



noranda

MATERIAL SAFETY DATA SHEET

Section I

Manufacturer's Name

Noranda Aluminum, Inc.
St. Jude Industrial Park
New Madrid, Missouri 3869

Emergency Telephone Number

(573) 643-2361
Daytime;(573)643-2361-Ext.2236

Chemical Name and Synonyms

Aluminum /Aluminum Alloy

Trade Name and Synonyms

Aluminum pig, sow, rod, billet, slab, ingot

Chemical Family

Aluminum

Formula

AL

Section II – Ingredients/Alloys

<i>Base Metal</i>	<i>% Composition by Weight</i>	<i>2001 ACGIH TLV (MG/M3)</i>	<i>OSHA1910.1000 TWA (MG/M3)</i>
Aluminum, Al	80.0-99.9	10.0 as metal dust & oxide 5.0 as welding fume	5.0 as respirable dust (PEL) 15.0 as total dust (PEL)
<i>Alloying Element</i>	<i>(Maximum composition by weight 1-20%)</i>	<i>ACGIH-TLV (MG/M3)</i>	<i>OSHA 1910.1000 TWA (MG/M3)</i>
Beryllium, Be	Less than 0.1% - Trace amount only	.002 as fume	.025 ceiling .005 STEL .002 PPM
Chromium, Cr	.25 max	.5 as metal .05 with water soluble compounds	1.0 as metal & insoluble salts
Copper, Cu	4.0 max	0.2 as fume 1.0 as dust/mist	0.1 as fume 1.0 as dust/mist
Iron, Fe	2.5 max	5.0 as fume/dust	10.0 as fume/dust
Magnesium, Mg	8.0 max	10.0 as oxide fume	15.0 as total particulate
Manganese, Mn	2.0 max	0.2 as inorganic compound	5.0 ceiling
Nickel, Ni	Less than .001	1.5 as metal 0.1 as soluble compound	1.0 metal
Silicon, Si	13.0 max	10.0, as total dust	5.0 respirable dust (PEL) 15.0 total dust (PEL)
Sodium, Na	Less than 1.0	hydroxide – STEL 2.0	2.0 ceiling



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The above elements in Section II are a representative sample only of the finished product and some of these elements may not be found in the finished product. Individual analyses may vary.

Section III – Physical Data

Boiling Point	NA	Specific Gravity (H2O=1)	2.65 – 2.80
Vapor Pressure (mm Hg.)	NA	Percent volatile by volume (%)	NA
Vapor Density (AIR=1)	NA	Evaporation Rate	NA

Solubility in Water: Insoluble

Appearance and Odor: Silvery White metal – Odorless

Section IV – Fire and Explosion Hazard Data

Flash Point (Method Used)	Flammable Limits	Lel	Uel
NA	NA	NA	NA

Special Fire Fighting Procedures:

Do not use halogenated-extinguishing agents on small chips or fires.

Extinguishing Media:

Use coarse water spray on chips or turnings. Use Class D extinguishing agents or dry sand on fires.

Unusual Fire and Explosion Hazards:

Firefighters should use self-contained breathing apparatus. Prevent formation of dust clouds may be explosive. Molten aluminum may explode on contact with water. May react violently with water rust.

Section V – Health Hazard Data

Aluminum dust fires and fumes are low health risks by inhalation. For standard operations i.e., milling, cutting, grinding, etc. aluminum should be treated as a nuisance dust and is so defined by the ACGIH.

Emergency First Aid Procedures:

Dust in eyes – flush for 15 minutes. Chips or sharp edges can cause cuts. Normal medical procedures for cuts.

Section VI – Reactivity Data

Stability	Unstable	<input checked="" type="checkbox"/>	Conditions to Avoid – NA
	Stable		



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Incompatibility (Materials to Avoid):

Do not use Halogen or water on dust fires.

Hazardous Decomposition Products:

See fire and explosion hazards and additional information.

Section VII – Spill or leak Procedures

Steps to be taken in case material is released or spilled:

Pick up spilled scrap for remelting.

Waste Disposal Method:

Comply with Federal, State and local disposal or discharge.

Section VIII – Special Protection Information

Respiratory Protection (Specify Type):

Appropriate PPE is required when melting, casting, forging or otherwise processing. The nature of the processing will determine what form of equipment is necessary.



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Protective Equipment:

Glasses, goggles, respirator, gloves, ear protection and protective clothing.

User is required to match employee exposure with applicable personal protective equipment as required by OSHA standards and to comply with all other OSHA standards dealing with employee protection. The personal protective equipment and respiratory protection set out herein is only a guideline. Actual exposures and OSHA standards must be used to select the appropriate personal protective equipment.

Section IX – Emergency Medical Procedures

1. For skin contact, remove particulars by thoroughly washing with soap and water.
2. For eye contact, flush with water for at least 15 minutes. Get medical attention if irritation persists.

Section X – Additional Information

1. Our product in its solid state has no unusual hazards. When melting, welding, cutting, grinding, blasting, polishing, etc., which may produce a vapor, mist dust, aerosol, particulate, etc., TLV's are given for your reference on page 1.
2. The elements in the aluminum must be treated as separate entities (see concentration in Section II).
3. Halogen acids and sodium hydroxide in contact with aluminum may generate explosive mixtures of hydrogen.
4. Finely divided aluminum will form explosive mixtures in air. It will also form explosive mixtures in air in the presence of bromates, iodates or ammonium nitrate.
5. Do not touch cast aluminum metal or heated aluminum product without knowing metal temperature. Aluminum experiences no color change during heating. If metal is hot and touched, burns can result.
6. The welding of aluminum alloys may generate carbon monoxide, carbon dioxide, ozone, nitrogen oxides, infrared radiation and ultra-violet radiation.
7. All remelt aluminum may have entrapped moisture. Precautionary measures should be taken. Explosions may result. All remelt material should be preheated prior to charging.

Section XI – Additional Information – Alloys

- a. **Beryllium (Aluminum Beryllium)** – Health Hazard Information Primary Route(s) of Exposure.

Inhalation: Inhalation of metal dust, fume or powder may result from melting, dross handling, casting, welding, grinding, crushing or similar operations which generate airborne metal particulate during use of this material.

Ingestion: Hand, clothing, food and drink contact with metal dust, fume or powder can cause ingestion of particulate during hand to mouth activities such as eating, drinking, smoking, nail biting, etc.



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Skin: Skin contact with this material may cause, in some sensitive individuals, an allergic response if elements such as chrome and nickel are present. In the form of metal dust or powder, skin contact or abrasion may also cause irritation or dermatitis.

Eyes: Particulate metal (dust, fume or powder) may be dangerous to the eye and surrounding tissue. Airborne particulate (chips, dust or powder) is always a potential problem as well as inserting fingers into the eye socket if the hand or clothing is contaminated with metal particulate.

Toxicity:

There is no information on the toxicity of this alloy. Under normal handling and use of the solid form of this material there are few health hazards. Cutting, welding, melting grinding, etc. of this material will produce dust, fume or particulate containing the component elements of this material. Exposure to the dust, fume or particulate may present significant health hazards, which are referable to the elemental constituents in Section II.

Effects of Overexposure:

Acute: The metal dust and fumes of those elements in Section II can cause irritation to the skin and mucous membranes. As dust, powder or fume, exposure, which abrades the skin, can cause irritation and dermatitis. Injury to the eyes is generally a result of particulate irritation or mechanical injury to the cornea or conjunctiva by dust or particulate. Excessive inhalation of aluminum and various aluminum alloy dusts and fumes may cause respiratory irritation, cough and bronchitis.

Chronic: Respiratory disease with symptoms ranging from shortness of breath and cough to permanent disability due to loss of lung function, fibrosis or subsequent effects on the heart may be caused by excessive exposure to dust or fumes containing beryllium. Beryllium metal and certain compounds have been linked to lung cancer. Inhalation of beryllium in excess concentrations can cause a serious lung disease; berylliosis. Aluminum has been indicated to cause gastro-intestinal disorders and non-significant changes in the lung.

Carcinogenic References:

Beryllium metal and some of its compounds have been listed in the 3rd Annual Report on Carcinogens as prepared by National Toxicology Program (NT) as well as the International agency for Research on Cancer (IARC) Monograph Series. Detailed information from these sources may be obtained from the following: IARC, Monographs on the Evaluation of the Carcinogenic Risk of Chemicals to Man; Geneva, WHO, IARC 1972-1977 (multi-volume work) 29 Sheridan Street, Albany, NY 12219. Third Annual Report on Carcinogens, Summary, September, 1983 NTP 82-330 NTP Public Information Office, MD B2-03 box 12233, Research Triangle Park, NC 27709.



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Medical conditions Aggravated by Exposure:

Persons with impaired pulmonary function, airway diseases and conditions such as asthma, emphysema, chronic bronchitis, etc. may incur further disability if excessive concentrations of dust or fume are inhaled. If prior damage or disease to the Neurologic (nervous), Circulatory, Hematologic (blood) or Renal (kidney) systems has occurred, proper screening or examinations should be conducted on individuals who may be exposed to further risk if handling and use of this material causes excessive exposure.

*Source of information - NGK Metals corporation
Environmental, Health and Safety Services
P. O. box 13367
Reading, PA 19612-3367
(215) 921-5000

b. Chromium

EFFECTS OF OVEREXPOSURE:

Effects, associated with overexposure to metal dust, may include respiratory irritation, conjunctivitis, pneumoconiosis, etc.

EMERGENCY AND FIRST AID PROCEDURES:

If irritation occurs, flush eyes, wash skin, remove to fresh air, as applicable. Contact physician.

PRIMARY ROUTE OF ENTRY:

Inhalation.

CARCINOGENICITY RATING:

The International Agency for Research on Cancer has determined a "causal" association between occupational exposure to chromium and certain chromium compounds and cancer in humans. This determination was based on evidence where exposures were essentially to hexavalent chromium compounds. The products covered in this data sheet contain chromium in the metallic state.

The American Conference of Governmental Industrial Hygienists has reviewed the available data and concluded that chromium metal is not carcinogenic to humans.

*Source of information – Shield Alloy Corporation
West Boulevard
Newfield, NJ 08344
(609) 692-4200



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- c. **Copper (Canned Copper)** – Prolonged exposure to copper fume and dust can result in upper respiratory tract irritation, nausea and metal fumes fever.

*Source of Information - U. S. Reduction Company
2025 175th Street
Lansing, IL 60438
(312) 895-9400

- d. **Iron (Pig Iron)** – No toxic effects would be expected from its normal inert solid form. Prolonged, repeated exposure to fumes or dusts generated during heating may cause adverse health effects associated with the following constituents:

Iron	OSHA Std.	10 mg/m ³
Carbon	OSHA Std.	.5 mg/m ³
Silicon	OSHA Std.	15 mg/m ³

No TLV's listed or pig iron. TLV's may be applicable to constituent elements.

Skin Contact: None
Eye Contact: None
Ingestion: None

*Source of Information - Pickands Mather & Company
100 Superior Avenue
Cleveland, OH 44114
(216) 694-5380

- e. **Magnesium Primary Ingot, MGI** – Health Hazard Data

Eye: Mechanical injury only.
Skin Contact: Mechanical injury only. Molten material may burn skin.
Skin Absorption: Skin absorption is unlikely due to physical properties.
Ingestion: Ingestion is unlikely due to physical state. If dusts are produced, amounts ingested incidental to industrial handling are not likely to cause injury; however, ingestion of larger amounts could cause serious injury, even death, because the acute or oral toxicity of magnesium is considered moderate.

Inhalation: Dust may cause irritation to upper respiratory tract.



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Systemic and Other Effects: Based on available data, repeated exposures are not anticipated to cause any significant adverse effects.

*Source of Information - Dow chemical USA
Midland, MI 48674
(517) 636-4400

f. Manganese (Metal)

FIRST AID PROCEDURES:

Inhalation: Remove from dusty area to fresh air.

Skin Contact: No hazard associated with skin contact.

Eye Contact: Flush with water to be sure that no particles remain in the eye.

EFFECTS OF OVEREXPOSURE:

Acute: Dusts in high concentrations can cause irritation of the eyes and throat. Manganese fume fever is characterized by cold-like symptoms. No residual injury is expected from acute overexposure.

Chronic: Central nervous system disorders may develop in isolated cases. No physical disorders are expected. Chronic effects usually require 3 years of overexposure to develop. No residual injury is expected from handling lump or coarse material.

*Source of Information - Elkem Metals Company
P. O. Box 1344
Niagara Falls, NY 14302
(716) 286-7548



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g. Silicon

Routes of Exposure	Yes	No	Acute Exposure Symptoms	Chronic Exposure Symptoms	Emergency Treatment & 1 st Aid
Inhalation (DUST)	X		Irritation, Coughing	Respiratory System irritation	Move to well-ventilated area
Skin Contact		X			
Skin Absorption		X			
Eye Contact (DUST)	X		Mechanical Irritation		Flush eyes with water
Ingestion					

*Source of information - Globe Metallurgical Inc.
P. O. Box 157
Beverly, OH 45715
(615) 984-2361

Section XII – SARA HAZARD NOTIFICATION

(40 C.F.R. Part 370): Immediate

Section 313 – Toxic chemicals

This product contains the following substances which are defined as toxic chemicals under and subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and to C.F.R. part 372:

Toxic Chemical Name	Chemical Abstract Service Registry	Percent by Weight & Product
Aluminum	7429-90-5	80.0-99.9
Beryllium	7440-41-7	Less than 0.1
Chromium	7440-47-3	.25 max
Copper	7440-50-8	4.0
Manganese	7439-96-5	1.2 max
Nickel	7440-02-0	Less than .001
Zinc	7440-66-6	.20 max



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Emergency Planning and Community Right-To-Know Act – Supplier Notification

Hazard categories under criteria of SARA Title III rules (40 CFR) Part 370)

Section 313 of the subject act requires us to inform you that a product or products you purchased from Noranda may contain one or more toxic chemicals. This information may be important to you if, under the act, you are required to estimate emission release of applicable toxic chemicals.

Material Safety Data Sheet of which this Section XII is a part, provides the following data:

- 1) The product or trade name containing a toxic chemical or chemicals.
- 2) The name of each toxic chemical and associated chemical abstract service registry.
- 3) The percentage by weight of each toxic chemical in the product.

Please note that per the regulations, this notification should not be detached from the accompanying MSDS and that any duplication or redistribution of the MSDS must include a copy of this notification.

The information in this MSDS was obtained from sources, which we believe are reliable. However, the information is provided without any representation or warranty, express or implied, regarding the accuracy or correctness.

The conditions or methods of handling, storage, use and disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with handling, storage, use or disposal of the product.

Troy L. Long
Safety Superintendent



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**ALUMINUM ALLOYS* (BY SERIES)
INGREDIENTS WHICH MAY BE GREATER THAN OR EQUAL TO 1%
(0.1% for Nickel, Chromium & Beryllium)**

CAS No.:	Si	(7440-21-3)	Fe	(7439-89-6)	Cu	(7440-50-8)	Mn	(7439-96-5)
	Mg	(7439-95-4)	Be	(7440-41-7)	Cr	(7440-47-3)	Bu	(7440-02-0)
	Zn	(7440-66-6)	Al	(7429-90-5)	Sn	(7440-31-5)	Ce	(7440-45-1)
	Pb	(7439-92-1)						

I) Castings (Ingot, Permanent Mold)

<u>1XX.0</u>	<u>2XX.0</u>	<u>3XX.0</u>	<u>4XX.0</u>	<u>5XX.0</u>	<u>7XX.0</u>	<u>8XX.0</u>
Aluminum	Silicon	Silicon	Silicon	Silicon	Iron	Silicon
	Iron	Iron	Iron	Iron	Copper	Copper
	Copper	Copper	Nickel	Magnesium	Magnesium	Nickel
	Magnesium	Magnesium	Aluminum	Zinc	Chromium	Aluminum
	Chromium	Chromium		Aluminum	Nickel	Tin
	Nickel	Nickel			Zinc	
	Zinc	Zinc			Aluminum	
	Aluminum	Aluminum				

II) Wrought Aluminum Alloys

<u>1XXX</u>	<u>2XXX</u>	<u>3XXX</u>	<u>4XXX</u>	<u>5XXX</u>	<u>6XXX</u>	<u>7XXX</u>	<u>8XXX</u>
Aluminum	Silicon	Silicon	Silicon	Manganese	Silicon	Copper	Silicon
	Iron	Manganese	Iron	Magnesium	Iron	Manganese	Iron
	Copper	Magnesium	Copper	Chromium	Copper	Magnesium	Copper
	Manganese	Chromium	Manganese	Zinc	Manganese	Chromium	Manganese
	Chromium	Aluminum	Magnesium	Aluminum	Magnesium	Zinc	Nickel
	Nickel		Chromium		Chromium	Aluminum	Zinc
	Aluminum		Nickel		Zinc		Cesium
			Aluminum		Aluminum		Aluminum
							Tin

To determine the percentage of each regulated constituent in the alloys you purchase, consult the following tables.



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Wrought alloys which can contain WHMIS-controlled ingredients in amounts equal to or above the threshold limits. (1)

Alloy	Cu	Mn	Cr	Ni	Footnotes/ Miscellaneous	Aluminum
1050						99.50 min
1060						99.60 min.
1065						99.65 min.
1080						99.80 min.
1100						99.00 min.
1135						99.35 min.
1235						99.35 min.
1435						99.45 min.
1145						99.45 min.
1345						99.50 min.
1250						99.50 min.
1350						99.70 min.
1170						99.75 min.
1175						99.80 min.
1180						99.85 min.
1285						99.88 min.
1188						99.99 min.
1199						60 – 100%
2008	0.7 - 1.1		0.10			60 – 100%
2011	5.0 - 6.0				0.20 – 0.6 PB	60 – 100%
2014	3.9 - 5.0	0.40 – 1.2	0.10			60 – 100%
2214	3.9 - 5.0	0.40 – 1.2	0.10			60 – 100%
2017	3.5 - 4.5	0.40 – 1.0	0.10			60 – 100%
2117	2.2 - 3.0		0.10			60 – 100%
2018	3.5 - 4.5		0.10	1.7 – 2.3		60 – 100%
2218	3.5 - 4.5		0.10	1.7 – 2.3		60 – 100%
2618	1.9 - 2.7			0.9 – 1.2		60 – 100%
2219	5.8 - 6.8					60 – 100%
2319	5.8 - 6.8					60 – 100%
2419	5.8 - 6.8					60 – 100%
2519	5.3 - 6.4					60 – 100%
2024	3.8 - 4.9		0.10			60 – 100%
2124	3.8 - 4.9		0.10			60 – 100%
2224	3.8 - 4.4		0.10			60 – 100%
2324	3.8 - 4.4		0.10			60 – 100%
2025	3.8 - 5.0	0.40 – 1.2	0.10			60 – 100%



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Alloy	Cu	Mn	Cr	Ni	Footnotes/ Miscellaneous	Aluminum
2036	2.2 - 3.0		0.10			60 - 100%
2090	2.4 - 3.0					60 - 100%
2091	1.8 - 2.5		0.10			60 - 100%
3002						60 - 100%
3102						60 - 100%
3003		1.0 - 1.5				60 - 100%
3303		1.0 - 1.5				60 - 100%
3004		1.0 - 1.5				60 - 100%
3005		1.0 - 1.5	0.10			60 - 100%
3105			0.20			60 - 100%
4032	0.50 - 1.3		0.10	0.50 - 1.3		60 - 100%
4009	1.0 - 1.5					60 - 100%
4343						60 - 100%
4045						60 - 100%
4145	3.3 - 4.7		0.15			60 - 100%
4047						60 - 100%
5005			0.10			60 - 100%
5042			0.10			60 - 100%
5050			0.10			60 - 100%
5051			0.10			60 - 100%
5151			0.10			60 - 100%
5052			0.15 - 0.35			60 - 100%
5252						60 - 100%
5352			0.10			60 - 100%
5552						60 - 100%
5652			0.15 - 0.35			60 - 100%
5154			0.15 - 0.35			60 - 100%
5254			0.15 - 0.35			60 - 100%
5454		0.50 - 1.0	0.05 - 0.20			60 - 100%
5554		0.50 - 1.0	0.05 - 0.20			60 - 100%
5654			0.15 - 0.35			60 - 100%
5754		0.50	0.30			60 - 100%
5056			0.05 - 0.20			60 - 100%
5356			0.05 - 0.20			60 - 100%
5456		0.50 - 1.0	0.05 - 0.20			60 - 100%
5556		0.50 - 1.0	0.05 - 0.20			60 - 100%
5357						60 - 100%
5457						60 - 100%
5657						60 - 100%



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Alloy	Cu	Mn	Cr	Ni	Footnotes/ Miscellaneous	Aluminum
5082			0.15			60 – 100%
5182			0.10			60 – 100%
5083		0.40 – 1.0	0.05 – 0.25			60 – 100%
5183		0.50 – 1.0	0.05 – 0.25			60 – 100%
5086			0.05 – 0.25			60 – 100%
6101						60 – 100%
6201						60 – 100%
6003			0.35			60 – 100%
6005			0.10			60 – 100%
6105			0.10			60 – 100%
6006			0.10			60 – 100%
6009			0.10			60 – 100%
6010			0.10			60 – 100%
6013	0.6 – 1.1		0.10			60 – 100%
6017	0.05 – 0.20		0.10			60 – 100%
6151	0.35		0.15 – 0.35			60 – 100%
6351	0.10					60 – 100%
6951	0.15 – 0.40					60 – 100%
6053	0.10		0.15 – 0.3			60 – 100%
6253	0.10		0.04 – 0.35			60 – 100%
6061	0.15 – 0.40		0.04 – 0.35			60 – 100%
6262	0.15 – 0.40		0.04 – 0.14		0.40 – 0.7 PB	60 – 100%
6063	0.10		0.10			60 – 100%
6463	0.15					60 – 100%
6066	0.7 – 1.2	0.6 – 1.1	0.40			60 – 100%
6070	0.15 – 0.4	0.4 – 1.0	0.10			60 – 100%
7001	1.6 – 2.6		0.18 – 0.35			60 – 100%
7004	0.05					60 – 100%
7005	0.10		0.06 – 2.0			60 – 100%
7008	0.05		0.12 – 0.25			60 – 100%
7013	0.10	1.0 – 1.5				60 – 100%
7021	0.25					60 – 100%
729	0.50 – 0.9					60 – 100%
7029	0.50 – 0.9					60 – 100%
7129	0.50 – 0.9		0.10			60 – 100%
7039	0.10		0.15 – 0.25			60 – 100%
7046	0.25		0.20			60 – 100%
7146						60 – 100%
7049	1.2 – 1.9		0.10 – 0.22			60 – 100%



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Alloy	Cu	Mn	Cr	Ni	Footnotes/ Miscellaneous	Aluminum
7149	1.2 – 1.9		0.10 – 0.22			60 – 100%
7050	2.0 – 2.6					60 – 100%
7150	1.9 – 2.5					60 – 100%
7072						60 – 100%
7472						60 – 100%
7075	1.2 – 2.0		0.18 – 0.28			60 – 100%
7175	1.2 – 2.0		0.18 – 0.28			60 – 100%
7475	1.2 – 1.9		0.18 – 0.25			60 – 100%
7076	0.30 – 1.0					60 – 100%
7277	0.8 – 1.7		0.18 – 0.35			60 – 100%
7178	1.7 – 2.4		0.18 – 0.28			60 – 100%
7079			0.10 – 0.25			60 – 100%
7090	0.69 – 1.3				1.0 – 1.9 Co	60 – 100%
7091	1.1 – 1.8				0.20 – 0.6 Co	60 – 100%
8001				0.9 – 1.3		60 – 100%
8111						60 – 100%
8076						60 – 100%
8177						60 – 100%
8280	0.7 – 1.3			0.20 – 0.7	5.5 – 7.0 Sn	60 – 100%
X8090 A	1.1 – 1.6					60 – 100%
X8092						60 – 100%
X8192						60 – 100%
8700					3.6 – 3.9 Si .2 Fe	60 – 100%

Footnote:

1. Composition in weight percent maximum unless shown as a range or minimum



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Alloys for castings or ingot, which can contain WHMIS –controlled ingredients in amounts equal to or above the threshold limits.

NOTE: All alloys contain 60-100% aluminum.

Alloy	Cu	Mn	Cr	Ni	Miscellaneous
A206.2	4.2 – 5.0				
208.2	3.5 – 4.5				
224.2	4.5 – 5.5				
242.2	3.5 – 4.5			1.7 – 2.3	
A242.2	3.7 – 4.5		0.15 – 0.25	1.8 – 2.3	
295.2	4.0 – 5.0				
296.2	4.0 – 5.0				
308.2	4.0 – 5.0				
319.2	3.0 – 4.0			0.10	
324.2				0.10	
332.2	2.0 – 4.0			0.10	
333.1	3.0 – 4.0			0.50	
336.2	0.5 – 1.15			2.0 – 3.0	
354.1	1.69 – 2.0				
355.2	1.0 – 1.5				
C355.2	1.0 – 1.5				
356.2					6.5 – 7.5 Si
357.1					6.5 – 7.5 Si
358.2					0.15 – 0.3 Be
360.2				0.10	
364.2			0.25 – 0.5	0.15	0.02 – 0.04 Be
365.1		0.5-0.8			9.5-11.5 Si
380.2	3.0 – 4.0			0.10	
A380.2	3.0 – 4.0			0.10	
384.2	3.0 – 4.5			0.10	
385.1	2.0 – 4.0			0.50	
390.2	4.0 – 5.0				
A390.1	4.0 – 5.0				
392.1				0.50	
413.2				0.10	
514.2					3.6 – 4.5 Mg
55.2					6.6 – 7.5 Mg
705.1			0.2 – 0.4		
707.1			0.2 – 0.4		



MATERIAL SAFETY DATA SHEET

Alloy	Cu	Mn	Cr	Ni	Miscellaneous
712.2			0.4 – 0.6		
713.1			0.35	0.15	
850.1	0.7 – 1.3			0.7 – 1.3	5.5 – 7.0 Sn
851.1	0.7 – 1.3			0.3 – 0.7	5.5 – 7.0 Sn
852.1	1.7 – 2.3			0.9 – 1.5	5.5 – 7.0 Sn