

MATERIAL SAFETY DATA SHEET

Product Name: ALUMINUM COMPOSITE PANEL

SECTION I. PRODUCT AND COMPANY IDENTIFICATION

Product Name: Aluminum Composite Panel
Product Use: Architectural panels, specialty applications
Chemical Formula: Mixture

Manufacturer: Anenda Systems, Inc. – AL 13
2-606 Meridith Road
Calgary NE, Alberta
Canada T2E 5A8

E-mail: info@al13.ca
Website: www.al13.ca
Phone: 1-855-438-2513

SECTION II. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

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

Explosion / fire hazards may be present when (See Sections V, VIII and X for additional information):

- Dust or fines are dispersed in the air.
- Chips, dust or fines are in contact with water.
- Dust or fines are in contact with certain metal oxides(e.g. rust)
- Molten metal is in contact with water / moisture or certain metal oxides.

Dust and fume from processing can cause irritation of eyes, skin and upper respiratory tract; metal fume fever and lung disease. Combustion of the coatings can generate toxic and irritating gases.

Potential Health Effects:

(If dusts or fumes are generated by processing)

Eyes: Can cause irritation

Skin: Can cause irritation

Inhalation: Can cause irritation of upper respiratory tract, metal fume fever and other health effects listed below. Cancer and reproductive hazard.

MATERIAL SAFETY DATA SHEET

Product Name: ALUMINUM COMPOSITE PANEL

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

Manganese Dust of Fumes: Chronic overexposures: Can cause inflammation of the lung tissue, scarring of the lungs (pulmonary fibrosis), central nervous system damage, secondary Parkinson's disease and reproductive harm in males.

Alumina (aluminum oxide): Low health risk by inhalation. Generally considered to be biologically inert.

Titanium dioxide: Can cause irritation of eyes and respiratory tract. Chronic overexposures: Can cause chronic bronchitis

Cobalt: Can cause irritation of eyes, skin and respiratory tract. Skin contact: Can cause allergic reactions. Acute and chronic overexposures: Can cause respiratory sensitization, asthma, scarring of the lungs (pulmonary fibrosis) and damage to the heart muscle (cardiomyopathy).

Antimony and Antimony Trioxide: Can cause irritation of eyes, skin, mucous membranes and upper respiratory tract. Acute overexposures: Can cause fever, chills, shortness of breath and malaise (metal fume fever). Chronic overexposures: Can cause dermatitis, ulcers in the mouth, chemical pneumonia, lung damage, liver damage and kidney damage. Ingestion: Can cause abdominal cramps, diarrhea, dizziness, abnormal heart rhythm (arrhythmia) and death.

Nickel Dust and Fumes: Can cause irritation of eyes, skin and respiratory tract. Eye contact: Can cause inflammation of the eyes and eyelids (conjunctivitis). Skin contact: Can cause sensitization and allergic contact dermatitis. Chronic overexposures: Can cause perforation of the nasal septum, inflammation of the nasal passages (sinusitis), respiratory sensitization, asthma and scarring of the lungs (pulmonary fibrosis). Nickel compounds: Associated with lung cancer, cancer of the vocal cords and nasal cancer.

Chromium dust: Can cause irritation of eyes, skin and respiratory tract. **Chromium and trivalent chromium.**

Hexavalent Chromium (Chrome VI) Can cause irritation of eyes, skin and respiratory tract. Skin contact: Can cause irritant dermatitis, allergic reactions and skin ulcers. Chronic overexposures: Can cause perforation of the nasal septum, respiratory sensitization, asthma, fluid in the lungs (pulmonary edema), lung damage, kidney damage, lung cancer, nasal cancer and cancer of the gastrointestinal tract.

MATERIAL SAFETY DATA SHEET

Product Name: ALUMINUM COMPOSITE PANEL

Carbon Black: Can cause mechanical irritation of eyes, skin and upper respiratory tract.
Chronic overexposures: Can cause chronic bronchitis and lung disease.

Lead Dust of Fume: Can cause irritation of eyes and upper respiratory tract. Acute overexposures: Can cause nausea and muscle cramps. Chronic overexposures: Can cause weakness in the extremities (peripheral neuropathy), abdominal cramps. Chronic overexposures: Can cause weakness in the extremities (peripheral neuropathy), abdominal cramps and other gastrointestinal tract effects, kidney damage, liver damage, central nervous system damage, damage to blood forming organs, blood cell damage and reproductive harm. Can cause reduced fertility and fetal toxicity in pregnant women.

Silica, amorphous: Acute overexposures: Can cause dryness of eyes, nose and upper respiratory tract.

IARC Classification Definitions:

Group 1: the agent is carcinogenic to humans. There is sufficient evidence that a causal relationship existed between exposure to the agent and human cancer.

Group 2B: The agent is possibly carcinogenic to humans. Generally includes agents for which there is limited evidence in the absence of sufficient evidence in experimental animals.

Medical Conditions Aggravated By Exposure to the Product:

Asthma, chronic lung disease, skin rashes and secondary Parkinson's disease.

SECTION III. COMPOSITION/INFORMATION ON INGREDIENTS

Component	Percent
Aluminum Face Sheets	-
Aluminum	30-60
Manganese	< 1
Composite may contain	-
Thermoplastic polymer	< 60
Aluminum oxide	< 25
Petroleum distillates	< 4
Titanium compounds	< 2
Cobalt compounds	< 2
Antimony compounds	< 1
Nickel compounds	< 1
Chromium compounds	< 1

MATERIAL SAFETY DATA SHEET

Product Name: ALUMINUM COMPOSITE PANEL

Carbon black	< 1
Silica, amorphous	< 1
Lead compounds	< 1

Component Related Regulatory Information:

This product may be regulated, have exposure limits or other information identified as the following: Cobalt; Nickel, Inorganic compounds, insoluble; Nickel insoluble compounds, Chromium (III) Compound; Chromium (VI) compounds (certain water insoluble forms); chromium (VI) compounds-water soluble; Chromates; Antimony; Lead chromate; Silica fume (amorphous); Manganese compounds, n.o.s.

Component Information:

Additional compounds which may be formed during processing or recycling are listed in Section VIII.

SECTION IV. FIRST AID MEASURES

Eyes: Flush eyes with plenty of water or saline for at least 15 minutes. Consult a physician.

Skin: Wash skin with soap and water for at least 15 minutes. Consult a physician if irritation persists.

Inhalation: Remove to fresh air. If unconscious or severely injured, check for clear airway, breathing and presence of pulse. Perform CPR if there is no pulse or respiration. Consult a physician.

SECTION V. FIRE FIGHTING MEASURES

Flammable Properties

This Product does not present fire or explosion hazards as shipped. Small chips, turnings, dust and fines from processing may be readily ignitable.

Fire / Explosion

May be a potential hazard under the following conditions:

- Dust or fines dispersed in the air can be explosive. Even a minor dust cloud can explode violently.
- Chips, dust or fines in contact with water can generate flammable / explosive hydrogen gas. Hydrogen gas could present an explosion hazard in confined or poorly ventilated spaces.

MATERIAL SAFETY DATA SHEET

Product Name: ALUMINUM COMPOSITE PANEL

- Dust or fines in contact with certain metal oxides (e.g., rust). A thermite reaction, with considerable heat generation, can be initiated by a weak ignition source.
- Molten metal in contact with water / moisture or other metal oxides (e.g., rust). Moisture entrapped by molten metal can be explosive. Contact of molten aluminum with other metal oxides can initiate a thermite reaction.

Extinguishing Media

Use Class D extinguishing agents on dusts, fines or molten metal. Use coarse water spray on chips and turnings. DO NOT USE: Halogenated agents on small chips, dusts or fines. Water around molten metal.

Fire Fighting Equipment / Instructions

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

SECTION VI. ACCIDENTAL RELEASE MEASURES

Small / Large Spill

Collect scrap for recycling. If molten: Contain the flow using dry sand or salt flux as a dam. Do not use shovels or hand tools to halt the flow of molten aluminum. Allow the spill to cool before remelting as scrap.

SECTION VII. HANDLING AND STORAGE

Handling / Storage

Avoid generating dust. Avoid contact with sharp edges or heated metal. Hot and cold aluminum are not visually different.

Requirements for Processes Which Generate Dusts or Fumes

If processing of these products includes operations where dust or extremely fine particulate is generated, Cover and reseal partially empty containers. Use non-sparking handling equipment. Provide grounding and bonding where necessary to prevent accumulation of static charges during dust handling and transfer operations.

Local ventilation and vacuum systems must be designed to handle explosive dusts. Dry vacuums and electrostatic precipitators must not be used. 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.

MATERIAL SAFETY DATA SHEET

Product Name: ALUMINUM COMPOSITE PANEL

Do not allow chips, fines or dust to contact water, particularly in enclosed areas.

Avoid all ignition sources. Good housekeeping practices must be maintained.

Requirements for Remelting of Scrap Material and /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 and containers which come in contact with molten metal must be preheated or specially coated and rust free. Molds and ladles must be preheated or oiled prior to casting. 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 or heavy items such as ingot 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 internal metal temperature of

the coldest item of the batch to 400°C and then hold at that temperature for 6 hours.

SECTION VIII. EXPOSURE CONTROLS/PERSONAL PROTECTION
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Engineering Controls

MATERIAL SAFETY DATA SHEET

Product Name: ALUMINUM COMPOSITE PANEL

Use with adequate explosion-proof ventilation to meet the limits listed in Section VIII, exposure Guidelines.

Personal Protective Equipment

Respiratory Protection

Use NIOSH-approved respiratory protection as specified by an Industrial Hygienist or other qualified professional if concentrations exceed the limits listed in Section 8, Exposure Guidelines.

Eye Protection

Wear safety glasses/goggles to avoid eye contact.

Skin Protection

Wear appropriate gloves to avoid any skin injury.

General

Sampling to establish lead exposures is advised where exposures to airborne particulate or fumes are possible.

Personnel who handle and work with molten metal should utilize primary protective clothing like face shields, fire resistant topper's jackets, 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.

SECTION IX. PHYSICAL AND CHEMICAL PROPERTIES

Physical State:	Solid panels
Appearance:	Various colors
Boiling Point:	Not applicable
Melting Point:	Aluminum: 660°C Plastic 108~ 126°C
Vapor Pressure:	Not applicable
Vapor Density:	Not applicable
Solubility in water:	None
Specific Gravity:	See Density
Density:	Range: generally 0.93-0.96 g/cm ³
pH Level:	Not applicable

MATERIAL SAFETY DATA SHEET

Product Name: ALUMINUM COMPOSITE PANEL

Odor: Odorless
Odor Threshold: Not applicable
Octanol-Water Coefficient: Not applicable

SECTION X. CHEMICAL STABILITY AND REACTIVITY INFORMATION

Stability:

Stable under normal conditions of use, storage, and transportation as shipped.

Conditions to Avoid:

Chips, fines dust and molten metal are considerably more reactive with the following:

- Water: Slowly generates flammable / explosive hydrogen gas and heat. Generation rate is greatly increased with smaller particles (e.g., fines and dusts). Molten metal can react violently / explosively with water or moisture, particularly when the water is entrapped.
- Heat: Oxidizes at a rate dependent upon temperature and particle size.
- Strong oxidizers: Violent reaction with considerable heat generation. Can react explosively with nitrate (e.g., ammonium nitrate and fertilizers containing nitrate) particularly when heated or molten.
- Acid 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 aluminum.
- Iron oxide (rust) and other metal oxides (e.g., copper and lead oxides): A violent thermite reaction generating considerable heat can occur. Reaction with aluminum fines and dusts requires only very weak ignition sources for initiation. Molten aluminum can react violently with iron oxide without external ignition source.
- Iron powder and water: An explosive reaction forming hydrogen gas occurs when heated

above 1470°F (800°C).

MATERIAL SAFETY DATA SHEET

Product Name: ALUMINUM COMPOSITE PANEL

Hazardous Decomposition:

Combustion of the coatings can generate carbon monoxide, carbon dioxide, aldehydes and oxides of nitrogen.