



SAFETY DATA SHEET

SECTION 1: IDENTIFICATION

Material Name: ALUMINUM SKIM AND DROSS
Chemical Formula: Mixture
Product Use: Metal Recovery
 Aluminum * Skim * Skim blocks * Black dross * Bulk dross * Chunky dross * Dross dust * Dross pellets * "Grizzly" dross * Rich dross * Salt dross * Trench metal
Synonym(s):

Manufacturer Information:

Pennex Aluminum Company, LLC.
 50 Community Street
 Wellsville, PA 17365
 (717) 432-9647

Pennex Aluminum Company, LLC.
 93 Werner Road
 Greenville, PA 16125

Emergency Information: Professional Emergency Resources Services (PERS)
 800-633-8253

Website: For a current Safety Data Sheet, refer to Pennex website:
www.Pennexaluminum.com

SECTION 2: HAZARDS IDENTIFICATION

DANGER



Physical Hazards:	Substance and mixtures which, in contact with water, emit flammable gasses	Category 2
Health Hazards:	Skin Corrosion / irritation	Category 2
	Serious eye damage / eye irritation	Category 1
	Sensitisation, respiratory	Category 1
	Sensitisation, skin	Category 1
	Carcinogenicity	Category 2
	Reproductive toxicity	Category 1B
	Specific target organ toxicity, repeated exposure (inhalation) (lungs, central nervous System, systemic toxicity)	Category 1

Environmental Hazards:	Not classified	
OSHA defined hazards:	Combustible dust	

HAZARD STATEMENT:

In contact with water releases flammable gas. Causes skin irritation. Causes serious eye irritation. May cause allergy or asthma symptoms or breathing difficulties if inhaled. May cause an allergic skin reaction. Suspected of causing cancer by inhalation. May damage fertility or the unborn child. Causes damage to organs through prolonged or repeated exposure. May form combustible dust concentrations in air. Reacts with water to release toxic gas

PRECAUTIONARY STATEMENT:

Prevention: Protect from moisture. Obtain special instructions before use. Do not breathe dust/fume/gas/mist/vapor/spray. Wear protective gloves/protective clothing/eye protection/face protection. Wash thoroughly after handling. Contaminated work clothing must not be allowed out of the workplace.

Response: In case of fire: use metal extinguishing media Class D for extinction. IF exposed or concerned, get medical advice/attention. If in eyes: rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists, get medical advice/attention. IF on skin, wash off with plenty of soap and water. If skin irritation or rash occurs, get medical advice/attention. If inhaled, if breathing is difficult, remove person to fresh air and keep comfortable for breathing. If experiencing respiratory symptoms, call POISON CONTROL.

Storage: Keep dry, Protect from moisture. Do not allow chips, fines or dust to contact water, particularly in enclosed areas.

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

Hazard(s) not otherwise classified: Reacts with water to release toxic gas.

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 1290°F (700°C). • 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.
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.
- Inhalation:** 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:** Can present a cancer hazard (Nickel).
- Reproductive Hazards:** Can present a reproductive hazard (Manganese).
- Medical Contitions aggravated by exposure to product:** Asthma, chronic lung disease, Secondary Parkinson's disease and skin rashes.

SECTION 3: COMPOSITION / INFORMATION ON INGREDIENTS

Composition Comments: Complete composition is provided below and may include some components classified as

COMPONENTS	CAS #	%
	1344-28-1	10-90
Aluminum	7429-90-5	10-90
Metal Chloride Salts	N/A	0-40
Silicon	7440-21-3	0-23
Zinc	7440-66-6	0-11
Copper	7440-50-8	0-10
Metal nitrides	N/A	0-10
Metal carbides	N/A	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.

SECTION 4: FIRST AID MEASURES

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. 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.
Ingestion:	Not likely, due to the form of the product.

SECTION 5: FIRE-FIGHTING MEASURES

Flammable/Combustible Non-combustible as supplied. Hot dross dust (above 1290°F or 700°C) may ignite readily. Contact **Properties** 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.

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: These fire extinguishing agents will react with the burning material.

DO NOT USE halogenated extinguishing agents on small chunks, dust or fines.

DO NOT USE water in fighting fires around molten metal.

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.

SECTION 6: ACCIDENTAL RELEASE MEASURES

Personal precautions, Protective equipment and emergency procedures:

Avoid generating dust. Avoid contact with skin and eyes. Avoid contact with sharp edges or heated metal. Avoid breathing dust/ fume/gas/mist/vapors/spray. Ensure adequate ventilation. Molten, heated and cold aluminum look alike; do not touch unless you know it is cold.

Evacuation Procedures:

Keep unnecessary personnel away

Methods and materials for containment and cleaning up:

Avoid dust formation. Protect from water run-on including participation. Use dry cleanup methods.

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.

Environmental precautions:

Avoid release to the environment.

SECTION 7: HANDLING AND STORAGE

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

Handling:

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.

SECTION 8: EXPOSURE CONTROL / PERSONAL PROTECTION

ENGINEERING CONTROLS

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

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).

U.S. OSHA OCCUPATIONAL EXPOSURE LIMITS

	TWA (mg/m3)	CEILING (mg/m3)	FORM
Aluminum Skim and Dross	5		respirable fraction
	15		total dust

COMPONENT	CAS #	TWA (mg/m3)	CEILING (mg/m3)	FORM
Aluminum oxide (not fibrous)	1344-28-1	5		respirable fraction
		15		total dust
Chromium	7440-47-3	1		
Copper	7440-50-8	1		dust & mist
		0.1		fume
Magnesium oxide	1309-48-4	15		fume, total particulate
Manganese	7439-96-5		5	
Nickel	7440-02-0	1		
Silicon	7440-21-3	5		respirable fraction
		15		total dust
Tin	7440-31-5	2		

US OSHA COMPOUNDS FORMED DURING PROCESSING

COMPONENT	CAS #	TWA (mg/m3)	TWA (ppm)	FORM
Ammonia	7664-41-7	35	50	
Phosphine	7803-51-2	0.4	0.3	

US ACGIH THRESHOLD LIMIT VALUES TIME WEIGHTED AVG (TLV) Non-Standard Units

COMPONENT	CAS #	TWA (mg/m3)	CEILING (mg/m3)	FORM
Aluminum	7429-90-5	1		respirable fraction
Aluminum oxide (non fibrous)	1344-28-1	1		respirable fraction, as Al
Chromium	7440-47-3	0.5		

Copper	7440-50-8	1		Cu, dust and mist
		0.2		fume
Magnesium oxide	1309-48-4	10		inhalable fraction
Manganese	7439-96-5	0.2		
Nickel	7440-02-0	1.5	5	inhalable fraction
Tin	7440-31-5	2		

SECTION 9: PHYSICAL AND 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
Autoignition Temperature:	Not applicable
Lower Flammability Limit:	Not applicable
Upper Flammability Limit:	Not applicable
Vapor Pressure:	Not applicable
Vapor Density:	Not applicable
Solubility (water):	Slight
Density:	2.3 - 3 g/cm ³ (143.589 - 187.290 lb/ft ³)
pH:	< 11.5 (saturated aqueous solution)
Odor:	Slight ammonia odor
Partition Coefficient (n-octanol/water):	Not applicable

SECTION 10: STABILITY AND REACTIVITY

Chemical Stability:	Stable under normal conditions of use, storage, and transportation as shipped. Conditions to avoid reactive with the following: Small chunks, dust or fines and molten metal are considerably more
Conditions to Avoid:	reactive with the following:
Water:	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. Violent reaction with considerable heat generation. Can react
Strong Oxidizers:	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:	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.

SECTION 11: TOXICOLOGICAL INFORMATION

Information on likely routes of entry

Eye contact:	Direct contact: Can cause severe irritation
Skin contact:	Direct contact: Can cause irritation especially when wet Dust: Can cause irritation of the upper respiratory tract. Chronic exposure: 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.
Inhalation:	Heath effects of additional compounds which may be formed on contact water: Vapors: Can causes severe irritation of the respiratory tract. Acute exposure: Can cause difficulty breathing and the accumulation of fluid in the lungs (pulmonary edema). Chronic exposure: Can cause lung damage and liver damage.
Ingestion:	Not likely, due to the form of the product

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.

Toxicology Data Selected LD50s and LC50s:

Components:	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:	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/m ³ 2 h
	Phosphine (7803-51-2)	Inhalation LC50 Rat 11 ppm 4 h

Carcinogenicity:	No information available for product.		
	Aluminum (7429-90-5)	A4	Not Classifiable as a Human Carcinogen
	Aluminum oxide (non-fibrous) (1344-28-)	A4	Not Classifiable as a Human Carcinogen
Components:	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]

SECTION 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

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.

SECTION 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.

SECTION 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 and 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 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. Dept. of Transportation (DOT) Additional Description and 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).

SECTION 15: REGULATORY INFORMATION

U.S. 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 (RQs)

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 Emissions 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

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.

Pressure Hazard: No

Reactivity Hazard: Yes, if molten

International Inventory Status

Country(ies) or Region	Inventory Name	On Inventory? (yes/no)*
Australia	Australian Inventory or 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
	European List of Notified Chemical Substances (ELINCS)	No
Japan	Inventory of Existing 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.

SECTION 16: OTHER INFORMATION

SDS History

Origination Date:

Supercedes: 10/26/2010

Revision Date: 1/23/2015

New format. October 26, 2010: Change(s). Reviewed on a periodic basis in accordance with Pennex policy.

MSDS Status:

SDS Status:

Prepared By:

Pennex Aluminum Company, LLC.

SDS System Number:

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.

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
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
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 SDS *****

Disclaimer

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