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To: Petersen Aluminum Customers

Attention: Health and Safety Department

Re: Material Safety Data Sheets

Following are Material Safety Data Sheets (MSDS) for materials provided by Petersen Aluminum Corporation. These Data Sheets were prepared in response to the OSHA Hazard Communication Standard and various state and local 'right-to-know' laws which require that distributors of metal products provide MSDS sheets, which contain health and safety information on the products they sell and on the ingredients of these products.

Petersen Aluminum has attempted to comply with the OSHA regulations as efficiently as possible so that you can meet your obligation to inform your employees of potential hazards in the workplace.

The information contained herein is intended to be used for Employee Health and Safety Education Training, and not for specification purposes.

The products provided by Petersen Aluminum Corporation in their solid state present no fire, explosion, inhalation, ingestion or contact health hazard under normal conditions of use. Sawing, grinding and machining, which results in the generation of airborne particles may present health hazards. Metallic dust, especially aluminum, can be a potential fire hazard. Metallic oxide fumes in high concentrations can be hazardous if chronically inhaled. Metals react with acids, alkalies and strong oxidizers to generate heat and/or hydrogen gas.

The Material Safety Data Sheets prepared by Petersen Aluminum Corporation summarize the product health and safety information provided to us by our vendors. Should you require original Material Safety Data Sheets, feel free to contact us directly.

Material Safety Data Information

I. Aluminum Alloys – 1xxx Through 7XXX Series

A. Ingredients	% Composition By Weight	Threshold Limit Value (mg/m3)
Base Metal		
Aluminum (Al)	80-99.7	10
Alloying Elements		
Copper (Cu)	<10	1
Magnesium (Mg)	<10	10
Zinc (Zn)	<10	10
Cobalt Iron (Fe)	<2	.1
Manganese (Mn)	<2	5
Silicon (Si)	<2	5
Tin (Sn)	<2	10
Chromium (Cr)	<.5	.5
Nickel (Ni)	<.5	1

B. Physical Data

- 1.) Natural State: Solid
- 2.) Appearance and Odor: Silver-Metallic, Odorless
- 3.) Acidity/Alkalinity: Not Applicable
- 4.) Melting Point: 440 Degrees Fahrenheit
- 5.) Boiling Point: Not Applicable
- 6.) Specific Gravity: (H2O = 1) 2.5-2.9
- 7.) Vapor Pressure: Not Applicable

E. Health/Safety Information:

- 1.) Flash Point: Not Applicable
- 2.) Auto Ignition Temperature: Not Applicable
- 3.) Extinguishing Media: Not Applicable
- 4.) Fire and Explosion Hazards: Steel products in their solid state present no fire or explosion hazard.
- 5.) Stability: Stable
- 6.) Incompatibility: Reacts with strong acid to produce hydrogen gas.

F. Environmental Information:

- 1.) Spill or Leak Procedures: Not applicable
- 2.) Waste Disposal Method: According to local, state and federal regulations.

G. Additional Information:

- 1.) Material will react with strong acid to liberate hydrogen gas. At temperatures above the melting point of the coating, may liberate zinc fumes.
- 2.) Short term exposure to fumes/dust may produce irritation of eyes and respiratory system. Inhalation of high concentrations of freshly formed oxide fumes of iron, zinc, manganese, and lead can result in a flu-like illness called metal fume fever. Early symptoms may include a sweet or metallic taste in the mouth, dryness and irritation of the throat, and coughing. These symptoms may progress to shortness of breath, headache, fever, chills, muscle aches, nausea, vomiting, fatigue and profuse sweating. The attack may last 6-48 hours and is more likely to occur after a period away from the job.
- 3.) Chronic inhalation of high concentrations of iron oxide fumes or dust may lead to benign pneumoconiosis (siderosis). Inhalation of high concentrations of ferric oxide may possibly enhance the risk of lung cancer development in workers exposed to pulmonary carcinogens.
- 4.) Inhalation or ingestion of lead particulates may result in lead-induced systemic toxicity. Symptoms of lead poisoning include abdominal cramps, anemia, muscle weakness and headache. Prolonged exposure can cause behavioral changes, kidney damage, CNS damage and reproductive effects.

III. Conclusion

- A. THE INFORMATION CONTAINED IN THIS MSDS WAS OBTAINED FROM SOURCES WHICH WE BELIEVE TO BE RELIABLE. HOWEVER, THE INFORMATION IS PROVIDED WITHOUT ANY REPRESENTATION OR WARRANTY, EXPRESS OR IMPLIED REGARDING THE ACCURACY OR CORRECTNESS.
- B. THE CONDITIONS OR METHODS OF HANDLING, STORAGE, USE AND DISPOSAL OF THESE PRODUCTS ARE BEYOND OUR KNOWLEDGE. FOR THIS AND OTHER REASONS, WE DO NOT ASSUME RESPONSIBILITY AND EXPRESSLY DISCLAIM LIABILITY FOR LOSS, DAMAGE OR EXPOSURE ARISING OUT OF OR IN ANY WAY CONNECTED WITH THE HANDLING, STORAGE, USE OF OR DISPOSAL OF THESE PRODUCTS.

II. Galvanized Sheet - Carbon Steel (Hot Dipped)

A. Ingredients:	<u>% Composition By Weight</u>	<u>Threshold Limit Value</u> (mg/m ³)
Base Metal		
Iron (Fe)	Balance	5
Alloying Elements		
Carbon (C)	.005-.50	None Est.
Manganese (Mn)	.05-1.50	5
Phosphorus (Ph)	.15 max.	None
Sulfur (S)	.05 max.	5
Aluminum (Al)	.10	10
Metallic Coating		
Zinc (Zn)	8.5-9.9	5
Aluminum (Al)	.04 max.	10
Antimony (An)	.02 max.	.5
Lead (Pb)	.02 max.	.15
Iron (Fe)	.1-1.5	5

B. Physical Data:

- 1.) Natural State: Solid
- 2.) Appearance and Odor: Metallic Gray, Odorless
- 3.) Acidity/Alkalinity: Not Applicable
- 4.) Melting Point (Base Metal): 2,750 Degrees F.)
- 5.) Melting Point (Metallic Coating): 800-900 D. F.
- 6.) Boiling Point: Not Applicable
- 7.) Specific Gravity: (H₂O = 1) 7.6?7.8
- 8.) Vapor Pressure: Not Applicable

C. Personal Protective Equipment

- 1.) Respiratory Protection: Approved dust and fume respirator should be used to avoid excessive inhalation of particulates.
- 2.) Hands, Arms and Body: Protective gloves should be worn as required for welding, burning or handling operations.
- 3.) Eyes and Face: Use safety glasses or goggles as required for welding, burning, sawing, brazing, grinding or machining operations.
- 4.) Ventilation: Local exhaust ventilation should be provided when welding, burning, sawing, brazing, grinding or machining to prevent excessive dust or fume exposure.
- 5.) Other Clothing and Equipment: Depending upon the conditions of use and specific work situations, additional protective equipment and/or clothing may be required to control exposure.

D. Emergency Medical Procedures

- 1.) If overexposure to airborne fumes and particulates, remove exposed person to fresh air. If breathing is difficult or has stopped, administer artificial respiration or oxygen as indicated. Seek medical attention promptly.
- 2.) In the event of eye contact, flush with water for at least 15 minutes.

C. Personal Protective Equipment

- 1.) Respiratory Protection: Approved dust and fume respirator should be used to avoid excessive inhalation of particulates when exposure exceeds TLV's.
- 2.) Hands, Arms and Body:
Protective gloves should be worn as required for welding, burning or handling operations.
- 3.) Eyes and Face: Use safety glasses or goggles as required for welding, burning, sawing, brazing, grinding or machining operations.
- 4.) Other Clothing and Equipment: As required.

D. Emergency Medical Procedures:

- 1.) If exposed to excessive levels of metal fumes, remove to fresh air, and seek medical aid immediately.
- 2.) In the event of eye contact, flush with water for at least 15 minutes.

E. Health/Safety Information

- 1.) Flash Point: Not Applicable
- 2.) Auto Ignition Temperature: Not Applicable
- 3.) Extinguishing Media: Dry Powder (Class D) or Sand.
- 4.) Fire and Explosion Hazards: Damp aluminum dust may spontaneously heat with liberation of hydrogen to form explosive mixtures. Molten particles may explode on contact with water.
- 5.) Stability: Stable
- 6.) Incompatibility: Anhydrous Bromine

F. Environmental Information

- 1.) Spill or Leak Procedures: Not applicable
- 2.) Waste Disposal Method: According to local, state and federal regulations.

G. Additional Information:

- 1.) Halogen acids and sodium hydroxide in contact with aluminum may generate mixtures of hydrogen.
- 2.) Finely divided aluminum may form explosive mixtures in air. It will also form explosive mixtures in air in the presence of bromates, iodates, or ammonium nitrate.
- 3.) When remelting aluminum scrap, entrapped moisture or the presence of strong oxidizers such as ammonium nitrate could cause an explosion. Moisture must be driven off prior remelting.
- 4.) Do not touch cast aluminum metal or heated aluminum without knowing metal temperature. Aluminum experiences no color change during heating. If metal is hot and touched, burns can result.
- 5.) The welding of aluminum alloys may generate carbon monoxide, carbon dioxide, ozone, nitrogen oxides, infra-red radiation and ultra-violet radiation.
- 6.) Aluminum dust should be treated as a nuisance dust and high exposure may produce irritation of the eyes and respiratory system. The potential for overexposure to copper fumes may exist when welding, flame cutting, etc. on alloys containing high amounts of copper > 2.5%. These alloys include 2XXX, 7XXX and 4145 wrought alloys. Overexposure to copper fume can result in respiratory irritation, nausea metal fume fever.
- 7.) Nickel and chromium are contained in certain alloys at levels of 0.1 % or more. Chromium and nickel are listed in the 3rd Annual Report on Carcinogens, as prepared by the National Toxicology Program (NTP). Their presence in aluminum alloys, however, should not present a carcinogenic or health concern due to either their low concentrations or the chemical form in which they are present.