Material Safety Data Sheet

Product Name: ALUMINUM-LITHIUM SKIM AND DROSS **ID: 728**

* * * Section 1 - Chemical Product and Company Identification * * *

Chemical Formula: Mixture of free Aluminum-Lithium alloy, Aluminum-Lithium oxide, and other ingredients
Product Use: Scrap reclamation
Other Designations: Aluminum-Lithium Skim and Dross

Alcoa Inc.
201 Isabella Street
Pittsburgh, PA 15212-5858

Phone: Health and Safety: 1-412-553-4649

Manufacturer/Supplier
Alcoa Inc.
Alcoa Technical Center
100 Technical Drive
Alcoa Center, PA 15069-0001

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Emergency Information: USA: Chemtrec: 1-800-424-9300 or 1-703-527-3887 Alcoa: 1-412-553-4001
Website: For a current MSDS, refer to Alcoa websites: www.alcoa.com or Internally at my.alcoa.com EHS Community

* * * Section 2 - Hazards Identification * * *

EMERGENCY OVERVIEW

Solid, dust to large chunks. Metallic appearance. Slight ammonia odor. Non-combustible as supplied. Hot dross dust, above 1290°F (700°C), may be readily ignitable. Contact with water can generate flammable and toxic gases.

Explosion/fire hazards may be present when (See Sections 5, 7 and 10 for additional information):

* Dust or fines dispersed in the air can be explosive.
* Dross is heated above 1290°F (700°C).
* Small chunks, dust or fines are in contact with water.
* Molten metal is in contact with water/moisture or certain metal oxides (e.g. rust).

Direct contact can cause severe irritation, burns, and permanent injury to the eyes and skin. Dust can cause irritation of the upper respiratory tract.

POTENTIAL HEALTH EFFECTS

The following statements summarize the health effects generally expected in cases of overexposures. User specific situations should be assessed by a qualified individual. Additional health information can be found in Section 11.

Eyes Direct contact can cause severe irritation, burns, and permanent injury.

Skin Direct contact can cause severe irritation, burns, and permanent injury, especially when wet.

Inhalation

Dust can cause irritation of the upper respiratory tract. **Acute overexposures:** Can cause central nervous system effects. **Chronic overexposures:** Can cause a reduction in the number of red blood cells (anemia), skin abnormalities (pigmentation changes), scarring of the lungs (pulmonary fibrosis), central nervous system effects, secondary Parkinson's disease and reproductive harm in males.

Additional health effects associated with gases and vapors generated on contact with water: Can cause irritation of the respiratory tract. **Acute overexposures:** Can cause difficulty breathing and the accumulation of fluid in the lungs (pulmonary edema). **Chronic overexposures:** Can cause lung damage and liver damage.

Carcinogenicity and Reproductive Hazard

Does not present any cancer hazards. Can present a reproductive hazard for males (manganese).

Medical Conditions Aggravated By Exposure to Product, Components or Compounds Formed During Processing

Asthma, chronic lung disease, skin rashes and secondary Parkinson's disease.

* * * Section 3 - Composition / Information on Ingredients * * *

Complete composition is provided below and may include some components classified as non-hazardous.

CAS #	Component	Percent
7429-90-5	Aluminum	1-80
1344-28-1	Aluminum oxide (non-fibrous)	1-75
Not Available	Metal chloride salts	0-35
11089-89-7	Lithium aluminate	1-10
Not Available	Metal nitrides	0-10
Not Available	Metal carbides	0-10
1309-48-4	Magnesium oxide	0-6.5
7439-95-4	Magnesium	0-6.5
12057-24-8	Lithium oxide	1-6
7439-93-2	Lithium	0-6
7440-50-8	Copper	0-5
7439-89-6	Iron	0-2.0
7440-66-6	Zinc	0-1.3
7440-47-3	Chromium	0-1
7439-96-5	Manganese	0-0.5

Component Related Regulatory Information

Some component information may be found under the following: Aluminum insoluble compounds.

Component Information

Aluminum dross is rich in metal content when it is skimmed off the molten metal. Variations in container type from which it is removed and different procedures used in following its removal may result in a product whose composition varies within the wide ranges shown above.

Additional compounds which can be formed on contact with water are listed in Section 8.

* * * Section 4 - First Aid Measures * * *

First Aid: Eyes

Flush eyes with plenty of water or saline for at least 20 minutes. Get emergency medical care. Call 911 if available in your area.

First Aid: Skin

Wash skin with soap and water for at least 15 minutes. Consult a physician if irritation persists.

First Aid: Inhalation

Remove to fresh air. If unconscious or severely injured, check for clear airway, breathing and presence of pulse. Perform CPR if there is no pulse or respiration. Consult a physician.

* * * Section 5 - Fire Fighting Measures * * *

Flammable/Combustible Properties

Non-combustible as supplied. Hot dross dust, above 1290°F (700°C), may be readily ignitable. Contact with water can generate flammable and toxic gases. (hydrogen, ammonia and other gases)

Fire/Explosion

May be a potential hazard under the following conditions:

* Dust or fines dispersed in the air can be explosive.
* Small chunks, dust or fines in contact with water can generate hydrogen, ammonia and other flammable or toxic gases. Hydrogen gas could present an explosion hazard in confined or poorly ventilated spaces.
* Molten metal in contact with water/moisture or other metal oxides (e.g., rust, copper oxide). Moisture entrapped by molten metal can be explosive. Finely divided metals (e.g., powders or wire) may have enough surface oxide to produce thermite reactions/explosions.

Extinguishing Media

Use Lith-X, Class D extinguishing agents, fluxing salts or dry sand on fires involving dusts, fines or molten metal.

Unsuitable Extinguishing Media

DO NOT USE:
* Halogenated agents on small chunks, dust or fines.
* Water around molten metal.

These agents will react with the burning material.

Fire Fighting Equipment/Instructions

Fire fighters should wear NIOSH approved, positive pressure, self-contained breathing apparatus and full protective clothing when appropriate.

* * * Section 6 - Accidental Release Measures * * *

Small/Large Spill

Clean up spilled material and place in dry metal containers. *If molten:* Contain the flow using dry sand or salt flux as a dam. Do not use shovels or hand tools to halt the flow of molten metal. Allow the spill to cool before remelting as scrap.

* * * Section 7 - Handling and Storage * * *

Handling/Storage

If wetted, remove to open area so that hydrogen gas does not accumulate. Prior to shipment, material should be dry and cooled to ambient temperature. Keep in closed, watertight containers. Shipment should be in closed containers, covered trailers, or covered hopper cars.

Keep material dry. Do not allow small chunks, fines or dust to contact water, particularly in enclosed areas. Avoid generating dust.

Local ventilation and vacuum systems must be designed to handle explosive dusts. Dry vacuums and electrostatic precipitators must not be used. Dust collection systems must be dedicated to aluminum dust only and should be clearly labeled as such. Do not co-mingle fines of aluminum with fines of iron, iron oxide (rust) or other metal oxides.

Requirements for Remelting of Scrap Material and/or Ingot

Molten metal and water can be an explosive combination. The risk is greatest when there is sufficient molten metal to entrap or seal off the water. Water and other forms of contamination on or contained in scrap or remelt ingot are known to have caused explosions in melting operations. While the products may have minimal surface roughness and internal voids, there remains the possibility of moisture contamination or entrapment. If confined, even a few drops of water can lead to violent explosions.

All tooling and containers which come in contact with molten metal must be preheated or specially coated and rust free. Molds and ladles must be preheated or oiled prior to casting. Any surfaces that may contact molten metal (e.g., concrete) should be specially coated.

Drops of molten metal in water (e.g. from plasma arc cutting), while not normally an explosion hazard, can generate enough flammable hydrogen gas to present an explosion hazard. Vigorous circulation of the water and removal of the particles minimize the hazards.

During melting operations, the following minimum guidelines should be observed:
* Inspect all materials prior to furnace charging and completely remove surface contamination such as water, ice, snow, deposits of grease and oil or other surface contamination resulting from weather exposure, shipment, or storage.
* Store materials in dry, heated areas with any cracks or cavities pointed downwards.
* Preheat and dry large or heavy items such as ingot adequately before charging into a furnace containing molten metal. This is typically done by use of a drying oven or homogenizing furnace. The drying cycle should bring the internal metal temperature of the coldest item of the batch to 400°F and then hold at that temperature for 6 hours.

Aluminum-Lithium products are heat treated by solution treatment and age process. When heat treating by salt bath processes, particular care must be exercised to control the temperature of the baths to prevent melting of these alloys because of the potential for explosion. For wrought products, melting can occur in the range of 1022-1122°F (550-600°C).

* * * Section 8 - Exposure Controls / Personal Protection * * *

Engineering Controls

If dust or fumes are generated: Ventilation and exhausting are required due to potential for formation of lithium oxide and lithium hydroxide. Remelting of aluminum-lithium scrap requires specialized ventilation and air pollution systems such as dry collectors.

Personal Protective Equipment

Respiratory Protection

If dust or fumes are generated: Use NIOSH-approved respiratory protection as specified by an Industrial Hygienist or other qualified professional if concentrations exceed the limits listed in Section 8, Exposure Guidelines. Suggested respiratory protection: N95. Use full face respirator with ammonia cartridge if ammonia is generated; supplied air if phosphine is generated.

Eye Protection Wear safety glasses/goggles to avoid eye contact.

Skin Protection Wear appropriate gloves and clothing to avoid direct skin contact.

General

When **Aluminum-Lithium alloys** are heated to elevated temperatures, irritating and corrosive dusts containing lithium oxide and lithium hydroxide can be generated. When these dusts are present, wear appropriate personal protective equipment (goggles and gloves) to prevent irritation or corrosive burns of the eyes and skin.

Personnel who handle and work with **molten metal** should utilize primary protective clothing like polycarbonate face shields, fire resistant tapper's jackets, neck shades (snoods), leggings, spats and similar equipment to prevent burn injuries. In addition to primary protection, secondary or day-to-day work clothing that is fire resistant and sheds metal splash is recommended for use with molten metal. Synthetic materials should never be worn even as secondary clothing (undergarments).

Exposure Guidelines

A: General Product Information

Alcoa recommends an Occupational Exposure Limit for **Lithium Oxide** of 1 mg/m3 (ceiling) TWA.
Alcoa recommends Occupational Exposure Limits for **Manganese** of 0.05 mg/m3 TWA (total particulate) and 0.02 mg/m3 TWA (respirable fraction).

B: Component Exposure Limits

Aluminum (7429-90-5)
ACGIH 1 mg/m3 TWA (respirable fraction)
OSHA 15 mg/m3 TWA (total dust); 5 mg/m3 TWA (respirable fraction)

Aluminum oxide (non-fibrous) (1344-28-1)
ACGIH 1 mg/m3 TWA (respirable fraction) (related to Aluminum insoluble compounds)
OSHA 15 mg/m3 TWA (total dust); 5 mg/m3 TWA (respirable fraction)

Magnesium oxide (1309-48-4)
ACGIH 10 mg/m3 TWA (inhalable fraction)
OSHA 15 mg/m3 TWA (total particulate)

Copper (7440-50-8)
ACGIH 0.2 mg/m3 TWA (fume); 1 mg/m3 TWA (dust and mist, as Cu)
OSHA 0.1 mg/m3 TWA (fume); 1 mg/m3 TWA (dust and mist)

Chromium (7440-47-3)
ACGIH 0.5 mg/m3 TWA
OSHA 1 mg/m3 TWA

Manganese (7439-96-5)
ACGIH 0.2 mg/m3 TWA
OSHA 5 mg/m3 Ceiling (fume)

C: Exposure Limits for Additional Compounds Which May Be Formed During Processing

Ammonia (7664-41-7)

ACGIH 25 ppm TWA
ACGIH 35 ppm STEL
OSHA 50 ppm TWA; 35 mg/m3 TWA

Hydrogen (1333-74-0)

ACGIH Simple Asphyxiant

Methane (74-82-8)

ACGIH 1000 ppm TWA (listed under Aliphatic hydrocarbon gases: Alkane C1-C4)

Phosphine (7803-51-2)

ACGIH 0.3 ppm TWA
ACGIH 1 ppm STEL
OSHA 0.3 ppm TWA; 0.4 mg/m3 TWA

* * * Section 9 - Physical & Chemical Properties * * *

Physical State:	Solid, dust to large chunks	**Appearance:**	Silvery to gray color.
Boiling Point:	Not applicable	**Melting Point:**	900-1200ºF (482-650ºC) metallic portion only
Vapor Pressure:	Not applicable	**Solubility in Water:**	Slight
Density:	2.0-3.0 g/cm3 (127-191 lb/ft3)	**pH Level:**	10-12 (slurry with water)
Odor:	Slight ammonia	**Odor Threshold:**	Not determined
Octanol-Water Coefficient:	Not applicable		

* * * Section 10 - Chemical Stability & Reactivity Information * * *

Stability

Stable under normal conditions of use, storage, and transportation as shipped.

Conditions to Avoid

Small chunks, fines, dust and molten metal are considerably more reactive with the following:

* **Water:** Generates flammable/explosive hydrogen gas, ammonia and other gases and heat. Generation rate is greatly increased with smaller particles (e.g. fines and dusts). Molten metal can react violently/explosively with water or moisture, particularly when the water is entrapped.
* **Heat:** Oxidizes at a rate dependent upon temperature and particle size.
* **Strong oxidizers:** Violent reaction with considerable heat generation. Can react explosively with nitrates (e.g., ammonium nitrate and fertilizers containing nitrate) particularly when heated or molten.
* **Acids and alkalis:** Reacts to generate flammable/explosive hydrogen gas. Generation rate is greatly increased with smaller particles (e.g., fines and dusts).
* **Halogenated compounds:** Many halogenated hydrocarbons, including halogenated fire extinguishing agents, can react violently with finely divided aluminum.
* **Iron oxide (rust) and other metal oxides (e.g., copper and lead oxides):** A violent thermite reaction generating considerable heat can occur. Reaction with aluminum fines and dusts requires only very weak ignition sources for initiation. Molten aluminum can react violently with iron oxide without external ignition source.
* **Iron powder and water:** An explosive reaction forming hydrogen gas occurs when heated above 1470°F (800°C).

Salt bath heat treatment of aluminum-lithium alloys may cause severe exothermic reactions if the alloy melts in the salt bath.

* * * Section 11 - Toxicological Information * * *

Health Effects Associated with Individual Ingredients

Aluminum dust, fines and fumes Low health risk by inhalation. Generally considered to be biologically inert (milling, cutting, grinding).

Alumina (aluminum oxide) Low health risk by inhalation. Generally considered to be biologically inert.

Metal chloride salts Can cause irritation of the eyes, skin and gastrointestinal tract. Ingestion: Can cause diarrhea, loss of appetite, low blood pressure (hypotension), central nervous system effects (dizziness, nausea and loss of coordination) and respiratory arrest.

Lithium Can cause severe irritation and burns of eyes and skin, especially when wet. Can cause irritation of respiratory tract. Skin contact: Can cause dermatitis. Acute overexposures: Can cause central nervous system effects (sedation and confusion), coma and death. Chronic overexposures: Can cause kidney damage, thyroid function changes, altered mental states, central nervous system effects, cardiovascular system effects and gastrointestinal tract effects (nausea, vomiting and pain). Associated with birth defects (heart abnormalities and central nervous system damage).

Copper dust and mists Can cause irritation of eyes, mucous membranes, skin and respiratory tract. Chronic overexposures: Can cause reduction in the number of red blood cells (anemia), skin abnormalities (pigmentation changes) and hair discoloration.

Manganese dust or fumes Chronic overexposures: Can cause inflammation of the lung tissue, scarring of the lungs (pulmonary fibrosis), central nervous system damage, secondary Parkinson's disease and reproductive harm in males.

Chromium dust and mist Can cause irritation of eyes, skin and respiratory tract. **Chromium and trivalent chromium** IARC/NTP: Listed as "unclassifiable as to carcinogenicity in humans" by IARC (Group 3).

Health Effects Associated with Individual Compounds Formed During Processing

Ammonia gas/vapor Can cause severe irritation of eyes, skin and respiratory tract. Acute overexposures: Can cause throat spasms, swelling of the throat, obstruction of the upper airway, constriction of the bronchial tubes and the accumulation of fluid in the lungs (pulmonary edema). Chronic overexposures: Can cause lung damage.

Phosphine Can cause irritation of eyes and respiratory tract. Acute overexposures: Can cause headache, vomiting, abdominal pain, cough, drowsiness (narcosis), difficulty breathing, malaise, central nervous system effects (nausea, dizziness and loss of coordination), the accumulation of fluid in the lungs (pulmonary edema), seizures, coma and death. Chronic overexposures: Can cause liver damage. Additional information: Associated with an increased risk of cancer of the blood forming organs.

Acute Toxicity of Ingredients/Formed Compounds

A: General Product Information No information available for product.

B: Component Analysis - LD50/LC50

Aluminum oxide (non-fibrous) (1344-28-1)
Oral LD50 Rat: >5000 mg/kg
Magnesium (7439-95-4)
Oral LD50 Rat: 230 mg/kg
Iron (7439-89-6)
Oral LD50 Rat: 984 mg/kg
Manganese (7439-96-5)
Oral LD50 Rat: 9 g/kg

C: Formed Compound Toxicity - LD50s/LC50s

Ammonia (7664-41-7)
Inhalation LC50 Rat: 5.1 mg/L/1H; Inhalation LC50 Rat:2000 ppm/4H; Oral LD50 Rat:350 mg/kg
Hydrogen (1333-74-0)
Inhalation LC50 Rat: >15000 ppm/1H
Methane (74-82-8)
Inhalation LC50 Mouse: 326 g/m3/2H
Phosphine (7803-51-2)
Inhalation LC50 Rat: 11 ppm/4H

Carcinogenicity of Ingredients
A: Ingredient Carcinogenicity - IARC/NTP

Component	CAS	IARC 1	IARC 2A	IARC 2B	IARC 3	IARC 4	NTP K	NTP RA
Chromium	7440-47-3	No	No	No	Yes	No	No	No

B: Ingredient Carcinogenicity - ACGIH

Aluminum (7429-90-5)
ACGIH A4 - Not Classifiable as a Human Carcinogen
Aluminum oxide (non-fibrous) (1344-28-1)
ACGIH A4 - Not Classifiable as a Human Carcinogen (related to Aluminum insoluble compounds)
Magnesium oxide (1309-48-4)
ACGIH A4 - Not Classifiable as a Human Carcinogen
Chromium (7440-47-3)
ACGIH A4 - Not Classifiable as a Human Carcinogen

C: Ingredient References

Chromium (7440-47-3)
IARC Monograph 49 [1990] (listed under Chromium and Chromium compounds), Supplement 7 [1987]

Carcinogenicity of Compounds Formed During Processing
None of the compounds formed during processing are classified by IARC, NTP or ACGIH.

Descriptions of IARC and NTP Classifications
IARC 1: The agent is carcinogenic to humans. There is sufficient evidence that a causal relationship existed between exposure to the agent and human cancer.
IARC 2A: The agent is probably carcinogenic to humans. Generally includes agents for which there is limited evidence of carcinogenicity in humans and sufficient evidence of carcinogenicity in experimental animals.
IARC 2B: The agent is possibly carcinogenic to humans. Generally includes agents for which there is limited evidence in humans and less than sufficient evidence in experimental animals.
IARC 3: The agent is not classifiable as to its carcinogenicity to humans. Generally includes agents for which there is inadequate evidence in humans and inadequate or limited evidence in experimental animals.
IARC 4: The agent is probably not carcinogenic to humans. Generally includes agents for which there is evidence suggesting lack of carcinogenicity in humans and in experimental animals.
NTP K: Known to be a human carcinogen.
NTP RA: Reasonably anticipated to be a human carcinogen.

* * * Section 12 - Ecological Information * * *

Ecotoxicity
A: General Product Information
No information available for product.
B: Component Analysis - Ecotoxicity - Aquatic Toxicity

Copper (7440-50-8)
96 Hr LC50 Pimephales promelas: 23 µg/L; 96 Hr LC50 Oncorhynchus mykiss: 13.8 µg/L; 96 Hr LC50 Lepomis macrochirus: 236 µg/L
72 Hr EC50 Scenedesmus subspicatus: 120 µg/L
96 Hr EC50 water flea: 10 µg/L; 96 Hr EC50 water flea: 200 µg/L
Iron (7439-89-6)
96 Hr LC50 Morone saxatilis: 13.6 mg/L [static]
Zinc (7440-66-6)
96 Hr LC50 Pimephales promelas: 6.4 mg/L
96 Hr EC50 Selenastrum capricornutum: 30 µg/L
72 Hr EC50 water flea: 5 µg/L

Environmental Fate

No information available for product.

* * * Section 13 - Disposal Considerations * * *

Disposal Instructions

While no specific standards have been established by the Food and Drug Administration (FDA), caution indicates that lithium containing scrap must not be recycled in such a manner as to become a component of FDA sensitive products.

If scrap is to be reclaimed by melting, it should be done with a qualified understanding of the health and safety issues described in Sections 3 and 5. If scrap is sent off-site, recipient should be made aware that the product contains lithium.

US EPA Waste Number & Descriptions

A: General Product Information

If reuse or recycle is not possible, then characterize in accordance with applicable regulations (40 CFR 261 or state equivalent in the U.S.) prior to disposal. TCLP testing is recommended for chromium.

B: Component Waste Numbers

RCRA waste codes other than described under Section A may apply depending on use of product. Refer to 40 CFR 261 or state equivalent in the U.S.

* * * Section 14 - Transportation Information * * *

Special Transportation

	PSN #1	**PSN #2**	**PSN #3**	**PSN #4**
Notes:	(1)(2)(3)(4)(5)(6)(7)(8)(9)(10)			
UN NA Number:	UN 3170			
Proper Shipping Name:	Aluminum remelting by-products			
Hazard Class:	4.3, (8)			
Packing Group:	PG III			
RQ:	-			
Other -	MSDS-0728 Aluminum-Lithium Skim			
TDG-Equivalent Level of Safety Permit	See note (4)			
STCC	49-163-22			
HTS	2620.40.0060			
OECD Waste Code	See note (7)			
Canada EIHWHRMR ID	See note (8)			

Notes:

(1) Shipment Prohibited Wet or Hot. Per Part 173.241(c) sift-proof, water tight, non-DOT specification portable tanks suitable for transport of liquids (including totes) are authorized for PG III solids in the domestic U.S. See Special Provision B115 for sift-proof, non-specification bulk packaging provisions in the U.S.

(2) In the US, a class 8 subsidiary risk placard **may** be applied to bulk shipments per SP-128 when appropriate [Also Ref: 49 CFR 172.505(d) and 172.519(b)(4)]. When the CL8 subsidiary risk is not present, delete the entry (8) that appears after the primary hazard class of 4.3 on the above table. When deleted, also make certain the class 8 placard is removed from the shipping container.

(3) In the US, loading and utilizing non-DOT specification integral gaskets, liners, non-structural additional packaging materials, bins, packagings, flexible bags, drums etc. may be considered non-structural additional packaging components <u>only if</u> necessary to render a bulk packaging (trailer, rail car, bulk bin) a sift-proof closed vehicle. Shipping paperwork for units so loaded should reflect one unit, e.g. 1 trailer, 1 rail car etc. (even if an LTL or LCL) and not the number of packaging pieces or components utilized. RQ's when applicable, will be based on the net weight of the load. Marking, labeling and placarding rules applicable to the vehicle and not the additional packaging components, apply. [DOT 94-05-02 interpretation].

(4) Equivalent Level of Safety permits are no longer required in order to ship 4.3 materials (e.g.; UN 3170) in sift-proof and vented bulk packagings in Canada as Part 5, Section 14 of the TDG has updated references to revised packaging standards (CSA-B621-road and CGSB43.147-rail) to reflect those conditions that used to be in the permits (SR4247, SR4367, SR4715).

(5) Standard Transportation Commodity Code/Hazmat Code STCC 49-163-22 applies and is required for rail shipments. This STCC code can also be used when required by other carrier modes and B/L generation and billing systems.

(6) Import/export HTSUS (Harmonized Tariff Schedule) subheading 2620.40.0060 <u>Ash and residue containing metal or metal compounds, mainly aluminum</u> applies.

(7) *MUST BE CONFIRMED:* The OECD (Organization for Economic Cooperation & Development) Control system for Transfrontier Movements of Wastes Destined for Recovery Operations [C(2001)/107 Final version] refers to the Basel Convention, which classifies Aluminum Skimmings (or Skim), excluding Salt as B1100. However, in Annex IX of the Basel Convention and according to Chapter II B(6)(c) of the OECD, wastes that exhibit a characteristic (Annex III of Basel and Appendix 2 of OECD, respectively) are to be managed as a hazardous waste and are to be subject to the Amber control procedures. Aluminum Dross meets the characteristic of H4.3 and H10, therefore is to be managed under Amber control procedures and as a hazardous waste per the Basel Convention. ***OECD code to be assigned is under investigation***.

(8) *MUST BE CONFIRMED:* Under the Canadian Environmental Protection Act, 1999 and according to SOR/2005-149: Export and Import of Hazardous Waste and Hazardous Recyclable Material Regulations (EIHWHRMR) under Definitions and Interpretations, 2(1)(b), Aluminum dross is considered a "hazardous recyclable material" as it meets the 4.3 hazard class of the TDG and when it is destined for recovery of metals and metal compounds (R4-Schedule 2 of the EIHWHRMR). The Identification Number at Schedule 4 Part 2: None Assigned.

(9) *MUST BE CONFIRMED:* The International Waste Identification Code (IWIC), a code established by the OECD, as required by Environment Canadian EIHWHRMR Part 1, section 8(j)(i) is: Q1//R4//S41//C6+7+22//H4.3+10//A222.

(10) For UN 3170, Alcoa maintains the following PSN internal convention: a) skim, dross and salts are designated as Aluminum remelting by-products no matter the source, and b) SPL and SPL contaminated materials are designated as Aluminum smelting by-products (See R.F. Burnos Memorandum dated June 16, 2005).

Canadian Controlled Products Regulation PIN:	4.3, UN 3170

* * * Section 15 - Regulatory Information * * *

US Federal Regulations

A: General Product Information

In reference to Title VI of the Clean Air Act of 1990, this material does not contain nor was it manufactured using ozone-depleting chemicals.

All electrical equipment must be suitable for use in hazardous atmospheres involving aluminum powder in accordance with 29 CFR 1910.307. The National Electrical Code, NFPA 70, contains guidelines for determining the type and design of equipment and installation that will meet this requirement.

B: Component Analysis

This material contains one or more of the following chemicals required to be identified under SARA Section 302 (40 CFR 355 Appendix A), SARA Section 313 (40 CFR 372.65) and/or CERCLA (40 CFR 302.4).

Aluminum (7429-90-5)

SARA 313: 1.0 % de minimis concentration (dust or fume only)

Copper (7440-50-8)

SARA 313: 1.0 % de minimis concentration

CERCLA: 5000 lb final RQ (no reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is larger than 100 micrometers); 2270 kg final RQ (no reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is larger than 100 micrometers)

Zinc (7440-66-6)

CERCLA: 1000 lb final RQ (no reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is larger than 100 micrometers); 454 kg final RQ (no reporting of releases of this hazardous substance is required if the diameter of the solid metal released is larger than 100 micrometers)

Chromium (7440-47-3)

CERCLA: 5000 lb final RQ (no reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is larger than 100 micrometers); 2270 kg final RQ (no reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is larger than 100 micrometers)

SARA 311/312 Physical and Health Hazard Categories:

Immediate (acute) Health Hazard: Yes, if particulates/fumes generated during processing.
Delayed (chronic) Health Hazard: Yes, if particulates/fumes generated during processing.
Fire Hazard: No
Sudden Release of Pressure: No
Reactive: Yes, if molten

State Regulations

A: General Product Information

PENNSYLVANIA "Special Hazardous Substance": Chromium.

B: Component Analysis - State

The following components appear on one or more of the following state hazardous substances lists:

Component	CAS #	CA	FL	MA	MN	NJ	PA
Aluminum	7429-90-5	Yes	No	Yes	Yes	Yes	Yes
Aluminum oxide (non-fibrous)	1344-28-1	Yes	No	Yes	Yes	Yes	Yes
Magnesium oxide	1309-48-4	Yes	No	Yes	Yes	Yes	Yes
Magnesium	7439-95-4	Yes	No	Yes	No	Yes	Yes
Lithium oxide	12057-24-8	No	No	No	Yes	No	No
Lithium	7439-93-2	No	No	Yes	No	Yes	Yes
Copper	7440-50-8	Yes	No	Yes	Yes	Yes	Yes
Iron	7439-89-6	Yes	No	No	No	No	No
Zinc	7440-66-6	Yes	No	Yes	No	Yes	Yes
Chromium	7440-47-3	Yes	No	Yes	Yes	Yes	Yes
Manganese	7439-96-5	Yes	No	Yes	Yes	Yes	Yes

Other Regulations

A: General Product Information

Material meets the criteria for inclusion in WHMIS B6, D2A, D2B.

B: Component Analysis - WHMIS IDL

The following components are identified under the Canadian Hazardous Products Act Ingredient Disclosure List:

Component	CAS #	Minimum Concentration
Aluminum	7429-90-5	1 %
Aluminum oxide (non-fibrous)	1344-28-1	1 %
Magnesium oxide	1309-48-4	1 %
Copper	7440-50-8	1 %
Chromium	7440-47-3	0.1 %

C: Component Analysis - Inventory

Component	CAS #	TSCA	DSL	EINECS	AUST.	MITI
Aluminum	7429-90-5	Yes	Yes	Yes	Yes	No
Aluminum oxide (non-fibrous)	1344-28-1	Yes	Yes	Yes	Yes	Yes
Lithium aluminate	11089-89-7	Yes	No	No	No	No
Magnesium oxide	1309-48-4	Yes	Yes	Yes	Yes	Yes
Magnesium	7439-95-4	Yes	Yes	Yes	Yes	No
Lithium oxide	12057-24-8	Yes	Yes	Yes	Yes	Yes
Lithium	7439-93-2	Yes	Yes	Yes	Yes	No
Copper	7440-50-8	Yes	Yes	Yes	Yes	No
Iron	7439-89-6	Yes	Yes	Yes	Yes	No
Zinc	7440-66-6	Yes	Yes	Yes	Yes	No
Chromium	7440-47-3	Yes	Yes	Yes	Yes	No
Manganese	7439-96-5	Yes	Yes	Yes	Yes	No

Inventory information

MITI Inventory: Pure metals are not specifically listed by CAS or MITI number on the MITI Inventory. However, the class of compounds for each of these metals is listed.

* * * Section 16 - Other Information * * *

MSDS History

Original: March 11, 1992
Supersedes: July 26, 2007
Revised: June 16, 2008

MSDS Status

06/16/2008: Changes in Sections 2, 3, 4, 8, 9, 11 and 14.
07/26/2007: Reviewed on a periodic basis in accordance with Alcoa policy. Changes in Sections 1, 2, 3, 4, 5, 8, 11, 12, 13, 14 and 15.
04/13/2004: Changes in Sections 2, 3, 5, 7, 8, 14 and 15.
02/08/2003: New format. Replaces Reynolds MSDS 5330 for Aluminum-Lithium Dross.

Prepared By

Hazardous Materials Control Committee
Preparer: Stephanie Williams, 412-553-1479/Jon N. Peace, 412-553-2293

MSDS System Number

145330

Other Information

* Guide to Occupational Exposure Values-2008, Compiled by the American Conference of Governmental Industrial Hygienists (ACGIH).
* Documentation of the Threshold Limit Values and Biological Exposure Indices, Sixth Edition, 1991, Compiled by the American Conference of Governmental Industrial Hygienists, Inc. (ACGIH).
* NIOSH Pocket Guide to Chemical Hazards, U.S. Department of Health and Human Services, February 2004.
* Patty's Industrial Hygiene and Toxicology: Volume II: Toxicology, 4th ed., 1994, Patty, F. A.; edited by Clayton, G. D. and Clayton, F. E.: New York: John Wiley & Sons, Inc.
* expub, www.expub.com, Expert Publishing, LLC.

Key-Legend:

ACGIH	American Conference of Governmental Industrial Hygienists
AICS	Australian Inventory of Chemical Substances
CAS	Chemical Abstract Service
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CPR	Cardio-pulmonary Resuscitation
DOT	Department of Transportation
DSL	Domestic Substances List (Canada)
EC	Effective Concentration
ED	Effective Dose
EINECS	European Inventory of Existing Commercial Chemical Substances
EPA	Environmental Protection Act
IARC	International Agency for Research on Cancer
LC_{50}	Lethal concentration (50 percent kill)
LC_{Lo}	Lowest published lethal concentration
LD_{50}	Lethal dose (50 percent kill)
LD_{Lo}	Lowest published lethal dose
LFL	Lower Flammable Limit
MITI	Ministry of International Trade & Industry
NFPA	National Fire Protection Association
NIOSH	National Institute for Occupational Safety and Health
NORM	Naturally Occurring Radioactive Materials
NTP	National Toxicology Program
OEL	Occupational Exposure Limit
OSHA	Occupational Safety and Health Administration
PEL	Permissible Exposure Limit
PIN	Product Identification Number
PSN	Proper Shipping Name
RCRA	Resource Conservation and Recovery Act
SARA	Superfund Amendments and Reauthorization Act
STEL	Short Term Exposure Limit
TCLP	Toxic Chemicals Leachate Program
TDG	Transportation of Dangerous Goods

TLV	Threshold Limit Value
TSCA	Toxic Substance Control Act
TWA	Time Weighted Average
UFL	Upper Flammable Limit
WHMIS	Workplace Hazardous Materials Information System
atm	atmosphere
cm	centimeter
g, gm	gram
in	inch
kg	kilogram
lb	pound
m	meter
mg	milligram
ml, ML	milliliter
mm	millimeter
mppcf	million particles per cubic foot
n.o.s.	not otherwise specified
ppb	parts per billion
ppm	parts per million
psia	pounds per square inch absolute
u	micron
ug	microgram

INFORMATION HEREIN IS GIVEN IN GOOD FAITH AS AUTHORITATIVE AND VALID; HOWEVER, NO WARRANTY, EXPRESS OR IMPLIED, CAN BE MADE.

This is the end of MSDS # 728

ALUMINUM-LITHIUM SKIM AND DROSS

⚠ WARNING

Physical Hazards: Non-combustible as supplied. Explosion potential may be present when: (1) Dross is heated above 1290°F, (2) Small chunks, fines or dust are in contact with water or (3) Molten aluminum is in contact with water/moisture or other metal oxides (e.g. rust).

On contact with water, dross can produce flammable and toxic gases.

Health Hazards: Health effects generally expected in cases of overexposure:
EYES: Direct contact can cause severe irritation, burns, and permanent injury.
SKIN: Direct contact can cause severe irritation, burns, and permanent injury, especially when wet.
INHALATION: Can cause irritation of the upper respiratory tract. **Acute overexposures:** Can cause central nervous system effects. **Chronic overexposures:** Can cause reduction in the number of red blood cells (anemia), skin abnormalities (pigmentation changes), scarring of the lungs (pulmonary fibrosis), central nervous system effects, secondary Parkinson's disease and reprod uctive harm in males.
Additional health effects associated with gases and vapors generated on contact with water: Can cause irritation of the respiratory tract. **Acute overexposures:** Can cause difficulty breathing and the accumulation of fluid in the lungs (pulmonary edema). **Chronic overexposures:** Can cause lung damage and liver damage.

Precautions: Keep material dry. Avoid generating dust. (added) Use with adequate ventilation.
Wear appropriate eye and skin protection to prevent direct contact. Wear appropr iate respiratory protection (N95, full face with ammonia cartridge if ammonia is generated ; supplied air if phosphine is generated) if concentrations exceed the permissible limits.

First Aid: EYES: Flush eyes with plenty of water or saline for at least 20 minutes. Get emergency medical care. Dial 911, if available. SKIN: Wash with soap and water for at least 15 minutes. Consult a physician if irritation persists. INHALATION: Remove to fresh air. If unconscious or severely i njured, check for clear airway, breathing and presence of pulse. Perform CPR if there is no pulse or respiration. Consult a physician.

In case of fire: Use Lith-X Class D extinguishing agents, fluxing salts, or dry sand on dusts, fines or molten metal. Do NOT use: Halogenated agents on small chunks, dust or fines; water around molten aluminum. These agents will react with the burning material.

Read Alcoa Material Safety Data Sheet No. 728 for more information about use and disposal.

Emergency Phone: (412) 553-4001.

INGREDIENTS:	CAS NUMBERS:	INGREDIENTS	CAS NUMBERS:
Aluminum	7429-90-5	Lithium oxide	12057-24-8
Aluminum oxide (non-fibrous)	1344-28-1	Lithium	7439-93-2
Metal chloride salts	---	Copper	7440-50-8
Lithium aluminate	11089-89-7	Iron	7439-89-6
Metal nitrides	---	Zinc	7440-66-6
Metal carbides	---	Chromium	7440-47-3
Magnesium oxide	1309-48-4	Manganese	7439-96-5
Magnesium	7439-95-4		

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ALCOA

6/08 728