MATERIAL SAFETY DATA SHEET

1. Product and Company Identification

Material Name	**REYNOBOND ALUMINUM COMPOSITE MATERIAL**
MSDS Number	1426
CAS Number	Mixture
Product use	Architectural/building materials
Manufacturer information	Alcoa Inc. 201 Isabella Street Pittsburgh, PA 15212-5858 US Health and Safety Email: accmsds@alcoa.com Health and Safety Fax: +1-412-553-4822 Health and Safety Tel: +1-412-553-4649 Alcoa Architectural Products 1, rue du Ballon Merxheim, France 68500 Tel: +00 33(0)3 89 74 46 00 Reynolds Metals Company Alcoa Architectural Products 50 Industrial Boulevard Eastman, GA 30123 Tel: +1-478-374-4746
Emergency Information	USA: Chemtrec: +1-703-527-3887 +1-800-424-9300 (24 Hour Emergency Telephone, multiple languages spoken); ALCOA: +1-412-553-4001 (24 Hour Emergency Telephone, only English spoken)
Website	For a current Material Safety Data Sheet, refer to Alcoa websites: www.alcoa.com or internally at my.alcoa.com EHS Community

2. Hazards Identification

Emergency overview

Solid, panels. Various colors. Odorless. Non-combustible as supplied. Small chips, fine turnings and dust from processing may be readily ignitable.

Explosion/fire hazards may be present when (See Sections 5, 7 and 10 for additional information):
- Dust or fines are dispersed in air.
- Chips, dust or fines are in contact with water.
- Dust and fines are in contact with certain metal oxides (e.g., rust, copper oxide).
- Molten metal in contact with water/moisture or certain metal oxides (e.g., rust, copper oxide).

Dust from processing: Can cause irritation of the eyes, skin and upper respiratory tract. Contact with molten polymer can cause thermal burns. Combustion of the coatings can generate toxic and irritating gases.

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.
The following health effects are not likely to occur unless sawing or cutting generates dust or unless material is heated to melting

Eyes	Dust from processing: Can cause irritation.
Skin	Dust from processing: Can cause irritation. Contact with molten polymer can cause thermal burns.
Inhalation	Dust from processing: Can cause irritation of the upper respiratory tract. Chronic overexposures: Can cause scarring of the lungs (pulmonary fibrosis), central nervous system damage, secondary Parkinson's disease and reproductive harm in males.
Carcinogenicity and Reproductive Hazard	Product as shipped: Does not present any cancer or reproductive hazards. Dust from processing: Does not present any cancer hazards. Can present a reproductive hazard for males (Manganese).
Medical conditions aggravated by exposure to product	Dust from processing: Asthma, chronic lung disease, Secondary Parkinson's disease and skin rashes.

3. Composition / Information on Ingredients

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

Components	CAS #	Percent
A. Aluminum Face Sheet		
Aluminum	7429-90-5	<60
Magnesium	7439-95-4	<5
Manganese	7439-96-5	<1
B. Polymeric Core		
Thermoplastic polymer	Proprietary	<45
Fire retardant	Proprietary	<20
Aramid polymer	Proprietary	<5
C. Coatings		
Resin	Various	<2
Colorant	Various	<1

4. First Aid Measures

First aid procedures

Eye contact Dust from processing: Rinse eyes with plenty of water or saline for at least 15 minutes. Consult a physician.

Skin contact Dust from processing: Wash with soap and water for at least 15 minutes. Get medical attention if irritation develops or persists.
Molten polymer: If molten material gets on skin, cool rapidly with cold water. Do not attempt to peel polymer from skin. Get medical treatment for thermal burn.

Inhalation Dust from processing: Remove to fresh air. Check for clear airway, breathing, and presence of pulse. If breathing is difficult, provide oxygen. Loosen any tight clothing on neck or chest. Provide cardiopulmonary resuscitation for persons without pulse or respirations. Consult a physician.

5. Fire Fighting Measures

Flammable/Combustible Properties This product does not present fire or explosion hazards as shipped. Small chips, fine turnings, and dust from processing may be readily ignitable.

Fire / Explosion Hazards May be a potential hazard under the following conditions:
• Dust clouds may be explosive. Even a minor dust cloud can explode violently. Dust accumulation on the floor, ledges and beams can present a risk of ignition, flame propagation and secondary explosions.
• Chips, fines and dust in contact with water can generate flammable/explosive hydrogen gas. These gases could present an explosion hazard in confined or poorly ventilated spaces.
• Dust and fines in contact with certain metal oxides (e.g., rust, copper oxide). A thermite reaction, with considerable heat generation, can be initiated by a weak ignition source.
• Molten metal in contact with water/moisture or certain metal oxides (e.g., rust, copper oxide). Moisture entrapped by molten metal can be explosive. Contact of molten aluminum with certain metal oxides can initiate a thermite reaction. Finely divided metals (e.g., powders or wire) may have enough surface oxide to produce thermite reactions/explosions.

Extinguishing media

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

Unsuitable extinguishing media DO NOT USE halogenated extinguishing agents on small chips/fines.
DO NOT USE water in fighting fires around molten metal.
These fire extinguishing agents will react with the burning material.

Protection of firefighters

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

6. Accidental Release Measures

Personal precautions	Avoid contact with sharp edges. Wear protective gloves.
Environmental precautions	No special environmental precautions required.
Spill or leak procedure	Collect scrap for recycling. 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 and approved for such use. Allow the spill to cool before remelting as scrap.
Evacuation procedures	None necessary.
Methods for cleaning up	No specific clean-up procedure noted.

7. Handling and Storage

Handling	Avoid generating dust. Avoid contact with sharp edges or heated metal. Hot and cold aluminum are not visually different. Hot aluminum does not necessarily glow red.
Requirements for Processes Which Generate Dusts or Fines	If processing of this product generates dust or if extremely fine particulate is generated, obtain and follow the safety procedures and equipment guides contained in Aluminum Association Bulletin F-1 and National Fire Protection Association (NFPA) brochures listed in Section 16. Use non-sparking handling equipment, tools and natural bristle brush. Cover and reseal partially empty containers. Provide grounding and bonding where necessary to prevent accumulation of static charges during metal dust handling and transfer operations (See Section 15). Local ventilation and vacuum systems must be designed to handle explosive dusts. Dry vacuums and electrostatic precipitators must not be used, unless specifically approved for use with flammable/explosive dusts. Dust collection systems must be dedicated to aluminum dust only and should be clearly labeled as such. Do not co-mingle fines of aluminum with fines of iron, iron oxide (rust) or other metal oxides. Do not allow chips, fines or dust to contact water, particularly in enclosed areas. Avoid all ignition sources. Good housekeeping practices must be maintained. Do not use compressed air to remove settled material from floors, beams or equipment.
Requirements for Remelting of Scrap Material or Ingot	Molten metal and water can be an explosive combination. The risk is greatest when there is sufficient molten metal to entrap or seal off the water. Water and other forms of contamination on or contained in scrap or remelt ingot are known to have caused explosions in melting operations. While the products may have minimal surface roughness and internal voids, there remains the possibility of moisture contamination or entrapment. If confined, even a few drops of water can lead to violent explosions. All tooling, containers, molds and ladles which come in contact with molten metal must be preheated or specially coated, rust free and approved for such use. Any surfaces that may contact molten metal (e.g., concrete) should be specially coated. Drops of molten metal in water (e.g. from plasma arc cutting), while not normally an explosion hazard, can generate enough flammable hydrogen gas to present an explosion hazard. Vigorous circulation of the water and removal of the particles minimize the hazards. During melting operations, the following minimum guidelines should be observed: • Inspect all materials prior to furnace charging and completely remove surface contamination such as water, ice, snow, deposits of grease and oil or other surface contamination resulting from weather exposure, shipment, or storage. • Store materials in dry, heated areas with any cracks or cavities pointed downwards. • Preheat and dry large items adequately before charging into a furnace containing molten metal. This is typically done by use of a drying oven or homogenizing furnace. The drying cycle should bring the metal temperature of the coldest item of the batch to 400°F (200°C) and then hold at that temperature for 6 hours. Thermite explosions have been reported when aluminum alloys were melted in furnaces used for alloying with lead, bismuth or other metals with low melting temperatures. These metals, when added as high purity ingots, can seep through cracks in furnace liners and become oxidized. During subsequent melts in the furnace, molten aluminum can contact these metal oxides resulting in a thermite explosion.

8. Exposure Controls / Personal Protection

Engineering controls If dust is generated through processing: Use with adequate explosion-proof ventilation designed to handle particulates to meet the limits listed in Section 8, Exposure Guidelines.

Occupational exposure limits

U.S. - OSHA

Components	Type	Value	Form
Aluminum (7429-90-5)	TWA	5 mg/m3	(respirable fraction)
	TWA (total dust)	15 mg/m3	(total dust)
Fire retardant (Proprietary)	TWA	5 mg/m3	(respirable fraction)
	TWA (total dust)	15 mg/m3	(total dust)
Manganese (7439-96-5)	Ceiling	5 mg/m3	(fume)

Alcoa

Components	Type	Value	Form
Aluminum (7429-90-5)	TWA	10 mg/m3	(inhalable)
		3 mg/m3	(respirable fraction)
Fire retardant (Proprietary)	TWA	3 mg/m3	(respirable fraction)
		10 mg/m3	(inhalable)
Manganese (7439-96-5)	TWA	0.02 mg/m3	(respirable fraction, as Mn)
		0.05 mg/m3	(total dust, as Mn)

ACGIH

Components	Type	Value	Form
Aluminum (7429-90-5)	TWA	1 mg/m3	(respirable fraction)
Fire retardant (Proprietary)	TWA	1 mg/m3	(respirable fraction, as Al)
Manganese (7439-96-5)	TWA	0.2 mg/m3	

Personal protective equipment

Eye / face protection Safety glasses with full side shields or goggles recommended.

Skin protection Wear appropriate gloves to avoid any skin injury.

Respiratory protection Dust 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.

General

Personnel who handle and work with molten metal should utilize primary protective clothing like polycarbonate face shields, fire resistant tapper's jackets, neck shades (snoods), leggings, spats and similar equipment to prevent burn injuries. In addition to primary protection, secondary or day-to-day work clothing that is fire resistant and sheds metal splash is recommended for use with molten metal. Synthetic materials should never be worn even as secondary clothing (undergarments).

9. Physical & Chemical Properties

Form	Solid, panels.
Appearance	Various colors
Boiling point	Not applicable
Melting point	896 - 1220 °F (480 - 660 °C) Aluminum; Polymer ˜220°F (˜104°C)
Flash point	Not applicable
Auto-ignition temperature	Not applicable
Flammability limits in air, lower, % by volume	Not applicable
Flammability limits in air, upper, % by volume	Not applicable
Vapor pressure	Not applicable
Vapor density	Not applicable
Solubility (water)	Insoluble
Density	1.1 - 2.27 g/cm3 (0.040 - 0.082 lb/in3)
pH	Not applicable

Odor	Odorless
Partition coefficient (n-octanol/water)	Not applicable

10. Chemical Stability & Reactivity Information

Chemical stability	Stable under normal conditions of use, storage, and transportation.
Conditions to avoid	None known.
Incompatible materials	Strong acids and oxidizing agents
Hazardous decomposition products	Combustion of the coatings can generate carbon monoxide, carbon dioxide and aldehydes.
Possibility of hazardous reactions	Chips, fines, dust and molten metal are considerably more reactive with the following: • Water: Slowly generates flammable and explosive hydrogen gas and heat. Generation rate is greatly increased with smaller particles (e.g., fines and dusts). Water/aluminum mixtures may be hazardous when confined. • Heat: Oxidizes at a rate dependent upon temperature and particle size. • Strong oxidizers: Violent reaction with considerable heat generation. Can react explosively with nitrates (e.g., ammonium nitrate and fertilizers containing nitrate) when heated or molten. • Acids and alkalis: Reacts to generate flammable/explosive hydrogen gas. Generation rate is greatly increased with smaller particles (e.g., fines and dusts). • Halogenated compounds: Many halogenated hydrocarbons, including halogenated fire extinguishing agents, can react violently with finely divided or molten aluminum. • Iron oxide (rust) and other metal oxides (e.g., copper and lead oxides): A violent thermite reaction generating considerable heat can occur. Reaction with aluminum fines and dusts requires only very weak ignition sources for initiation. • Iron powder and water: Explosive reaction forming hydrogen gas when heated above 1470°F (800°C).
Hazardous polymerization	Will not occur.

11. Toxicological Information

Health effects associated with ingredients

The following health effects are not likely to occur unless sawing or cutting generates dust or unless material is heated to melting

Aluminum dust/fines and fumes: Low health risk by inhalation. Generally considered to be biologically inert (milling, cutting, grinding).

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.

Fire retardant: Low health risk by inhalation. Generally considered to be biologically inert.

Considering the physical and chemical properties of aramid polymer and the fact that aramid polymer products in normal use represent minimal risk to human health, health hazards from fiber exposures secondary to handling aramid polymers are not expected to pose a significant risk to users.

When the paint is dried and cured, the colorants/pigments in this material are bound into the cured resin and will not be released through skin contact or under anticipated conditions of use. However, if the cured material is processed in such a manner (i.e., grinding) that large quantities of fine dusts are generated or the cured material is burned, a potential for exposure to dust containing the colorants/pigments may be created.

Health effects associated with compounds formed during processing

No new/additional compounds are expected to be formed during processing.

Component analysis - LD50 No information available for product.

Components

Toxicology Data - Selected LD50s and LC50s

Fire retardant (Proprietary)	Oral LD50 Rat >5000 mg/kg
Magnesium (7439-95-4)	Oral LD50 Rat 230 mg/kg
Manganese (7439-96-5)	Oral LD50 Rat 9 g/kg
Thermoplastic polymer (Proprietary)	Inhalation LC50 Mouse 12 g/m3 30 min

Carcinogenicity None of this product's components are listed by ACGIH, IARC or NTP.

Components

ACGIH - Threshold Limit Values - Carcinogens

Aluminum (7429-90-5)	A4 - Not Classifiable as a Human Carcinogen
Fire retardant (Proprietary)	A4 - Not Classifiable as a Human Carcinogen

12. Ecological Information

General Product Information No information available for product.

Environmental Fate No data available for product.

13. Disposal Considerations

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

Waste codes RCRA Status: Not federally regulated in the U.S. if disposed of "as is."
RCRA waste codes other than described here may apply depending on use of the product. Status must be determined at the point of waste generation. Refer to 40 CFR 261 or state equivalent in the U.S.

14. Transport Information

General Shipping Information

Basic shipping description:

UN number	-
Proper shipping name	Not regulated
Hazard class	-
Packing group	-

General Shipping Notes

- When "Not regulated", enter the proper freight classification, MSDS Number and Product Name onto the shipping paperwork.

15. Regulatory Information

US federal regulations 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.

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.

Components

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

Aluminum (7429-90-5)	1.0 % de minimis concentration (dust or fume only)
Manganese (7439-96-5)	1.0 % de minimis concentration

State regulations WARNING: This product contains a chemical known to the State of California to cause cancer.

Components

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

Aluminum (7429-90-5)	Present
Magnesium (7439-95-4)	Present
Manganese (7439-96-5)	Present

U.S. - Massachusetts - Right To Know List

Aluminum (7429-90-5)	Present
Magnesium (7439-95-4)	Present
Manganese (7439-96-5)	Present

U.S. - Minnesota - Hazardous Substance List

Aluminum (7429-90-5)	Present (dust)
Manganese (7439-96-5)	Present (as Mn)

Components

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

Aluminum (7429-90-5)	sn 0054
Magnesium (7439-95-4)	sn 1136
Manganese (7439-96-5)	sn 1155 (dust and fume)

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

Aluminum (7429-90-5)	Environmental hazard
Magnesium (7439-95-4)	Present
Manganese (7439-96-5)	Environmental hazard

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories

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

Inventory status

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

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

Inventory information

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

16. Other Information

MSDS History

Origination date: January 25, 2008
Supersedes: April 25, 2011
Revision date: May 18, 2011

MSDS Status

May 18, 2011: Change(s) in Section: 2, 3, 8, 10, 11, 12, and 13.
April 25, 2011: New format.
January 25, 2008: New MSDS.

Prepared By

Hazardous Materials Control Committee
Preparer: Jim Perriello, +1-480-278-6928/Jon N. Peace, +1-412-553-2293

MSDS System Number

214550

Other information

• Guide to Occupational Exposure Values 2010, Compiled by the American Conference of Governmental Industrial Hygienists (ACGIH).
• NIOSH Pocket Guide to Chemical Hazards, U.S. Department of Health and Human Services, September 2005.
• expub, Expert Publishing, LLC., www.expub.com
• Aluminum Association's Bulletin F-1, "Guidelines for Handling Aluminum Fines Generated During Various Aluminum Fabricating Operations." The Aluminum Association, 1525 Wilson Boulevard, Suite 600, Arlington, Virginia 22209, www.aluminum.org.
• Aluminum Association, "Guidelines for Handling Molten Aluminum, The Aluminum Association, 1525 Wilson Boulevard, Suite 600, Arlington, Virginia 22209, www.aluminum.org.
• NFPA 484, Standard for Combustible Metals (NFPA phone: 800-344-3555)
• NFPA 654, Standard for the Prevention of Fire and Dust Explosions from the Manufacturing, Processing, and Handling of Combustible Particulate Solids
• NFPA 70, Standard for National Electrical Code (Electrical Equipment, Grounding and Bonding)
• NFPA 77, Standard for Static Electricity

Key/Legend:

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

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

*** End of MSDS ***

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

REYNOBOND ALUMINUM COMPOSITE MATERIAL

WARNING

Non-combustible as supplied. Small chips, fine turnings and dust from processing may be readily ignitable.
Explosion/fire hazards may be present when: Dust or fines are dispersed in air; Chips, fines or dust are in contact with water; Dust and fines are in contact with certain metal oxides (e.g., rust, copper oxide). Molten metal in contact with water/moisture or certain metal oxides (e.g., rust, copper oxide).
Dust from processing: Can cause irritation of the eyes, skin and upper respiratory tract. Chronic overexposures: Can cause scarring of the lungs, central nervous system damage, secondary Parkinson's disease and reproductive harm in males.
Contact with molten polymer can cause thermal burns. Combustion of the coatings can generate toxic and irritating gases.

FIRST AID

Eye contact	Dust from processing: Rinse eyes with plenty of water or saline for at least 15 minutes. Consult a physician.
Skin contact	Dust from processing: Wash with soap and water for at least 15 minutes. Get medical attention if irritation develops or persists. Molten polymer: If molten material gets on skin, cool rapidly with cold water. Do not attempt to peel polymer from skin. Get medical treatment for thermal burn.
Inhalation	Dust from processing: Remove to fresh air. Check for clear airway, breathing, and presence of pulse. If breathing is difficult, provide oxygen. Loosen any tight clothing on neck or chest. Provide cardiopulmonary resuscitation for persons without pulse or respirations. Consult a physician.

See Alcoa Material Safety Data Sheet No. 1426 for more information about use and disposal.
Emergency Phone: +1-412-553-4001

FIRE FIGHTING

Suitable extinguishing media	Use Class D extinguishing agents on fines, dust or molten metal. Use coarse water spray on chips and turnings.
Extinguishing media which must not be used for safety reasons	DO NOT USE halogenated extinguishing agents on small chips/fines. DO NOT USE water in fighting fires around molten metal. These fire extinguishing agents will react with the burning material.

SPILL PROCEDURES

Spill or leak procedure	Collect scrap for recycling.

HANDLING AND STORAGE

Handling	Avoid generating dust. Avoid contact with sharp edges or heated metal. Hot and cold aluminum are not visually different. Hot aluminum does not necessarily glow red.

Contains:

Aluminum	7429-90-5
Magnesium	7439-95-4
Manganese	7439-96-5
Thermoplastic polymer	Proprietary
Fire retardant	Proprietary
Aramid polymer	Proprietary
Resin	Various
Colorant	Various

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ALCOA