or does not fill the criteria for classification
✓ – Data available to make classification

SECTION 12 ECOLOGICAL INFORMATION

Toxicity

Tomago Dross Ex Casthouse To Refiner

ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
Not Available	Not Available	Not Available	Not Available	Not Available

aluminium

ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
LC50	96	Fish	0.001-0.134mg/L	2
EC50	48	Crustacea	0.7364mg/L	2
EC50	72	Algae or other aquatic plants	0.001-0.799mg/L	2
BCF	360	Algae or other aquatic plants	9mg/L	4
NOEC	168	Crustacea	0.001-mg/L	2

fresh alumina

ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
LC50	96	Fish	0.001-0.134mg/L	2
EC50	48	Crustacea	0.7364mg/L	2
EC50	72	Algae or other aquatic plants	0.001-0.799mg/L	2
NOEC	240	Crustacea	0.001-0.1002mg/L	2

aluminium nitride

ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
LC50	96	Fish	ca.0.57mg/L	2
EC50	72	Algae or other aquatic plants	>=10.02mg/L	2
NOEC	1464	Fish	0.0012mg/L	2

sodium aluminium fluoride

ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
LC50	96	Fish	42.5mg/L	4
EC50	48	Crustacea	5mg/L	4
EC50	72	Algae or other aquatic plants	3.2mg/L	2
NOEC	72	Algae or other aquatic plants	1mg/L	2

potassium chloride

ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
LC50	96	Fish	2-10mg/L	2
EC50	48	Crustacea	83mg/L	4
EC50	72	Algae or other aquatic plants	2-500mg/L	2
NOEC	72	Algae or other aquatic plants	>=100mg/L	2

hydrogen

ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
Not Available	Not Available	Not Available	Not Available	Not Available

Legend: *Extracted from 1. IUCLID Toxicity Data 2. Europe ECHA Registered Substances - Ecotoxicological Information - Aquatic Toxicity 3. EPIWIN Suite V3.12 (QSAR) - Aquatic Toxicity Data (Estimated) 4. US EPA, Ecotox database - Aquatic Toxicity Data 5. ECETOC Aquatic Hazard Assessment Data 6. NITE (Japan) - Bioconcentration Data 7. METI (Japan) - Bioconcentration Data 8. Vendor Data*

No data.

Persistence and degradability

Ingredient	Persistence: Water/Soil	Persistence: Air
potassium chloride	HIGH	HIGH

Bioaccumulative potential

Ingredient	Bioaccumulation
potassium chloride	LOW (LogKOW = -0.4608)

Continued...

APPENDIX 2 – DROSS SDS

Mobility in soil

Ingredient	Mobility
potassium chloride	LOW (KOC = 14.3)

SECTION 13 DISPOSAL CONSIDERATIONS

Waste treatment methods

Product / Packaging disposal	Recovered material may be recycled and/or remelted as scrap.

SECTION 14 TRANSPORT INFORMATION

Labels Required

Marine Pollutant	NO
HAZCHEM	4W

Land transport (ADG)

UN number	3170
UN proper shipping name	ALUMINIUM SMELTING BY-PRODUCTS or ALUMINIUM REMELTING BY-PRODUCTS
Transport hazard class(es)	Class: 4.3 Subrisk: Not Applicable
Packing group	III
Environmental hazard	Not Applicable
Special precautions for user	Special provisions: 223 244 Limited quantity: 1 kg

Air transport (ICAO-IATA / DGR)

UN number	3170
UN proper shipping name	Aluminium remelting by-products; Aluminium smelting by-products
Transport hazard class(es)	ICAO/IATA Class: 4.3 ICAO / IATA Subrisk: Not Applicable ERG Code: 4W
Packing group	III
Environmental hazard	Not Applicable
Special precautions for user	Special provisions: A3 A103 Cargo Only Packing Instructions: 491 Cargo Only Maximum Qty / Pack: 100 kg Passenger and Cargo Packing Instructions: 486 Passenger and Cargo Maximum Qty / Pack: 25 kg Passenger and Cargo Limited Quantity Packing Instructions: Y477 Passenger and Cargo Limited Maximum Qty / Pack: 10 kg

Sea transport (IMDG-Code / GGVSee)

UN number	3170
UN proper shipping name	ALUMINIUM SMELTING BY-PRODUCTS or ALUMINIUM RE-MELTING BY-PRODUCTS
Transport hazard class(es)	IMDG Class: 4.3 IMDG Subrisk: Not Applicable
Packing group	III
Environmental hazard	Not Applicable
Special precautions for user	EMS Number: F-G , S-P Special provisions: 223 244

Continued...

APPENDIX 2 – DROSS SDS

Limited Quantities	1 kg

Transport in bulk according to Annex II of MARPOL and the IBC code

Not Applicable

SECTION 15 REGULATORY INFORMATION

Safety, health and environmental regulations / legislation specific for the substance or mixture

ALUMINIUM(7429-90-5) IS FOUND ON THE FOLLOWING REGULATORY LISTS

Australia Dangerous Goods Code (ADG Code) - Dangerous Goods List
Australia Dangerous Goods Code (ADG Code) - List of Emergency Action Codes
Australia Exposure Standards
Australia Hazardous Chemical Information System (HCIS) - Hazardous Chemicals
Australia Inventory of Chemical Substances (AICS)
International Air Transport Association (IATA) Dangerous Goods Regulations
International Maritime Dangerous Goods Requirements (IMDG Code)
United Nations Recommendations on the Transport of Dangerous Goods Model Regulations

FRESH ALUMINA(1344-28-1.) IS FOUND ON THE FOLLOWING REGULATORY LISTS

Australia Exposure Standards
Australia Inventory of Chemical Substances (AICS)

ALUMINIUM NITRIDE(24304-00-5) IS FOUND ON THE FOLLOWING REGULATORY LISTS

Australia Dangerous Goods Code (ADG Code) - Dangerous Goods List
Australia Dangerous Goods Code (ADG Code) - List of Emergency Action Codes
Australia Inventory of Chemical Substances (AICS)
International Air Transport Association (IATA) Dangerous Goods Regulations
International Maritime Dangerous Goods Requirements (IMDG Code)
United Nations Recommendations on the Transport of Dangerous Goods Model Regulations

SODIUM ALUMINIUM FLUORIDE(15096-52-3) IS FOUND ON THE FOLLOWING REGULATORY LISTS

Australia Dangerous Goods Code (ADG Code) - Dangerous Goods List
Australia Dangerous Goods Code (ADG Code) - List of Emergency Action Codes
Australia Hazardous Chemical Information System (HCIS) - Hazardous Chemicals
Australia Inventory of Chemical Substances (AICS)
Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Appendix E (Part 2)
Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Appendix J (Part 2)
International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs
International Air Transport Association (IATA) Dangerous Goods Regulations
International Maritime Dangerous Goods Requirements (IMDG Code)
United Nations Recommendations on the Transport of Dangerous Goods Model Regulations

POTASSIUM CHLORIDE(7447-40-7) IS FOUND ON THE FOLLOWING REGULATORY LISTS

Australia Inventory of Chemical Substances (AICS)
Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Index
Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 4
GESAMP/EHS Composite List - GESAMP Hazard Profiles
IMO IBC Code Chapter 17: Summary of minimum requirements
IMO IBC Code Chapter 18: List of products to which the Code does not apply
IMO MARPOL (Annex II) - List of Noxious Liquid Substances Carried in Bulk

HYDROGEN(1333-74-0) IS FOUND ON THE FOLLOWING REGULATORY LISTS

Australia Dangerous Goods Code (ADG Code) - Dangerous Goods List
Australia Dangerous Goods Code (ADG Code) - List of Emergency Action Codes
Australia Dangerous Goods Code (ADG Code) - Packing Instruction - Compressed Gases
Australia Hazardous Chemical Information System (HCIS) - Hazardous Chemicals
Australia Inventory of Chemical Substances (AICS)
International Air Transport Association (IATA) Dangerous Goods Regulations
International Maritime Dangerous Goods Requirements (IMDG Code)
United Nations Recommendations on the Transport of Dangerous Goods Model Regulations

National Inventory Status

National Inventory	Status
Australia - AICS	Yes
Canada - DSL	Yes
Canada - NDSL	No (hydrogen; aluminium nitride; potassium chloride; aluminium; fresh alumina)
China - IECSC	Yes
Europe - EINEC / ELINCS / NLP	Yes
Japan - ENCS	No (hydrogen; aluminium; sodium aluminium fluoride)
Korea - KECI	Yes
New Zealand - NZIoC	No (aluminium nitride)
Philippines - PICCS	Yes
USA - TSCA	Yes
Taiwan - TCSI	Yes
Mexico - INSQ	No (aluminium nitride)
Vietnam - NCI	Yes
Russia - ARIPS	Yes
Thailand - TECI	No (aluminium)
Legend:	*Yes = All CAS declared ingredients are on the inventory* *No = Not determined or one or more ingredients are not on the inventory and are not exempt from listing(see specific ingredients in brackets)*

SECTION 16 OTHER INFORMATION

Revision Date	27/06/2017
Initial Date	28/06/2004

Continued...

APPENDIX 2 – DROSS SDS

Other information

Classification of the preparation and its individual components has drawn on official and authoritative sources as well as independent review by the Chemwatch Classification committee using available literature references.

The SDS is a Hazard Communication tool and should be used to assist in the Risk Assessment. Many factors determine whether the reported Hazards are Risks in the workplace or other settings. Risks may be determined by reference to Exposures Scenarios. Scale of use, frequency of use and current or available engineering controls must be considered.

Definitions and abbreviations

PC—TWA: Permissible Concentration-Time Weighted Average
PC—STEL: Permissible Concentration-Short Term Exposure Limit
IARC: International Agency for Research on Cancer
ACGIH: American Conference of Governmental Industrial Hygienists
STEL: Short Term Exposure Limit
TEEL: Temporary Emergency Exposure Limit,
IDLH: Immediately Dangerous to Life or Health Concentrations
OSF: Odour Safety Factor
NOAEL :No Observed Adverse Effect Level
LOAEL: Lowest Observed Adverse Effect Level
TLV: Threshold Limit Value
LOD: Limit Of Detection
OTV: Odour Threshold Value
BCF: BioConcentration Factors
BEI: Biological Exposure Index

end of SDS

APPENDIX 3 – MAP OF THE SITE