SAFETY DATA SHEET

SUPERIOR ALUMINUM ALLOYS

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1. Identification

Product identifier **Molten Aluminum**

Other means of identification

SDS number 20150401-01

Recommended use Industrial & Manufacturing

Recommended restrictions None known.

Manufacturer / Importer / Supplier / Distributor information

Company name Superior Aluminum Alloys

Address 14214 Edgerton Rd.
New Haven, IN 46774

Telephone 1-260-749-7599

E-mail sdshelp@omnisource.com

Contact person Safety Department

Emergency phone number CHEMTREC 1-800-424-9300

Molten Aluminum

2. Hazard(s) identification

Physical hazards Fire hazard
Reacts violently with water

Health hazards May be harmful in contact with skin
Causes skin irritation
Causes severe skin burns and eye damage

OSHA defined hazards

Label elements

Signal word Danger

Hazard statement Causes severe skin burns and eye damage. May be harmful in contact with skin. Causes skin irritation. Reacts violently with water.

Precautionary statement

Prevention Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Wear protective gloves/protective clothing/eye protection/face protection. Do not expose molten aluminum to water.

Response If exposed or concerned: Get medical advice/attention. Use special powder against metal fires, dry sand or graphite powder for extinction.

Storage Store in a container rated for molten aluminum.

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

Hazard(s) not otherwise classified (HNOC) Not classified

Supplemental information

3. Composition/information on ingredients

Chemical name	CAS number	%
Aluminum	7429-90-5	76-99
Silicon	7440-21-3	0.01-24
Magnesium as magnesium oxides	7439-95-4	0.01-8
Zinc	7440-66-6	0.01-7
Copper	7440-50-8	0.01-6
Iron	7439-89-6	0.01-3.5
Manganese	7439-96-5	0.01-3
Nickel	7440-02-0	0.01-3
Chromium	7440-47-3	0.01-0.5
Lead	7439-92-1	0.01-0.5

4. First-aid measures

Inhalation Move to fresh air. If breathing is difficult, give oxygen. If breathing stops, provide cardiopulmonary resuscitation. Call a physician if symptoms develop or persist.

Skin contact In case of contact with hot or molten aluminum, cool rapidly with water and seek immediate medical attention. Do not attempt to remove molten product from skin because skin may tear easily. Removal of solidified molten material from skin may require medical assistance. Emergency showers are recommended.

Eye contact Do not rub eye. If molten material contacts the eye, immediately flush with plenty of water for at least 15 minutes. Seek medical attention immediately. Eye wash fountain is recommended.

Ingestion Seek medical attention.

Most important symptoms/effects, acute and delayed Treat symptomatically

Indication of immediate medical attention and special treatment needed Treat symptomatically

General information If exposed or concerned, seek medical advice/attention. Ensure that medical personnel are aware of the material(s) involved and the hazards. Provide this safety data sheet to the medical professionals as needed.

5. Fire-fighting measures

Suitable extinguishing media Sand, Class D Extinguishers

Unsuitable extinguishing media Do not use water as an extinguisher. Hot molten material reacts violently with water. Dousing metallic fires with water may cause dangerous explosion hazards, particularly if a fire is in a confined environment.

Specific hazards arising from the chemical May generate hydrogen gas if exposed to water, acids, bases or oxidizers. Molten aluminum temperatures meet or exceed many ignition thresholds and may ignite other material or chemicals on contact.

Special protective equipment and precautions for firefighters Self-contained breathing apparatus and full protective clothing are recommended in case of fire.

Fire-fighting equipment/instructions In case of fire and/or explosion do not breathe fumes. Use sand or Class D Extinguishers. Isolating and/or controlling the molten aluminum or associated material(s) while burning or cooling may also be the safest action.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures Keep unnecessary personnel away. Eliminate all sources of ignition. Use protective equipment and clothing during clean-up. Ensure adequate ventilation.

Methods and materials for containment and cleaning up Wait for the molten aluminum to solidify if possible to mitigate a burn or explosion. Use the proper tools to clean-up – make sure the tools are not cold. Safely collect the aluminum.

Environmental precautions Avoid discharge into drains, sewers, watercourses, or the ground.

7. Handling and storage

Precautions for safe handling

Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Minimize dust generation and accumulation. Routine housekeeping should be instituted to ensure that dusts do not accumulate on surfaces. Avoid inhalation of dust and fumes. Avoid contact with eyes, skin, and clothing. Wear appropriate personal protective equipment.

Conditions for safe storage, including any incompatibilities

Store in a cool, dry, well-ventilated location. Keep away from ignitable and flammable material. Store away from incompatible materials such as water and moisture-containing material.

8. Exposure controls/personal protection

Occupational exposure limits

US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Components	Type	Value
Lead (CAS 7439-92-1)	TWA	0.05 mg/m3

US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)

Components	Type	Value	Form
Aluminum (CAS 7429-90-5)	PEL	5 mg/m3	Respirable dust.
		15 mg/m3	Total dust.
Chromium (CAS 7440-47-3)	PEL	1 mg/m3	
Copper (CAS 7440-50-8)	PEL	1 mg/m3	Dust and mist.
		0.1 mg/m3	Fume.
Manganese (CAS 7439-96-5)	Ceiling	5 mg/m3	Fume.
Nickel (CAS 7440-02-0)	PEL	1 mg/m3	
Silicon (CAS 7440-21-3)	PEL	5 mg/m3	Respirable fraction.
		15 mg/m3	Total dust.

US. ACGIH Threshold Limit Values

Components	Type	Value	Form
Aluminum (CAS 7429-90-5)	TWA	1 mg/m3	Respirable fraction.
Chromium (CAS 7440-47-3)	TWA	0.5 mg/m3	
Copper (CAS 7440-50-8)	TWA	1 mg/m3	Dust and mist.
		0.2 mg/m3	Fume.
Lead (CAS 7439-92-1)	TWA	0.05 mg/m3	
Manganese (CAS 7439-96-5)	TWA	0.1 mg/m3	Inhalable fraction.
		0.02 mg/m3	Respirable fraction.
Nickel (CAS 7440-02-0)	TWA	1.5 mg/m3	Inhalable fraction.

US NIOSH Pocket Guide to Chemical Hazards: Recommended exposure limit (REL)

Components	Type	Value	Form
Aluminum (CAS 7429-90-5)	TWA	5 mg/m3	Respirable.
		5 mg/m3	Welding fume or pyrophoric powder.
		10 mg/m3	Total
Chromium (CAS 7440-47-3)	TWA	0.5 mg/m3	
Copper (CAS 7440-50-8)	TWA	1 mg/m3	Dust and mist.
Lead (CAS 7439-92-1)	TWA	0.05 mg/m3	
Manganese (CAS 7439-96-5)	TWA	1 mg/m3	Fume.
Nickel (CAS 7440-02-0)	TWA	0.015 mg/m3	
Silicon (CAS 7440-21-3)	TWA	5 mg/m3	Respirable.
		10 mg/m3	Total

US NIOSH Pocket Guide to Chemical Hazards: Short Term Exposure Limit (STEL)

Components	Type	Value	Form
Manganese (CAS 7439-96-5)	STEL	3 mg/m3	Fume.

Biological limit values

ACGIH Biological Exposure Indices

Components	Value	Determinant	Specimen	Sampling Time
Lead (CAS 7439-92-1)	300 µg/l	Lead	Blood	*

* - For sampling details, please see the source document.

Appropriate engineering controls Observe occupational exposure limits and minimize the risk of exposure. Use process enclosures, local exhaust ventilation, or other engineering controls to control sources of dust and fumes. Provide explosion-proof ventilation for high dust concentrations. Eye wash fountain and emergency showers are recommended.

Individual protection measures, such as personal protective equipment

Eye/face protection Use tight fitting goggles if dust is generated. Wear a full-face respirator, if needed. Wear a face shield rated for molten metal when working around molten aluminum.

Skin protection

Hand protection Wear protective gloves. Heat-resistant gloves are recommended.

Other At a minimum the following is recommended protective clothing and equipment: hard-hat, steel-toed composite-toed boots, safety glasses (or if dust is present, goggles), vinex clothing, leggings/leg spats, and face shield. All mentioned protective equipment should be rated for molten aluminum. All individuals not employed by Superior Aluminum Alloys shall rely on their own hazard assessments of molten aluminum and select their own protective clothing and equipment according to industry best practices and standards.

Respiratory protection If engineering controls do not maintain airborne concentrations below recommended exposure limits (where applicable) or to an acceptable level (in countries where exposure limits have not been established), an approved respirator must be worn. A NIOSH approved respirator with the appropriate cartridge or canister, suitable for present airborne concentration levels is recommended. All individuals not employed by Superior Aluminum Alloys shall rely on their own hazard assessments respiratory protection according to industry best practices and standards.

Thermal hazards See "Other" section above under Skin Protection.

General hygiene considerations Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, or engaging in any other activity that could result in the absorption or ingestion of chemicals. Routinely wash work clothing and protective equipment to remove contaminants according to the manufacturer. Contaminated work clothing should not be allowed out of the workplace and should be handled according to Federal, State, and municipal standards.

9. Physical and chemical properties

Appearance Molten

Physical state Molten

Form Molten

Color Silver

Odor Metallic

Odor threshold Not available.

pH Not available.

Melting point 1200 °F (648.89 °C)

Initial boiling point and boiling range Not available.

Flash point Not available.

Evaporation rate Not available.

Flammability (solid, gas) Not available.

Upper/lower flammability or explosive limits

Flammability limit - lower (%) Not available.

Flammability limit - upper (%) Not available.

Explosive limit - lower (%) Not available.

Explosive limit - upper (%) Not available.

Vapor pressure Not available.

Vapor density Not available.

Relative density Not available.

Solubility(ies)	Insoluble
Partition coefficient (n-octanol/water)	Not available.
Auto-ignition temperature	Not available.
Decomposition temperature	Not available.
Viscosity	Not available.

10. Stability and reactivity

Reactivity	The product is stable and non-reactive under normal conditions of storage and transport.
Chemical stability	Material is stable under normal conditions.
Possibility of hazardous reactions	Water reacts violently.
Conditions to avoid	Minimize dust generation and accumulation. Avoid molten metal contact with water or flammable material. Metal oxide contact resulting in a thermite explosion.
Incompatible materials	Strong oxidizing agents. Acids. Bases. Halogenated compounds. Iron Oxide (rust) Water.
Hazardous decomposition products	Metal oxides.

11. Toxicological information

Information on likely routes of exposure

Ingestion	Ingestion of dusts generated during working operations may cause nausea and vomiting.
Inhalation	Dust may irritate respiratory system. May cause inhalation hypersensitivity (occupational asthma) in sensitive individuals. Prolonged exposure may cause chronic effects.
Skin contact	Dust may irritate skin and cause sensitization by skin contact. Contact with molten aluminum may cause severe burns, permanent injuries, and even death.
Eye contact	Dust may irritate eyes. Molten aluminum may cause severe burns resulting in partial or complete blindness.
Symptoms related to the physical, chemical and toxicological characteristics	Irritant effects. Rash. Discomfort in the chest. Shortness of breath. Coughing.

Information on toxicological effects

Acute toxicity High concentrations of freshly formed fumes and/or dusts of metal oxides can produce symptoms of a metal fume fever.

Components	Species	Test Results
Iron (CAS 7439-89-6)		
Acute		
Oral		
LD50	Rat	30 g/kg
Manganese (CAS 7439-96-5)		
Acute		
Oral		
LD50	Rat	9000 mg/kg
Silicon (CAS 7440-21-3)		
Acute		
Oral		
LD50	Rat	3160 mg/kg
Aluminum (CAS 7429-90-5)		
Acute		
Oral		
LD50	Rat	> 10000 mg/kg

Skin corrosion/irritation	Dust may irritate skin.
Serious eye damage/eye irritation	Dust may irritate the eyes. Molten metal may cause serious damage to eyes.
Respiratory sensitization	Dust may cause allergy or asthma symptoms or breathing difficulties if inhaled.
Skin sensitization	Dust may cause an allergic skin reaction. May irritate skin.
Germ cell mutagenicity	No data available.

Carcinogenicity Dust: Suspected of causing cancer.

IARC Monographs. Overall Evaluation of Carcinogenicity

Chromium (CAS 7440-47-3)	3 Not classifiable as to carcinogenicity to humans.
Lead (CAS 7439-92-1)	2B Possibly carcinogenic to humans.
Nickel (CAS 7440-02-0)	2B Possibly carcinogenic to humans.

NTP Report on Carcinogens

Nickel (CAS 7440-02-0)	Known To Be Human Carcinogen. Reasonably Anticipated to be a Human Carcinogen.

Reproductive toxicity Dust: May damage fertility or the unborn child.

Specific target organ toxicity - single exposure No data available.

Specific target organ toxicity - repeated exposure Dust may cause damage to organs (respiratory tract) through prolonged or repeated exposure by inhalation.

Aspiration hazard Not applicable.

Chronic effects Frequent inhalation of fume or dust over a long period of time increases the risk of developing lung diseases. Prolonged and repeated overexposure to dust can lead to benign pneumoconiosis.

Chronic inhalation of metallic oxide dust/fume may cause metal fume fever.

Further information Symptoms may be delayed.

12. Ecological information

Ecotoxicity

Components		Species	Test Results
Aluminum (CAS 7429-90-5)			
Aquatic			
Fish	LC50	Rainbow trout, Donaldson trout (Oncorhynchus mykiss)	0.16 mg/l, 96 hours
Copper (CAS 7440-50-8)			
Aquatic			
Crustacea	EC50	Water flea (Daphnia magna)	0.0318 mg/l, 48 hours
	LC50	Water flea (Daphnia magna)	0.04 - 0.05 mg/l, 48 hours
Fish	LC50	Chinook salmon (Oncorhynchus tshawytscha)	0.02 mg/l, 96 hours
		Oncorhynchus mykiss	200 µg/l, 96 hours
Iron (CAS 7439-89-6)			
Aquatic			
Fish	LC50	Channel catfish (Ictalurus punctatus)	> 500 mg/l, 96 hours
Lead (CAS 7439-92-1)			
	LC50	Rainbow trout, Donaldson trout (Oncorhynhus mykiss)	1.17 mg/l, 96 Hours
Nickel (CAS 7440-02-0)			
Aquatic			
Fish	LC50	Fathead minnow (Pimephales promelas)	2.916 mg/l, 96 hours
Zinc (CAS 7440-66-6)			
Aquatic			
Crustacea	LC50	Daphnia magna	0.068 mg/l, 48 hours
Fish	LC50	Bony fish superclass (Osteichthyes)	0.52 - 3.59 mg/l, 96 hours

Persistence and degradability The product is not readily biodegradable.

Bioaccumulative potential No data available on bioaccumulation.

Mobility in soil No data available.

Mobility in general The product is immiscible with water and will sediment in water systems.

Other adverse effects No other adverse environmental effects (e.g. ozone depletion, photochemical ozone creation potential, endocrine disruption, global warming potential) are expected from this component.

13. Disposal considerations

Disposal instructions	Disposal recommendations are based on material as supplied. Disposal must be in accordance with current applicable laws and regulations, and material characteristics at time of disposal. Waste must be kept in sealed and labeled containers. Dispose of waste and residues in accordance with local authority requirements. Recover and reclaim or recycle, if practical.
Local disposal regulations	Dispose of in accordance with local regulations.
Hazardous waste code	The waste code should be assigned in discussion between the user, the producer and the waste disposal company.
Waste from residues / unused products	Byproducts and residues from this product can be reprocessed or recycled.
Contaminated packaging	Empty containers should be taken to an approved waste handling site for recycling or disposal. Since emptied containers may retain product residue, follow label warnings even after container is emptied.

14. Transport information

General Shipping Information
ID number NA9260
Basic Shipping Information
Proper shipping name Elevated temperature liquid, n.o.s.
Technical name MOLTEN ALUMINUM
Hazard class 9, Miscellaneous Dangerous Goods
Packing group III

Shipping Notes:
Elevated temperature materials (NA9260) must be specially marked according to country specific regulations.

U.S. Department of Transportation (DOT)

Basic Shipping Information
ID number NA9260
Proper shipping name Aluminum, molten
Hazard class 9, Miscellaneous Dangerous Goods
Packing group III

DOT Specific Notes
-To be used for domestic U.S. transportation only.
-Bulk packages must be marked with the words "MOLTEN ALUMINUM" in the following manner: (1) on two opposing sides and (2) in black or white Gothic lettering on contrasting background. The marking must be displayed on the package itself or in black lettering on a plain white placard [49 CFR 172.325(b) and (a)].
-Dedicated railroads carrying molten aluminum on plant property, such as the ATRR that are not part of the (National) system, are not DOT carriers and, therefore, are not required but are permitted to follow this classification rule.

Please Note: There are no special Department of Transportation (DOT) regulations (49 CFR Subpart H) for aluminum unless transported in molten form. Molten Aluminum is regulated as a 'Hazardous Material' by the DOT because of high heat content and reactivity potential.

IATA
Not regulated as a dangerous good.

IMDG
Not regulated as a dangerous good.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code	Not applicable.

15. Regulatory information

US federal regulations This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)
Not regulated.

US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Lead (CAS 7439-92-1)	Reproductive toxicity Central nervous system Kidney Blood Acute toxicity

CERCLA Hazardous Substance List (40 CFR 302.4)

Chromium (CAS 7440-47-3)	LISTED
Copper (CAS 7440-50-8)	LISTED
Lead (CAS 7439-92-1)	LISTED
Manganese (CAS 7439-96-5)	LISTED
Nickel (CAS 7440-02-0)	LISTED
Zinc (CAS 7440-66-6)	LISTED

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories	Immediate Hazard - Yes Delayed Hazard - Yes Fire Hazard - Yes Pressure Hazard - No Reactivity Hazard - Yes
SARA 302 Extremely hazardous substance	No
SARA 311/312 Hazardous chemical	Yes

Other federal regulations

Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List

Chromium (CAS 7440-47-3)
Lead (CAS 7439-92-1)
Manganese (CAS 7439-96-5)
Nickel (CAS 7440-02-0)

Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130)

Not regulated.

Safe Drinking Water Act (SDWA)	Not regulated.
Food and Drug Administration (FDA)	Not regulated.

US state regulations

US. Massachusetts RTK - Substance List

Aluminum (CAS 7429-90-5)
Chromium (CAS 7440-47-3)
Copper (CAS 7440-50-8)
Lead (CAS 7439-92-1)
Magnesium as magnesium oxides (CAS 7439-95-4)
Manganese (CAS 7439-96-5)
Nickel (CAS 7440-02-0)
Silicon (CAS 7440-21-3)
Zinc (CAS 7440-66-6)

US. New Jersey Worker and Community Right-to-Know Act

Aluminum (CAS 7429-90-5)	500 lbs
Chromium (CAS 7440-47-3)	500 lbs
Copper (CAS 7440-50-8)	500 lbs
Lead (CAS 7439-92-1)	500 lbs
Manganese (CAS 7439-96-5)	500 lbs
Nickel (CAS 7440-02-0)	500 lbs
Zinc (CAS 7440-66-6)	500 lbs

US. Pennsylvania RTK - Hazardous Substances

Aluminum (CAS 7429-90-5)
Chromium (CAS 7440-47-3)
Copper (CAS 7440-50-8)
Lead (CAS 7439-92-1)
Magnesium as magnesium oxides (CAS 7439-95-4)
Manganese (CAS 7439-96-5)
Nickel (CAS 7440-02-0)
Silicon (CAS 7440-21-3)
Zinc (CAS 7440-66-6)

US. Rhode Island RTK

Aluminum (CAS 7429-90-5)
Chromium (CAS 7440-47-3)
Copper (CAS 7440-50-8)
Lead (CAS 7439-92-1)
Manganese (CAS 7439-96-5)
Nickel (CAS 7440-02-0)

Zinc (CAS 7440-66-6)

US. California Proposition 65

WARNING: This product contains a chemical known to the State of California to cause cancer and birth defects or other reproductive harm.

US - California Proposition 65 - Carcinogens & Reproductive Toxicity (CRT): Listed substance

Lead (CAS 7439-92-1)
Nickel (CAS 7440-02-0)

International Inventories

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)	Yes
Europe	European Inventory of Existing Commercial Chemical Substances (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	Yes
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	Yes
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

*A "Yes" indicates this product complies with the inventory requirements administered by the governing country(s).
A "No" indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(s).

16. Other information, including date of preparation or last revision

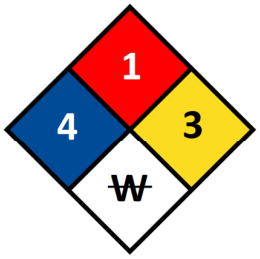
Issue date 1 April 2015

Revision date 21 April 2016

Version # 02

Further information Refer to NFPA 654, Standard for the Prevention of Fire and Dust Explosions from the Manufacturing, Processing, and Handling of Combustible Particulate Solids, for safe handling.

NFPA Rating



List of abbreviations

LD50: Lethal Dose, 50%.
LC50: Lethal Concentration, 50%.
EC50: Effective concentration, 50%.
TWA: Time weighted average.
STEL: Short term exposure limit.

References	EPA: AQUIRE database HSDB® - Hazardous Substances Data Bank US. IARC Monographs on Occupational Exposures to Chemical Agents IARC Monographs. Overall Evaluation of Carcinogenicity ACGIH Documentation of the Threshold Limit Values and Biological Exposure Indices
Disclaimer	This information is provided without warranty. The information is believed to be correct. This information should be used to make an independent determination of the methods to safeguard workers and the environment.
SDS Status / Rev. Info	-
Other information	-