MATERIAL SAFETY DATA SHEET

1. Product and Company Identification

Material Name	**ALUMINUM SKIM AND DROSS**
MSDS Number	471
Chemical Formula	Mixture
Product use	Metal recovery
Synonym(s)	Aluminum * Skim * Skim blocks * Black dross * Bulk dross * Chunky dross * Dross dust * Dross pellets * "Grizzly" dross * Rich dross * Salt dross * Trench metal * Écumes * Écumes d'aluminium * Écumes de fonderie * Crasses de fonderie * Écumes du centre de coulée * Écumes de fournaises * Scorie
Manufacturer information	Alcoa Inc. 201 Isabella Street Pittsburgh, PA 15212-5858 US Health and Safety: +1-412-553-4649
Emergency Information	USA: Chemtrec: +1-703-527-3887 +1-800-424-9300 ALCOA: +1-412-553-4001
Website	For a current Material Safety Data Sheet, refer to Alcoa websites: www.alcoa.com or Internally at my.alcoa.com EHS Community

2. Hazards Identification

Emergency overview

Solid, dust to large chunks. Silver to gray. Slight ammonia odor. Non-combustible as supplied. Hot dross dust (above 1290°F or 700°C) may ignite readily.

Explosion/fire hazards may be present when (See Sections 5, 7 and 10 for additional information):
- Dross is heated above 1290ºF (700ºC).
- Small chunks, dust or fines are in contact with water.
- Molten metal in contact with water/moisture or certain metal oxides (e.g., rust, copper oxide).

Direct contact: Can cause severe irritation of the eyes and irritation of the skin. Dust: Can cause irritation of the upper respiratory tract.

Contact with water can generate flammable and toxic gases. Vapors: Can cause severe irritation of the eyes, skin and respiratory tract. Acute overexposures: Can cause difficulty breathing and the accumulation of fluid in the lungs.

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.
Skin	Direct contact: Can cause irritation especially when wet. Prolonged or repeated skin contact may cause sensitization.
Inhalation	Dust: Can cause irritation of the upper respiratory tract. Chronic overexposures: Can cause reduction in the number of red blood cells (anemia), skin abnormalities (pigmentation changes), respiratory sensitization, scarring of the lungs (pulmonary fibrosis), central nervous system damage, secondary Parkinson's disease and reproductive harm in males. Health effects of additional compounds which may be formed on contact with water: Vapors: Can cause severe 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	Can present a cancer hazard (Nickel). Can present a reproductive hazard (Manganese).
Medical conditions aggravated by exposure to product	Asthma, chronic lung disease, Secondary Parkinson's disease and skin rashes.

3. Composition / Information on Ingredients

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

Components	CAS #	Percent
Aluminum oxide (non-fibrous)	1344-28-1	10 - 90
Aluminum	7429-90-5	10 - 90
Metal chloride salts	CASNo. Not available	0 - 40
Silicon	7440-21-3	0 - 23
Zinc	7440-66-6	0 - 11
Copper	7440-50-8	0 - 11
Metal nitrides	CASNo. Not available	0 - 10
Metal carbides	CASNo. Not available	0 - 10
Magnesium	7439-95-4	0 - 10
Magnesium oxide	1309-48-4	0 - 10
Iron	7439-89-6	0 - 10
Tin	7440-31-5	0 - 7
Nickel	7440-02-0	0 - 5
Manganese	7439-96-5	0 - 2
Chromium	7440-47-3	<1

Additional 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 following its removal may result in a product whose composition varies within the wide ranges shown above.
While lead is not intentionally added to this mixture, it could potentially enter through the recycle stream. If lead is present, see MSDS 391.
Additional compounds which may be formed on contact with water are listed in Section 8.

4. First Aid Measures

First aid procedures

Eye contact Rinse eyes with plenty of water or saline for at least 15 minutes. Consult a physician immediately.

Skin contact Wash with soap and water for at least 15 minutes. Get medical attention if irritation develops or persists.

Inhalation Remove to fresh air. Check for clear airway, breathing, and presence of pulse. Provide cardiopulmonary resuscitation for persons without pulse or respirations. Consult a physician.

5. Fire Fighting Measures

Flammable/Combustible Properties Non-combustible as supplied. Hot dross dust (above 1290°F or 700°C) may ignite readily. Contact with water can generate flammable and toxic gases (ammonia, phosphine, hydrogen and methane).

Fire / Explosion Hazards May be a potential hazard under the following conditions:
• Small chunks, dust or fines in contact with water can generate flammable or toxic gases. These gases could present an explosion hazard in confined or poorly ventilated spaces.
• Molten metal in contact with water/moisture or certain metal oxides (e.g., rust, copper oxide). Moisture entrapped by molten metal can be explosive. Contact of molten aluminum with certain metal oxides can initiate a thermite reaction. Finely divided metals (e.g., powders or wire) may have enough surface oxide to produce thermite reactions/explosions.

Extinguishing media

Suitable extinguishing media: Use Class D extinguishing agents on fines, dust or molten metal. Use coarse water spray on chunks, dust or fines.

Unsuitable extinguishing media: DO NOT USE halogenated extinguishing agents on small chunks, dust or fines.
DO NOT USE water in fighting fires around molten metal.
These fire extinguishing agents will react with the burning material.

Protection of firefighters

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

6. Accidental Release Measures

Spill or leak procedure: Collect scrap for recycling. Shovel into a dry metal container.
If molten: Contain the flow using dry sand or salt flux as a dam. All tooling (e.g., shovels or hand tools) and containers which come in contact with molten metal must be preheated or specially coated, rust free and approved for such use. Allow the spill to cool before remelting as scrap.

7. Handling and Storage

Handling: Keep material dry. Avoid generating dust. Avoid contact with skin and eyes.

Prior to shipment, material should be dry and cooled to ambient temperature. Shipment should be in closed containers, covered trailers, or covered hopper cars.

Storage: Keep material dry. Store in a tightly closed, water-tight container. Do not allow small chunks, fines or dust to contact water, particularly in enclosed areas. If wetted, remove to open area.

Requirements for Remelting of Scrap Material 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, containers, molds and ladles which come in contact with molten metal must be preheated or specially coated, rust free and approved for such use. 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 items 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 metal temperature of the coldest item of the batch to 400°F (200°C) and then hold at that temperature for 6 hours.

Thermite explosions have been reported when aluminum alloys were melted in furnaces used for alloying with lead, bismuth or other metals with low melting temperatures. These metals, when added as high purity ingots, can seep through cracks in furnace liners and become oxidized. During subsequent melts in the furnace, molten aluminum can contact these metal oxides resulting in a thermite explosion.

8. Exposure Controls / Personal Protection

Engineering controls: Dust and fumes from processing: Use with adequate ventilation to meet the limits listed in Section 8.

Occupational exposure limits

U.S. - OSHA

Components	Type	Value	Form
Aluminum (7429-90-5)	TWA	5 mg/m3	(respirable fraction)
	TWA (total dust)	15 mg/m3	(total dust)

Components	Type	Value	Form
Aluminum oxide (non-fibrous) (1344-28-1)	TWA	5 mg/m3	(respirable fraction)
	TWA (total dust)	15 mg/m3	(total dust)
Chromium (7440-47-3)	TWA	1 mg/m3	
Copper (7440-50-8)	TWA	1 mg/m3	(dust and mist)
	TWA (fume)	0.1 mg/m3	(fume)
Magnesium oxide (1309-48-4)	TWA	15 mg/m3	(fume, total particulate)
Manganese (7439-96-5)	Ceiling	5 mg/m3	(fume)
Nickel (7440-02-0)	TWA	1 mg/m3	
Silicon (7440-21-3)	TWA	5 mg/m3	(respirable fraction)
	TWA (total dust)	15 mg/m3	(total dust)
Tin (7440-31-5)	TWA	2 mg/m3	

Compounds Formed During Processing	Type	Value	Form
Ammonia (7664-41-7)	TWA	50 ppm	
		35 mg/m3	
Phosphine (7803-51-2)	TWA	0.3 ppm	
		0.4 mg/m3	

Alcoa

Components	Type	Value	Form
Aluminum (7429-90-5)	TWA	3 mg/m3	(respirable fraction)
		10 mg/m3	(8 Hour)
Aluminum oxide (non-fibrous) (1344-28-1)	TWA	10 mg/m3	(8 Hour)
		3 mg/m3	(respirable fraction)
Manganese (7439-96-5)	TWA	0.05 mg/m3	(total dust, as Mn)
		0.02 mg/m3	(respirable fraction, as Mn)

ACGIH

Components	Type	Value	Form
Aluminum (7429-90-5)	TWA	1 mg/m3	(respirable fraction)
Aluminum oxide (non-fibrous) (1344-28-1)	TWA	1 mg/m3	(respirable fraction, as Al)
Chromium (7440-47-3)	TWA	0.5 mg/m3	
Copper (7440-50-8)	TWA	1 mg/m3	(Cu, dust and mist)
	TWA (fume)	0.2 mg/m3	(fume)
Magnesium oxide (1309-48-4)	TWA	10 mg/m3	(inhalable fraction)
Manganese (7439-96-5)	TWA	0.2 mg/m3	
Nickel (7440-02-0)	TWA	1.5 mg/m3	(inhalable fraction)
Tin (7440-31-5)	TWA	2 mg/m3	

Compounds Formed During Processing	Type	Value	Form
Ammonia (7664-41-7)	STEL	35 ppm	
	TWA	25 ppm	
Methane (74-82-8)	TWA	1000 ppm	
Phosphine (7803-51-2)	STEL	1 ppm	
	TWA	0.3 ppm	

Personal protective equipment

Eye / face protection Wear safety glasses with side shields. Use tight fitting goggles if excessive levels of dust are generated.

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

Respiratory protection Dust and fumes from processing: Use NIOSH-approved respiratory protection as specified by an Industrial Hygienist or other qualified professional if concentrations exceed the limits listed in Section 8. Suggested respiratory protection: N95, Full face mask for ammonia, Supplied air respirators for phosphine.

General

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).

9. Physical & Chemical Properties

Form	Solid, dust to large chunks.
Appearance	Silver to gray.
Boiling point	Not applicable
Melting point	899.6 - 1202 °F (482 - 650 °C) (metal)
Flash point	Not applicable
Auto-ignition temperature	Not applicable
Flammability limits in air, lower, % by volume	Not applicable
Flammability limits in air, upper, % by volume	Not applicable
Vapor pressure	Not applicable
Vapor density	Not applicable
Solubility (water)	Slight
Density	2.3 - 3 g/cm3 (143.589 - 187.290 lb/ft3)
pH	< 11.5 (saturated aqueous solution)
Odor	Slight ammonia odor.
Partition coefficient (n-octanol/water)	Not applicable

10. Chemical Stability & Reactivity Information

Chemical stability	Stable under normal conditions of use, storage, and transportation as shipped.
Conditions to avoid	Small chunks, dust or fines and molten metal are considerably more reactive with the following: • Water: Slowly generates flammable/explosive hydrogen gas 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) 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 or molten 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: Explosive reaction forming hydrogen gas when heated above 1470°F (800°C).
Hazardous polymerization	Will not occur.

11. Toxicological Information

Health effects associated with ingredients

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

Aluminum dust/fines and fumes: 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.

Silicon (inert dusts): Chronic overexposures: Can cause chronic bronchitis and narrowing of airways.

Copper dust/mists: Can cause irritation of the 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.

Tin (dust or fume): Chronic overexposures: Can cause benign lung disease (stannosis).

Nickel dust and fume: Can cause irritation of eyes, skin and respiratory tract. Eye contact: Can cause inflammation of the eyes and eyelids (conjunctivitis). Skin contact: Can cause sensitization and allergic contact dermatitis. Chronic overexposures: Can cause perforation of the nasal septum, inflammation of the nasal passages (sinusitis), respiratory sensitization, asthma and scarring of the lungs (pulmonary fibrosis). Nickel alloys IARC/NTP: Reviewed and not recommended for listing by NTP. Listed as possibly carcinogenic to humans by IARC (Group 2B).

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

Chromium dust and fumes: Can cause irritation of eye, skin and respiratory tract.
Metallic chromium and trivalent chromium: Not classifiable as to their carcinogenicity to humans by IARC.

Health effects associated with 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 lung (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.

Component analysis - LD50 No information available for product.

Components

Toxicology Data - Selected LD50s and LC50s

Aluminum oxide (non-fibrous) (1344-28-1)	Oral LD50 Rat >5000 mg/kg
Iron (7439-89-6)	Oral LD50 Rat 984 mg/kg
Magnesium (7439-95-4)	Oral LD50 Rat 230 mg/kg
Manganese (7439-96-5)	Oral LD50 Rat 9 g/kg
Nickel (7440-02-0)	Oral LD50 Rat >9000 mg/kg
Silicon (7440-21-3)	Oral LD50 Rat 3160 mg/kg

Compounds Formed During Processing

Toxicology Data - Selected LD50s and LC50s

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

Carcinogenicity No information available for product.

Components

ACGIH - Threshold Limit Values - Carcinogens

Aluminum (7429-90-5)	A4 - Not Classifiable as a Human Carcinogen
Aluminum oxide (non-fibrous) (1344-28-1)	A4 - Not Classifiable as a Human Carcinogen
Chromium (7440-47-3)	A4 - Not Classifiable as a Human Carcinogen
Magnesium oxide (1309-48-4)	A4 - Not Classifiable as a Human Carcinogen
Nickel (7440-02-0)	A5 - Not Suspected as a Human Carcinogen

IARC - Group 2B (Possibly Carcinogenic to Humans)

Nickel (7440-02-0)	Monograph 49 [1990]; Supplement 7 [1987]

12. Ecological Information

Ecotoxicity

Components

Ecotoxicity - Freshwater Algae Data

Copper (7440-50-8)	72 Hr EC50 Pseudokirchneriella subcapitata: 0.0426 - 0.0535 mg/L [static]; 96 Hr EC50 Pseudokirchneriella subcapitata: 0.031 - 0.054 mg/L [static]
Nickel (7440-02-0)	72 Hr EC50 Pseudokirchneriella subcapitata: 0.18 mg/L; 96 Hr EC50 Pseudokirchneriella subcapitata: 0.174 - 0.311 mg/L [static]
Zinc (7440-66-6)	96 Hr EC50 Pseudokirchneriella subcapitata: 0.11 - 0.271 mg/L [static]; 72 Hr EC50 Pseudokirchneriella subcapitata: 0.09 - 0.125 mg/L [static]

Ecotoxicity - Freshwater Fish Species Data

Copper (7440-50-8)	96 Hr LC50 Pimephales promelas: 0.0068 - 0.0156 mg/L; 96 Hr LC50 Pimephales promelas: <0.3 mg/L [static]; 96 Hr LC50 Pimephales promelas: 0.2 mg/L [flow-through]; 96 Hr LC50 Oncorhynchus mykiss: 0.052 mg/L [flow-through]; 96 Hr LC50 Lepomis macrochirus: 1.25 mg/L [static]; 96 Hr LC50 Cyprinus carpio: 0.3 mg/L [semi-static]; 96 Hr LC50 Cyprinus carpio: 0.8 mg/L [static]; 96 Hr LC50 Poecilia reticulata: 0.112 mg/L [flow-through]
Iron (7439-89-6)	96 Hr LC50 Morone saxatilis: 13.6 mg/L [static]; 96 Hr LC50 Cyprinus carpio: 0.56 mg/L [semi-static]
Nickel (7440-02-0)	96 Hr LC50 Brachydanio rerio: >100 mg/L; 96 Hr LC50 Cyprinus carpio: 1.3 mg/L [semi-static]; 96 Hr LC50 Cyprinus carpio: 10.4 mg/L [static]
Zinc (7440-66-6)	96 Hr LC50 Pimephales promelas: 2.16-3.05 mg/L [flow-through]; 96 Hr LC50 Pimephales promelas: 0.211-0.269 mg/L [semi-static]; 96 Hr LC50 Pimephales promelas: 2.66 mg/L [static]; 96 Hr LC50 Cyprinus carpio: 30 mg/L; 96 Hr LC50 Cyprinus carpio: 0.45 mg/L [semi-static]; 96 Hr LC50 Cyprinus carpio: 7.8 mg/L [static]; 96 Hr LC50 Lepomis macrochirus: 3.5 mg/L [static]; 96 Hr LC50 Oncorhynchus mykiss: 0.24 mg/L [flow-through]; 96 Hr LC50 Oncorhynchus mykiss: 0.

Ecotoxicity - Water Flea Data

Copper (7440-50-8)	48 Hr EC50 Daphnia magna: 0.03 mg/L [Static]
Nickel (7440-02-0)	48 Hr EC50 Daphnia magna: >100 mg/L; 48 Hr EC50 Daphnia magna: 1 mg/L [Static]
Zinc (7440-66-6)	48 Hr EC50 Daphnia magna: 0.139 - 0.908 mg/L [Static]

Compounds Formed During Processing

Ecotoxicity - Freshwater Fish Species Data

Ammonia (7664-41-7)	96 Hr LC50 Cyprinus carpio: 0.44 mg/L; 96 Hr LC50 Lepomis macrochirus: 0.26 - 4.6 mg/L; 96 Hr LC50 Lepomis macrochirus: 1.17 mg/L [flow-through]; 96 Hr LC50 Pimephales promelas: 0.73 - 2.35 mg/L; 96 Hr LC50 Pimephales promelas: 5.9 mg/L [static]; 96 Hr LC50 Poecilia reticulata: >1.5 mg/L; 96 Hr LC50 Poecilia reticulata: 1.19 mg/L [static]

Ecotoxicity - Microtox Data

Ammonia (7664-41-7)	5 min EC50 Photobacterium phosphoreum: 2.0 mg/L (15 °C)

Ecotoxicity - Water Flea Data

Ammonia (7664-41-7)	48 Hr LC50 Daphnia magna: 25.4 mg/L

Environmental Fate No data available for product.

13. Disposal Considerations

Disposal instructions Reuse or recycle material whenever possible. If reuse or recycling is not possible, disposal must be made according to local or governmental regulations.

Waste codes Status must be determined at the point of waste generation. If material is disposed as a waste, it must be characterized under RCRA according to 40 CFR, Part 261, or state equivalent in the U.S. TCLP testing is recommended for chromium, lead and selenium.

14. Transport Information

General Shipping Information

Basic shipping description:

UN number	UN3170
Proper shipping name	Aluminum remelting by-products
Hazard class	4.3
Packing group	III

Additional description & information:

HTS	2620.40.0060
STCC	49-163-22
OECD	B1100-see notes
BASEL	B1100-see notes

General Shipping Notes

• Shipment Prohibited Wet or Hot.
• The import/export HTS (Harmonized Tariff Schedule) code given above is the United States HTS code provided by Alcoa's Customs Compliance Office in Knoxville, TN. Other country specific HTS codes may apply. If available, more information on the HTS codes will be provided on country specific Material Safety Data Sheets.
• 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 Skim & Dross (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 / Appendix 2 of OECD, respectively) are to be managed as a hazardous waste and are to be subject to the Amber control procedures. Aluminum Skim & Dross meets the characteristic of H4.3, therefore is to be managed under Amber control procedures and as a hazardous waste per the Basel Convention. OECD code to be confirmed with competent authorities.
• 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.

U.S. Department of Transportation (DOT)

Additional description & information:

Reportable quantity	RQ
Technical name	ZINC & NICKEL
Special provisions	B115

DOT Specific Notes

• Per United States transportation regulations 49 CFR 173.241(c), sift-proof, non-Department of Transportation specification, portable tanks suitable for transport of liquids (including totes) are authorized for Packing Group III solids in the domestic U.S.
• See Special Provision B115 for sift-proof, non-specification bulk packaging provisions in the U.S.
• Delete "RQ & Zinc & Nickel" reference when in packages less than 2000 lb. of pieces of metal having a diameter smaller than 100 micrometers (0.004 inches).
• Delete "RQ, Zinc & Nickel" reference when the Zinc & Nickel concentration by weight in the dross is less than 20,000 ppm (2%) and 2,000 ppm (0.2%) respectively.
• In the U.S., 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" only if necessary to render a bulk packaging (e.g.; Trailer, rail car, bulk bin) a sift-proof closed vehicle. Shipping papers for units so loaded should reflect one unit(e.g.; 1-trailer, 1 rail car, etc), and not the number of packaging pieces or components utilized-even if an LTL or LCL. RQ's when applicable, are to be based on the net weight of the load. Marking, labeling and placarding rules are applicable to the vehicle and not the additional packaging components (RE: DOT May 2, 1994 interpretation).

15. Regulatory Information

US federal regulations

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 which will meet this requirement.

Components

U.S. - CERCLA/SARA - Hazardous Substances and their Reportable Quantities

Chromium (7440-47-3)	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)
Copper (7440-50-8)	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)
Nickel (7440-02-0)	100 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); 45.4 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)	454 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); 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)

U.S. - CERCLA/SARA - Section 313 - Emission Reporting

Aluminum (7429-90-5)	1.0 % de minimis concentration (dust or fume only)
Chromium (7440-47-3)	1.0 % de minimis concentration
Copper (7440-50-8)	1.0 % de minimis concentration
Manganese (7439-96-5)	1.0 % de minimis concentration
Nickel (7440-02-0)	0.1 % de minimis concentration
Zinc (7440-66-6)	1.0 % de minimis concentration (dust or fume only)

State regulations

Components

U.S. - California - 8 CCR Section 339 - Director's List of Hazardous Substances

Aluminum (7429-90-5)	Present
Aluminum oxide (non-fibrous) (1344-28-1)	Present
Chromium (7440-47-3)	Present
Copper (7440-50-8)	Present
Iron (7439-89-6)	Present
Magnesium (7439-95-4)	Present
Magnesium oxide (1309-48-4)	Present
Manganese (7439-96-5)	Present
Nickel (7440-02-0)	Present
Tin (7440-31-5)	Present
Zinc (7440-66-6)	Present

U.S. - California - Proposition 65 - Carcinogens List

Nickel (7440-02-0)	carcinogen, initial date 10/1/89

U.S. - Massachusetts - Right To Know List

Aluminum (7429-90-5)	Present
Aluminum oxide (non-fibrous) (1344-28-1)	Present
Chromium (7440-47-3)	Carcinogen; Extraordinarily hazardous
Copper (7440-50-8)	Present
Magnesium (7439-95-4)	Present
Magnesium oxide (1309-48-4)	Present (fume)
Manganese (7439-96-5)	Present
Nickel (7440-02-0)	Carcinogen; Extraordinarily hazardous
Silicon (7440-21-3)	Present (dust, exempt when encapsulated or if particulates are not present and cannot be substantially generated through use of the product)
Tin (7440-31-5)	Present
Zinc (7440-66-6)	Present

U.S. - Minnesota - Hazardous Substance List

Aluminum (7429-90-5)	Present (dust)
Aluminum oxide (non-fibrous) (1344-28-1)	Present (dust)
Chromium (7440-47-3)	Present
Copper (7440-50-8)	Present (dust, fume, and mist)
Magnesium oxide (1309-48-4)	Present
Manganese (7439-96-5)	Present
Nickel (7440-02-0)	Carcinogen
Silicon (7440-21-3)	Present (dust)

State regulations

Components

U.S. - Minnesota - Hazardous Substance List

Tin (7440-31-5)	Present

U.S. - New Jersey - Right to Know Hazardous Substance List

Aluminum (7429-90-5)	sn 0054
Aluminum oxide (non-fibrous) (1344-28-1)	sn 2891
Chromium (7440-47-3)	sn 0432
Copper (7440-50-8)	sn 0528
Magnesium (7439-95-4)	sn 1136
Magnesium oxide (1309-48-4)	sn 1144 (fume)
Manganese (7439-96-5)	sn 1155 (dust and fume)
Nickel (7440-02-0)	sn 1341 (dust and fume)
Silicon (7440-21-3)	sn 3125 (powder)
Tin (7440-31-5)	sn 1858
Zinc (7440-66-6)	sn 2021 (dust and fume)

U.S. - Pennsylvania - RTK (Right to Know) - Special Hazardous Substances

Chromium (7440-47-3)	Present
Nickel (7440-02-0)	Present

U.S. - Pennsylvania - RTK (Right to Know) List

Aluminum (7429-90-5)	Environmental hazard
Aluminum oxide (non-fibrous) (1344-28-1)	Environmental hazard
Chromium (7440-47-3)	Environmental hazard; Special hazardous substance
Copper (7440-50-8)	Environmental hazard (dust and fume)
Magnesium (7439-95-4)	Present
Magnesium oxide (1309-48-4)	Present
Manganese (7439-96-5)	Environmental hazard
Nickel (7440-02-0)	Environmental hazard; Special hazardous substance
Silicon (7440-21-3)	Present
Tin (7440-31-5)	Present
Zinc (7440-66-6)	Environmental hazard

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories

Immediate Hazard - Yes, If particulates/fumes generated during processing.
Delayed Hazard - Yes, If particulates/fumes generated during processing.
Fire Hazard - No
Pressure Hazard - No
Reactivity Hazard - Yes, If molten

Inventory status

Country(s) or region	Inventory name	On inventory (yes/no)*
Australia	Australian Inventory of Chemical Substances (AICS)	Yes
Canada	Domestic Substances List (DSL)	Yes
Canada	Non-Domestic Substances List (NDSL)	No
China	Inventory of Existing Chemical Substances in China (IECSC)	No
Europe	European Inventory of New and Existing Chemicals (EINECS)	Yes
Europe	European List of Notified Chemical Substances (ELINCS)	No
Japan	Inventory of Existing and New Chemical Substances (ENCS)	No
Korea	Existing Chemicals List (ECL)	Yes
New Zealand	New Zealand Inventory	No
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	No
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

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

Inventory information

Japan - ENCS Inventory: Pure metals are not specifically listed by CAS or ENCS number. The class of compounds for each of these metals is listed on the ENCS inventory.

16. Other Information

MSDS History	Origination date: March 1, 1983 Supersedes: April 28, 2008 Revision date: March 30, 2010
MSDS Status	March 30, 2010: New format. April 28, 2008: Change(s) in Section: 1, 2, 4, 8, 9, 11, 13 and 14. June 21, 2007: Reviewed on a periodic basis in accordance with Alcoa policy. Change(s) in Section: 1, 2, 3, 4, 5, 8, 11, 12, 13, 14 and 15 April 6, 2004: Change(s) in Section: 3, 5, 7, 8, 14 and 15. January 15, 2002: New format: Replaces Reynolds MSDSs 5126 and 5152 and Alumax MSDS for dross.
Prepared By	Hazardous Materials Control Committee Preparer: Jon N. Peace, 412-553-2293/Robert W. Barr, 412-553-2618/Jim Perriello, 480-278-6928
MSDS System Number	115912

Other information

- Guide to Occupational Exposure Values 2009, 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.
- Dangerous Properties of Industrial Materials, Sax, N. Irving, Van Nostrand Reinhold Co., Inc., 1984.
- 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, Expert Publishing, LLC., www.expub.com
- Aluminum Association's Bulletin F-1, "Guidelines for Handling Aluminum Fines Generated During Various Aluminum Fabricating Operations." The Aluminum Association, 1525 Wilson Boulevard, Suite 600, Arlington, Virginia 22209, www.aluminum.org.
- Aluminum Association, "Guidelines for Handling Molten Aluminum, The Aluminum Association, 1525 Wilson Boulevard, Suite 600, Arlington, Virginia 22209, www.aluminum.org.
- NFPA 65, Standard for Processing and Finishing of Aluminum (NFPA phone: 800-344-3555)
- NFPA 651, Standard for Manufacture of Aluminum and Magnesium Powder
- NFPA 70, Standard for National Electrical Code (Electrical Equipment, Grounding and Bonding)
- NFPA 77, Standard for Static Electricity

Key/Legend:

ACGIH	American Conference of Governmental Industrial Hygienists
AICS	Australian Inventory of Chemical Substances
CAS	Chemical Abstract Services
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
ENCS	Japan - Existing and New Chemical Substances
EWC	European Waste Catalogue
EPA	Environmental Protective Agency
IARC	International Agency for Research on Cancer
LC	Lethal Concentration
LD	Lethal Dose
MAK	Maximum Workplace Concentration (Germany) "maximale Arbeitsplatz-Konzentration"
NDSL	Non-Domestic Substances List (Canada)
NIOSH	National Institute for Occupational Safety and Health
NTP	National Toxicology Program
OEL	Occupational Exposure Limit
OSHA	Occupational Safety and Health Administration
PIN	Product Identification Number
PMCC	Pensky Marten Closed Cup
RCRA	Resource Conservation and Recovery Act
SARA	Superfund Amendments and Reauthorization Act
SIMDUT	Système d'Information sur les Matières Dangereuses Utilisées au Travail
STEL	Short Term Exposure Limit
TCLP	Toxic Chemicals Leachate Program
TDG	Transportation of Dangerous Goods
TLV	Threshold Limit Value
TSCA	Toxic Substances Control Act
TWA	Time Weighted Average
WHMIS	Workplace Hazardous Materials Information System

m meter, cm centimeter, mm millimeter, in inch,
g gram, kg kilogram, lb pound, µg microgram,
ppm parts per million, ft feet

*** End of MSDS ***

Disclaimer The information in the sheet was written based on the best knowledge and experience currently available.

ALUMINUM SKIM AND DROSS

CAUTION: Non-combustible as supplied. Hot dross dust (above 1290°F or 700°C) may ignite readily.
Explosion/fire hazards may be present when: Dross is heated above 1290ºF (700ºC). Small chunks, dust or fines are in contact with water. Molten metal in contact with water/moisture or certain metal oxides (e.g., rust, copper oxide).
Direct contact: Can cause severe irritation of the eyes and irritation of the skin. Dust: Can cause irritation of the upper respiratory tract. Chronic overexposures: Can cause reduction in the number of red blood cells, skin abnormalities, respiratory sensitization, scarring of the lungs, central nervous system damage, secondary Parkinson's disease and reproductive harm in males.
Contact with water can generate flammable and toxic gases. Vapors: Can cause severe irritation of the eyes, skin and respiratory tract. Acute overexposures: Can cause difficulty breathing and the accumulation of fluid in the lungs. Chronic overexposures: Can cause lung damage and liver damage.

FIRST AID

Eye contact Rinse eyes with plenty of water or saline for at least 15 minutes. Consult a physician immediately.

Skin contact Wash with soap and water for at least 15 minutes. Get medical attention if irritation develops or persists.

Inhalation Remove to fresh air. Check for clear airway, breathing, and presence of pulse. Provide cardiopulmonary resuscitation for persons without pulse or respirations. Consult a physician.

See Alcoa Material Safety Data Sheet No. 471 for more information about use and disposal.
Emergency Phone: (412) 553-4001.

FIRE FIGHTING

Suitable extinguishing media Use Class D extinguishing agents on fines, dust or molten metal. Use coarse water spray on chunks, dust or fines.

Extinguishing media which must not be used for safety reasons DO NOT USE halogenated extinguishing agents on small chunks, dust or fines. DO NOT USE water in fighting fires around molten metal. These fire extinguishing agents will react with the burning material.

SPILL PROCEDURES

Spill or leak procedure Collect scrap for recycling. Shovel into a dry metal container.

HANDLING AND STORAGE

Handling Keep material dry. Avoid generating dust. Avoid contact with skin and eyes.

Storage Keep material dry. Store in a tightly closed, water-tight container. Do not allow small chunks, fines or dust to contact water, particularly in enclosed areas. If wetted, remove to open area.

Contains:

Aluminum oxide (non-fibrous)	1344-28-1
Aluminum	7429-90-5
Metal chloride salts	CASNo. Not available
Silicon	7440-21-3
Zinc	7440-66-6
Copper	7440-50-8
Metal nitrides	CASNo. Not available
Metal carbides	CASNo. Not available
Magnesium	7439-95-4
Magnesium oxide	1309-48-4
Iron	7439-89-6
Tin	7440-31-5
Nickel	7440-02-0
Manganese	7439-96-5
Chromium	7440-47-3

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ALCOA