MATERIAL SAFETY DATA SHEET ATTACHMENT

1. **ALUMINUM**..... EFFECTS OF EXPOSURE: Fumes are a low health risk by inhalation. Defined as a nuisance by (ACGIH)
EMERGENCY & FIRST AID TREAMENT: No medical treatment necessary.

2. **ANTIMONY**..... EFFECTS OF EXPOSURE: May cause irritation to skin/contact dermatitis. Inhalation can cause inflammation of the upper and lower respiratory tracts. Chronic poisoning symptoms are dryness of throat, nausea, headaches, sleeplessness, loss of appetite and dizziness. In acute severe poisoning there may be death from circulatory or respiratory failure or toxic hepatitis.
EMERGENCY & FIRST AID TREAMENT: Remove from exposure and have biological monitoring under direction of physician.

3. **BISMUTH**..... EFFECTS OF EXPOSURE: No reported or recognized ill effects have been traced to bismuth metal. All reported toxicity data has been determined on soluble bismuth pharmaceuticals that are no longer used.
EMERGENCY & FIRST AID TREATMENT: Remove from exposure. Place individual under care of a physician.

4. **BERYLLIUM**..... EFFECTS OF EXPOSURE: Enters the body almost entirely by inhalation and can cause systemic disease of long duration. Symptoms are weakness, easy fatigue and weight loss.
EMERGENCY & FIRST AID TREATMENT: Remove from exposure. On overexposure obtain prompt medical care by a physician.

5. **CADMIUM**..... EFFECTS OF EXPOSURE: Inhalation may lead to chemical pneumonitis and in severe cases pulmonary edema. Symptoms are influenza-like similar to metal-fume fever and generally occur within an 8 hour period. In severe cases death can occur after 4 to 7 days. It should be stressed that cadmium induced kidney damage is irreversible.
EMERGENCY & FIRST AID TREATMENT: Remove from exposure and give oxygen therapy if necessary. Obtain prompt medical care.

6. **CHROMIUM**..... EFFECTS OF EXPOSURE: Can cause skin and mucous membrane irritation, dermatitis, chrome ulceration, perforation of the nasal septum, bronchial carcinoma, and adenocarcinoma. Listed NTP and IARC monographs.
EMERGENCY & FIRST AID TREATMENT: Wash skin thoroughly after contact. Obtain medical care for chrome ulceration.

7. **COBALT**..... EFFECTS OF EXPOSURE: Inhalation of fume will produce systemic poisoning with myocardial disorders and irritant effects on the airways, eyes and digestive tract. Symptoms range from shortness of breath to coughing.
EMERGENCY & FIRST AID TREATMENT: No antidote exists. Monitoring by a physician with particular attention to the cardiovascular system advisable.

8. **COPPER**..... EFFECTS OF EXPOSURE: Industrial exposure to copper fumes results in metal fume fever with atrophic changes in nasal mucous membranes. Chronic poisoning results in Wilson's disease, characterized by a hepatic cirrhosis, brain damage, demyelination, renal disease and copper deposition in the cornea.
EMERGENCY & FIRST AID TREATMENT: Remove from exposure.

9. **IRON**..... EFFECTS OF EXPOSURE: Inhalation of oxide or dust can result in siderosis which causes a shortness of breath and coughing tendencies.
EMERGENCY & FIRST AID TREATMENT: Remove from exposure and obtain medical attention.

10. **LEAD**..... EFFECTS OF EXPOSURE: Short term exposure symptoms may include stomach cramps, persistent vomiting, severe anemia, peripheral neuropathy and acute encephalopathy followed by coma, cardiorespiratory arrest and death. Long term exposure symptoms are the above with a metallic taste in mouth. Weakness of extensor muscles of the wrist and ankles is noticeable in serious cases.
EMERGENCY & FIRST AID TREATMENT: No immediate first aid is generally necessary. Biological monitoring under the direction of a physician is required in accordance with OSHA regulations.

11. **MAGNESIUM**..... EFFECTS OF EXPOSURE: Heavy exposure to fume may be irritating to eyes, nose and throat. Can cause metal-fume fever.
EMERGENCY & FIRST AID TREATMENT: Eye wash station facilities should be used immediately. No contact lenses should be worn in this area.

12. **MANGANESE**..... EFFECTS OF EXPOSURE: Dusts in high concentration can cause irritation of the eyes and throat. May cause nose to bleed. Manganese fume fever is characterized by cold-like symptoms. Chronic exposure can affect the central nervous system.
EMERGENCY & FIRST AID TREATMENT: On irritation wash thoroughly. On ingestion induce vomiting. Obtain medical attention.

13. **NICKEL**..... EFFECTS OF EXPOSURE: Potential sensitizer and may cause allergic reactions. Inhalation can cause hypertrophic rhinitis and nasal sinusitis. Excessive inhalation of nickel fumes has been associated with respiratory cancer. Listed NTP and IARC monographs.
EMERGENCY & FIRST AID TREATMENT: Wash affected area after contact. Annual medical monitoring by a physician is recommended in areas where concentrations are greater than 15 ugNi/M3 TWA for a 40-hour workweek.

14. **PHOSPHORUS**..... EFFECTS OF EXPOSURE: Inhalation may cause osteomyelitis of the jaw bone. Skin contact by burning phosphorus slivers will cause severe burns.
EMERGENCY & FIRST AID TREATMENT: Douse burning slivers with a 1 – 5% solution of aqueous copper sulphate. Then remove slivers with large quantities of water. Medical advice need be sought in cases of steomyelitis.

15. **SELENIUM**..... EFFECTS OF EXPOSURE: Effects of exposure are bronchial irritation and gastrointestinal distress which may occur from overexposure to selenium dioxide fumes. Chronic overexposure may cause depression, tiredness, nervousness, dermatitis, gastrointestinal disturbances and garlic odor of breath and sweat.
EMERGENCY & FIRST AID TREATMENT: Remove from exposure. Place individual under care of physician.

16. **SILICON**..... EFFECTS OF EXPOSURE: In a cold state silicon is not dangerous.
EMERGENCY & FIRST AID TREATMENT: None necessary.

17. **TIN**..... EFFECTS OF EXPOSURE: Tin powder is moderately irritant to the eyes and airways.
EMERGENCY & FIRST AID TREATMENT: Remove from exposure.

18. **ZINC**..... EFFECTS OF EXPOSURE: Exposure to zinc oxide fume can cause metal-fume fever. Symptoms resemble influenza with chills and nausea.
EMERGENCY & FIRST AID TREATMENT: Usually lasts less than 24 hours with no known treatment or lasting ill effects.

THE ABOVE INFORMATION IS PROVIDED FOR THE SOLE PURPOSE OF COMPLYING WITH THE U.S. OSHA HAZARD COMMUNICATION STANDARD, 20 CFR 1910.1200. THE INFORMATION IS GIVEN IN GOOD FAITH AND IS BELIEVED TO BE CORRECT, BUT WITHOUT GUARANTEE. WE DO NOT ASSUME RESPONSIBILITY FOR THE RESULTS OF ITS USE.

SOME OF THE SOURCES YOU MAY WISH TO CONSULT:

"Handbook of Hazardous Materials" (2nd Edition) . . Alliance of American Insurers

"Encyclopedia of Occupational Health & Safety" (Vol I & II) International Labour Office

"Threshold Limit Values for Chemical Substances in Work Environment" . . ACGIH