MATERIAL SAFETY DATA SHEET

1 PRODUCT AND COMPANY IDENTIFICATION

Product Name: Uncoated Aluminum metal, 3XXX type alloys **Product No.:** 000052NOV

Manufacturer and Supplier Name:
Novelis Inc.
3560 Lenox Road
Suite 2000
Atlanta, GA USA 30326

Emergency Telephone:
In case of an Emergency call CHEMTREC Within USA and Canada: 1-800-424-9300 Outside USA and Canada: +1 703-527-3887

Physical State: Solid
Color: Grey to silver
Odor: Odorless

Synonyms: 30XXX, 31XXX, ENAW3003, 3004A, 3105A, 3207A, HS35, Aluminium Can Body Stock: Alloy 3104, Temper H19, 0.262MM x 1709.85MM, X383

Intended Use: Primary metal

2 HAZARDS IDENTIFICATION

GHS Classification:
Specific target organ systemic toxicity - Repeated exposure Category 2.

EU Classification: Not classified.

US Emergency Overview:

Low hazard for usual industrial or commercial handling by trained personnel.

Chronic Health Effects: Chronic inhalation of manganese and zinc oxide fumes may cause metal fume fever.

Other Hazards: Not a fire hazard unless in particle form. Suspensions of aluminum dust in air may pose a severe explosion hazard.

OSHA Regulatory Status: Under some use conditions, this material may be considered to be hazardous in accordance with OSHA 29 CFR 1910.1200.

Canada WHMIS Classification: D2A

3 COMPOSITION / INFORMATION ON INGREDIENTS

General Information: This product may have non-hazardous lubricant residue on the surface at a concentration below 1% by weight.

Chemical Name †	EC No.	CAS-No.	Composition *	Classification	Notes
Aluminum	231-072-3	7429-90-5	95 - 98.9%	-	-
Manganese	231-105-1	7439-96-5	0.05 - 1.98%	Xn;R48/20	-
Zinc	231-175-3	7440-66-6	0.3 - 2.5%	-	-
Silicon	231-130-8	7440-21-3	0.03 - 1.6%	-	-
Magnesium	231-104-6	7439-95-4	0.02 - 1.47%	F;R11, R15	-
Iron	231-096-4	7439-89-6	0.2 - 1.2%	-	-
Copper	231-159-6	7440-50-8	0.1 - 0.6%	-	-

† For more detailed chemical composition, refer to the certificate of analysis.
*Chemical composition is reported in mass fraction (percent by weight) unless the ingredient is a gas. Gas compositions are reported in volume fraction (percent by volume).

The full text for all R-phrases is displayed in Section 16 of the MSDS.

4 FIRST AID MEASURES

Inhalation: If symptomatic, move to fresh air. Get medical attention if symptoms persist.

Eye Contact: Flush eyes thoroughly with water, taking care to rinse under eyelids. If irritation persists, continue flushing for 15 minutes, rinsing from time to time under eyelids. If discomfort continues, consult a physician.

Skin Contact: In case of burns with hot metal, rinse with plenty of cold water. If burns are severe, consult a physician. Wash skin thoroughly with cold water to remove residual aluminum dust or fume and other related surface coatings. If discomfort continues, consult a physician.

Ingestion: Not Applicable

5 FIRE-FIGHTING MEASURES

Extinguishing Media: In case of aluminum fires, use a class D dry-powder extinguisher (Lith-X).

Unsuitable Extinguishing Media: Do not use water or halogenated extinguishing media.

Special Fire Fighting Procedures: Use standard firefighting procedures and consider the hazards of other involved materials.

Unusual Fire & Explosion Hazards: Not a fire hazard unless in particle form. Suspensions of aluminum dust in air may pose a severe explosion hazard. A potential for explosion exists for a mixture of fine and coarse particles if at least 15% to 20% of the material is finer than 44 microns (325 mesh). Buffing and polishing generate finer material than grinding, sawing and cutting.

Hazardous Combustion Products: Aluminum oxides, Magnesium oxides, Manganese oxides, Silicone oxides, Zinc oxides

Protective Measures: Self-contained breathing apparatus and full protective clothing must be worn in case of fire.

Flammability Class: NFPA Rating Fire = 0. Materials that will not burn.

6 ACCIDENTAL RELEASE MEASURES

Personal Precautions: Aluminum in the form of particles may be reactive. Its hazardous characteristics, including fire and explosion, should be considered prior to handling. Avoid generation and spreading of dust. See Section 8 of the MSDS for Personal Protective Equipment.

Spill Cleanup Methods: Spillage should be collected for recycling.

7 HANDLING AND STORAGE

Handling: The lubricant that is coating the sheet can make it slippery. Use appropriate gloves and tools to ensure safe handling. Avoid contact with sharp edges and hot surfaces. Because of the risk of explosion, aluminum ingots and metal scrap should be thoroughly dried prior to remelting. Use standard techniques to check metal temperature before handling. Hot aluminum does not present any warning color change. Exercise great caution, since the metal may be hot. For more information on the handling and storage of aluminum, consult the following documents published by Aluminum Association, 900 19th St., N.W., Washington D.C., 20006: Guidelines for handling molten aluminum; Recommendation for storage and handling of aluminum powders and paste; and Guidelines for handling Aluminum Fines generated during various aluminum fabricating operations. **For wetted coil of foil:** Do not cut, transport or even approach any coil giving off a crackling sound or emitting steam vapor. Once a coil of foil has been partially or completely wetted: keep the coil cool until the interior is completely dry. If such cooling is impractical, leave the coil in place and keep people at least 30 meters away from it for at least 72 hours.

Storage: Store in a dry place. Store away from incompatible materials.

8 EXPOSURE CONTROLS / PERSONAL PROTECTION

Exposure Limits:

Chemical Name	Source	Type	Exposure Limits	Notes
Aluminum (Respirable fraction.)	US. ACGIH TLV	TWA	1 mg/m³	as Al
Copper (Fume.)	US. ACGIH TLV	TWA	0.2 mg/m³	
Copper (Dust and mist.)	US. ACGIH TLV	TWA	1 mg/m³	as Cu

Manganese	US. ACGIH TLV	TWA	0.2 mg/m³	as Mn
Silicon	US. ACGIH TLV	TWA	10 mg/m³	
Aluminum (Total dust.)	US. OSHA Z-1 PEL	TWA	5 mg/m³	as Al
Aluminum (Respirable fraction.)	US. OSHA Z-1 PEL	TWA	15 mg/m³	as Al
Copper (Fume.)	US. OSHA Z-1 PEL	TWA	0.1 mg/m³	as Cu
Copper (Dust and mist.)	US. OSHA Z-1 PEL	TWA	1 mg/m³	as Cu
Manganese (Fume.)	US. OSHA Z-1 PEL	Ceiling	5 mg/m³	as Mn
Silicon (Respirable fraction.)	US. OSHA Z-1 PEL	TWA	5 mg/m³	
Silicon (Total dust.)	US. OSHA Z-1 PEL	TWA	15 mg/m³	
Aluminum (Respirable dust.)	Germany TRGS 900	STEL factor: 2		Category II substance
Aluminum (Inhalable dust.)	Germany TRGS 900	STEL factor: 2		Category II substance
Aluminum (Inhalable dust.)	Germany TRGS 900	TWA	10 mg/m³	General dust
Aluminum (Respirable dust.)	Germany TRGS 900	TWA	3 mg/m³	General dust
Manganese	Germany TRGS 900	TWA	0.5 mg/m³	as Mn, as Y

Consult local authorities for recommended exposure limits. Iron oxide is formed at temperatures above the melting point.

Engineering Controls: Special ventilation should be used to convey finely divided metallic dust generated by grinding, sawing etc., in order to eliminate explosion hazards. Maintain dust concentration in ventilation ducts below the lower explosive limit of 40 g/m3 (0.04 oz/ft3). See "National Fire Protection Association Codes": Code 65 "Processing and Finishing of Aluminum", Code 651 "Standard for the manufacture of aluminum and magnesium powder" and Code 77 "Static electricity".

Respiratory Protection: Use an approved respirator designed for the hazard, where concentrations exceed exposure limits. The use of both primary and secondary protective equipment is necessary when handling molten metal. Refer to "Aluminum Association" guidelines.

Eye Protection: Risk of contact: Wear dust-resistant safety goggles where there is danger of eye contact. Wear approved safety goggles.

Hand Protection: Wear suitable gloves. When material is heated, wear gloves to protect against thermal burns.

Skin Protection: Apron and long sleeves are recommended. Risk of contact: Wear suitable protective clothing.

Thermally protective apron and long sleeves are recommended when volume of hot material is significant.

Hygiene Measures: Always observe national occupational health and hygiene requirements including requirements for medical surveillance.

Environmental Exposure Controls: Environmental manager must be informed of all major spillages.

9 PHYSICAL AND CHEMICAL PROPERTIES

Color: Grey to silver
Odor: Odorless
Odor Threshold: Not applicable.
Physical State: Solid
pH: Not applicable
Melting Point: 482°C (900°F) - 660°C (1220°F)
Freezing Point: Not applicable.
Boiling Point: Not applicable.
Flash Point: Not applicable.
Evaporation Rate: Not applicable.
Flammability Limit - Upper (%): No data available.
Flammability Limit - Lower (%): No data available.
Vapor Pressure: Not applicable.
Vapor Density (Air=1): Not applicable.
Specific Gravity: 2.5 - 2.9
Solubility in Water: Not applicable
Solubility (Other): No data available.
Partition Coefficient (n-Octanol/water): Not applicable.
Autoignition Temperature: Not applicable.
Decomposition Temperature: No data available.
Volatile Organic Compounds (VOC): No data available.

10 STABILITY AND REACTIVITY

Stability: Material is stable under normal conditions.

Conditions to Avoid: **For wetted coil of foil:** In coils of aluminum foil immersed in water, a vigorous oxidation reaction may occur, producing hydrogen gas and heat. When the coils are removed from the cooling effect of the water, this reaction accelerates, large amounts of steam are produced, temperature rises significantly, hydrogen gas can reach concentrations over the lower explosive limit (4.1%): this can result in an explosive rupture of the coils. Rupturing of a coil may occur even when the coil is only partly immersed in water, and even if the immersion time is short.

Incompatible Materials: Molten aluminum may explode on contact with water, concrete, oxides of other materials or other oxidizing agents. In the form of particles, may explode when mixed with halogenated acids, halogenated

solvents, bromates, iodates or ammonium nitrate.

Hazardous Decomposition Products:

At Elevated Temperatures:	Acrid fumes
Strong Acid Contact:	Hydrogen
Strong Base Contact:	Hydrogen

Possibility of Hazardous Reactions: Aluminum reacts with strong basic solutions, strong acidic solutions, and producing flammable hydrogen gas. Aluminum particles on contact with copper, lead, or iron oxides can react vigorously with release of heat if there is a source of ignition or intense heat.

11 TOXICOLOGICAL INFORMATION

Specified Substance(s)
Acute Toxicity:

Chemical Name	Test Results
Aluminum	Oral LD50 (Rat): 9 g/kg
Iron	Oral LD50 (Rat): 30 g/kg
Manganese	Oral LD50 (Rat): 9 g/kg
Silicon	Oral LD50 (Rat): 3160 mg/kg

Inhalation: Solid aluminum does not present an inhalation hazard. Aluminum and silicon dusts generated during use are considered nuisance particulates. Heating above the melting point releases metallic oxides which may cause metal fume fever by inhalation. The symptoms are shivering, fever, malaise and muscular pain. Iron oxide is formed at temperatures above the melting point.

Eye Contact: Dust may irritate the eyes.

Skin Contact: Skin contact with hot metal can cause burns. Skin contact with non-hazardous lubricant residues may cause irritation.

Ingestion: Not applicable.

Sensitization: No data recorded.

Carcinogenicity: None.

Listed Carcinogens: None.

Mutagenesis: No data available.

Reproductive Toxicity: No data available.

Other Effects: Aluminum and other inherent metal may cause fumes generated during welding or melting which

present low health risks. Welding or plasma arc cutting of aluminum alloys can generate ozone, nitric oxides and ultraviolet radiation. Ozone overexposure may result in mucous membrane irritation or pulmonary discomfort. UV radiation can cause skin erythema and welders flash. High concentrations of freshly-formed magnesium oxide and manganese oxide fumes can produce symptoms of metal fume fever. High concentrations of manganese dust can affect the central nervous system (apathy, drowsiness, weakness and other symptoms resembling to Parkinson's disease).

Medical conditions aggravated by exposure to the product: None known.

12 ECOLOGICAL INFORMATION

Ecotoxicity: Aluminum and its alloys in solid forms, such as ingots or manufactured items, do not present any hazard for the environment because metals are not biologically available.

Specified Substance(s)

Chemical Name	Test
Aluminum	LC50 (96 hour(s), Oncorhynchus mykiss): 120 ug/l

Mobility: Not relevant, due to the form of the product.

Persistence and Degradability: No data available.

Bioaccumulation Potential: The product is not bioaccumulating.

Other Adverse Effects: None known.

13 DISPOSAL CONSIDERATIONS

General Information: Dispose of waste and residues in accordance with local authority requirements.

Disposal Methods: 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. Recover and reclaim or recycle, if practical. Aluminum in the form of particles may be reactive. Its hazardous characteristics, including fire and explosion, should be determined prior to disposal. The lubricant that has been washed off the aluminum sheets must be disposed of in accordance with federal, state or local regulations.

European Waste Codes
Used Product: 10 03 99

Container: Since emptied containers retain product residue, follow label warnings even after container is emptied.

14 TRANSPORT INFORMATION

DOT Not regulated.

ADR / RID Not regulated.

TDG Not regulated.

IATA Not regulated.

IMDG Not regulated.

15 REGULATORY INFORMATION

EU Regulations

Label information: Not classified.

Germany:

Water Hazard Class (WGK): nwg

Canadian Controlled Products Regulations: This product has been classified according to the hazard criteria of the Canadian Controlled Products Regulations, Section 33, and the MSDS contains all required information.

US Regulations

CERCLA Hazardous Substance List (40 CFR 302.4): For metals, the stated Reportable Quantity (RQ) applies to particles smaller than 100 micrometers.

Chemical Name	RQ
Zinc	1000 lbs
Copper	5000 lbs

SARA Title III

Section 302 Extremely Hazardous Substances (40 CFR 355, Appendix A): Not regulated.

Section 311/312 (40 CFR 370):

☐ Acute (Immediate) ☒ Chronic (Delayed) ☐ Fire ☐ Reactive ☐ Pressure Generating

Section 313 Toxic Release Inventory (40 CFR 372): SARA 313 – Select chemical(s) may exist in this product or preparation at concentrations less than the de minimis exemption (40CFR372.45) for supplier notification. However, affected customers should be aware of the Lower Thresholds for Chemicals of Special Concern (40CFR372.28) reporting requirements which may be applicable to this product and/or preparation.

Chemical Name	CAS-No.	Reporting threshold for other users	Reporting threshold for manufacturing and processing

Manganese	7439-96-5	10000 lbs	25000 lbs
Copper	7440-50-8	10000 lbs	25000 lbs
Zinc (Fume or dust)	7440-66-6	10000 lbs	25000 lbs
Aluminum (Fume or dust)	7429-90-5	10000 lbs	25000 lbs

For reporting purposes: the De Minimis Concentration for a toxic chemical in a mixture is 0.1% for carcinogens as defined in 29 CFR 1910.1200(d)(4) or 1% for others.

State Regulations

California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65): Not regulated.
This product contains trace amounts of lead (Pb) (< 0.01 %). Any process resulting exposure to more than 0.5 mg/m3 of metal dust per day may result in a daily dose of lead of over 0.5 µg/day, the dose above which the "California Safe Drinking Water and Toxic Enforcement Act" of 1986 requires notification. Refer to the appropriate regulation notification wording guidelines. The dose is not considered dangerous for health according to current toxicology studies.

Inventory Status

This product or all components are listed or exempt from listing on the following inventory: EINECS, DSL, TSCA

16 OTHER INFORMATION

Wording of the R-phrases in section 2 and 3: R11; Highly flammable. R15; Contact with water liberates extremely flammable gases. R48/20; Harmful: danger of serious damage to health by prolonged exposure through inhalation.

Issued by: Novelis Toxicology Service, 390 Griswold Street, NE, Warren, OH 44483 Tel: 330-841-3134 Fax: 330-841-3144
Issue Date: 13-Sept-2013
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SDS No.: 000052NOV
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Product Name: Uncoated Aluminum metal, 3XXX type alloys

Synonyms: 30XXX, 31XXX, ENAW3003, 3004A, 3105A, 3207A, HS35, Aluminium Can Body Stock: Alloy 3104, Temper H19, 0.262MM x 1709.85MM

Product No.: 000052NOV

Contains:
Aluminum, (CAS No.7429-90-5)
Manganese, (CAS No.7439-96-5)
Zinc, (CAS No.7440-66-6)
Silicon, (CAS No.7440-21-3)
Magnesium, (CAS No.7439-95-4)
Iron, (CAS No.7439-89-6)
Copper, (CAS No.7440-50-8)

Emergency Overview:

Low hazard for usual industrial or commercial handling by trained personnel.

Handling and Storage:
The lubricant that is coating the sheet can make it slippery. Use appropriate gloves and tools to ensure safe handling. Avoid contact with sharp edges and hot surfaces. Because of the risk of explosion, aluminum ingots and metal scrap should be thoroughly dried prior to remelting. Use standard techniques to check metal temperature before handling. Hot aluminum does not present any warning color change. Exercise great caution, since the metal may be hot. For more information on the handling and storage of aluminum, consult the following documents published by Aluminum Association, 900 19th St., N.W., Washington D.C., 20006: Guidelines for handling molten aluminum; Recommendation for storage and handling of aluminum powders and paste; and Guidelines for handling Aluminum Fines generated during various aluminum fabricating operations. **For wetted coil of foil:** Do not cut, transport or even approach any coil giving off a crackling sound or emitting steam vapor. Once a coil of foil has been partially or completely wetted: keep the coil cool until the interior is completely dry. If such cooling is impractical, leave the coil in place and keep people at least 30 meters away from it for at least 72 hours.Store in a dry place. Store away from incompatible materials.

Precautions:
Use an approved respirator designed for the hazard, where concentrations exceed exposure limits. The use of both primary and secondary protective equipment is necessary when handling molten metal. Refer to "Aluminum Association" guidelines.Risk of contact: Wear dust-resistant safety goggles where there is danger of eye contact. Wear approved safety goggles. Wear suitable gloves. When material is heated, wear gloves to protect against thermal burns.Apron and long sleeves are recommended. Risk of contact: Wear suitable protective clothing. Thermally protective apron and long sleeves are recommended when volume of hot material is significant.

First Aid:
Inhalation: If symptomatic, move to fresh air. Get medical attention if symptoms persist.
Eye Contact: Flush eyes thoroughly with water, taking care to rinse under eyelids. If irritation persists, continue flushing for 15 minutes, rinsing from time to time under eyelids. If discomfort continues, consult a physician.
Skin Contact: In case of burns with hot metal, rinse with plenty of cold water. If burns are severe, consult a physician. Wash skin thoroughly with cold water to remove residual aluminum dust or fume and other related surface coatings. If discomfort continues, consult a physician.
Ingestion: Not Applicable

Fire Fighting:
Flammability Class: NFPA Rating Fire = 0. Materials that will not burn.
In case of aluminum fires, use a class D dry-powder extinguisher (Lith-X).Do not use water or halogenated

extinguishing media.

Spill or Leak Instructions:
Spillage should be collected for recycling.

For additional information read Material Safety Data Sheet for this product

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In case of an Emergency call CHEMTREC Within USA and Canada: 1-800-424-9300 Outside USA and Canada: +1 703-527-3887