PRODUCT CODE: 19S HMIS CODES: H F R P
PRODUCT NAME: 19S EPOXY BASE SERIES MASTER MSDS 2*3 0 J

SECTION I - MANUFACTURER IDENTIFICATION

MANUFACTURER'S NAME: FORREST PAINT CO.
ADDRESS : 1011 MCKINLEY ST.
EUGENE, OR 97402

EMERGENCY PHONE : 1(800)424-9300
INFORMATION PHONE : 1(541)342-1821
DATE ISSUED : 5/23/2006
INFORMATION CONTACT: T. BOLLENBAUGH

SECTION II - REPORTABLE COMPONENTS

REPORTABLE COMPONENTS	CAS NUMBER	mm Hg @	TEMP	WEIGHT PERCENT
2-PROPANOL,1-METHOXY-,ACETATE PEL-TWA: NOT ESTAB.	000108-65-6	3.7	68	10 - 20
EPOXY RESIN PEL-TWA: NOT ESTABLISHED	NOT ESTAB.			5 - 15
METHYL ISOBUTYL KETONE PEL-TWA: 50 ppm, PEL-STEL: 75 ppm, ACGIH-TLV: 50 ppm	000108-10-1	15	68	5 - 15
TOLUENE PEL-TWA: 100 ppm, PEL-STEL: 150 ppm, ACGIH-TLV: 50 ppm - skin	000108-88-3	25	68	5 - 15
TITANIUM DIOXIDE PEL-TWA: 15 mg/m3, ACGIH-TLV: 10 mg/m3	013463-67-7			5 - 15
XYLENE PEL-TWA: 100 ppm, PEL-STEL: 150 ppm, ACGIH-TLV: 100 ppm	001330-20-7	5.1	68	5 - 15
IRON OXIDE PEL-TWA/ACGIH-TLV: 10 mg/m3 total dust, 5 mg/m3 (fume)	001309-37-1			5 - 15
ALUMINUM ACGIH-TLV: 5 mg/m3	007429-90-5			5 - 15
MANGANESE CMPDS ACGIH-CEILING: 5 ppm				5 - 15
PETROLEUM NAPHTHA PEL-TWA: 300 ppm, ACGIH-TLV: 100 ppm	064742-88-7	5	68	5 - 15
AROMATIC PETROLEUM DISTILLATES PEL-TWA: 100 ppm, PEL-STEL: 150 ppm, ACGIH-TLV: 100 ppm	064742-95-6	10.3	77	5 - 15
MINERAL SPIRITS PEL-TWA: 100 ppm, ACGIH-TLV: 100 ppm	008052-41-3	5	68	1 - 10
AMORPHOUS SILICA PEL-TWA: 6 mg/m3 (Dust); ACGIH-TLV: 10 mg/m3	063231-67-4			1 - 10
AMORPHOUS FUMED SILICA PEL-TWA: 6 mg/m3, ACGIH-TLV: 6 mg/m3	112945-52-5			1 - 10
ALUMINUM HYDROXIDE PEL-TWA: 15 mg/m3, ACGIH-TLV: 10 mg/m3 - Total dust	021645-51-2			1 - 10
CARBON BLACK PEL-TWA: 3.5mg/m3, ACGIH-TLV: 3.5 mg/m3	001333-86-4			1 - 10
ETHYL BENZENE PEL-TWA/ACGIH-TLV: 100 ppm; STEL: 150 ppm	000100-41-4	7	68	1 - 10
BARIUM SULFATE PEL-TWA/ACGIH-TLV: 10 mg/m3 Total Dust, 5 mg/m3 Respirable Fraction.	007727-43-7			1 - 10
1,2,4-TRIMETHYLBENZENE PEL-TWA: NOT ESTABLISHED	000095-63-6	1	68	1 - 10
n-BUTYL ALCOHOL PEL-TWA: 100 ppm, ACGIH-TLV: 50ppm ceil	000071-36-3	7	68	1 - 10

SEE SECTION 9 FOR SARA AND HAPS INFORMATION.

SECTION III - PHYSICAL/CHEMICAL CHARACTERISTICS

BOILING RANGE: 220 deg F - 337
DENSITY : 9.5 lb/gl
SPECIFIC GRAVITY (H20=1): 1.14
VAPOR DENSITY : Heavier than air.
EVAPORATION RATE: Slower than ether.

VOC AS SUPPLIED: 5.08 lb/gl 609 g/l
VOC EXCLUDING EPA EXEMPT SOLVENTS/WATER: 5.08 lb/gl 609 g/l

NOTE: Check with your state/local Air Quality regulatory agency to determine which VOC calculation you should use.

SOLUBILITY IN WATER: Insoluble.
APPEARANCE AND ODOR: Liquid with strong epoxy odor.

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT: 40 deg F
FLAMMABLE LIMITS IN AIR BY VOLUME- LOWER: .8 UPPER: 13.1

EXTINGUISHING MEDIA: Foam, Alcohol foam, CO2, Dry chemical, Water fog.

SPECIAL FIREFIGHTING PROCEDURES: Hazardous decomposition products may form from incomplete combustion. Wear full protection gear with self-contained positive pressure breathing apparatus. Contains aluminum which may react with water creating hydrogen gas. Dry chemical and CO2 are preferred over foam and water fog.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Aluminum pigment can react with water creating hydrogen gas. Dry chemical and Carbon dioxide are preferred over water in case of fire.
FLAMMABLE LIQUID AND VAPORS!! Closed container can build pressure from heat and rupture violently. Volatile vapors can burn in the open or explode if confined. Vapor is heavier than air and can travel long distances to source of ignition.

SECTION V - REACTIVITY DATA

STABILITY: Stable.

CONDITIONS TO AVOID: High temperatures, sources of ignition.
Do not use in areas with poor ventilation.

INCOMPATIBILITY (MATERIALS TO AVOID): Strong acids, oxidizing agents, water.
Avoid contamination with strong acids, bases, amines, or mercaptans.

HAZARDOUS DECOMPOSITION OR BYPRODUCTS: Carbon monoxide, carbon dioxide, hydrogen gas.

HAZARDOUS POLYMERIZATION: Will not occur.

SECTION VI - HEALTH HAZARD DATA

*****Note: This product is a blend of materials which has not been tested as a mixture. The health effect data is based on the individual components.*****
One part of a 2 part system. Mixture will contain the hazards of both parts. Read all cautions, warnings and MSDS for both parts before using.*

INHALATION HEALTH RISKS AND SYMPTOMS OF EXPOSURE:
ALUMINUM METAL DUST: Generally the metallic dust is considered a nuisance dust. However, fine powder can cause scarring of the lungs (pulmonary fibrous) with symptoms of cough and shortness of breath.
AMORPHOUS SILICA: Dust or in aerosol mist(inhalation): Considered to be less toxic than quartz or crystalline silica. Potential effects - scarring of the lungs (pulmonary fibrosis) and silicotic nodules - scar tissue (silicosis).
n-, sec- BUTYL ALCOHOLS: Irritation of the nose and throat may occur. Higher levels may cause you to become dizzy and pass out.
CARBON BLACK: Overexposure may cause mechanical irritation of the lungs. Long term exposure (many years) may cause reduced lung functions, with possible shortness of breath.

NAPHTHAS/ALIPHATIC SOLVENTS: Vapors or aerosol mists are central nervous system (CNS) depressant and a mild irritation of the eye and upper respiratory tract. Narcotic in high concentration. High concentrations can cause unconsciousness which may go to coma, difficult breathing and bluish tint to the skin.
PM ACETATE: Can cause mucous membrane irritation, nausea, dizziness or nasal tract tumors at higher concentrations.
MANGANESE COMPOUNDS: There has been found an association between manganese exposure and pulmonary effects including pneumonia, chronic bronchitis and airway disability.
TOLUENE/VM&P NAPHTHA/PETROLEUM NAPHTHA: Vapors or aerosol mists are central nervous system (CNS) depressant and a mild irritant of the eyes and upper respiratory tract. Narcotic in high concentration. High concentrations can cause unconsciousness which may go to coma, difficult breathing, tremors and nausea, excitation and hyperactivity, impairment of coordination and reaction time.
XYLENE/ETHYL BENZENE: Vapors are irritating to the eyes, mucous membranes and skin; at high concentrations it causes narcosis or unconsciousness. Giddiness, anorexia, vomiting, headache, vertigo (dizziness), gastric (stomach) discomfort, dryness of the throat and signs of slight drunkenness.
EPOXY RESIN: May cause headaches, nausea, dizziness, respiratory irritation, central nervous system depression or lung injury.
METHYL ISOBUTYL KETONE: Exposure can be very irritating to the eyes, mucous membranes of the nose and throat, producing eye and throat symptoms. Higher concentrations may cause dizziness, weakness, fatigue, headaches, lightedness, nausea, vomiting, incoordination and coma. Very high concentrations or prolonged exposure may cause kidney and liver damage.
AROMATIC HYDROCARBONS: Excessive inhalation of vapors can cause

nasal and respiratory irritation, central nervous system effects including dizziness, weakness, fatigue, headaches, nausea, possible unconsciousness and even death.
BARIUM SULFATE: May cause mild respiratory tract irritation at levels above recommended exposure limits.

EYE CONTACT HEALTH RISKS AND SYMPTOMS OF EXPOSURE:
AMORPHOUS SILICA: Dust or in aerosol mist (inhalation): Exposure can cause eye irritation.
n-, sec-, ISO-BUTYL ALCOHOLS: Exposure can cause eye irritation and headaches. n-Butyl causes severe eye symptoms including burning sensation, blurring of vision, tearing and light phobia.
CARBON BLACK: The particles may cause eye irritation.
NAPHTHAS/ALIPHATIC SOLVENTS: Contact could cause eye irritation.
PM ACETATE: Contact can cause painful eye irritation.
TOLUENE/VM&P NAPHTHA/PETROLEUM NAPHTHA: Toluene is a strong irritant to the eyes.
XYLENE/ETHYL BENZENE: Eye contact with liquid is irritating and may cause conjunctivitis, redness, tearing and blurred vision.
EPOXY RESIN: Mild to moderate irritation, possible minor temporary corneal injury.
METHYL ISOBUTYL KETONE: Liquid causes severe irritation, redness, tearing and blurred vision. May cause corneal damage.
AROMATIC HYDROCARBONS: Can cause severe irritation, redness, tearing and blurred vision.
BARIUM SULFATE: May cause mechanical irritation of the eye.

SKIN CONTACT HEALTH RISKS AND SYMPTOMS OF EXPOSURE:
TOLUENE/VM&P NAPHTHA/PETROLEUM NAPHTHA: Minor skin contact causes some irritation. Prolonged contact will cause drying of the skin and cracking.
XYLENE/ETHYL BENZENE: Skin contact may result in immediate irritation characterized by redness (erythema and hyperemia) and will remove fat from the skin resulting in dermatitis. Painful burning sensation and blisters formed on exposed areas.
EPOXY RESIN: May cause moderate skin injury (reddening and swelling.) May be a weak sensitizer. Can cause allergic skin reaction in certain individuals.
METHYL ISOBUTYL KETONE: Brief contact may dry the skin. Prolonged or repeated contact may irritate and defat the skin, causing cracking and dermatitis.
AROMATIC HYDROCARBONS: Prolonged or repeated contact can cause moderate irritation, defatting, dermatitis.

SKIN ABSORPTION HEALTH RISKS AND SYMPTOMS OF EXPOSURE:
n-, sec- BUTYL ALCOHOLS: n-Butyl has skin notation rapid entry through the skin, the other alcohols are a lesser extent. May damage the liver, kidneys, hearing and the sense of balance.
PM ACETATE: Can be absorbed and cause mild poisoning.
TOLUENE/VM&P NAPHTHA/PETROLEUM NAPHTHA: Can be absorbed and cause systemic poisoning.
XYLENE/ETHYL BENZENE: Can be slowly absorbed through the skin and cause systemic poisoning.
EPOXY RESIN: May be moderately toxic.

INGESTION HEALTH RISKS AND SYMPTOMS OF EXPOSURE:
If vomiting occurs do not allow vomitus to be breathed into the lungs. Even small quantities may cause chemical pneumonia and fluid in the lungs (pulmonary edema) which may result in hemorrhage (bleeding) and may be fatal.
n-, sec- BUTYL ALCOHOLS: Can be absorbed orally showing signs of general solvent toxicity.
NAPHTHAS/ALIPHATIC SOLVENTS: These solvents are not particularly toxic by ingesting, but will cause gastrointestinal disturbance and there is a risk of aspiration of the liquid into the lungs if vomiting takes place.
TOLUENE/VM&P NAPHTHA/PETROLEUM NAPHTHA: Ingestion produces similar effects to vapor inhalation. The liquid causes damage to stomach and intestinal linings.
XYLENE/ETHYL BENZENE: Ingestion produces similar effects to vapor inhalation. The liquid causes damage to stomach and intestinal linings.
EPOXY RESIN: May be slightly toxic.
METHYL ISOBUTYL KETONE: The solvent has low acute oral toxicity, but may cause gastric irritation, headache, nausea, vomiting, diarrhea. High doses can lead to narcosis and unconsciousness.
AROMATIC HYDROCARBONS: Can cause gastrointestinal irritation, nausea, vomiting and diarrhea. Breathing of material into the lungs can cause chemical pneumonitis which can be fatal.

CHRONIC HEALTH RISKS:
ALUMINUM METAL DUST: Inhalation of finely divided powder has been reported as a cause of pulmonary fibrosis.
AMORPHOUS SILICA: May cause lung scarring (silicosis).
n-, sec- BUTYL ALCOHOLS: Repeated contact may cause drying and cracking of the skin. n-Butyl alcohol can damage the hearing and sense of balance. Exposure may damage the liver and kidneys.
CARBON BLACK: Repeated and prolonged exposure may cause lung scarring, visible on chest x-rays, and/or some loss of lung function, with a shortness of breath. The changes usually develop slowly over a period of years.
Recent research has shown that the PAH content of carbon blacks is not released in biological fluids and thus not available for biological activity.
PM ACETATE: Human systemic effects by inhalation: olfactory (nasal) tumors, general anesthesia, nausea. An experimental teratogen. Many glycol ethers have dangerous human reproductive effects.
MANGANESE COMPOUNDS: None known at this time, however, manganese can cause a neurological disorder known as manganism. This disease begins with headaches, irritability and occasionally, psychotic behavior.
TOLUENE/VM&P NAPHTHA/PETROLEUM NAPHTHA: Prolonged contact will cause drying of the skin and cracking. Muscular weakness syndromes, gastrointestinal syndromes or neuropsychiatric syndromes are common symptoms in toluene sniffers.
Encephalophathy (toxic brain disease), progressive memory loss, fatigue, impaired concentration, irritability, persistent headaches and brain dysfunction has been reported.
XYLENE/ETHYL BENZENE: Can interfere with motor functions in exposed workers, loss of appetite, nausea, headache, dizziness, sleeplessness, indigestion, nose bleeds, liver and kidney damage,

toxic brain disease (encephalopathy), dementia (loss of memory), and other neurological disorders.
Experimental animals experienced teratogenic and reproductive effects. Temporary blood disorders and kidney damage has been observed in male rats.
Prolonged or repeated exposure to solvents may cause permanent brain and nervous system damage, including memory loss and impairment of coordination and reaction time. May cause toxic brain disease (encephalopathy), associated with brain tissue death. May cause liver and kidney damage. Inhaling concentrated vapors is harmful and may be fatal.
EPOXY RESIN: Repeated and prolonged use may cause central nervous system damage. May cause liver, kidneys, bone marrow and blood cell injury.
METHYL ISOBUTYL KETONE: May cause liver, kidney, lung and brain damage.
BARIUM SULFATE: Heavy extended industrial exposure may produce a benign Pneumoconiosis, termed "Baritosis". The reaction results in no impairment of the ventilatory function. Mild bronchial irritation may occur.

CARCINOGENICITY:
NTP CARCINOGEN: No IARC MONOGRAPHS: Yes OSHA REGULATED: No
ETHYL BENZENE: Classified by IARC (International Agency for Research on Cancer) as possibly carcinogenic to humans (group 2B). Risk of cancer depends on duration and level of exposure.

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE:
Exposure for employees with a history of certain medical conditions such as skin, liver, kidney, eye, chronic respiratory, central and peripheral nervous system disease may have an increased risk from exposure to this material.

EMERGENCY AND FIRST AID PROCEDURES:
***NOTES TO PHYSICIAN: If victim is a child, give no more than 1 glass of water and 15cc (1 tablespoon) syrup of Ipecac. If symptoms such as loss of gag reflex, convulsions or unconsciousness occur before emesis, gastric lavage should be considered following intubation with a cuffed endotracheal tube.
The danger of aspiration must be weighed against toxicity when considering emptying the stomach. Stomach contents should be emptied quickly in a manner which avoids the vomitus entering the lungs.***
EYE AND SKIN CONTACT: In case of contact, immediately flush eyes (lifting eyelids occasionally) or skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention. Wash clothing before reuse.
INHALATION: Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.
INGESTION: If swallowed, do not induce vomiting. Get medical attention immediately.

SECTION VII - PRECAUTIONS FOR SAFE HANDLING AND USE

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: Evacuate all nonessential personnel. Remove all source of ignition. Ventilate

area if possible. Avoid breathing vapors. Spill clean up beyond the scope of normal maintenance activities should be performed by trained response personnel.
In the event of a large transportation related spill or emergency call CHEMTREC at 1(800)424-9300.

WASTE DISPOSAL METHOD: Waste material is a RCRA hazardous waste. Dispose of in accordance to Federal, state and local waste disposal regulations. Do not discharge into public water ways or water treatment facilities. Do not bury.

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING: FLAMMABLE LIQUID AND VAPORS. Store only in areas approved for flammable liquids. Keep clear of all sources of ignition. Ground and bond all holding and transfer containers. Storage temperature must be below 120 deg. F. Freezing temperatures may effect product stability. KEEP CONTAINER TIGHTLY CLOSED WHEN NOT IN USE. DO NOT TRANSFER TO UNLABELED CONTAINER.

OTHER PRECAUTIONS: Ignition temperatures of this product will decrease with increased vapor volume and vapor/air contact time and are influenced by pressure changes. Any proposed use of this product in elevated-temperature processes should be evaluated to assure that safe operating conditions are established.

SECTION VIII - CONTROL MEASURES

RESPIRATORY PROTECTION: If ventilation is not adequate to reduce vapors below regulatory limits, use a self-contained (air supplied) positive pressure breathing apparatus, or a NIOSH approved air purifying respirator (APR) equipped with organic vapor cartridges (black striped cartridge). Failure to use proper respiratory protection may be harmful or fatal.
User must be properly trained and fitted to assure effective protection. Follow all manufacturers recommendations for use of filter.
WARNING: Do not use an APR if oxygen level is below 19.5% by volume.

VENTILATION: Sufficient ventilation, in volume and pattern should be provided to keep the air contaminants below the TLV/PEL levels. Remove vapors from low areas of stagnant air (e.g., corners near floor where vapors may collect).

PROTECTIVE GLOVES: Use gloves impervious to solvent. Follow glove manufacturer's recommendation for selecting gloves according to the solvents in this product.

EYE PROTECTION: Wear splash goggles or use face shield with safety glasses for splash protection. If vapor concentration causes eye irritation wear full-face respirator. Do not wear contact lenses when working with chemicals. Contact lenses can trap chemical next to eye which may increase eye damage.

OTHER PROTECTIVE CLOTHING OR EQUIPMENT: A protective apron should be used for splash protection. When spraying this product a spray hood is recommended to cover hair and face. Skin should be covered as much as possible to protect from overspray or mist.
A continuous 15 minute eye wash station and a chemical spill shower

should be available in case of emergency.

WORK/HYGIENIC PRACTICES: In handling any chemicals, personal hygiene is extremely important. Always wash your hands and face before eating or when done handling or using this product. Keep food and drink out of work areas. Some items such as cigarettes or gum readily absorb solvent vapors and may increase your overall exposure to this product.

SECTION IX - REGULATORY INFORMATION

SARA 313 / 40 CFR 372:		% / WT
METHYL ISOBUTYL KETONE	000108-10-1	8
TOLUENE	000108-88-3	8
XYLENE	001330-20-7	7
MANGANESE CMPDS		6
ETHYL BENZENE	000100-41-4	2
1,2,4-TRIMETHYLBENZENE	000095-63-6	2
n-BUTYL ALCOHOL	000071-36-3	1

CLEAN AIR ACT AMENDMENT SECTION 112 (HAPS):		% / WT
+ METHYL ISOBUTYL KETONE	000108-10-1	8
+ TOLUENE	000108-88-3	8
+ XYLENE	001330-20-7	7
x MANGANESE CMPDS		6
+ ETHYL BENZENE	000100-41-4	2

+ Indicates volatile Hazardous Air Pollutant chemicals at or above the reporting requirements of the Clean Air Act Amendments Section 112.
x Indicates non-volatile Hazardous Air Pollutant chemicals at or above the reporting requirements of the Clean Air Act Amendments Section 112.

DOT SHIPPING INFORMATION (GROUND): Paint, 3, UN1263, PGII. ERG # 128

DOT SHIPPING INFORMATION (LIMITED QUANTITIES/GROUND): Inner packaging 1.3 gallons (5 L) or less each net capacity in strong outer packaging and total package weight not exceeding 66 pounds (30 kg): Consumer Commodity, ORM-D

IATA SHIPPING DESCRIPTION (AIR SHIPMENTS): Paint, Class 3, UN1263, PG II.

IMDG SHIPPING DESCRIPTION (WATERWAYS SHIPMENTS): Paint, Flammable Liquid, Class 3, UN1263, PG II. Flashpoint 5 C.

OSHA CLASSIFICATION: Flammable Liquid - Class IB.

CLEAN AIR ACT - OZONE DEPLETING CHEMICALS: Not known to contain or be manufactured with Class 1 or Class 2 Ozone Depleting Chemicals (ODC's).

SECTION X - DISCLAIMER

The above information is based on current information available to Forrest Paint Co. and is believed to be accurate but is not warranted.

SECTION 1 - MANUFACTURER IDENTIFICATION

PRODUCT CODE: 1A64ER70449 HMIS CODES: H F R P
PRODUCT NAME: ACRYLIC ENAMEL - GHEEN GREEN 2*4 0 I
MANUFACTURER'S NAME: FORREST PAINT CO.
ADDRESS : 1011 MCKINLEY ST.
EUGENE, OR 97402

EMERGENCY PHONE : 1(800)424-9300 (CHEMTREC - Contract # 8730)
INFORMATION PHONE : 1(541)342-1821
DATE ISSUED : 11/14/2013
INFORMATION CONTACT: T. BOLLENBAUGH

SECTION 2 - COMPOSITION/INFORMATION ON INGREDIENTS

REPORTABLE COMPONENTS	CAS NUMBER	mm Hg @	TEMP	WEIGHT PERCENT
XYLENE	001330-20-7	5.1	68	15 - 25
PEL-TWA: 100 ppm, PEL-STEL: 150 ppm, ACGIH-TLV: 100 ppm				
ACETONE	000067-64-1	186	68	15 - 25
PEL-TWA: 750 ppm, PEL-STEL: 1000 ppm, ACGIH-TLV: 750 ppm				
PROPANE	000074-98-6	205	100	10 - 20
ACGIH-TLV: 1000 ppm				
BUTANE	000106-97-8	1520	66	10 - 20
ACGIH-TLV: 800 ppm				
TITANIUM DIOXIDE	013463-67-7			1 - 10
PEL-TWA: 15 mg/m3, ACGIH-TLV: 10 mg/m3				
ISOBUTYL ACETATE	000110-19-0	15	68	1 - 10
PEL-TWA: 150 ppm, PEL-STEL: 750 ppm, ACGIH-TLV: 150 ppm				
ETHYL BENZENE	000100-41-4	7	68	1 - 10
PEL-TWA/ACGIH-TLV: 100 ppm; STEL: 150 ppm				
n-BUTYL ALCOHOL	000071-36-3	7	68	1 - 10
PEL-TWA: 100 ppm, ACGIH-TLV: 50ppm ceil				
2-ETHYLHEXYL ACETATE	000103-09-3.	.4	68	1 - 10
OSHA-PEL / ACGIH-TLV: Not established				
TOLUENE	000108-88-3	25	68	1 - 10
PEL-TWA: 100 ppm, PEL-STEL: 150 ppm, ACGIH-TLV: 20 ppm - skin				

SEE SECTION 15 FOR SARA AND HAPS INFORMATION.

SECTION 3 - HAZARD IDENTIFICATION

Note: This product is a blend of materials which has not been tested as a mixture. The health effect data is based on the individual components.

INHALATION:
ISOBUTYL ACETATE: The vapors may irritate the nose and throat. At higher levels, strong throat irritation has been reported. Breathing vapors may also lead to headache, nausea, vomiting, dizziness, depression of the central nervous system and loss of consciousness.
ACETONE: Vapors are irritating and may cause a stinging and itching sensation in the eyes, nose and throat, coughing, excessive blinking, tear production, nausea and possibly vomiting. High vapor concentrations may result in dryness of mouth and throat, headache,

dizziness, incoordination and eventually unconsciousness or, in extreme cases, coma.
TOLUENE: Vapors or aerosol mists are central nervous system (CNS) depressant and a mild irritant of the eyes and upper respiratory tract. Narcotic in high concentration. High concentrations can cause unconsciousness which may go to coma, difficult breathing, tremors and nausea, excitation and hyperactivity, impairment of coordination and reaction time.
XYLENE/ETHYL BENZENE: Vapors are irritating to the eyes, mucous membranes and skin; at high concentrations it causes narcosis or unconsciousness. Giddiness, anorexia, vomiting, headache, vertigo (dizziness), gastric (stomach) discomfort, dryness of the throat and signs of slight drunkenness.
n-, sec- BUTYL ALCOHOLS: Irritation of the nose and throat may occur. Higher levels may cause you to become dizzy and pass out.

EYE CONTACT:
ISOBUTYL ACETATE: Can cause eye irritation.
Contact with eyes can cause severe irritation, reddness, tearing and blurred vision.
ACETONE: Causes severe irritation, seen as marked excess redness and swelling of the membrane lining the eye and the inside of the eyelid, and immediate pain. Injury to the cornea may occur if the eye is not flushed with water immediately.
TOLUENE: Toluene is a strong irritant to the eyes.
XYLENE/ETHYL BENZENE: Eye contact with liquid is irritating and may cause conjunctivitis, redness, tearing and blurred vision.
n-, sec-, BUTYL ALCOHOLS: Exposure can cause eye irritation and headaches. n-Butyl causes severe eye symptoms including burning sensation, blurring of vision, tearing and light phobia.

SKIN CONTACT:
ACETONE: Causes skin irritation. Prolonged or repeated contact may cause defatting, drying and cracking of the skin.
ISOBUTYL ACETATE: Causes skin irritation. Prolonged or repeated contact may cause defatting, drying and cracking of the skin.
TOLUENE: Minor skin contact causes some irritation. Prolonged contact will cause drying of the skin and cracking.
XYLENE/ETHYL BENZENE: Skin contact may result in immediate irritation characterized by redness (erythema and hyperemia) and will remove fat from the skin resulting in dermatitis. Painful burning sensation and blisters formed on exposed areas.
2-ETHYLHEXYL ACETATE: Causes skin irritation.

SKIN ABSORPTION:
ACETONE: Skin absorption can occur, however, inhalation is the primary route of exposure.
TOLUENE: Can be absorbed and cause systemic poisoning.
XYLENE/ETHYL BENZENE: Can be slowly absorbed through the skin and cause systemic poisoning.
n-, sec- BUTYL ALCOHOLS: n-Butyl has skin notation rapid entry through the skin, the other alcohols are a lesser extent. May damage the liver, kidneys, hearing and the sense of balance.

INGESTION:
If vomiting occurs do not allow vomitus to be breathed into the lungs. Even small quantities may cause chemical pneumonia and fluid in the lungs (pulmonary edema) which may result in hemorrhage (bleeding) and may be fatal.
Ingestion of aerosol mist unlikely. Swallowing of liquid may result in nausea and vomiting.
ISOBUTYL ACETATE: Ingestion leads to many of the effects of vapor inhalation
ACETONE: Toxic by ingestion. Causes nausea, vomiting, headache, dizziness, unconsciousness, coma, kidney damage and metabolic changes.
TOLUENE: Ingestion produces similar effects to vapor inhalation. The liquid causes damage to stomach and intestinal linings.
XYLENE/ETHYL BENZENE: Ingestion produces similar effects to vapor inhalation. The liquid causes damage to stomach and intestinal linings.
n-, sec- BUTYL ALCOHOLS: Can be absorbed orally showing signs of general solvent toxicity.

CHRONIC HEALTH RISKS
Prolonged or repeated exposure to solvents may cause permanent brain and nervous system damage, including memory loss and impairment of coordination and reaction time. May cause toxic brain disease (encephalopathy), associated with brain tissue death. May cause liver and kidney damage. Inhaling concentrated vapors is harmful and may be fatal.
ACETONE: In industry, the primary reported effects have been skin irritation resulting from its defatting action and headaches from prolonged inhalation. Chronic overexposure may lead to kidney or eye damage.
TOLUENE: Prolonged contact will cause drying of the skin and cracking. Muscular weakness syndromes, gastrointestinal syndromes or neuropsychiatric syndromes are common symptoms in toluene sniffers. Encephalophathy (toxic brain disease), progressive memory loss, fatigue, impaired concentration, irritability, persistent headaches and brain dysfunction has been reported.
XYLENE/ETHYL BENZENE: Can interfere with motor functions in exposed workers, loss of appetite, nausea, headache, dizziness, sleeplessness, indigestion, nose bleeds, liver and kidney damage, toxic brain disease (encephalopathy), dementia (loss of memory), and other neurological disorders. Experimental animals experienced teratogenic and reproductive effects. Temporary blood disorders and kidney damage has been observed in male rats.
n-, sec- BUTYL ALCOHOLS: Repeated contact may cause drying and cracking of the skin. n-Butyl alcohol can damage the hearing and sense of balance. Exposure may damage the liver and kidneys.

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE
Exposure for employees with a history of certain medical conditions such as skin, liver, kidney, eye, chronic respiratory, central and peripheral nervous system disease may have an increased risk from exposure to this material.
ACETONE: May enhance the toxicity on the kidneys of other solvents

in mixed solvent systems.

SECTION 4 - FIRST AID MEASURES

EYE CONTACT AND SKIN: In case of eye contact, flush immediately with plenty of water (lifting eyelids occasionally) for a least 15 minutes. Get medical attention immediately; for skin, wash thoroughly with soap and water.
INHALATION: Remove to fresh air. If, not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.
INGESTION: If swallowed, do not induce vomiting. Call a physician, hospital emergency room or poison control center (800-222-1222) immediately.

SECTION 5 - FIRE-FIGHTING MEASURES

FLASH POINT: (-134) F / (-92) C
FLAMMABLE LIMITS IN AIR BY VOLUME- LOWER: .8 UPPER: 13
EXTINGUISHING MEDIA: Foam, Alcohol foam, CO2, Dry chemical, Water fog.

SPECIAL FIREFIGHTING PROCEDURES: Hazardous decomposition products may form from incomplete combustion. Wear full protection gear with self-contained positive pressure breathing apparatus.

UNUSUAL FIRE AND EXPLOSION HAZARDS: EXTREMELY FLAMMABLE LIQUID AND VAPORS! Container can build pressure from heat and rupture explosively. Volatile vapors can burn in the open or explode if confined. Vapor is heavy and can travel long distances to source of ignition.

SECTION 6 - ACCIDENTAL RELEASE MEASURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: Use absorbent material to collect spill. Scoop into a container and dispose of according to local regulations.
In the event of a large transportation related spill or emergency, see emergency contact number in Section 1.

SECTION 7 - HANDLING AND STORAGE

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING: EXTREMELY FLAMMABLE LIQUID AND VAPORS! Keep clear of all sources of ignition. Do not store at temperature greater than 120° F / 49° C. Contents under pressure. Exposure to sunlight may cause bursting. Do not puncture or incinerate. Avoid prolonged exposure to sunlight.

OTHER PRECAUTIONS: None known.

SECTION 8 - EXPOSURE CONTROLS AND PERSONAL PROTECTION

RESPIRATORY PROTECTION: If ventilation is not adequate to reduce vapors below regulatory limits, use a self-contained (air supplied) positive pressure breathing apparatus, or a NIOSH approved air purifying respirator (APR) equipped with organic vapor cartridges (black striped cartridge). Failure to use proper respiratory

protection may be harmful or fatal.
User must be properly trained and fitted to assure effective protection. Follow all manufacturers recommendations for use of filter.
WARNING: Do not use an APR if oxygen level is below 19.5% by volume.

VENTILATION: Good general ventilation should be sufficient for most conditions. Use local exhaust if necessary to control mist or vapor.

PROTECTIVE GLOVES: Use gloves impervious to liquid.
EYE PROTECTION: Goggles or approved safety glasses with sideshields should be worn. DO NOT wear contact lenses when working with chemicals. Contact lenses can trap chemical next to eye which may increase eye damage.

OTHER PROTECTIVE CLOTHING OR EQUIPMENT: None known.
WORK/HYGIENIC PRACTICES: In handling any chemicals, personal hygiene is extremely important. Always wash your hands and face before eating or when done handling or using this product. Keep food and drink out of work areas. Some items such as cigarettes or gum readily absorb solvent vapors and may increase your overall exposure to this product.

SECTION 9 - PHYSICAL / CHEMICAL PROPERTIES

BOILING RANGE: -13 - 390 deg F
DENSITY: 6.64 lb/gl
SPECIFIC GRAVITY (H20=1): .8
VAPOR DENSITY : Heavier than air.
EVAPORATION RATE: Faster than ether.
SOLUBILITY IN WATER: Insoluble.
APPEARANCE AND ODOR: Aerosol mist with solvent odor.

VOC EMISSIONS: 3.85 lb/gl 461 g/l
VOC EXCLUDING EPA EXEMPT SOLVENTS/WATER: 4.77 lb/gl 572 g/l
NOTE: Check with your state/local Air Quality regulatory agency to determine which VOC calculation you should use.

SECTION 10 - STABILITY AND REACTIVITY

STABILITY: Stable.
CONDITIONS TO AVOID: High temperatures, sources of ignition. Do not use in areas with poor ventilation.

INCOMPATIBILITY (MATERIALS TO AVOID): Strong oxidizing agents.
2-ETHYLHEXYL ACETATE: Strong oxidizing agents.

HAZARDOUS DECOMPOSITION OR BYPRODUCTS: Carbon monoxide, carbon dioxide.

HAZARDOUS POLYMERIZATION: Will not occur.

SECTION 11 - TOXICOLOGICAL INFORMATION

CARCINOGENICITY:
NTP CARCINOGEN: No IARC MONOGRAPHS: Yes OSHA REGULATED: No

TITANIUM DIOXIDE: Classified by IARC (International Agency for Research on Cancer) as possibly carcinogenic to humans (group 2B).
ETHYL BENZENE: Classified by IARC (International Agency for Research on Cancer) as possibly carcinogenic to humans (group 2B).

SECTION 12 - ECOLOGICAL INFORMATION

This product has not been tested for environmental effects.

SECTION 13 - DISPOSAL CONSIDERATIONS

WASTE DISPOSAL METHOD: Dispose of waste according to Federal, State, and local regulations. Do not put used container into incinerator, wood stove, or home trash compactor.

SECTION 14 - TRANSPORT INFORMATION

DOT SHIPPING INFORMATION (GROUND): Does not apply.
DOT SHIPPING INFORMATION (LIMITED QUANTITIES/GROUND): Consumer Commodity, ORM-D (Note: After 12/31/13 Consumer Commodity - ORM-D must be shipped as Limited Quantity)

IATA SHIPPING DESCRIPTION (AIR SHIPMENTS): Consumer commodity, Class 9, ID 8000.

IMDG SHIPPING DESCRIPTION (WATERWAYS SHIPMENTS): UN1950, Aerosols, Class 2.1, Limited Quantity. Flashpoint -92 C.

SECTION 15 - REGULATORY INFORMATION

SARA 313 / 40 CFR 372:		% / WT
* XYLENE	001330-20-7	20
* ETHYL BENZENE	000100-41-4	3.7
* n-BUTYL ALCOHOL	000071-36-3	2
* TOLUENE	000108-88-3	1

CLEAN AIR ACT AMENDMENT SECTION 112 (HAPS):		% / WT
+ XYLENE	001330-20-7	20
+ ETHYL BENZENE	000100-41-4	3.7
+ TOLUENE	000108-88-3	1

+ Indicates volatile Hazardous Air Pollutant chemicals at or above the reporting requirements of the Clean Air Act Amendments Section 112.

OSHA CLASSIFICATION: Flammable Liquid - Class IA.

CLEAN AIR ACT - OZONE DEPLETING CHEMICALS: Not known to contain or be manufactured with Class 1 or Class 2 Ozone Depleting Chemicals (ODC's).

RoHS DIRECTIVE: This product complies with the RoHS (Restriction of Hazardous Substances) Directive.

U.S. TOXIC SUBSTANCES CONTROL ACT: All components of this product are on the TSCA Inventory or are exempt from TSCA Inventory requirements under 40 CFR 720.30

SECTION 16 - OTHER INFORMATION

The above information is based on current information available to Forrest Paint Co. and is believed to be accurate but is not warranted.

PRODUCT CODE: 14EN2211 HMIS CODES: H F R P
PRODUCT NAME: BLUE - N2211 QUIXNAMEL 2*3 0 J

SECTION I - MANUFACTURER IDENTIFICATION

MANUFACTURER'S NAME: FORREST PAINT CO.
ADDRESS : 1011 MCKINLEY ST.
EUGENE, OR 97402

EMERGENCY PHONE : 1(800)424-9300
INFORMATION PHONE : 1(541)342-1821
DATE ISSUED : 12/18/2008
INFORMATION CONTACT: T. BOLLENBAUGH

SECTION II - REPORTABLE COMPONENTS

REPORTABLE COMPONENTS	CAS NUMBER	mm Hg @	TEMP	WEIGHT PERCENT
XYLENE	001330-20-7	5.1	68	40 - 50
PEL-TWA: 100 ppm, PEL-STEL: 150 ppm, ACGIH-TLV: 100 ppm				
ETHYL BENZENE	000100-41-4	7	68	5 - 15
PEL-TWA/ACGIH-TLV: 100 ppm; STEL: 150 ppm				
TOLUENE	000108-88-3	25	68	5 - 15
PEL-TWA: 100 ppm, PEL-STEL: 150 ppm, ACGIH-TLV: 20 ppm - skin				
TITANIUM DIOXIDE	013463-67-7			1 - 10
PEL-TWA: 15 mg/m3, ACGIH-TLV: 10 mg/m3				
SOLVENT NAPHTHA	064742-89-8	7.7	68	1 - 10
PEL-TWA/ACGIH-TLV: 300 ppm, PEL-STEL: 400 ppm				
AROMATIC PETROLEUM DISTILLATES	064742-95-6	10.3	77	1 - 10
PEL-TWA: 100 ppm, PEL-STEL: 150 ppm, ACGIH-TLV: 100 ppm				

SEE SECTION 9 FOR SARA AND HAPS INFORMATION.

SECTION III - PHYSICAL/CHEMICAL CHARACTERISTICS

BOILING RANGE: 232 deg F - 320 deg F
DENSITY : 8.31 lb/gl
SPECIFIC GRAVITY (H20=1): 1.
VAPOR DENSITY : Heavier than air.
EVAPORATION RATE: Slower than ether.

VOC AS SUPPLIED: 5.09 lb/gl 609 g/l
VOC EXCLUDING EPA EXEMPT SOLVENTS/WATER: 5.09 lb/gl 609 g/l

NOTE: Check with your state/local Air Quality regulatory agency
to determine which VOC calculation you should use.

SOLUBILITY IN WATER: Insoluble.
APPEARANCE AND ODOR: Liquid with strong solvent odor.

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT: 40 deg F
FLAMMABLE LIMITS IN AIR BY VOLUME- LOWER: .8 UPPER: 7.6

EXTINGUISHING MEDIA:
Foam, Alcohol foam, CO2, Dry chemical, Water fog.

SPECIAL FIREFIGHTING PROCEDURES:
Hazardous decomposition products may form from incomplete combustion. Wear full protection gear with self-contained positive pressure breathing apparatus.

UNUSUAL FIRE AND EXPLOSION HAZARDS:
FLAMMABLE LIQUID AND VAPORS!! Closed container can build pressure from heat and rupture violently. Volatile vapors can burn in the open or explode if confined. Vapor is heavier than air and can travel long distances to source of ignition.

Dried paint residue may spontaneously combust. Sweepings, rags, etc., should be wet down and put in a closed container.

SECTION V - REACTIVITY DATA

STABILITY: Stable.

CONDITIONS TO AVOID:
High temperatures, sources of ignition. Do not use in areas with poor ventilation.

INCOMPATIBILITY (MATERIALS TO AVOID):
Strong oxidizing agents.

HAZARDOUS DECOMPOSITION OR BYPRODUCTS:
Carbon monoxide, carbon dioxide.

HAZARDOUS POLYMERIZATION: Will not occur.

SECTION VI - HEALTH HAZARD DATA

*****Note: This product is a blend of materials which has not been tested as a mixture. The health effect data is based on the individual components.*****

INHALATION HEALTH RISKS AND SYMPTOMS OF EXPOSURE:
NAPHTHAS/ALIPHATIC SOLVENTS: Vapors or aerosol mists are central nervous system (CNS) depressant and a mild irritation of the eye and upper respiratory tract. Narcotic in high concentration. High concentrations can cause unconsciousness which may go to coma, difficult breathing and bluish tint to the skin.

TOLUENE/VM&P NAPHTHA/PETROLEUM NAPHTHA: Vapors or aerosol mists are central nervous system (CNS) depressant and a mild irritant of the eyes and upper respiratory tract. Narcotic in high concentration. High concentrations can cause unconsciousness which may go to coma, difficult breathing, tremors and nausea, excitation and hyperactivity, impairment of coordination and reaction time.

XYLENE/ETHYL BENZENE: Vapors are irritating to the eyes, mucous membranes and skin; at high concentrations it causes narcosis or unconsciousness. Giddiness, anorexia, vomiting, headache, vertigo (dizziness), gastric (stomach) discomfort, dryness of the throat and

signs of slight drunkenness.

AROMATIC HYDROCARBONS: Excessive inhalation of vapors can cause nasal and respiratory irritation, central nervous system effects including dizziness, weakness, fatigue, headaches, nausea, possible unconsciousness and even death.

EYE CONTACT HEALTH RISKS AND SYMPTOMS OF EXPOSURE:
NAPHTHAS/ALIPHATIC SOLVENTS: Contact could cause eye irritation.

TOLUENE/VM&P NAPHTHA/PETROLEUM NAPHTHA: Toluene is a strong irritant to the eyes.

XYLENE/ETHYL BENZENE: Eye contact with liquid is irritating and may cause conjunctivitis, redness, tearing and blurred vision.

AROMATIC HYDROCARBONS: Can cause severe irritation, redness, tearing and blurred vision.

SKIN CONTACT HEALTH RISKS AND SYMPTOMS OF EXPOSURE:
TOLUENE/VM&P NAPHTHA/PETROLEUM NAPHTHA: Minor skin contact causes some irritation. Prolonged contact will cause drying of the skin and cracking.

XYLENE/ETHYL BENZENE: Skin contact may result in immediate irritation characterized by redness (erythema and hyperemia) and will remove fat from the skin resulting in dermatitis. Painful burning sensation and blisters formed on exposed areas.

AROMATIC HYDROCARBONS: Prolonged or repeated contact can cause moderate irritation, defatting, dermatitis.

SKIN ABSORPTION HEALTH RISKS AND SYMPTOMS OF EXPOSURE:
TOLUENE/VM&P NAPHTHA/PETROLEUM NAPHTHA: Can be absorbed and cause systemic poisoning.

XYLENE/ETHYL BENZENE: Can be slowly absorbed through the skin and cause systemic poisoning.

INGESTION HEALTH RISKS AND SYMPTOMS OF EXPOSURE:
If vomiting occurs do not allow vomitus to be breathed into the lungs. Even small quantities may cause chemical pneumonia and fluid in the lungs (pulmonary edema) which may result in hemorrhage (bleeding) and may be fatal.

NAPHTHAS/ALIPHATIC SOLVENTS: These solvents are not particularly toxic by ingesting, but will cause gastrointestinal disturbance and there is a risk of aspiration of the liquid into the lungs if vomiting takes place.

TOLUENE/VM&P NAPHTHA/PETROLEUM NAPHTHA: Ingestion produces similar effects to vapor inhalation. The liquid causes damage to stomach and

intestinal linings.

XYLENE/ETHYL BENZENE: Ingestion produces similar effects to vapor inhalation. The liquid causes damage to stomach and intestinal linings.

AROMATIC HYDROCARBONS: Can cause gastrointestinal irritation, nausea, vomiting and diarrhea. Breathing of material into the lungs can cause chemical pneumonitis which can be fatal.

CHRONIC HEALTH RISKS:
TOLUENE/VM&P NAPHTHA/PETROLEUM NAPHTHA: Prolonged contact will cause drying of the skin and cracking. Muscular weakness syndromes, gastrointestinal syndromes or neuropsychiatric syndromes are common symptoms in toluene sniffers.
Encephalophathy (toxic brain disease), progressive memory loss, fatigue, impaired concentration, irritability, persistent headaches and brain dysfunction has been reported.

XYLENE/ETHYL BENZENE: Can interfere with motor functions in exposed workers, loss of appetite, nausea, headache, dizziness, sleeplessness, indigestion, nose bleeds, liver and kidney damage, toxic brain disease (encephalopathy), dementia (loss of memory), and other neurological disorders.
Experimental animals experienced teratogenic and reproductive effects. Temporary blood disorders and kidney damage has been observed in male rats.

Prolonged or repeated exposure to solvents may cause permanent brain and nervous system damage, including memory loss and impairment of coordination and reaction time. May cause toxic brain disease (encephalopathy), associated with brain tissue death. May cause liver and kidney damage. Inhaling concentrated vapors is harmful and may be fatal.

CARCINOGENICITY:
NTP CARCINOGEN: No IARC MONOGRAPHS: Yes OSHA REGULATED: No
ETHYL BENZENE: Classified by IARC (International Agency for Research on Cancer) as possibly carcinogenic to humans (group 2B). Risk of cancer depends on duration and level of exposure.

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE:
Exposure for employees with a history of certain medical conditions such as skin, liver, kidney, eye, chronic respiratory, central and peripheral nervous system disease may have an increased risk from exposure to this material.

EMERGENCY AND FIRST AID PROCEDURES:
EYE AND SKIN CONTACT: In case of contact, immediately flush eyes (lifting eyelids occasionally) or skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention. Wash clothing before reuse.
INHALATION: Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical

attention immediately.
INGESTION: If swallowed, do not induce vomiting. Get medical attention immediately.

SECTION VII - PRECAUTIONS FOR SAFE HANDLING AND USE

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: Evacuate all nonessential personnel. Remove all source of ignition. Ventilate area if possible. Avoid breathing vapors. Spill clean up beyond the scope of normal maintenance activities should be performed by trained response personnel.
In the event of a large transportation related spill or emergency call CHEMTREC at 1(800)424-9300.

WASTE DISPOSAL METHOD: Waste material is a RCRA hazardous waste. Dispose of in accordance to Federal, state and local waste disposal regulations. Do not discharge into public water ways or water treatment facilities. Do not bury.

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING: FLAMMABLE LIQUID AND VAPORS. Store only in areas approved for flammable liquids. Keep clear of all sources of ignition. Ground and bond all holding and transfer containers. Storage temperature must be below 120 deg. F. Freezing temperatures may effect product stability. KEEP CONTAINER TIGHTLY CLOSED WHEN NOT IN USE. DO NOT TRANSFER TO UNLABELED CONTAINER.

OTHER PRECAUTIONS: Ignition temperatures of this product will decrease with increased vapor volume and vapor/air contact time and are influenced by pressure changes. Any proposed use of this product in elevated-temperature processes should be evaluated to assure that safe operating conditions are established.
To avoid spontaneous combustion during temporary storage, soak soiled rags and waste immediately after use in a water-filled, closed metal container.

SECTION VIII - CONTROL MEASURES

RESPIRATORY PROTECTION: If ventilation is not adequate to reduce vapors below regulatory limits, use a self-contained (air supplied) positive pressure breathing apparatus, or a NIOSH approved air purifying respirator (APR) equipped with organic vapor cartridges (black striped cartridge). Failure to use proper respiratory protection may be harmful or fatal.
User must be properly trained and fitted to assure effective protection. Follow all manufacturers recommendations for use of filter.
WARNING: Do not use an APR if oxygen level is below 19.5% by volume.

VENTILATION: Sufficient ventilation, in volume and pattern should be provided to keep the air contaminants below the TLV/PEL levels. Remove vapors from low areas of stagnant air (e.g., corners near floor where vapors may collect).

PROTECTIVE GLOVES: Use gloves impervious to solvent. Follow glove manufacturer's recommendation for selecting gloves according to the solvents in this product.

EYE PROTECTION: Wear splash goggles or use face shield with safety glasses for splash protection. If vapor concentration causes eye irritation wear full-face respirator. Do not wear contact lenses when working with chemicals. Contact lenses can trap chemical next to eye which may increase eye damage.

OTHER PROTECTIVE CLOTHING OR EQUIPMENT: A protective apron should be used for splash protection. When spraying this product a spray hood is recommended to cover hair and face. Skin should be covered as much as possible to protect from overspray or mist. A continuous 15 minute eye wash station and a chemical spill shower should be available in case of emergency.

WORK/HYGIENIC PRACTICES: In handling any chemicals, personal hygiene is extremely important. Always wash your hands and face before eating or when done handling or using this product. Keep food and drink out of work areas. Some items such as cigarettes or gum readily absorb solvent vapors and may increase your overall exposure to this product.

SECTION IX - REGULATORY INFORMATION

SARA 313 / 40 CFR 372:		% / WT
XYLENE	001330-20-7	41
ETHYL BENZENE	000100-41-4	7.1
TOLUENE	000108-88-3	6

CLEAN AIR ACT AMENDMENT SECTION 112 (HAPS):		% / WT
+ XYLENE	001330-20-7	41
+ ETHYL BENZENE	000100-41-4	7.1
+ TOLUENE	000108-88-3	6

+ Indicates volatile Hazardous Air Pollutant chemicals at or above the reporting requirements of the Clean Air Act Amendments Section 112.

DOT SHIPPING INFORMATION (GROUND): Paint, 3, UN1263, PGII. ERG # 128

DOT SHIPPING INFORMATION (LIMITED QUANTITIES/GROUND): Inner packaging 1.3 gallons (5 L) or less each net capacity in strong outer packaging and total package weight not exceeding 66 pounds (30 kg): Consumer Commodity, ORM-D

IATA SHIPPING DESCRIPTION (AIR SHIPMENTS): Paint, Class 3, UN1263, PG II.

IMDG SHIPPING DESCRIPTION (WATERWAYS SHIPMENTS): Paint, Flammable Liquid, Class 3, UN1263, PG II. Flashpoint 5 C.

OSHA CLASSIFICATION: Flammable Liquid - Class IB.

CLEAN AIR ACT - OZONE DEPLETING CHEMICALS: Not known to contain or be manufactured with Class 1 or Class 2 Ozone Depleting Chemicals (ODC's).

RoHS DIRECTIVE: This product complies with the RoHS (Regulation of Hazardous Substances) Directive.

SECTION X - DISCLAIMER

The above information is based on current information available to Forrest Paint Co. and is believed to be accurate but is not warranted.

MATERIAL SAFETY DATA SHEET #1

TRADE NAME (Common or Synonym): Carbon and Alloy Steel

CHEMICAL NAME: AISI/SAE 10xx thru 93xx

1. INGREDIENTS

Material or Compound	CAS Number	%Weight	Exposure Limits OSHA PEL (mg/m³)	Exposure Limits ACHIG-TLV (mg/m³)
Aluminum (Al)	7429-90-5	<0.01 - 0.5	15	10
Bismuth (Bi)	7440-69-9	<0.2 - 0.5	n/a	n/a
Boron (B)	7440-42-8	<0.01 - 1.0	15	10
Carbon (C)	7440-44-0	<0.1 - 1.5	10	10
Chromium (Cr)	7440-47.3	<0.4 - 10	1.0	0.5
Columbium (Cb)	7440-03-1	<0.15 - 0.35	n/a	n/a
Copper (Cu)	7440-50-8	<0.3 - 1.9	1	1
Iron (Fe)	7439-89-6	86.5 - 99.5	10	5
Lead (Pb)	7439-92-1	0.15 - 0.35	0.05	0.05
Manganese (Mn)	7439-96-5	<0.04 - 0.7	5	5
Molybdenum (Mo)	7439-98-7	<0.15 - 1.10	15	10
Nickel (Ni)	7440-02-0	<0.10 - 10	1	1
Phosphorous (P)	7723-14-0	<0.04 - 0.12	0.1	0.1
Silicon (Si)	7740-21-3	<0.15 - 2.0	15	10
Sulfur (S)	7704-34-9	<0.05 - 0.35	13 (Sulfur Dioxide)	5 (Sulfur Dioxide)
Vanadium (V)	7440-62-2	<0.01 - 0.15	0.5	0.5

NOTE: The above is a summary of elements used in alloying steel. Various grades of steel will contain different combinations of these elements. Trace elements may also be present in minute amounts.

2. PHYSICAL DATA

Material is (at normal conditions):
- ○ LIQUID
- ● SOLID
- ○ GAS
- ○ OTHER

Vapor Density: N/A

Specific Gravity (H20 - 1): Approximately 7

Acidity/Alkalinity: pH - N/A

Solubility In Water: N/A

Appearance and Odor: Silvery - Grey, Odorless

Melting Point (approximate): 2800° F

Vapor Pressure (mm Hg @ 20° C): N/A

Volatile By Volume: N/A

Boiling Point: N/A

3. PERSONAL PROTECTIVE EQUIPMENT

Respiratory Protection:
Appropriate dust/mist/fume respirator should be used to avoid excessive inhalation of particulates. If exposure limits are reached or exceeded, use NIOSH approved equipment.

Eyes and Face:
Safety glasses should be worn when grinding or cutting. Face shields should be worn when welding or cutting.

Hands, Arms and Body:
Protective gloves should be worn as required for welding, burning or handling operations.

Other Clothing and Equipment:
As required depending upon operations and safety codes.

4. EMERGENCY MEDICAL PROCEDURES

Inhalation:
Remove to fresh air; if condition continues, consult a physician.

Eye Contact:
Flush thoroughly with running water to remove particulate; obtain medical attention.

Skin Contact:
Remove particles by washing thoroughly with soap and water. Seek medical attention if condition persists.

Ingestion:
If significant amounts of metal are ingested, consult a physician.

5. HEALTH AND SAFETY INFORMATION

HEALTH

Steel products in their solid state present no inhalation, ingestion, or contact health hazard. Operations such as burning, welding, sawing, brazing , grinding, and machining, which result in elevating the temperature of the product to or above its melting point, or result in the generation of airborne particulates, may present hazards. The major exposure hazard is inhalation. Effects or overexposure to fume and dust are as follows:

Acute:

Excessive inhalation of metallic fumes and dust may result in irritation of eyes, nose and throat. High concentrations of fumes and

dust of iron-oxide, manganese, copper, zinc and lead may result in metal fume fever. Typical symptoms last from 12 to 48 hours and consist of a metallic taste in the mouth, dryness and irritation of the throat, chills and fever.

Chronic:

Chronic and prolonged inhalation of high concentrations of fumes or dust of the following elements may lead to the conditions listed.

Aluminum:
May initiate fibrotic changes to lung tissue, nausea, nervous disorder.
Bismuth:
No chronic debilitating symptoms indicated.
Boron:
No chronic debilitating symptoms indicated.
Chromium:
Lesions of the skin and mucous membranes, possible cancer of the nose or lungs-bronchogenic carcinoma.
Copper:
No chronic debilitating symptoms indicated.
Iron:
Siderosis, pulmonary effects.
Lead:
Anemia, urinary dysfunction, weakness, constipation.
Manganese:
Bronchitis, pneumonitis, lack of coordination.
Molybdenum:
Respiratory tract irritation, possible liver and kidney damage, bone deformity.
Nickel:
Lesions of the skin and mucous membranes, possible cancer of the nose or lungs-bronchogenic carcinoma.
Phosphorous:
Necrosis of the mandible.
Sulfur:
No chronic debilitating symptoms indicated.
Vanadium:
Emphysema, pneumonia.

Medical Conditions Aggravated by Exposure: Individuals with chronic respiratory disorders (i.e. asthma, chronic bronchitis, emphysema, etc) may be adversely affected by any fume or airborne particulate matter exposure.

Occupational Exposure Limits: See Products Ingredients Section 1. Chromium and Nickel have been identified by the International Agency for Research on Cancer (IARC) and/or the National Toxicology Program (NTP) as potential cancer causing agents.

FIRE AND EXPLOSION

Flash Point:
N/A

6. ENVIRONMENTAL

Auto Ignition Temperature:
N/A
Flammable Limits in Air:
Lower: N/A
Upper: N/A
Extinguishing Media:
For molten metal use dry powder or sand.
Extinguishing Media **NOT TO BE USED:**
Do not use water on molten metal.
Fire and Explosion Hazards:
Steel products do not present fire or explosion hazards under normal conditions. Fine metal particles such as produced in grinding or sawing can burn. High concentrations of metallic fines in the air may present an explosion hazard.

REACTIVITY

Stability:
- ● Stable
- ○ Unstable

Incompatibility (materials to avoid):
Reacts with strong acids to form hydrogen gas.
Conditions to Avoid:
Steel at temperatures above the melting point may liberate fumes containing oxides of iron and alloying elements. Avoid generation of airborne fume and dust.
Hazardous Decomposition Products:
Metallic dust or fumes may be produced during welding, burning, grinding and possible machining.
Refer to ANSI Z49.1

Spill or Leak Procedures:
Fine turnings and small chips should be swept or vacuumed. Scrap metal can be reclaimed for reuse.

Waste Disposal Method*:
Used or unused product should be disposed of in accordance with Federal, State or local laws and regulations.

*Disposer must comply with Federal, State and local disposal or discharge laws.

7. ADDITIONAL INFORMATION

In welding, precautions should be taken for airborne contaminants which may originate from components of the welding rod.

Arc or spark generated when welding or burning could be a source of ignition for combustion and flammable materials.

MATERIAL SAFETY DATA SHEET

I. MATERIAL IDENTIFICATION

Manufacturer's Name: Miller Centrifugal Casting Company
Address: P.O. Box 456
110 Centrifugal Lane
Cecil, PA 15321-0456

Telephone Number: 724-745-0300

Material Name: Copper Alloy Castings

II. HAZARDOUS INGREDIENTS

	CAS NUMBER	%	OSHA 8-hr TWA	ACGIH 8-hr. TWA
Aluminum	7429-90-5	See Chart	None	10 mg/m3
Antimony	7440-36-0	See Chart	.5 mg/m3	0.5 mg/m3
Copper	7440-50-8	See Chart	Dust = 1 mg/m3 Fume=0.1 mg/m3	1mg/m3 0.2 mg/m3
Iron	1309-37-1	See Chart	10 mg/m3 as oxide fume	5 mg/m3 as oxide fume
Lead	7439-92-1	See Chart	50 ug/m3	150 mg/m3
Magnesium	1309-48-4	See Chart	15 mg/m3 as oxide fume	10 mg/m3 as oxide fume
Manganese	7439-96-5	See Chart	Dust - 5 mg/m3 Fume - None	Dust – 5 mg/m3 Fume – 1 mg/m3
Nickel	7440-02-0	See Chart	1 mg/m3	1 mg/m3
Phosphorus	7732-14-0	See Chart	0.1 mg/m3	0.1 mg/m3
Silicon	7440-21-3	See Chart	None	Total – 10 mg/m3
Tin	7440-31-5	See Chart	2 mg/m3 inorganics except as oxides for PEL and TLV	2 mg/m3
Zinc	7440-66-6	See Chart	5 mg/m3	5 mg/m3 Fume
Silica	7631-86-9	Unknown	(1)	0.1 mg/m3 Respirable

Trace Elements: Arsenic and Sulfur

(1) OSHA PEL for quartz (Respirable Dust Fraction) is: 10 mg/m3 divided by the percent of quartz plus 2

$$= \frac{10}{\%Si02 + 2}$$

Miller Centrifugal produces various types of copper base castings. These alloys may contain some or all of the metals above. To determine the levels or presence of these metals in the alloys produced, please refer to the chart attached at the end of this material safety data sheet.

III. PHYSICAL DATA

Melting Point (F): 1550-2150 Specific Gravity: 7.5 – 9.0
Vapor Pressure: NA Vapor Density: NA
% Volatile by Volume: NA Evaporation Rate: NA
Solubility in Water: Insoluble
Appearance and or: Yellow to reddish color with no odor

IV. FIRE AND EXPLOSION HAZARD DATA

Flash Point: NA Method Used: NA
Flammable Limits: LEL = NA UEL = NA
Extinguishing Media: See Below

Special Fire Fighting Procedures: Solid, massive form is not combustible under normal conditions. Use fire fighting methods that are appropriate for surrounding fire. Fire and explosion hazards are moderate when material is in the form of dust and exposed to heat, flames, chemical reaction, or contact with powerful oxidizers. Use special mixtures of dry chemical or sand. Molten metal may explode on contact with water. Firefighters should wear self-contained breathing apparatus and protective clothing.

V. HEALTH HAZARD DATA

Permissible Exposure Limits and Threshold Limit Values: See Section II

Route(s) of Entry:
- Inhallation: Yes
- Skin: Yes
- Ingestion: Yes

Effects of Overexposure:

Aluminum
Aluminum dust/fines and fumes are a low health risk by inhalation and are normally treated as a nuisance dust in normal operations (e.g. milling, cutting, grinding). The AIHA Hygiene Guide lists toxicity as “none expected.”

Antimony
Antimony and its compounds are irritating to the skin and mucous membranes and are systemic poisons. Effects are reported to include a metallic taste in the mouth, vomiting, colic, loss of appetite and weight, and diarrhea. In addition, dermatitis may result which starts as an inflammation of the hair follicles and can progress through pus formation and sloughing to leave a contracted scar. Chronic inhalation of antimony trioxide is reported to produce a reduction in white blood cells and damage to the liver. Antimony and its compounds have been identified as suspected cancer causing agents.

Nickel
The most common ailment arising from contact with nickel or its compounds is an allergic dermatitis known as “nickel itch” which usually occurs when the skin is moist. Generally nickel and most salts of nickel do not cause systemic poisoning. IARC has determined that there is at least limited evidence that nickel and certain nickel compounds may be human carcinogens. Several nickel compounds are carcinogenic to laboratory animals by various routes of entry.

Copper

Melting, grinding, cutting of copper may produce fumes or dust exposure and breathing these fumes or dust may present potentially significant health hazards. Fumes of copper may cause metal fume fever with flu-like symptoms and skin and hair discoloration. While industrial dermatitis has not been reported, keratinization of the hands and the soles of the feet has been reported. Systemically as well, copper dust and fume cause irritation of the upper respiratory tract, metallic taste in the mouth, and nausea.

Iron

The inhalation of iron oxide fumes may cause an apparent benign pneumoconiosis which is called siderosis. This disease is reported not to be disabling, but makes x-ray determination of other lung conditions difficult or impossible.

Lead

Short-term exposure – Lead is an accumulative poison. Inhalation effects of exposure to fumes or dust of inorganic lead may not develop quickly. Symptoms may include decreased physical fitness, fatigue, sleep disturbance, headache, aching bones and muscles, constipation, abdominal pains, and decreasing appetite. The effects are reversible and complete recovery is possible. Inhalation of large amounts of lead may lead to seizures, coma, and death.

Long-term exposure – Long-term exposure can result in a buildup of lead in the body and more severe symptoms. These may include anemia, pale skin, a blue line at the gum margin, decreased hand-grip strength, abdominal pain, severe constipation, nausea, vomiting, and paralysis of the wrist joint. Prolonged exposure may also result in kidney damage. If the nervous system is affected, usually due to very high exposures, the resulting effects include severe headache, convulsions, coma, delirium, and death. Alcohol ingestion and physical exertion may bring on symptoms. Continued exposure can result in decreased fertility and/or increased chances of miscarriage or birth defects.

Magnesium

Inhalation of freshly produced magnesium fume has caused metal fume fever similar to the better known “zinc chills.” Heavy exposure to magnesium oxide is irritating to the eyes, nose, and throat. Presence in a wound can increase inflammation and retard healing. Finely powdered magnesium is a fire hazard, and severe injuries and deaths have occurred from ignition of powdered magnesium.

Manganese

Chronic manganese poisoning may result from inhalation of dust or fume. The central nervous system is the chief site of the injury. Chronic manganese poisoning is not a fatal disease although it is extremely disabling. Some individuals may be hypersusceptible to manganese. Freshly formed manganese fume has caused fever and chill similar to metal fume fever.

Tin

The inhalation of inorganic tin fumes or dust may cause an apparent benign pneumonconiosis called stannosis which is reported not to be disabling.

Zinc

Zinc is relatively low in toxicity but inhalation of fumes may cause “metal fume fever.” Onset of symptoms may be delayed 4-12 hours and include irritation of the nose, mouth, and throat, cough, stomach pain, headache, nausea, vomiting, metallic taste, chills, fever, pains in the muscles and joints, thirst, bronchitis or pneumonia and a bluish tint to the skin. These symptoms go away in 24-48 hours and are reported to leave no effect.

Silica

Inhalation Hazard – The disease associated with chronic (long-term) exposure to free silica is called silicosis. This is a form of pneumonconiosis which is characterized by the formation of nodules of scar tissue (fibrosis) throughout the lungs. Silicosis can cause difficult or labored breathing especially on exertion, decreased physical work capacity, and sometimes an enlarged chest. The degree of hazard depends upon the silica content, concentration and size of the airborne dust, as well as the length of exposure. Silicosis may also make the lungs more susceptible to other diseases and silicotuberculosis can be a severe complication.

Emergency and First Aid Procedures:

Eye Contact: Flush well with running water to remove particulate. Get medical attention.
Skin Contact: Vacuum off excess dust. Wash well with soap and water. Avoid blowing particulate into the atmosphere.
Inhalation: Remove to fresh air. Get medical attention.
Ingestion: Seek medical attention if large quantities of material have been ingested (unlikely in the product state as sold, castings.)

VI. REACTIVITY DATA

Stability: Stable under normal conditions of use, storage, and transportation.
Conditions to Avoid: Molten metal may react violently with water.
Incompatability (Materials to avoid): Acids, bases, and oxidizers
Hazardous Decomposition or Byproducts: Metal fume. NOTE: if grinding or any work is done on the casting, release of silica may result from residual sand on the surface of the casting.
Hazardous Polymerization: Will not occur.

VII. PRECAUTIONS FOR SAFE HANDLING OR USE

Steps to Be Taken in Case Material is Released or Spilled: No special precautions are necessary for spills of bulk material. If large quantities of dust are spilled, remove by vacuuming or wet sweeping to prevent heavy concentrations of airborne dust. Follow federal, state, and local regulations concerning the disposal of waste.
Waste Disposal Method: Dispose of in accordance with federal, state, and local regulations. Cleanup personnel should wear respirators and protective clothing.
Precautions to be Taken in Handling and Storing: Store material away from incompatible materials and keep dust from sources of ignition.
Other Precautions: See all other sections of this MSDS.

VIII. CONTROL MEASURES

Respiratory Protection: If exposure above the PEL or TLV, NIOSH approved respirator for fume or dust, dependent upon the source of airborne contaminant.
Ventilation: Required if dust or fume created in handling or working on this material.
Local Exhaust: Required if dust or fume created in handling or working on this material.
Mechanical (general): As above to reduce airborne dust or fume levels.
Protective gloves: Required for melt, grind, cut, weld operations. Select glove approved for the specific operation.
Eye Protection: Required for melt, grind, cut, or weld operations. Minimum requirement of safety glasses with side shields for these operations. Melting and welding may require special eye protection including face shields and specially tinted glass. Grinding operations may also require faceshield.
Other Protective Clothing or Equipment: As required for the work done on or with the casting.
Work/Hygiene Practices: As required for the work done with lead bearing materials. No food may be allowed in the work area. Always wash thoroughly before leaving work area. Shower before leaving the work site and provide special work clothing when necessary. Work clothes must be stored separate from street clothing and be marked for laundering. Meet requirements of the OSHA lead standard where necessary. Always evaluate the jobs done on theis product in accordance with OSHA or relevant state, federal, or local standards.

		Composition, % max except as indicated													
Classification	Copper Alloy UNS No	Copper	Tin	Lead	Zinc	Iron	Antimony	Nickel (incl. Cobalt)	Sulfur	Phosphorus	Aluminum	Manganese	Silicon	Arsenic	Magnesium
Leaded red brass	C83450	87.0 –89.0	2.2-3.0	1.5-2.5	5.8-7.5	0.25	0.25	0.8-1.5	0.08	0.03	0.005		0.005		
	C83600	84.0-86.0	4.3-6.0	4.0-5.7	4.3-6.0	0.25	0.25	0.8	0.08	0.03	0.005		0.005		
	C83800	82.0-83.5	3.5-4.2	5.8-6.8	5.5-8.0	0.25	0.25	0.8	0.08	0.02	0.005		0.005		
Leaded semi-red brass	C84200	78.0-82.0	4.3-6.0	2.0-2.8	10.0-16.0	0.35	0.25	0.8	0.08	0.02	0.005		0.005		
	C84400	79.0-82.0	2.5-3.5	6.3-7.7	7.0-10.0	0.35	0.25	0.8	0.08	0.02	0.005		0.005		
	C84800	75.0-76.7	2.3-3.0	5.5-6.7	13.0-16.0	0.35	0.25	0.8	0.08	0.02	0.005		0.005		
Leaded yellow brass	C85200	70.0-73.0	0.8-1.7	1.5-3.5	21.0-27.0	0.50	0.20	0.8	0.05	0.01	0.005		0.05		
	C85400	66.0-69.0	0.50-1.5	1.5-3.5	25.0-31.0	0.50		0.8			0.005		0.05		
	C85700	58.0-63.0	0.50-1.5	0.8-1.5	33.0-40.0	0.50		0.8			0.80		0.05		
	C85800	57.0 min	1.5	1.5	31.0-41.0	0.50	0.05	0.50	0.05	0.01	0.50	0.25	0.25	0.05	
High-strength yellow brass	C86200	60.0-66.0	0.10	0.10	22.0-28.0	2.0-4.0		0.8			3.0-4.9	2.5-5.0			
	C86300	60.0-66.0	0.10	0.10	22.0-28.0	2.0-4.0		0.8			5.0-7.5	2.5-5.0			
	C86400	56.0-62.0	0.50-1.0	0.50-1.3	34.0-42.0	0.40-2.0		0.8			0.50-1.5	0.10-1.0			
	C86500	55.0-60.0	1.0	0.30	36.0-42.0	0.40-2.0		0.8			0.50-1.5	0.10-1.5			
	C86700	55.0-60.0	1.5	0.50-1.5	30.0-38.0	1.0-3.0		0.8			1.0-3.0	1.0-3.5			
Silicon bronze and silicon brass	C87300	94.0 min		0.20	0.25	0.20					1.0-3.0	0.8-1.5	3.5-4.5		
	C87400	79.0 min		1.0	12.0-16.0						0.5		2.5-4.0		
	C87500	88.0 min		0.50	12.0-16.0						0.5		3.0-5.0		
	C87600	80.0 min		0.50	4.0-7.0	0.20						0.25	3.5-5.5		
	C87800	80.0 min	0.25	0.15	12.0-16.0	0.15	0.05	0.20	0.05	0.01	0.15	0.15	3.8-4.2	0.05	0.01
	C87900	63.0 min	0.25	0.25	30.0-36.0	0.40	0.05	0.50	0.05	0.01	0.15	0.15	0.8-1.2	0.05	
Tin bronze and leaded tin bronze	C90300	86.0-89.0	7.8-9.0	0.25	3.5-5.0	0.15	0.20	0.8	0.05		0.005				
	C90500	86.0-89.0	9.5-10.5	0.25	1.5-3.0	0.15	0.20	0.8	0.05		0.005				
	C90700	88.0-90.0	10.3-12.0	0.50	0.50	0.15	0.10	0.50	0.05		0.005				
	C90800	85.0-89.0	11.3-13.0	0.25	0.25	0.15	0.10	0.50	0.05		0.005				
	C91000	84.0-86.0	14.3-16.0	0.20	1.5	0.15	0.10	0.8	0.05		0.005				
	C91100	82.0-85.0	15.3-17.0	0.25	0.25	0.15	0.20	0.50	0.05		0.005				
	C91300	79.0-82.0	18.3-20.0	0.25	0.25	0.15	0.20	0.50	0.05		0.005				
	C91600	86.0-89.0	10.0-10.8	0.25	0.25	0.15	0.10	1.2-2.0	0.05		0.005				
	C91700	84.0-87.0	11.5-12.5	0.25	0.25	0.15	0.10	1.2-2.0	0.05		0.005				
	C92200	86.0-89.0	5.8-6.5	1.0-1.8	3.5-5.0	0.20	0.20	0.8	0.05		0.005				
	C92300	85.0-89.0	7.8-9.0	0.30-0.9	3.0-5.0	0.20	0.20	0.8	0.05		0.005				
	C92500	85.0-88.0	10.3-12.0	1.0-1.5	0.50	0.20	0.20	0.8-1.5	0.05		0.005				
	C92700	86.0-89.0	9.3-11.0	1.0-2.3	0.8	0.15	0.20	0.8	0.05		0.005				
	C92800	78.0-82.0	15.3-17.0	4.0-5.7	0.8	0.15	0.20	0.8	0.05		0.005				
	C92900	82.0-86.0	9.3-11.0	2.0-3.0	0.25	0.15	0.10	2.8-4.0	0.05		0.005				
High-lead tin bronze	C93200	82.0-84.0	6.5-7.5	6.5-7.7	2.5-4.0	0.20	0.30	0.8	0.08	0.03	0.005		0.005		
	C93400	82.0-85.0	7.3-9.0	7.0-8.7	0.8	0.20	0.30	0.8	0.08	0.03	0.005		0.005		
	C93500	83.0-85.0	4.5-5.5	8.5-9.7	0.50-1.5	0.10	0.30	0.8	0.08	0.04	0.005		0.005		
	C93700	78.0-81.0	9.3-10.7	8.3-10.7	0.8	0.10	0.50	0.8	0.08	0.05	0.005		0.005		
	C93800	76.0-79.0	6.5-7.5	14.0-16.0	0.8	0.10	0.50	0.8	0.08	0.05	0.005		0.005		
	C93900	76.5-79.5	5.3-7.0	14.0-17.7	1.5	0.35	0.50	0.8	0.08	0.05	0.005		0.005		
	C94000	69.0-72.0	12.3-14.0	14.0-15.7	0.50	0.25	0.50	0.50-1.0	0.08	0.05	0.005		0.005		
	C94100	72.0-79.0	4.7-6.5	15.0-21.7	3.0	0.10	0.7	0.8	0.08	0.05	0.005		0.005		
	C94300	69.0-73.0	4.7-5.8	22.0-24.5	0.8	0.10	0.7	0.8	0.08	0.05	0.005		0.005		
	C94400	78.0-82.0	7.3-9.0	9.0-11.7	0.8	0.10	0.7	0.8	0.08	0.05	0.005		0.005		
	C94500	70.0-75.0	6.3-8.0	16.0-21.5	1.0	0.10	0.7	0.8	0.08	0.05	0.005		0.005		
Nickel tin bronze and leaded pickle tine bronze	C94700	86.0-89.0	4.7-6.0	0.08	1.3-2.5	0.20	0.10	4.5-6.0	0.05	0.05	0.005		0.005		
	C94800	85.0-89.0	4.7-6.0	0.30-0.9	1.3-2.5	0.20	0.10	4.5-6.0	0.05	0.05	0.005		0.005		
	C94900	79.0-81.0	4.3-6.0	4.0-5.7	4.3-6.0	0.25	0.25	4.5-6.0	0.08	0.05	0.005		0.005		
	C95200	86.0 min				2.5-4.0					8.5-9.5				
	C95300	86.0 min				0.8-1.5					9.0-11.0				
	C95400	83.0 min				3.0-5.0		1.5 max			10.0-11.5				
	C95410	83.0 min				3.0-5.0		1.5-2.5			10.0-11.5				
	C95500	78.0 min				3.0-5.0		3.0-5.5			10.0-11.5				

	C95600 C95700 C95800	88.0 min 71.0 min 78.0 min		0.03 0.02		2.0-4.0 3.5-4.5		0.25 1.5-3.0 4.0-5.0			6.0-8.0 7.0-8.5 8.5-9.5	11.0-14.0 0.8-1.5	1.8-3.3 0.10 0.05		
Cupro-nickel	C96200 C96400 C96800	84.5-87.0 65.0-67.0 remainder	0.05C 0.05C 7.5-8.5	0.005 0.005	1.0Cb 0.7-1.5Cb 0.1-0.3Cb	1.0-1.8 0.25-1.0		9.0-11.0 29.5-31.5 9.5-10.5	0.02 0.020	0.005 0.005	0.8-1.5 0.8-1.5 0.05-0.30	0.25 0.30-0.50			0.005 -0.15
Leaded nickel bronze	C97300 C97600 C97800	53.0-58.0 63.0-66.0 64.0-67.0	1.5-3.0 3.5-4.5 4.5-5.5	8.0-11.0 3.5-5.0 1.0-2.0	17.0-25.0 3.0-9.0 1.0-4.0	1.0 1.0 1.0	0.35 0.25 0.20	11.0-14.0 19.5-21.0 24.0-26.0	0.08 0.08 0.08	0.05 0.05 0.05	0.005 0.005 0.005	0.5 1.0 1.0	0.05 0.05 0.05		

PRODUCT CODE: 1PC-019-7205 HMIS CODES: H F R P
PRODUCT NAME: S-9 GREEN 1*0 0 E

SECTION I - MANUFACTURER IDENTIFICATION

MANUFACTURER'S NAME: FORREST PAINT CO.
ADDRESS : 1011 MCKINLEY ST.
EUGENE, OR 97402

EMERGENCY PHONE : 1(800)424-9300
INFORMATION PHONE : 1(541)342-1821
DATE ISSUED : 12/18/2008
INFORMATION CONTACT: T. BOLLENBAUGH

SECTION II - REPORTABLE COMPONENTS

REPORTABLE COMPONENTS	CAS NUMBER	mm Hg @ TEMP	WEIGHT PERCENT
TITANIUM DIOXIDE PEL-TWA: 15 mg/m3, ACGIH-TLV: 10 mg/m3	013463-67-7		5 - 15
COLLOIDAL SILICA PEL-TWA: 6 mg/m3, ACGIH-TLV: 10 mg/m3 - TOTAL DUST	007631-86-9		1 - 10
COBALT PEL-TWA: .05 mg/m3, ACGIH-TLV: .05 mg/m3	007440-48-4		<1

SEE SECTION 9 FOR SARA AND HAPS INFORMATION.

SECTION III - PHYSICAL/CHEMICAL CHARACTERISTICS

BOILING RANGE: n/a
DENSITY : 13.27 lb/gl
SPECIFIC GRAVITY (H20=1): 1.59
VAPOR DENSITY : n/a
EVAPORATION RATE: n/a

VOC AS SUPPLIED: 0.0 lb/gl 0 g/l
VOC EXCLUDING EPA EXEMPT SOLVENTS/WATER: 0.0 lb/gl 0 g/l

NOTE: Check with your state/local Air Quality regulatory agency to determine which VOC calculation you should use.

SOLUBILITY IN WATER: Negligible.
APPEARANCE AND ODOR: Powder with little or no odor.

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT: n/a
FLAMMABLE LIMITS IN AIR BY VOLUME- LOWER: n/a UPPER: n/a

EXTINGUISHING MEDIA:
Foam, CO2, Dry chemical, Water spray.

SPECIAL FIREFIGHTING PROCEDURES:
Wear self-contained breathing apparatus and full protective clothing.

UNUSUAL FIRE AND EXPLOSION HAZARDS:

Dust may form explosive mixture with air in the presence of an ignition source. Practice good housekeeping and grounding of all equipment. Combustion products may be toxic.

SECTION V - REACTIVITY DATA

STABILITY: Stable.

CONDITIONS TO AVOID:
Avoid direct sunlight, excessive heat and fire.

INCOMPATIBILITY (MATERIALS TO AVOID):
Strong oxidizing agents.

HAZARDOUS DECOMPOSITION OR BYPRODUCTS:
Carbon monoxide, carbon dioxide.

HAZARDOUS POLYMERIZATION: Will not occur.

SECTION VI - HEALTH HAZARD DATA

*****Note: This product is a blend of materials which has not been tested as a mixture. The health effect data is based on the individual components.*****

INHALATION HEALTH RISKS AND SYMPTOMS OF EXPOSURE:
COLLOIDAL SILICA: May cause irritation to the respiratory tract and lungs if dust is inhaled.

EYE CONTACT HEALTH RISKS AND SYMPTOMS OF EXPOSURE:
May cause mechanical irritation of eyes.

SKIN CONTACT HEALTH RISKS AND SYMPTOMS OF EXPOSURE:
Skin may experience some irritation with repeated and prolonged exposure.

SKIN ABSORPTION HEALTH RISKS AND SYMPTOMS OF EXPOSURE:
None known.

INGESTION HEALTH RISKS AND SYMPTOMS OF EXPOSURE:
None known.

CHRONIC HEALTH RISKS:
COLLOIDAL SILICA: Prolonged inhalation of dust can cause pneumconiosis.

CARCINOGENICITY:
NTP CARCINOGEN: No IARC MONOGRAPHS: Yes OSHA REGULATED: No
COBALT AND COBALT COMPOUNDS: Classified by IARC as possibly carcinogenic to humans. (Group 2B, Monograph #52)

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE:
Existing skin and respiratory disorders.

COLLOIDAL SILCIA: Prolonged inhalation of dust can increase lung injury in individuals with emphysema, asthma or other lung disorders.

EMERGENCY AND FIRST AID PROCEDURES:
EYES: Immediately flush with large quantities of running water for 15 minutes, lifting the upper and lower eyelids occasionally and seek medical attention if irriation develops.
SKIN: Remove clothing and wash with soap and water for 15 minutes. Get medical attention if irritation develops.
INGESTION: If appreciable quantities are swallowed, seek medical attention.
INHALATION: In case of exposure to a high concentration of dust, remove person to fresh air. If breathing has stopped, administer artificial respiration.

SECTION VII - PRECAUTIONS FOR SAFE HANDLING AND USE

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: Transfer material into closed containers for re-use or disposal. Maintain dust control.
In the event of a large transportation related spill or emergency call CHEMTREC at 1(800)424-9300.

WASTE DISPOSAL METHOD: Sweep up spilled powder and dispose of in accordance with Federal, State and local waste disposal regulations.

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING: Store in a cool, dry area out of direct sunlight. Keep containers closed and protect from physical damage.

OTHER PRECAUTIONS: Avoid creating dust clouds and breathing dust when handling and spraying powder. Use adequate ventilation or respirator as needed. Possiblity of explosion exists under dusty conditions. Avoid dusting and all potential ignition sources (spark or flame). Ground equipment to reduce static electricity; use spark resistant tools.

SECTION VIII - CONTROL MEASURES

RESPIRATORY PROTECTION: Use NIOSH approved respirator (particle mask) for dusts.

VENTILATION: Use mechanical ventilation to keep dust below regulatory standards. Ovens should be vented in a way which prevents employee exposure to vapors which may be released during the baking process.

PROTECTIVE GLOVES: Wear impervious gloves for operations where contact is likely.

EYE PROTECTION: Goggles or approved safety glasses should be worn. DO NOT wear contact lenses when working with chemicals. Contact lenses can trap chemical next to eye which may increase eye damage.

OTHER PROTECTIVE CLOTHING OR EQUIPMENT: Wear coveralls to keep dust off skin and clothing. An eyewash station and emergency shower should be nearby and ready for use.

WORK/HYGIENIC PRACTICES: In handling any chemicals, personal hygiene is extremely important. Always wash your hands and face before eating or when done handling or using this product. Keep food and drink out of work areas.

SECTION IX - REGULATORY INFORMATION

SARA 313 / 40 CFR 372:		% / WT
COBALT	007440-48-4	.2

CLEAN AIR ACT AMENDMENT SECTION 112 (HAPS):		% / WT
COBALT	007440-48-4	.2

x Indicates non-volatile Hazardous Air Pollutant chemicals at or above the reporting requirements of the Clean Air Act Amendments Section 112.

DOT SHIPPING INFORMATION (GROUND): Not regulated.

DOT SHIPPING INFORMATION (LIMITED QUANTITIES/GROUND): None known.

IATA SHIPPING DESCRIPTION (AIR SHIPMENTS): Not regulated.

IMDG SHIPPING DESCRIPTION (WATERWAYS SHIPMENTS): Not regulated.

OSHA CLASSIFICATION: Not regulated.

CLEAN AIR ACT - OZONE DEPLETING CHEMICALS: Not known to contain or be manufactured with Class 1 or Class 2 Ozone Depleting Chemicals (ODC's).

RoHS DIRECTIVE: This product complies with the RoHS (Regulation of Hazardous Substances) Directive.

SECTION X - DISCLAIMER

The above information is based on current information available to Forrest Paint Co. and is believed to be accurate but is not warranted.

PRODUCT CODE: 1PC-019-1054 HMIS CODES: H F R P
PRODUCT NAME: S-9 BRIGHT WHITE 1*0 0 E

SECTION I - MANUFACTURER IDENTIFICATION

MANUFACTURER'S NAME: FORREST PAINT CO.
ADDRESS : 1011 MCKINLEY ST.
EUGENE, OR 97402

EMERGENCY PHONE : 1(800)424-9300
INFORMATION PHONE : 1(541)342-1821
DATE ISSUED : 12/18/2008
INFORMATION CONTACT: T. BOLLENBAUGH

SECTION II - REPORTABLE COMPONENTS

REPORTABLE COMPONENTS	CAS NUMBER	mm Hg @ TEMP	WEIGHT PERCENT
TITANIUM DIOXIDE PEL-TWA: 15 mg/m3, ACGIH-TLV: 10 mg/m3	013463-67-7		15 - 25
COLLOIDAL SILICA PEL-TWA: 6 mg/m3, ACGIH-TLV: 10 mg/m3 - TOTAL DUST	007631-86-9		1 - 10

SEE SECTION 9 FOR SARA AND HAPS INFORMATION.

SECTION III - PHYSICAL/CHEMICAL CHARACTERISTICS

BOILING RANGE: n/a
DENSITY : 13.33 lb/gl
SPECIFIC GRAVITY (H20=1): 1.6
VAPOR DENSITY : n/a
EVAPORATION RATE: n/a

VOC AS SUPPLIED: 0.0 lb/gl 0 g/l
VOC EXCLUDING EPA EXEMPT SOLVENTS/WATER: 0.0 lb/gl 0 g/l

NOTE: Check with your state/local Air Quality regulatory agency to determine which VOC calculation you should use.

SOLUBILITY IN WATER: Negligible.
APPEARANCE AND ODOR: Powder with little or no odor.

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT: n/a
FLAMMABLE LIMITS IN AIR BY VOLUME- LOWER: n/a UPPER: n/a

EXTINGUISHING MEDIA:
Foam, CO2, Dry chemical, Water spray.

SPECIAL FIREFIGHTING PROCEDURES:
Wear self-contained breathing apparatus and full protective clothing.

UNUSUAL FIRE AND EXPLOSION HAZARDS:
Dust may form explosive mixture with air in the presence of an ignition source. Practice good housekeeping and grounding of all

equipment. Combustion products may be toxic.

SECTION V - REACTIVITY DATA

STABILITY: Stable.

CONDITIONS TO AVOID:
Avoid direct sunlight, excessive heat and fire.

INCOMPATIBILITY (MATERIALS TO AVOID):
Strong oxidizing agents.

HAZARDOUS DECOMPOSITION OR BYPRODUCTS:
Carbon monoxide, carbon dioxide.

HAZARDOUS POLYMERIZATION: Will not occur.

SECTION VI - HEALTH HAZARD DATA

*****Note: This product is a blend of materials which has not been tested as a mixture. The health effect data is based on the individual components.*****

INHALATION HEALTH RISKS AND SYMPTOMS OF EXPOSURE:
COLLOIDAL SILICA: May cause irritation to the respiratory tract and lungs if dust is inhaled.

EYE CONTACT HEALTH RISKS AND SYMPTOMS OF EXPOSURE:
May cause mechanical irritation of eyes.

SKIN CONTACT HEALTH RISKS AND SYMPTOMS OF EXPOSURE:
Skin may experience some irritation with repeated and prolonged exposure.

SKIN ABSORPTION HEALTH RISKS AND SYMPTOMS OF EXPOSURE:
None known.

INGESTION HEALTH RISKS AND SYMPTOMS OF EXPOSURE:
None known.

CHRONIC HEALTH RISKS:
COLLOIDAL SILICA: Prolonged inhalation of dust can cause pneumconiosis.

CARCINOGENICITY:
NTP CARCINOGEN: No IARC MONOGRAPHS: No OSHA REGULATED: No
Not known to contain any ingredients recognized as carcinogens by the National Toxicology Program (NTP), the International Agency for Cancer Research (IARC) or the Occupational Safety and Heath Administration (OSHA).

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE:
Existing skin and respiratory disorders.

COLLOIDAL SILCIA: Prolonged inhalation of dust can increase lung injury in individuals with emphysema, asthma or other lung disorders.

EMERGENCY AND FIRST AID PROCEDURES:
EYES: Immediately flush with large quantities of running water for 15 minutes, lifting the upper and lower eyelids occasionally and seek medical attention if irriation develops.
SKIN: Remove clothing and wash with soap and water for 15 minutes. Get medical attention if irritation develops.
INGESTION: If appreciable quantities are swallowed, seek medical attention.
INHALATION: In case of exposure to a high concentration of dust, remove person to fresh air. If breathing has stopped, administer artificial respiration.

SECTION VII - PRECAUTIONS FOR SAFE HANDLING AND USE

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: Transfer material into closed containers for re-use or disposal. Maintain dust control.
In the event of a large transportation related spill or emergency call CHEMTREC at 1(800)424-9300.

WASTE DISPOSAL METHOD: Sweep up spilled powder and dispose of in accordance with Federal, State and local waste disposal regulations.

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING: Store in a cool, dry area out of direct sunlight. Keep containers closed and protect from physical damage.

OTHER PRECAUTIONS: Avoid creating dust clouds and breathing dust when handling and spraying powder. Use adequate ventilation or respirator as needed. Possiblity of explosion exists under dusty conditions. Avoid dusting and all potential ignition sources (spark or flame). Ground equipment to reduce static electricity; use spark resistant tools.

SECTION VIII - CONTROL MEASURES

RESPIRATORY PROTECTION: Use NIOSH approved respirator (particle mask) for dusts.

VENTILATION: Use mechanical ventilation to keep dust below regulatory standards. Ovens should be vented in a way which prevents employee exposure to vapors which may be released during the baking process.

PROTECTIVE GLOVES: Wear impervious gloves for operations where contact is likely.

EYE PROTECTION: Goggles or approved safety glasses should be worn. DO NOT wear contact lenses when working with chemicals. Contact lenses can trap chemical next to eye which may increase eye damage.

OTHER PROTECTIVE CLOTHING OR EQUIPMENT: Wear coveralls to keep dust off skin and clothing. An eyewash station and emergency shower should be nearby and ready for use.

WORK/HYGIENIC PRACTICES: In handling any chemicals, personal hygiene is extremely important. Always wash your hands and face before eating or when done handling or using this product. Keep food and drink out of work areas.

SECTION IX - REGULATORY INFORMATION

SARA 313 / 40 CFR 372:	% / WT

. This product contains no reportable materials at or above normal reporting levels.

CLEAN AIR ACT AMENDMENT SECTION 112 (HAPS):	% / WT

. This product contains no reportable materials at or above normal reporting levels.

DOT SHIPPING INFORMATION (GROUND): Not regulated.

DOT SHIPPING INFORMATION (LIMITED QUANTITIES/GROUND): None known.

IATA SHIPPING DESCRIPTION (AIR SHIPMENTS): Not regulated.

IMDG SHIPPING DESCRIPTION (WATERWAYS SHIPMENTS): Not regulated.

OSHA CLASSIFICATION: Not regulated.

CLEAN AIR ACT - OZONE DEPLETING CHEMICALS: Not known to contain or be manufactured with Class 1 or Class 2 Ozone Depleting Chemicals (ODC's).

RoHS DIRECTIVE: This product complies with the RoHS (Regulation of Hazardous Substances) Directive.

SECTION X - DISCLAIMER

The above information is based on current information available to Forrest Paint Co. and is believed to be accurate but is not warranted.

PRODUCT CODE: 10K011 HMIS CODES: H F R P
PRODUCT NAME: 19S EPOXY SEMI-GLOSS CATALYST B 2*3 0 J

SECTION I - MANUFACTURER IDENTIFICATION

MANUFACTURER'S NAME: FORREST PAINT CO.
ADDRESS : 1011 MCKINLEY ST.
EUGENE, OR 97402

EMERGENCY PHONE : 1(800)424-9300
INFORMATION PHONE : 1(541)342-1821
DATE ISSUED : 9/10/2007
INFORMATION CONTACT: T. BOLLENBAUGH

SECTION II - REPORTABLE COMPONENTS

REPORTABLE COMPONENTS	CAS NUMBER	mm Hg @	TEMP	WEIGHT PERCENT
EPOXY RESIN PEL-TWA: NOT ESTABLISHED	PROPRIETARY			20 - 30
METHYL ISOBUTYL KETONE PEL-TWA: 50 ppm, PEL-STEL: 75 ppm, ACGIH-TLV: 50 ppm	000108-10-1	15	68	10 - 20
XYLENE PEL-TWA: 100 ppm, PEL-STEL: 150 ppm, ACGIH-TLV: 100 ppm	001330-20-7	5.1	68	10 - 20
AMORPHOUS FUMED SILICA PEL-TWA: 6 mg/m3, ACGIH-TLV: 6 mg/m3	112945-52-5			5 - 15
TOLUENE PEL-TWA: 100 ppm, PEL-STEL: 150 ppm, ACGIH-TLV: 20 ppm - skin	000108-88-3	25	68	5 - 15
POLYAMIDE POLYMER PEL-TWA: NOT ESTABLISHED	PROPRIETARY			1 - 10
ISOPROPANOL PEL-TWA: 400 ppm, PEL-STEL: 500 ppm, ACGIH-TLV: 400 ppm	000067-63-0	33	68	1 - 10
ETHYL BENZENE PEL-TWA/ACGIH-TLV: 100 ppm; STEL: 150 ppm	000100-41-4	7	68	1 - 10

SEE SECTION 9 FOR SARA AND HAPS INFORMATION.

SECTION III - PHYSICAL/CHEMICAL CHARACTERISTICS

BOILING RANGE: 180 deg F - 279 deg F
DENSITY : 9.64 lb/gl
SPECIFIC GRAVITY (H20=1): 1.16
VAPOR DENSITY : Heavier than air.
EVAPORATION RATE: Slower than ether.

VOC AS SUPPLIED: 3.73 lb/gl 447 g/l
VOC EXCLUDING EPA EXEMPT SOLVENTS/WATER: 3.73 lb/gl 447 g/l

NOTE: Check with your state/local Air Quality regulatory agency to determine which VOC calculation you should use.

SOLUBILITY IN WATER: Insoluble.
APPEARANCE AND ODOR: Liquid with epoxy odor.

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT: 40 deg F
FLAMMABLE LIMITS IN AIR BY VOLUME- LOWER: .8 UPPER: 12

EXTINGUISHING MEDIA: Foam, Alcohol foam, CO2, Dry chemical, Water fog.

SPECIAL FIREFIGHTING PROCEDURES: Hazardous decomposition products may form from incomplete combustion. Wear full protection gear with self-contained positive pressure breathing apparatus.

UNUSUAL FIRE AND EXPLOSION HAZARDS: FLAMMABLE LIQUID AND VAPORS!! Closed container can build pressure from heat and rupture violently. Volatile vapors can burn in the open or explode if confined. Vapor is heavier than air and can travel long distances to source of ignition.

SECTION V - REACTIVITY DATA

STABILITY: Stable.

CONDITIONS TO AVOID: High temperatures, sources of ignition. Do not use in areas with poor ventilation.

INCOMPATIBILITY (MATERIALS TO AVOID): Strong oxidizers, acids, bases and epoxy hardeners under uncontrolled conditions.

HAZARDOUS DECOMPOSITION OR BYPRODUCTS: Carbon monoxide, carbon dioxide.

HAZARDOUS POLYMERIZATION: Will not occur.

SECTION VI - HEALTH HAZARD DATA

*****Note: This product is a blend of materials which has not been tested as a mixture. The health effect data is based on the individual components.*****

One part of a 2 part system. Mixture will contain the hazards of both parts. Read all cautions, warnings and MSDS for both parts before using.*

INHALATION HEALTH RISKS AND SYMPTOMS OF EXPOSURE:
AMORPHOUS SILICA: Dust or in aerosol mist(inhalation): Considered to be less toxic than quartz or crystalline silica. Potential effects - scarring of the lungs (pulmonary fibrosis) and silicotic nodules - scar tissue (silicosis).

ISOPROPANOL: Exposure can cause irritation of the eyes, nose, mouth and throat. IPA is of low toxicity by any route and the TLV is set on the basis of eye, nose and throat irritation.

EPOXY RESIN: May cause nasal irritation, central nervous system depression (headache, dizziness, incoordination, nausea) and lung injury.

TOLUENE/VM&P NAPHTHA/PETROLEUM NAPHTHA: Vapors or aerosol mists are central nervous system (CNS) depressant and a mild irritant of the eyes and upper respiratory tract. Narcotic in high concentration. High concentrations can cause unconsciousness which may go to coma, difficult breathing, tremors and nausea, excitation and hyperactivity, impairment of coordination and reaction time.

XYLENE/ETHYL BENZENE: Vapors are irritating to the eyes, mucous membranes and skin; at high concentrations it causes narcosis or unconsciousness. Giddiness, anorexia, vomiting, headache, vertigo (dizziness), gastric (stomach) discomfort, dryness of the throat and signs of slight drunkenness.

METHYL ISOBUTYL KETONE: Exposure can be very irritating to the eyes, mucous membranes of the nose and throat, producing eye and throat symptoms. Higher concentrations may cause dizziness, weakness, fatigue, headaches, lightedness, nausea, vomiting, incoordination and coma. Very high concentrations or prolonged exposure may cause kidney and liver damage.

EYE CONTACT HEALTH RISKS AND SYMPTOMS OF EXPOSURE:
AMORPHOUS SILICA: Dust or in aerosol mist (inhalation):
Exposure can cause eye irritation.

ISOPROPANOL: Contact can cause eye irritation.

TOLUENE/VM&P NAPHTHA/PETROLEUM NAPHTHA: Toluene is a strong irritant to the eyes.

XYLENE/ETHYL BENZENE: Eye contact with liquid is irritating and may cause conjunctivitis, redness, tearing and blurred vision.

EPOXY RESIN: May cause mild to moderate irritation, possible minor temporary corneal injury.

METHYL ISOBUTYL KETONE: Liquid causes severe irritation, redness, tearing and blurred vision. May cause corneal damage.

SKIN CONTACT HEALTH RISKS AND SYMPTOMS OF EXPOSURE:
ISOPROPANOL: Can irritate the skin on contact, causing a rash or burning feeling.

TOLUENE/VM&P NAPHTHA/PETROLEUM NAPHTHA: Minor skin contact causes some irritation. Prolonged contact will cause drying of the skin and cracking.

XYLENE/ETHYL BENZENE: Skin contact may result in immediate irritation characterized by redness (erythema and hyperemia) and will remove fat from the skin resulting in dermatitis. Painful burning sensation and blisters formed on exposed areas.

EPOXY RESIN: Prolonged or repeated contact may cause irritation or defatting. May cause allergic skin reaction.

METHYL ISOBUTYL KETONE: Brief contact may dry the skin. Prolonged or

repeated contact may irritate and defat the skin, causing cracking and dermatitis.

SKIN ABSORPTION HEALTH RISKS AND SYMPTOMS OF EXPOSURE:
ISOPROPANOL: Can absorbed through the skin.

TOLUENE/VM&P NAPHTHA/PETROLEUM NAPHTHA: Can be absorbed and cause systemic poisoning.

XYLENE/ETHYL BENZENE: Can be slowly absorbed through the skin and cause systemic poisoning.

EPOXY RESIN: Not likely to absorbed in toxic amounts.

INGESTION HEALTH RISKS AND SYMPTOMS OF EXPOSURE:
If vomiting occurs do not allow vomitus to be breathed into the lungs. Even small quantities may cause chemical pneumonia and fluid in the lungs (pulmonary edema) which may result in hemorrhage (bleeding) and may be fatal.

ISOPROPANOL: Ingestion gives rise to symptoms of alcoholic intoxication. Other symptoms may include vomiting, depression, headache, coma and shock.

TOLUENE/VM&P NAPHTHA/PETROLEUM NAPHTHA: Ingestion produces similar effects to vapor inhalation. The liquid causes damage to stomach and intestinal linings.

XYLENE/ETHYL BENZENE: Ingestion produces similar effects to vapor inhalation. The liquid causes damage to stomach and intestinal linings.

METHYL ISOBUTYL KETONE: The solvent has low acute oral toxicity, but may cause gastric irritation, headache, nausea, vomiting, diarrhea. High doses can lead to narcosis and unconsciousness.

CHRONIC HEALTH RISKS:
AMORPHOUS SILICA: May cause lung scarring (silicosis).

ISOPROPANOL: Skin exposure can cause itching, redness and rashes in some people. Repeated or prolonged exposure can cause dryness and cracking of skin. This chemical has not been adequately evaluated to determine whether brain or nerve damage could occur with repeated exposure. However, many solvents and other petroleum based chemicals have been shown to cause such damage.

TOLUENE/VM&P NAPHTHA/PETROLEUM NAPHTHA: Prolonged contact will cause drying of the skin and cracking. Muscular weakness syndromes, gastrointestinal syndromes or neuropsychiatric syndromes are common symptoms in toluene sniffers.
Encephalophathy (toxic brain disease), progressive memory loss, fatigue, impaired concentration, irritability, persistent headaches and brain dysfunction has been reported.

XYLENE/ETHYL BENZENE: Can interfere with motor functions in exposed workers, loss of appetite, nausea, headache, dizziness, sleeplessness, indigestion, nose bleeds, liver and kidney damage, toxic brain disease (encephalopathy), dementia (loss of memory), and other neurological disorders.
Experimental animals experienced teratogenic and reproductive effects. Temporary blood disorders and kidney damage has been observed in male rats.

Prolonged or repeated exposure to solvents may cause permanent brain and nervous system damage, including memory loss and impairment of coordination and reaction time. May cause toxic brain disease (encephalopathy), associated with brain tissue death. May cause liver and kidney damage. Inhaling concentrated vapors is harmful and may be fatal.

METHYL ISOBUTYL KETONE: May cause liver, kidney, lung and brain damage.

CARCINOGENICITY:
NTP CARCINOGEN: No IARC MONOGRAPHS: Yes OSHA REGULATED: No
ETHYL BENZENE: Classified by IARC (International Agency for Research on Cancer) as possibly carcinogenic to humans (group 2B). Risk of cancer depends on duration and level of exposure.

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE:
Exposure for employees with a history of certain medical conditions such as skin, liver, kidney, eye, chronic respiratory, central and peripheral nervous system disease may have an increased risk from exposure to this material.

EMERGENCY AND FIRST AID PROCEDURES:
***NOTES TO PHYSICIAN: If victim is a child, give no more than 1 glass of water and 15cc (1 tablespoon) syrup of Ipecac. If symptoms such as loss of gag reflex, convulsions or unconsciousness occur before emesis, gastric lavage should be considered following intubation with a cuffed endotracheal tube.
The danger of aspiration must be weighed against toxicity when considering emptying the stomach. Stomach contents should be emptied quickly in a manner which avoids the vomitus entering the lungs.***

EYE AND SKIN CONTACT: In case of contact, immediately flush eyes (lifting eyelids occasionally) or skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention. Wash clothing before reuse.
INHALATION: Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.
INGESTION: If swallowed, do not induce vomiting. Get medical attention immediately.

SECTION VII - PRECAUTIONS FOR SAFE HANDLING AND USE

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: Evacuate all nonessential personnel. Remove all source of ignition. Ventilate

area if possible. Avoid breathing vapors. Spill clean up beyond the scope of normal maintenance activities should be performed by trained response personnel.
In the event of a large transportation related spill or emergency call CHEMTREC at 1(800)424-9300.

WASTE DISPOSAL METHOD: Waste material is a RCRA hazardous waste. Dispose of in accordance to Federal, state and local waste disposal regulations. Do not discharge into public water ways or water treatment facilities. Do not bury.

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING: FLAMMABLE LIQUID AND VAPORS. Store only in areas approved for flammable liquids. Keep clear of all sources of ignition. Ground and bond all holding and transfer containers. Storage temperature must be below 120 deg. F. Freezing temperatures may effect product stability. KEEP CONTAINER TIGHTLY CLOSED WHEN NOT IN USE. DO NOT TRANSFER TO UNLABELED CONTAINER.

OTHER PRECAUTIONS: Ignition temperatures of this product will decrease with increased vapor volume and vapor/air contact time and are influenced by pressure changes. Any proposed use of this product in elevated-temperature processes should be evaluated to assure that safe operating conditions are established.

SECTION VIII - CONTROL MEASURES

RESPIRATORY PROTECTION: If ventilation is not adequate to reduce vapors below regulatory limits, use a self-contained (air supplied) positive pressure breathing apparatus, or a NIOSH approved air purifying respirator (APR) equipped with organic vapor cartridges (black striped cartridge). Failure to use proper respiratory protection may be harmful or fatal.
User must be properly trained and fitted to assure effective protection. Follow all manufacturers recommendations for use of filter.
WARNING: Do not use an APR if oxygen level is below 19.5% by volume.

VENTILATION: Sufficient ventilation, in volume and pattern should be provided to keep the air contaminants below the TLV/PEL levels. Remove vapors from low areas of stagnant air (e.g., corners near floor where vapors may collect).

PROTECTIVE GLOVES: Use gloves impervious to solvent. Follow glove manufacturer's recommendation for selecting gloves according to the solvents in this product.

EYE PROTECTION: Wear splash goggles or use face shield with safety glasses for splash protection. If vapor concentration causes eye irritation wear full-face respirator. Do not wear contact lenses when working with chemicals. Contact lenses can trap chemical next to eye which may increase eye damage.

OTHER PROTECTIVE CLOTHING OR EQUIPMENT: A protective apron should be used for splash protection. When spraying this product a spray hood is recommended to cover hair and face. Skin should be covered as much as possible to protect from overspray or mist.

A continuous 15 minute eye wash station and a chemical spill shower should be available in case of emergency.

WORK/HYGIENIC PRACTICES: In handling any chemicals, personal hygiene is extremely important. Always wash your hands and face before eating or when done handling or using this product. Keep food and drink out of work areas. Some items such as cigarettes or gum readily absorb solvent vapors and may increase your overall exposure to this product.

SECTION IX - REGULATORY INFORMATION

SARA 313 / 40 CFR 372:		% / WT
METHYL ISOBUTYL KETONE	000108-10-1	14
XYLENE	001330-20-7	10
TOLUENE	000108-88-3	8
ETHYL BENZENE	000100-41-4	2

CLEAN AIR ACT AMENDMENT SECTION 112 (HAPS):		% / WT
+ METHYL ISOBUTYL KETONE	000108-10-1	14
+ XYLENE	001330-20-7	10
+ TOLUENE	000108-88-3	8
+ ETHYL BENZENE	000100-41-4	2

+ Indicates volatile Hazardous Air Pollutant chemicals at or above the reporting requirements of the Clean Air Act Amendments Section 112.

DOT SHIPPING INFORMATION (GROUND): Paint, 3, UN1263, PGII. ERG # 128

DOT SHIPPING INFORMATION (LIMITED QUANTITIES/GROUND): Inner packaging 1.3 gallons (5 L) or less each net capacity in strong outer packaging and total package weight not exceeding 66 pounds (30 kg): Consumer Commodity, ORM-D

IATA SHIPPING DESCRIPTION (AIR SHIPMENTS): Paint, Class 3, UN1263, PG II.

IMDG SHIPPING DESCRIPTION (WATERWAYS SHIPMENTS): Paint, Flammable Liquid, Class 3, UN1263, PG II. Flashpoint 5 C.

OSHA CLASSIFICATION: Flammable Liquid - Class IB.

CLEAN AIR ACT - OZONE DEPLETING CHEMICALS: Not known to contain or be manufactured with Class 1 or Class 2 Ozone Depleting Chemicals (ODC's).

RoHS DIRECTIVE: This product complies with the RoHS (Regulation of Hazardous Substances) Directive.

SECTION X - DISCLAIMER

The above information is based on current information available to Forrest Paint Co. and is believed to be accurate but is not warranted.

PRODUCT CODE: 14E306 HMIS CODES: H F R P
PRODUCT NAME: SAFETY RED - QUIXNAMEL 2*3 0 J

SECTION I - MANUFACTURER IDENTIFICATION

MANUFACTURER'S NAME: FORREST PAINT CO.
ADDRESS : 1011 MCKINLEY ST.
EUGENE, OR 97402

EMERGENCY PHONE : 1(800)424-9300
INFORMATION PHONE : 1(541)342-1821
DATE ISSUED : 9/30/2008
INFORMATION CONTACT: T. BOLLENBAUGH

SECTION II - REPORTABLE COMPONENTS

REPORTABLE COMPONENTS	CAS NUMBER	mm Hg @	TEMP	WEIGHT PERCENT
XYLENE	001330-20-7	5.1	68	35 - 45
PEL-TWA: 100 ppm, PEL-STEL: 150 ppm, ACGIH-TLV: 100 ppm				
ETHYL BENZENE	000100-41-4	7	68	5 - 15
PEL-TWA/ACGIH-TLV: 100 ppm; STEL: 150 ppm				
TOLUENE	000108-88-3	25	68	1 - 10
PEL-TWA: 100 ppm, PEL-STEL: 150 ppm, ACGIH-TLV: 20 ppm - skin				
D&C ORANGE NO. 17	003468-63-1			1 - 10
PEL-TWA/ACGIH-TLV: 10 mg/m3 Total dust				
SOLVENT NAPHTHA	064742-89-8	7.7	68	1 - 10
PEL-TWA/ACGIH-TLV: 300 ppm, PEL-STEL: 400 ppm				
MANGANESE CMPDS				1 - 10
ACGIH-CEILING: 5 ppm				
AROMATIC PETROLEUM DISTILLATES	064742-95-6	10.3	77	1 - 10
PEL-TWA: 100 ppm, PEL-STEL: 150 ppm, ACGIH-TLV: 100 ppm				

SEE SECTION 9 FOR SARA AND HAPS INFORMATION.

SECTION III - PHYSICAL/CHEMICAL CHARACTERISTICS

BOILING RANGE: 232 deg F - 320 deg F
DENSITY : 8.13 lb/gl
SPECIFIC GRAVITY (H20=1): .98
VAPOR DENSITY : Heavier than air.
EVAPORATION RATE: Slower than ether.

VOC AS SUPPLIED: 4.8 lb/gl 575 g/l
VOC EXCLUDING EPA EXEMPT SOLVENTS/WATER: 4.8 lb/gl 575 g/l

NOTE: Check with your state/local Air Quality regulatory agency to determine which VOC calculation you should use.

SOLUBILITY IN WATER: Insoluble.
APPEARANCE AND ODOR: Liquid with strong solvent odor.

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT: 40 deg F
FLAMMABLE LIMITS IN AIR BY VOLUME- LOWER: .8 UPPER: 7.6

EXTINGUISHING MEDIA:

Foam, Alcohol foam, CO2, Dry chemical, Water fog.

SPECIAL FIREFIGHTING PROCEDURES:
Hazardous decomposition products may form from incomplete combustion. Wear full protection gear with self-contained positive pressure breathing apparatus.

UNUSUAL FIRE AND EXPLOSION HAZARDS:
FLAMMABLE LIQUID AND VAPORS!! Closed container can build pressure from heat and rupture violently. Volatile vapors can burn in the open or explode if confined. Vapor is heavier than air and can travel long distances to source of ignition.

Dried paint residue may spontaneously combust. Sweepings, rags, etc., should be wet down and put in a closed container.

SECTION V - REACTIVITY DATA

STABILITY: Stable.

CONDITIONS TO AVOID:
High temperatures, sources of ignition. Do not use in areas with poor ventilation.

INCOMPATIBILITY (MATERIALS TO AVOID):
Strong oxidizing agents.

HAZARDOUS DECOMPOSITION OR BYPRODUCTS:
Carbon monoxide, carbon dioxide.

HAZARDOUS POLYMERIZATION: Will not occur.

SECTION VI - HEALTH HAZARD DATA

*****Note: This product is a blend of materials which has not been tested as a mixture. The health effect data is based on the individual components.*****

INHALATION HEALTH RISKS AND SYMPTOMS OF EXPOSURE:
NAPHTHAS/ALIPHATIC SOLVENTS: Vapors or aerosol mists are central nervous system (CNS) depressant and a mild irritation of the eye and upper respiratory tract. Narcotic in high concentration. High concentrations can cause unconsciousness which may go to coma, difficult breathing and bluish tint to the skin.

MANGANESE COMPOUNDS: There has been found an association between manganese exposure and pulmonary effects including pneumonia, chronic bronchitis and airway disability.

TOLUENE/VM&P NAPHTHA/PETROLEUM NAPHTHA: Vapors or aerosol mists are central nervous system (CNS) depressant and a mild irritant of the eyes and upper respiratory tract. Narcotic in high concentration. High concentrations can cause unconsciousness which may go to coma, difficult breathing, tremors and nausea, excitation and

hyperactivity, impairment of coordination and reaction time.

XYLENE/ETHYL BENZENE: Vapors are irritating to the eyes, mucous membranes and skin; at high concentrations it causes narcosis or unconsciousness. Giddiness, anorexia, vomiting, headache, vertigo (dizziness), gastric (stomach) discomfort, dryness of the throat and signs of slight drunkenness.

AROMATIC HYDROCARBONS: Excessive inhalation of vapors can cause nasal and respiratory irritation, central nervous system effects including dizziness, weakness, fatigue, headaches, nausea, possible unconsciousness and even death.

EYE CONTACT HEALTH RISKS AND SYMPTOMS OF EXPOSURE:
NAPHTHAS/ALIPHATIC SOLVENTS: Contact could cause eye irritation.

TOLUENE/VM&P NAPHTHA/PETROLEUM NAPHTHA: Toluene is a strong irritant to the eyes.

XYLENE/ETHYL BENZENE: Eye contact with liquid is irritating and may cause conjunctivitis, redness, tearing and blurred vision.

AROMATIC HYDROCARBONS: Can cause severe irritation, redness, tearing and blurred vision.

SKIN CONTACT HEALTH RISKS AND SYMPTOMS OF EXPOSURE:
TOLUENE/VM&P NAPHTHA/PETROLEUM NAPHTHA: Minor skin contact causes some irritation. Prolonged contact will cause drying of the skin and cracking.

XYLENE/ETHYL BENZENE: Skin contact may result in immediate irritation characterized by redness (erythema and hyperemia) and will remove fat from the skin resulting in dermatitis. Painful burning sensation and blisters formed on exposed areas.

AROMATIC HYDROCARBONS: Prolonged or repeated contact can cause moderate irritation, defatting, dermatitis.

SKIN ABSORPTION HEALTH RISKS AND SYMPTOMS OF EXPOSURE:
TOLUENE/VM&P NAPHTHA/PETROLEUM NAPHTHA: Can be absorbed and cause systemic poisoning.

XYLENE/ETHYL BENZENE: Can be slowly absorbed through the skin and cause systemic poisoning.

INGESTION HEALTH RISKS AND SYMPTOMS OF EXPOSURE:
If vomiting occurs do not allow vomitus to be breathed into the lungs. Even small quantities may cause chemical pneumonia and fluid in the lungs (pulmonary edema) which may result in hemorrhage (bleeding) and may be fatal.

NAPHTHAS/ALIPHATIC SOLVENTS: These solvents are not particularly

toxic by ingesting, but will cause gastrointestinal disturbance and there is a risk of aspiration of the liquid into the lungs if vomiting takes place.

TOLUENE/VM&P NAPHTHA/PETROLEUM NAPHTHA: Ingestion produces similar effects to vapor inhalation. The liquid causes damage to stomach and intestinal linings.

XYLENE/ETHYL BENZENE: Ingestion produces similar effects to vapor inhalation. The liquid causes damage to stomach and intestinal linings.

AROMATIC HYDROCARBONS: Can cause gastrointestinal irritation, nausea, vomiting and diarrhea. Breathing of material into the lungs can cause chemical pneumonitis which can be fatal.

CHRONIC HEALTH RISKS:
MANGANESE COMPOUNDS: None known at this time, however, manganese can cause a neurological disorder known as manganism. This disease begins with headaches, irritability and occasionally, psychotic behavior.

TOLUENE/VM&P NAPHTHA/PETROLEUM NAPHTHA: Prolonged contact will cause drying of the skin and cracking. Muscular weakness syndromes, gastrointestinal syndromes or neuropsychiatric syndromes are common symptoms in toluene sniffers.
Encephalophathy (toxic brain disease), progressive memory loss, fatigue, impaired concentration, irritability, persistent headaches and brain dysfunction has been reported.

XYLENE/ETHYL BENZENE: Can interfere with motor functions in exposed workers, loss of appetite, nausea, headache, dizziness, sleeplessness, indigestion, nose bleeds, liver and kidney damage, toxic brain disease (encephalopathy), dementia (loss of memory), and other neurological disorders.
Experimental animals experienced teratogenic and reproductive effects. Temporary blood disorders and kidney damage has been observed in male rats.

Prolonged or repeated exposure to solvents may cause permanent brain and nervous system damage, including memory loss and impairment of coordination and reaction time. May cause toxic brain disease (encephalopathy), associated with brain tissue death. May cause liver and kidney damage. Inhaling concentrated vapors is harmful and may be fatal.

CARCINOGENICITY:
NTP CARCINOGEN: No IARC MONOGRAPHS: Yes OSHA REGULATED: No
ETHYL BENZENE: Classified by IARC (International Agency for Research on Cancer) as possibly carcinogenic to humans (group 2B). Risk of cancer depends on duration and level of exposure.

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE:
Exposure for employees with a history of certain medical conditions such as skin, liver, kidney, eye, chronic respiratory,

central and peripheral nervous system disease may have an increased risk from exposure to this material.

EMERGENCY AND FIRST AID PROCEDURES:
EYE AND SKIN CONTACT: In case of contact, immediately flush eyes (lifting eyelids occasionally) or skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention. Wash clothing before reuse.
INHALATION: Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.
INGESTION: If swallowed, do not induce vomiting. Get medical attention immediately.

SECTION VII - PRECAUTIONS FOR SAFE HANDLING AND USE

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: Evacuate all nonessential personnel. Remove all source of ignition. Ventilate area if possible. Avoid breathing vapors. Spill clean up beyond the scope of normal maintenance activities should be performed by trained response personnel.
In the event of a large transportation related spill or emergency call CHEMTREC at 1(800)424-9300.

WASTE DISPOSAL METHOD: Waste material is a RCRA hazardous waste. Dispose of in accordance to Federal, state and local waste disposal regulations. Do not discharge into public water ways or water treatment facilities. Do not bury.

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING: FLAMMABLE LIQUID AND VAPORS. Store only in areas approved for flammable liquids. Keep clear of all sources of ignition. Ground and bond all holding and transfer containers. Storage temperature must be below 120 deg. F. Freezing temperatures may effect product stability. KEEP CONTAINER TIGHTLY CLOSED WHEN NOT IN USE. DO NOT TRANSFER TO UNLABELED CONTAINER.

OTHER PRECAUTIONS: Ignition temperatures of this product will decrease with increased vapor volume and vapor/air contact time and are influenced by pressure changes. Any proposed use of this product in elevated-temperature processes should be evaluated to assure that safe operating conditions are established.
To avoid spontaneous combustion during temporary storage, soak soiled rags and waste immediately after use in a water-filled, closed metal container.

SECTION VIII - CONTROL MEASURES

RESPIRATORY PROTECTION: If ventilation is not adequate to reduce vapors below regulatory limits, use a self-contained (air supplied) positive pressure breathing apparatus, or a NIOSH approved air purifying respirator (APR) equipped with organic vapor cartridges (black striped cartridge). Failure to use proper respiratory protection may be harmful or fatal.
User must be properly trained and fitted to assure effective protection. Follow all manufacturers recommendations for use of filter.

WARNING: Do not use an APR if oxygen level is below 19.5% by volume.

VENTILATION: Sufficient ventilation, in volume and pattern should be provided to keep the air contaminants below the TLV/PEL levels. Remove vapors from low areas of stagnant air (e.g., corners near floor where vapors may collect).

PROTECTIVE GLOVES: Use gloves impervious to solvent. Follow glove manufacturer's recommendation for selecting gloves according to the solvents in this product.

EYE PROTECTION: Wear splash goggles or use face shield with safety glasses for splash protection. If vapor concentration causes eye irritation wear full-face respirator. Do not wear contact lenses when working with chemicals. Contact lenses can trap chemical next to eye which may increase eye damage.

OTHER PROTECTIVE CLOTHING OR EQUIPMENT: A protective apron should be used for splash protection. When spraying this product a spray hood is recommended to cover hair and face. Skin should be covered as much as possible to protect from overspray or mist. A continuous 15 minute eye wash station and a chemical spill shower should be available in case of emergency.

WORK/HYGIENIC PRACTICES: In handling any chemicals, personal hygiene is extremely important. Always wash your hands and face before eating or when done handling or using this product. Keep food and drink out of work areas. Some items such as cigarettes or gum readily absorb solvent vapors and may increase your overall exposure to this product.

SECTION IX - REGULATORY INFORMATION

SARA 313 / 40 CFR 372:		% / WT
XYLENE	001330-20-7	39
ETHYL BENZENE	000100-41-4	7.3
TOLUENE	000108-88-3	5
MANGANESE CMPDS		3

CLEAN AIR ACT AMENDMENT SECTION 112 (HAPS):		% / WT
+ XYLENE	001330-20-7	39
+ ETHYL BENZENE	000100-41-4	7.3
+ TOLUENE	000108-88-3	5
x MANGANESE CMPDS		3

+ Indicates volatile Hazardous Air Pollutant chemicals at or above the reporting requirements of the Clean Air Act Amendments Section 112.

x Indicates non-volatile Hazardous Air Pollutant chemicals at or above the reporting requirements of the Clean Air Act Amendments Section 112.

DOT SHIPPING INFORMATION (GROUND): Paint, 3, UN1263, PGII. ERG # 128

DOT SHIPPING INFORMATION (LIMITED QUANTITIES/GROUND): Inner packaging 1.3 gallons (5 L) or less each net capacity in strong outer packaging and total package weight not exceeding 66 pounds (30 kg): Consumer Commodity, ORM-D

IATA SHIPPING DESCRIPTION (AIR SHIPMENTS): Paint, Class 3, UN1263, PG II.

IMDG SHIPPING DESCRIPTION (WATERWAYS SHIPMENTS): Paint, Flammable Liquid, Class 3, UN1263, PG II. Flashpoint 5 C.

OSHA CLASSIFICATION: Flammable Liquid - Class IB.

CLEAN AIR ACT - OZONE DEPLETING CHEMICALS: Not known to contain or be manufactured with Class 1 or Class 2 Ozone Depleting Chemicals (ODC's).

RoHS DIRECTIVE: This product complies with the RoHS (Regulation of Hazardous Substances) Directive.

SECTION X - DISCLAIMER

The above information is based on current information available to Forrest Paint Co. and is believed to be accurate but is not warranted.

Material Safety Data Sheet

SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: SCOTCHKOTE 206N Fusion Bonded Epoxy Coating (Standard, Long Gel, Extra Long Gel, and Fluid Bed Versions)
MANUFACTURER: 3M
DIVISION: Corrosion Protection Products Dept

ADDRESS: 3M Center
St. Paul, MN 55144-1000

EMERGENCY PHONE: 1-800-364-3577 or (651) 737-6501 (24 hours)

Issue Date: 05/16/2005
Supercedes Date: 09/30/2004

Document Group: 06-5494-7

Product Use:
Specific Use: Corrosion Protection Coating for Metal

SECTION 2: INGREDIENTS

Ingredient	C.A.S. No.	% by Wt
4,4'-ISOPROPYLIDENEDIPHENOL-EPICHLOROHYDRIN POLYMER	25068-38-6	60 - 80
CALCIUM SILICATE	13983-17-0	20 - 40
CYANOGUANIDINE	461-58-5	1 - 5
ACRYLONITRILE-BUTADIENE-ITACONIC ACID-STYRENE POLYMER	29383-53-7	1 - 5
TITANIUM DIOXIDE	13463-67-7	1 - 5

SECTION 3: HAZARDS IDENTIFICATION

3.1 EMERGENCY OVERVIEW

Specific Physical Form: Powder
Odor, Color, Grade: Green Powder
General Physical Form: Solid
Immediate health, physical, and environmental hazards: May cause severe eye irritation. May cause allergic skin reaction. May cause target organ effects.

3.2 POTENTIAL HEALTH EFFECTS

Eye Contact: Severe Eye Irritation: Signs/symptoms may include significant redness, swelling, pain, tearing, cloudy appearance of the cornea, and impaired vision.
Skin Contact: Moderate Skin Irritation: Signs/symptoms may include localized redness, swelling, itching, and dryness.

Allergic Skin Reaction (non-photo induced): Signs/symptoms may include redness, swelling, blistering, and itching.
Inhalation: Upper Respiratory Tract Irritation: Signs/symptoms may include cough, sneezing, nasal discharge, headache, hoarseness, and nose and throat pain.
Prolonged or repeated exposure may cause:

Lung Effects: Signs/symptoms may include difficulty breathing, cough, wheezing, weakness, increased heart rate, bluish colored skin (cyanosis), sputum production and changes in lung function tests.

Ingestion: Gastrointestinal Irritation: Signs/symptoms may include abdominal pain, nausea, diarrhea and vomiting.

SECTION 4: FIRST AID MEASURES

4.1 FIRST AID PROCEDURES

The following first aid recommendations are based on an assumption that appropriate personal and industrial hygiene practices are followed.
Eye Contact: Immediately flush eyes with large amounts of water for at least 15 minutes. Get immediate medical attention.
Skin Contact: Remove contaminated clothing and shoes. Immediately flush skin with large amounts of water. If signs/symptoms develop, get medical attention. Wash contaminated clothing and clean shoes before reuse.
Inhalation: Remove person to fresh air. If signs/symptoms develop, get medical attention.
If Swallowed: Do not induce vomiting. Give victim two glasses of water. Never give anything by mouth to an unconscious person. Get immediate medical attention.

SECTION 5: FIRE FIGHTING MEASURES

5.1 FLAMMABLE PROPERTIES

Autoignition temperature	450 - 550 ºC [*Details:* For Dust Cloud Form; determined on a range of typical coating powders.]
Autoignition temperature	325 - 375 ºC [*Details:* For Dust Layer Form; determined on a range of typical coating powders.]
Flash Point	*Not Applicable*
Flammable Limits - LEL	35 - 55 g/m3 [*Details:* Minimum Explosive Concentration (MEC) for dust - air mixture; determined on a range of typical coating powders.]
Flammable Limits - UEL	*No Data Available*

5.2 EXTINGUISHING MEDIA

Ordinary combustible material. Use fire extinguishers with class A extinguishing agents (e.g., water, foam). Use fire extinguishers with class B extinguishing agents (e.g., dry chemical, carbon dioxide).

5.3 PROTECTION OF FIRE FIGHTERS

Special Fire Fighting Procedures: Wear full protective equipment (Bunker Gear) and a self-contained breathing apparatus (SCBA).
Unusual Fire and Explosion Hazards: Dust clouds of this material in combination with an ignition source may be explosive.

Note: See STABILITY AND REACTIVITY (SECTION 10) for hazardous combustion and thermal decomposition information.

SECTION 6: ACCIDENTAL RELEASE MEASURES

Accidental Release Measures: Observe precautions from other sections. Call 3M- HELPS line (1-800-364-3577) for more information on handling and managing the spill. Evacuate unprotected and untrained personnel from hazard area. The spill should be cleaned up by qualified personnel. Remove all ignition sources such as flames, smoking materials, and electrical spark sources. Use only non-sparking tools. Ventilate the area with fresh air. Collect as much of the spilled material as possible. Use wet sweeping

compound or water to avoid dusting. Sweep up. Clean up residue. Place in a closed container approved for transportation by appropriate authorities. Dispose of collected material as soon as possible.

In the event of a release of this material, the user should determine if the release qualifies as reportable according to local, state, and federal regulations.

SECTION 7: HANDLING AND STORAGE

7.1 HANDLING

Avoid eye contact. Avoid eye contact with dust or airborne particles. Avoid eye contact with vapors, mists, or spray. Avoid breathing of airborne material. Avoid breathing of vapors created during cure cycle. Avoid breathing of fumes. Avoid breathing of dust created by cutting, sanding, grinding or machining. Avoid skin contact. Avoid skin contact with hot material. Do not eat, drink or smoke when using this product. Wash exposed areas thoroughly with soap and water. Avoid static discharge. Do not spray near flames or sources of ignition. For industrial or professional use only. Keep out of the reach of children.

7.2 STORAGE

Store away from heat. Store in a cool, dry place. Keep container tightly closed. Store at temperatures which are below 80 degrees F (26 C).

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 ENGINEERING CONTROLS

Provide local exhaust ventilation at transfer points. Provide ventilated enclosure for heat curing. Provide appropriate local exhaust for molten or extruded material. Provide appropriate local exhaust for cutting, grinding, sanding or machining. Curing enclosures must be exhausted to outdoors or to a suitable emission control device. Provide appropriate local exhaust when product is heated. Provide ventilation adequate to control dust concentrations below recommended exposure limits and/or control dust. Use general dilution ventilation and/or local exhaust ventilation to control airborne exposures to below Occupational Exposure Limits and/or control dust, fume, or airborne particles. If ventilation is not adequate, use respiratory protection equipment.

8.2 PERSONAL PROTECTIVE EQUIPMENT (PPE)

8.2.1 Eye/Face Protection

Avoid eye contact with vapors, mists, or spray. The following eye protection(s) are recommended: Indirect Vented Goggles.

8.2.2 Skin Protection

Wear appropriate gloves, such as Nomex, when handling this material to prevent thermal burns. Avoid skin contact. Avoid skin contact with hot material.

Select and use gloves and/or protective clothing to prevent skin contact based on the results of an exposure assessment. Consult with your glove and/or protective clothing manufacturer for selection of appropriate compatible materials.

Gloves made from the following material(s) are recommended: Neoprene, Nitrile Rubber.

8.2.3 Respiratory Protection

Avoid breathing of vapors created during cure cycle. Avoid breathing of fumes. Avoid breathing of dust created by cutting, sanding, grinding or machining.

Select one of the following NIOSH approved respirators based on airborne concentration of contaminants and in accordance with OSHA regulations: Half facepiece air-purifying respirator with organic vapor/acid gas cartridges and P95 particulate prefilters, Half facepiece air-purifying respirator with organic vapor/acid gas cartridges and N95 particulate prefilters, Half facepiece air-purifying respirator with organic vapor/acid gas cartridges and P100 particulate prefilters, Half facepiece or fullface air-purifying respirator with organic vapor cartridges and P100 particulate prefilters. Consult the current 3M Respiratory Selection Guide for additional information or call 1-800-243-4630 for 3M technical assistance.

8.2.4 Prevention of Swallowing

Do not eat, drink or smoke when using this product. Wash exposed areas thoroughly with soap and water.

8.3 EXPOSURE GUIDELINES

Ingredient	Authority	Type	Limit	Additional Information
TITANIUM DIOXIDE	ACGIH	TWA	10 mg/m3	Table A4
TITANIUM DIOXIDE	CMRG	TWA, as respirable dust	5 mg/m3	
TITANIUM DIOXIDE	OSHA	TWA, Vacated, as dust	10 mg/m3	
TITANIUM DIOXIDE	OSHA	TWA, as total dust	15 mg/m3	Table Z-1

VAC Vacated PEL:Vacated Permissible Exposure Limits [PEL] are enforced as the OSHA PEL in some states. Check with your local regulatory agency.

SOURCE OF EXPOSURE LIMIT DATA:
ACGIH: American Conference of Governmental Industrial Hygienists
CMRG: Chemical Manufacturer Recommended Guideline
OSHA: Occupational Safety and Health Administration
AIHA: American Industrial Hygiene Association Workplace Environmental Exposure Level (WEEL)

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Specific Physical Form:	Powder
Odor, Color, Grade:	Green Powder
General Physical Form:	Solid
Autoignition temperature	450 - 550 ºC [*Details:* For Dust Cloud Form; determined on a range of typical coating powders.]
Autoignition temperature	325 - 375 ºC [*Details:* For Dust Layer Form; determined on a range of typical coating powders.]
Flash Point	*Not Applicable*
Flammable Limits - LEL	35 - 55 g/m3 [*Details:* Minimum Explosive Concentration (MEC) for dust - air mixture; determined on a range of typical coating powders.]
Flammable Limits - UEL	*No Data Available*
Boiling point	*Not Applicable*
Density	1.44 g/ml
Vapor Density	*Not Applicable*
Vapor Pressure	*Not Applicable*
Specific Gravity	1.44 [*Ref Std:* WATER=1]
pH	*Not Applicable*
Melting point	*No Data Available*
Solubility in Water	Nil
Evaporation rate	*Not Applicable*
Volatile Organic Compounds	0 %
Percent volatile	0 %
VOC Less H2O & Exempt Solvents	0 %
Viscosity	*Not Applicable*

SECTION 10: STABILITY AND REACTIVITY

Stability: Stable.
Materials and Conditions to Avoid: Sparks and/or flames
Hazardous Polymerization: Hazardous polymerization will not occur.

Hazardous Decomposition or By-Products

Substance	Condition

Aldehydes	During Combustion
Carbon monoxide	During Combustion
Carbon dioxide	During Combustion
Ammonia	During Combustion
Oxides of Nitrogen	During Combustion
Oxides of Phosphorus	During Combustion

SECTION 11: TOXICOLOGICAL INFORMATION

Please contact the address listed on the first page of the MSDS for Toxicological Information on this material and/or its components.

SECTION 12: ECOLOGICAL INFORMATION

ECOTOXICOLOGICAL INFORMATION
Not determined.

CHEMICAL FATE INFORMATION
Not determined.

SECTION 13: DISPOSAL CONSIDERATIONS

Waste Disposal Method: For quantities <100 lbs. (50kg): dispose of waste product in a sanitary landfill. For larger quantities: incinerate in an industrial or commercial facility in the presence of a combustible material. As a disposal alternative, dispose of waste product in a facility permitted to accept chemical waste. Be sure that container of waste product is not compromised during landfill operation. Destruction of package may produce nuisance dust.

EPA Hazardous Waste Number (RCRA): Not regulated

Since regulations vary, consult applicable regulations or authorities before disposal.

SECTION 14:TRANSPORT INFORMATION

ID Number(s): 80-6107-8246-0, 80-6108-4006-0, 80-6108-4213-2, 80-6108-6729-5, 80-6300-0004-2, 80-6300-0125-5

Please contact the emergency numbers listed on the first page of the MSDS for Transportation Information for this material.

SECTION 15: REGULATORY INFORMATION

US FEDERAL REGULATIONS
Contact 3M for more information.

311/312 Hazard Categories:
Fire Hazard - No Pressure Hazard - No Reactivity Hazard - No Immediate Hazard - Yes Delayed Hazard - Yes

STATE REGULATIONS
Contact 3M for more information.

CHEMICAL INVENTORIES

The components of this product are in compliance with the chemical notification requirements of TSCA.

All applicable chemical ingredients in this material are listed on the European Inventory of Existing Chemical Substances (EINECS), or are exempt polymers whose monomers are listed on EINECS.

Contact 3M for more information.

INTERNATIONAL REGULATIONS

Contact 3M for more information.

This MSDS has been prepared to meet the U.S. OSHA Hazard Communication Standard, 29 CFR 1910.1200.

SECTION 16: OTHER INFORMATION

NFPA Hazard Classification

Health: 2 **Flammability:** 1 **Reactivity:** 0 **Special Hazards:** None

National Fire Protection Association (NFPA) hazard ratings are designed for use by emergency response personnel to address the hazards that are presented by short-term, acute exposure to a material under conditions of fire, spill, or similar emergencies. Hazard ratings are primarily based on the inherent physical and toxic properties of the material but also include the toxic properties of combustion or decomposition products that are known to be generated in significant quantities.

HMIS Hazard Classification

Health: 2 **Flammability:** 1 **Reactivity:** 0 **Protection:** X - See PPE section.

Hazardous Material Identification System (HMIS®) hazard ratings are designed to inform employees of chemical hazards in the workplace. These ratings are based on the inherent properties of the material under expected conditions of normal use and are not intended for use in emergency situations. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered mark of the National Paint and Coatings Association (NPCA).

Revision Changes:
Copyright was modified.
Section 8: Engineering controls information was modified.
Section 8: Skin protection phrase was modified.
Section 8: Respiratory protection information was modified.
Section 14: ID Number(s) was modified.
Section 15: Inventories information was modified.

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3M MSDSs are available at www.3M.com

ZINC METAL
SAFETY DATA SHEET

SECTION 1. IDENTIFICATION

Product Identity: Zinc Metal

Trade Names and Synonyms: High Grade Zinc; Special High Grade Zinc; Zinc, Zn, CGG Alloy <1% Aluminum.

Manufacturer:
Teck Metals Ltd.
Trail Operations
Trail, British Columbia
V1R 4L8
Emergency Telephone: 250-364-4214

Supplier:
In U.S.:
Teck American Metal Sales Incorporated
501 North Riverpoint Blvd, Suite 300
Spokane, WA
USA, 99202

Other than U.S.:
Teck Metals Ltd.
#1700 – 11 King Street West
Toronto, Ontario
M5H 4C7

Preparer:
Teck Metals Ltd.
Suite 3300 – 550 Burrard Street
Vancouver, British Columbia
V6C 0B3

Date of Last Review: July 15, 2015.

Date of Last Edit: July 15, 2015.

Product Use: Zinc metal is used to coat steel for corrosion protection (galvanizing, electroplating, electrogalvanizing), as an alloying element in bronze, brass, aluminum and other metal alloys, for zinc die casting alloys, for zinc dry cell and zinc/air batteries, for the production of zinc sheet for architectural and coinage applications, as a reducing agent in organic chemistry and for other chemical applications.

SECTION 2. HAZARDS IDENTIFICATION

CLASSIFICATION:

NOTE: In the form in which it is sold this product is not regulated as a Hazardous Product in the U.S. or Canada. This Safety Data Sheet is provided for information purposes only.

Health		Physical	Environmental
Acute Toxicity (Oral, Inhalation)	– Does not meet criteria	Does not meet criteria for any Physical Hazard	Aquatic Toxicity – (Short Term/Long Term) Does not meet any criteria
Skin Corrosion/Irritation	– Does not meet criteria		
Eye Damage/Eye Irritation	– Does not meet criteria		
Respiratory or Skin Sensitization	– Does not meet criteria		
Mutagenicity	– Does not meet criteria		
Carcinogenicity	– Does not meet criteria		
Reproductive Toxicity	– Does not meet criteria		
Specific Target Organ Toxicity:			
Acute Exposure	– Does not meet criteria		
Chronic Exposure	– Does not meet criteria		

LABEL:

Symbols: None required	**Signal Word:** None required
Hazard Statements	**Precautionary Statements:**
None required	None required

Emergency Overview: A lustrous bluish-silver metal that does not burn in bulk but may form explosive mixtures if dispersed in air as a fine powder. Zinc oxide fume is formed when zinc metal is heated to or near the boiling point, or is burned. Contact with acids or alkalis generates flammable hydrogen gas which can accumulate in poorly ventilated areas. Do NOT use water or foam on burning zinc metal. Apply dry chemical, sand or special powder extinguishing media. Zinc is relatively non-toxic and poses little immediate hazard to the health of emergency response personnel or to the environment in an emergency situation.

Potential Health Effects: Zinc is essentially non-toxic to humans. However, zinc oxide fumes may cause mild local irritation to eyes, nose, throat and upper airways. Acute over-exposure to zinc oxide fume may cause metal fume fever, characterized by flu-like symptoms such as chills, fever, nausea, and vomiting which may be delayed 3 – 10 hours in onset. In most cases, dermal exposure to zinc or zinc compounds does not result in any noticeable toxic effects. Zinc is not listed as a carcinogen by OSHA, NTP, IARC, ACGIH or the EU (see Toxicological Information, Section 11).

Potential Environmental Effects: Zinc metal has relatively low bioavailability and poses no immediate ecological risks. Depending on physico-chemical characteristics (e.g., pH, water hardness), compounds of zinc metal can be toxic, particularly in the aquatic environment. Zinc also has the potential to bioaccumulate in plants and animals in both aquatic and terrestrial environments (see Ecological Information, Section 12).

SECTION 3. COMPOSITION / INFORMATION ON INGREDIENTS

COMPONENTS	CAS Registry No.	CONCENTRATION (% wgt/wgt)
Zinc	7440-66-6	99+%

Note: See Section 8 for Occupational Exposure Guidelines.

SECTION 4. FIRST AID MEASURES

Eye Contact: *Symptoms:* Mild eye irritation, redness. Do not rub eye(s). Let the eye(s) water naturally for a few minutes. Look right and left, then up and down. If particle/dust does not come out, cautiously rinse eye(s) with lukewarm, gently flowing water for 5 minutes or until particle/dust is removed, while holding eyelid(s) open. If eye irritation persists, get medical advice/attention. DO NOT attempt to manually remove anything from the eye.

Skin Contact: *Symptoms:* Soiling of skin. No health effects expected. If irritation does occur, rinse with lukewarm, gently flowing water for 5 minutes or until the product is removed. If skin irritation occurs or you feel unwell, get medical advice/attention. *Molten Metal:* Flush contact area to solidify and cool but do not attempt to remove encrusted material or clothing. Cover burns and seek medical attention immediately.

Inhalation: *Symptoms:* Coughing and irritation in heavy dust clouds. If symptoms are experienced remove source of contamination or move victim from exposure area to fresh air immediately and obtain medical advice. NOTE: Metal fume fever may develop 3-10 hours after exposure to zinc oxide fumes. If symptoms of metal fume fever (flu-like symptoms) develop, obtain medical attention.

Ingestion: *Symptoms:* Stomach upset, nausea, diarrhea. If swallowed, no specific intervention is indicated as this material is not likely to be hazardous by ingestion. However, if you are concerned or you feel unwell, obtain medical advice.

SECTION 5. FIRE FIGHTING MEASURES

Fire and Explosion Hazards: Massive metal is difficult to ignite and is not considered a serious fire hazard. However, finely-divided metallic dust may form flammable or explosive dust clouds when dispersed in the air at high concentrations and exposed to heat, flame, or other ignition sources. Bulk dust in a damp state may heat spontaneously and ignite on exposure to air. Contact with acids and alkali hydroxides results in evolution of hydrogen gas which is potentially explosive. Mixtures with potassium chlorate or fused ammonium nitrate may explode on impact.

Extinguishing Media: Apply dry chemical, dry sand, or special powder extinguishing (Class D) media. Do NOT use water, carbon dioxide or foam on molten metals. Water may be ineffective for extinguishing a fire but should be used to keep fire-exposed billets, ingots and castings cool.

Fire Fighting: If possible, move material not yet involved in the fire from the fire area. If this is not possible, cool fire-exposed zinc by applying hose streams or fogs. Apply only dry chemical, sand, or special powder extinguishing media to any molten or burning zinc metal. Take extreme caution to prevent contact of water with molten or burning zinc. Zinc foil in particular may ignite in the presence of water. Zinc oxide fumes may evolve in fires. Fire fighters should be fully trained and wear full protective clothing including an approved, self-contained breathing apparatus which supplies a positive air pressure within a full face-piece mask.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Procedures for Cleanup: Control source of release if possible to do so safely. Clean up spilled material immediately observing precautions in Section 8, Personal Protection. Molten metal should be allowed to cool and harden before cleanup. Once solidified wear gloves, pick up and return to process. Powder or dust should be cleaned up by sweeping/shoveling, etc. Solid metal is recyclable. Return uncontaminated spilled material to the process if possible. Place contaminated material in clean, dry,

suitably labelled containers for later recovery or disposal. Treat or dispose of waste material in accordance with all local, state/provincial, and national requirements.

Personal Precautions: Protective clothing, gloves, and a respirator are recommended for persons responding to an accidental release (see also Section 8). Close-fitting safety goggles may be necessary in some circumstances to prevent eye contact with zinc dust and fume. Where molten metal is involved, wear heat-resistant gloves and suitable clothing for protection from hot-metal splash.

Environmental Precautions: Zinc metal has relatively low bioavailability and poses no immediate ecological risks. Depending on physico-chemical characteristics (e.g., pH, water hardness), compounds of zinc metal can be toxic, particularly in the aquatic environment. Zinc also has the potential to bioaccumulate in plants and animals in both aquatic and terrestrial environments. Releases of the product to water and soil should be prevented.

SECTION 7. HANDLING AND STORAGE

Store zinc in a DRY covered area, separate from incompatible materials. Zinc ingots suspected of containing moisture should be THOROUGHLY DRIED before being added to a molten bath. Ingots may contain cavities that collect moisture. Entrained moisture will expand explosively when immersed in a molten bath.

SECTION 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Occupational Exposure Guidelines: *(Time-Weighted Average (TWA) concentration over 8 hr unless otherwise indicated)*

Component	ACGIH TLV	OSHA PEL	NIOSH REL
Zinc	None established†	None established†	None established†

NOTE: OEGs for individual jurisdictions may differ from those given above. Check with local authorities for the applicable OEGs in your jurisdiction.

ACGIH - American Conference of Governmental Industrial Hygienists; OSHA - Occupational Safety and Health Administration; NIOSH - National Institute for Occupational Safety and Health. TLV – Threshold Limit Value, PEL – Permissible Exposure Limit, REL – Recommended Exposure Limit.

† NOTE: While there is no established OEL for zinc as such, there are OELs for zinc oxide which may be formed during burning, welding or other fuming processes.

The OSHA PEL final rule limits for zinc oxide dust are 10 mg/m^3 (total) and 5 mg/m^3 (respirable); the OSHA PEL final rule limit for zinc oxide fume is 5 mg/m^3. Note that the OSHA PEL final rule limits are currently non-enforceable due to a court decision. The OSHA PEL transitional limits therefore remain in force at present. They are 15 mg/m^3 (total) and 5 mg/m^3 (respirable) while the transitional PEL for zinc oxide fume is 5 mg/m^3. The ACGIH TLV for zinc oxide is 2 mg/m^3 (respirable fraction) with a Short Term Exposure Limit (STEL) of 10 mg/m^3 (respirable fraction). The NIOSH REL for zinc oxide (dust or fume) is 5 mg/m^3 10 hr TWA with a 15 mg/m^3 ceiling limit (15 minute sample) for zinc oxide dust and a 10 mg/m^3 STEL for zinc oxide fume (15 minute sample).

NOTE: The selection of the necessary level of engineering controls and personal protective equipment will vary depending upon the conditions of use and the potential for exposure. The following are therefore only general guidelines that may not fit all circumstances. Control measures to consider include:

Ventilation: Use adequate local or general ventilation to maintain the concentration of zinc oxide fumes in the working environment well below recommended occupational exposure limits. Supply sufficient replacement air to make up for air removed by the exhaust system. Where metallic particles of zinc are being collected and transported by a ventilation system, use a non-sparking, grounded ventilation system separate from other exhaust ventilation systems. Locate dust collectors and fans outdoors if possible and provide dust collectors with explosion vents or blow out panels. Refer to appropriate NFPA Standards 484, 654, and/or 68 for specific guidance.

Protective Clothing: Gloves and coveralls, shop coat or other work clothing are recommended to prevent prolonged or repeated direct skin contact when zinc is processed. Eye protection should be worn where fume or dust is generated. Respiratory protection may be required where zinc oxide fume is generated. Where hot or molten metal is handled, heat-resistant gloves, face shield, and clothing to protect from hot metal splash should be worn. Safety type boots are recommended.

Respirators: Where zinc oxide dust or fumes are generated and cannot be controlled to within acceptable levels, use appropriate NIOSH-approved respiratory protection equipment (a 42CFR84 Class N, R or P-95 particulate filter cartridge).

General Hygiene Considerations: Always practice good personal hygiene. Refrain from eating, drinking, or smoking in work areas. Thoroughly wash hands before eating, drinking, or smoking in appropriate designated areas. No special packaging materials are required.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance: Bluish-silver lustrous metal	**Odour:** None	**Odour Threshold:** None	**pH:** Not Applicable
Vapour Pressure: 1 mm at 487ºC Negligible at 20ºC	**Vapour Density:** Not Applicable	**Melting Point/Range:** 420º C	**Boiling Point/Range:** 908º C
Relative Density (Water = 1)**:** 7.1	**Evaporation Rate:** Not Applicable	**Coefficient of Water/Oil Distribution:** Log P (oct) = -0.47 (estimated)	**Solubility:** Insoluble in Water (0.2 mg/l @ pH 7)
Flash Point: Not Applicable.	**Flammable Limits (LEL/UEL):** LEL (Zinc Dust): 500 g/m^3; UEL Not Determined.	**Auto-ignition Temperature:** Approx 680ºC (dust cloud in air), Approx 460ºC (dust layer).	**Decomposition Temperature:** Oxidation starts approx 450°C

SECTION 10. STABILITY AND REACTIVITY

Stability & Reactivity: Massive metal is stable and not considered reactive under normal temperatures and pressures. Hazardous polymerization or runaway reactions will not occur. Zinc metal slowly becomes covered with a white coating of a hydrated basic zinc carbonate on exposure to moist air. Fine, condensed zinc dust or powder may heat spontaneously and ignite on exposure to air when damp. Zinc metal will react with acids and strong alkalis to generate hydrogen gas. A violent, explosive reaction may occur when powdered zinc is heated with sulphur. Powdered zinc will become incandescent or ignite in the presence of fluorine, chlorine, bromine or interhalogens (e.g., chlorine trifluoride). Powdered zinc can also react explosively with halogenated hydrocarbons if heated. Mixtures with potassium chlorate or fused ammonium nitrate may explode on impact.

Incompatibilities: Contact with acids and alkalis will generate highly flammable hydrogen gas. Contact with acidic solutions of arsenic and antimony compounds may evolve highly toxic ARSINE or STIBINE gas. Incompatible with strong oxidizing agents such as chlorine, fluorine, bromine, sodium, potassium or barium peroxide, sodium or potassium chlorate, chromium trioxide and fused ammonium nitrate. Also incompatible with elemental sulphur dust, halogenated hydrocarbons or chlorinated solvents, chlorinated rubber, and ammonium sulphide or calcium disulphide.

Hazardous Decomposition Products: High temperature operations such as oxy-acetylene cutting, electric arc welding or overheating a molten bath will generate zinc oxide fume which, on inhalation in sufficient quantity, can produce metal fume fever, a transient influenza-like illness.

SECTION 11. TOXICOLOGICAL INFORMATION

General: Zinc, especially in the metal form, is relatively non-toxic. However, it can react with other materials, such as oxygen or acids, to form compounds that can be potentially toxic. The primary route of exposure would be through the generation and inhalation of zinc oxide fume.

Acute:
Skin/Eye: In most cases, dermal exposure to zinc or zinc compounds does not result in any noticeable toxic effects. Zinc metal is not chemically irritating to the eyes.

Inhalation: If excessive quantities of zinc oxide fume are inhaled, it can result in the condition called metal fume fever. The symptoms of metal fume fever will occur within 3 to 10 hours, and include immediate dryness and irritation of the throat, tightness of the chest and coughing, which may later be followed by flu-like symptoms of fever, malaise, perspiration, frontal headache, muscle cramps, low back pain, occasionally blurred vision, nausea, and vomiting. The symptoms are temporary and generally disappear, without medical intervention, within 24 to 48 hours of onset. There are no recognized complications, after affects, or chronic affects that result from this condition.

Ingestion: Zinc is not expected to be harmful if ingested. When ingested in excessive quantities, zinc can irritate the stomach resulting in nausea, vomiting, abdominal pain and diarrhea. Ingestion is not a typical route of occupational exposure.

Chronic:
There is no chronic form of metal fume fever but in rare instances an acute incident may be followed by complaints such as bronchitis or pneumonia. Some workers may develop a short-term immunity (resistance) so that repeated exposure to zinc oxide fumes does not cause metal fume fever. This immunity (resistance) however is quickly lost after short absences from work (weekends or vacations). Workers exposed to finely-divided metallic zinc for up to 35 years revealed no acute or chronic illnesses

attributable to zinc. Prolonged or repeated skin contact with zinc dust or powder may cause dryness, irritation and cracking (dermatitis) since zinc is astringent and may tend to draw moisture from the skin. Zinc is not listed as a human carcinogen by the Occupational Safety and Health Administration (OSHA), the National Toxicology Program (NTP), the International Agency for Research on Cancer (IARC), the American Conference of Governmental Industrial Hygienists (ACGIH) or the European Union (EU).

Animal Toxicity:

Ingredient:	Acute Oral Toxicity:	Acute Dermal Toxicity:	Acute Inhalation Toxicity:
Zinc	>5,000 mg/kg†	No data	No data

† LD_{50}, Mouse, Oral,

SECTION 12. ECOLOGICAL INFORMATION

Zinc metal is relatively insoluble; however, processing of the product or extended exposure in aquatic and terrestrial environments may lead to the release of zinc compounds in bioavailable forms. Zinc is highly mobile, and can be toxic in the aquatic environment with water hardness, pH and dissolved organic carbon content being major regulating factors. Zinc also has the potential to bioaccumulate in plants and animals in both aquatic and terrestrial environments. In soils, zinc is moderately mobile in accordance with soil properties (e.g., cation exchange capacity, pH, redox potential, chemical species); these properties also influence its bioavailability to terrestrial plants.

SECTION 13. DISPOSAL CONSIDERATIONS

If material cannot be returned to process or salvage, dispose of in accordance with applicable regulations.

SECTION 14. TRANSPORT INFORMATION

PROPER SHIPPING NAME ..... Not applicable – not regulated.
U.S. DOT AND TRANSPORT CANADA HAZARD CLASSIFICATION .... Not applicable
U.S. DOT AND TRANSPORT CANADA PID ..... Not applicable
MARINE POLLUTANT..... No
IMO CLASSIFICATION ..... Not regulated

SECTION 15. REGULATORY INFORMATION

U.S.
INGREDIENTS LISTED ON TSCA INVENTORY..... Yes

HAZARDOUS UNDER HAZARD COMMUNICATION STANDARD..... No

CERCLA SECTION 103 HAZARDOUS SUBSTANCES ..... Zinc.....Yes ..... RQ: 1,000 lb. (454 kg.)*
* reporting not required when diameter of the pieces of solid metal released is equal to or exceeds 100 micrometers (0.004 inches).

EPCRA SECTION 302 EXTREMELY HAZARDOUS SUBSTANCE ..... No

EPCRA SECTION 311/312 HAZARD CATEGORIES ..... No Hazard Categories Apply

EPCRA SECTION 313 TOXIC RELEASE INVENTORY:..... This product does not contain any toxic chemicals subject to the Toxic Release reporting requirements. However, potential by-products from working with this product - "Zinc (Fume or Dust)" CAS 7440-66-6 are reportable.

SECTION 16. OTHER INFORMATION

Date of Original Issue: July 23, 1997 **Version:** 01 *(First edition)*

Date of Latest Revision: July 15, 2015 **Version:** 14

The information in this Safety Data Sheet is based on the following references:

- American Conference of Governmental Industrial Hygienists, 2004, Documentation of the Threshold Limit Values and Biological Exposure Indices, 7th Edition plus updates.

- American Conference of Governmental Industrial Hygienists, 2015, Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices.
- American Conference of Governmental Industrial Hygienists, 2015, Guide to Occupational Exposure Values.
- Bretherick's Handbook of Reactive Chemical Hazards, 20th Anniversary Edition (P. G. Urben, Ed), 1995.
- Canadian Centre for Occupational Health and Safety (CCOHS) Hamilton, ON, CHEMINFO Record No. 239 – Zinc Metal.
- European Regulation (EC) No 1272/2008 on classification, labelling and packaging of substances and mixtures, amending and repealing directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006 (REACH).
- Health Canada, SOR/2015-17, Hazardous Products Regulations, 30 January 2015.
- International Agency for Research on Cancer (IARC), Monographs on the Evaluation of the Carcinogenic Risk of Chemicals to Man, 1972 – present, (multi-volume work), World Health Organization, Geneva.
- Merck & Co., Inc., 2001, The Merck Index, An Encyclopedia of Chemicals, Drugs, and Biologicals, 13th Edition.
- National Library of Medicine, National Toxicology Information Program, Hazardous Substance Data Bank (on-line version).
- Oak Ridge National Laboratory, Oak Ridge, Tennessee – Toxicity Summary for Zinc and Zinc Compounds, April 1992.
- Patty's Toxicology, 5th Edition, 2001 E. Bingham, B. Cohrssen & CH Powell (Eds.).
- U.S. Dept. of Health and Human Services, National Institute of Environmental Health Sciences, National Toxicology Program (NTP), 13th Report on Carcinogens, October 2014.
- U.S. Dept. of Health and Human Services, National Institute for Occupational Safety and Health, NIOSH Pocket Guide to Chemical Hazards (on-line edition).
- U.S. Dept. of Health and Human Services, Public Health Service, Agency for Toxic Substances and Disease Registry, Toxicological Profile for Zinc - August 2005.
- U.S. Dept. of Health and Human Services, National Institute for Occupational Safety and Health, Registry of Toxic Effects of Chemical Substances (RTECS), CCOHS on-line version.
- U.S. Occupational Safety and Health Administration, 1989, Code of Federal Regulations, Title 29, Part 1910.

Notice to Reader

Although reasonable precautions have been taken in the preparation of the data contained herein, it is offered solely for your information, consideration and investigation. Teck American Metal Sales Incorporated and Teck Metals Ltd. extend no warranty and assume no responsibility for the accuracy of the content and expressly disclaim all liability for reliance thereon. This safety data sheet provides guidelines for the safe handling and processing of this product; it does not and cannot advise on all possible situations. Therefore, your specific use of this product should be evaluated to determine if additional precautions are required. Individuals exposed to this product should read and understand this information and be provided pertinent training prior to working with this product.

Heckmann Building Products Inc.
1501 N. 31st Avenue
Melrose Park, IL 60160-2911
800-621-4140
Fax: 708-865-2640

MATERIAL SAFETY DATA SHEETS (MSDS) June 30, 2000.

Heckmann Building Products Inc. manufactures its building products from sheet steel, bar and coil stock, and wire in Plain Steel, Mill Galvanized Steel, Electro Galvanized After Fabrication, Hotdip Galvanized After Fabrication, and Stainless Steel. The products we manufacture present no health hazard in their natural state during use, storage, or transportation. However, operations such as flame cutting, shot blasting, or welding may generate concentrations of dust particles
of the alloying elements that may present hazards. All operations of this nature should be performed in well ventilated areas.

The following paragraph is the exemption for finished products which are not welded, such as the Pos-I-Tie® anchoring system and the eye and pintle combination. It is from the Code of Federal Regulations:

29 CFR Ch. XVII (7-1-92 Edition) 1910.1200 Hazard Communication. (6) (IV) Articles: (c) Definitions. ARTICLE means a manufactured item: (I) which is formed to a specific shape or design during manufacture; (II) which has end use function(s) dependent in whole or in part upon its shape or design during end use; and (III) which does not release, or otherwise result in exposure to, a hazardous chemical, under normal conditions of use.

The information contained in the MSDS reports is intended to be used for employee health and safety education and not for specification purposes.

We appreciate your business and will continue to strive to provide a high quality of service and product to meet your requirements.

Sincerely,

Paul G. Curtis
President

Heckmann Building Products Inc.
1501 N. 31st Avenue
Melrose Park, IL 60160-2911
708-865-2403

MATERIAL SAFETY DATA SHEET
STAINLESS STEEL – revised June 30, 2000

I. PRODUCT INFORMATION

Company: Heckmann Building Products Inc.,
1501 N. 31st Avenue
Melrose Park, IL 60160
708-865-2403.

Trade Name: Stainless Steels
Chemical Name: AISI/SAE Grades 300 Series, 400 Series, Special Alloys.
Form: Anchors, Ties, Flashing, Steel Connectors.

II. PRODUCT INGREDIENTS

MATERIAL	CAS NUMBER	%WEIGHT	Exposure Limits OSHA PEL (mg/m3)	ACGIH TLV (mg/m3)
Base Metal				
Iron (Fe)	7439-89-6	38.0-89.6	10 Oxide Fume	5 Oxide Fume
Aluminum (Al)	7429-90-5	.01-0.5	Not Established	10 Dust/5 Fume
Carbon (C)	7440-44-0	.03-2.0	Not Established	Not Established
Chromium (Cr)	7440-47-3	10-27	1.0 Chrome Metal	0.5 Chrome Fume
Cobalt (Co)	7440-48-4	.01- .75	0.1 Cobalt Metal	0.05 Cobalt Fume
Copper (Cu)	7440-50-8	.18-4.5	0.1/Fume/1.0 Dust	0.2 Fume/1.0 Dust
Manganese (Mn)	7439-96-5	2-10	5c Dust/5c Fume	5c Dust/1 Fume
Molybdenum (Mo)	7439-98-7	.04-5	15 Insoluble Comp.	10 Insoluble Comp.
Nickel (Ni)	7440-02-0	.12-34	1 Nickel Metal	1 Nickel Metal
Phosphorous (P)	7723-14-0	.01-.06	0.1 Phosphorous	0.1 Phosphorous
Selenium (Se)	7782-49-2	.01-0.3	0.2 Se Metal	0.2 Se Metal
Silicon (Si)	7440-21-3	.15-2.0	Not Established	10 Total Dust
Sulfur (S)	7704-34-9	.01-.06	13 Sulfur Dioxide	5 Sulfur Dioxide
Titanium (Ti)	7440-32-6	.01-0.7	15 Ti Eioxide	15 Ti Eioxide
Columbium (Cb)	7440-25-7		Not Established	Not Established
Tantalum (Ta)	7440-03-1	.01-1.1	5.0 Ta Metal	5.0 Ta Metal

Note: The above listing is a summary of elements used in alloying Stainless Steels. Various grades of Stainless Steel will contain different combinations of these elements. Trace elements may also be present in minute amounts. No permissible exposure limits (PEL) or threshold limit values (TLV) exist for Stainless Steels. Values shown are applicable to component elements.

III. PHYSICAL DATA

PHYSICAL FORM: Solid under normal conditions BOILING POINT: Not applicable
APPEARANCE & ODOR: Silvery gray odorless metal VAPOR PRESSURE: Not applicable
SPECIFIC GRAVITY: (H20=1): Approx. 8 VAPOR DENSITY: Not applicable.
MELTING POINT: Approx. 2400 F - 2800 F ACIDITY/ALKANITY: Not applicable.
SOLUBILITY IN WATER: % by weight Not Applicable %VOLITILE BY VOLUME: Not applicable.

IV. FIRE AND EXPLOSION DATA

FLASH POINT: Not applicable AUTO IGNITION TEMP: Not applicable.
FLAMMABLE LIMITS IN AIR: Not applicable.
FIRE & EXPLOSION HAZARDS-EXTINGUISHING MEDIA: Stainless steel does not present fire or explosion hazards under normal conditions. Use fire fighting methods and materials that are appropriate for surrounding fire.
Fine metal particles, such as produced in grinding and sawing, can burn. High concentration of metallic fines in the air may present an explosion hazard. Molten metal may explode on contact with water. For these fires, use dry powder or sand extinguishing media.

V. ENVIRONMENTAL HEALTH & SAFETY INFORMATION

HEALTH HAZARDS: Stainless steel products in their solid state present no inhalation, ingestion, or contact health hazard.
Operations such as burning, welding, sawing, brazing, grinding, and machining, which result in elevating the temperature of the product to, or above its melting point, or result in the generation of airborne particulates may present hazards. The major exposure hazard is inhalation. Effects of overexposure to fume and dust are as follows:
ACUTE: Excessive inhalation of metallic fumes and dusts may result in irritation of eyes, nose, and throat. High concentrations
of fumes and dusts of iron-oxide, maganese, copper, and zinc may result in metal fume fever. Typical symptoms last from 12 to 48 hours and consist of a metallic taste in the mouth, dryness and irritation of the throat, chills, and fever.
CHRONIC: Chronic and prolonged inhalation of high concentrations of fumes or dust of the following elements may lead to the conditions listed opposite the element:
ALUMINUM: Irritation of the eyes, nose, and throat.
CHROMIUM: Lesions of the skin and mucous membranes, possible cancer of nose or lungs - bronchogenic carcinoma.
COBALT: Respiratory tract irritation, skin rash.
COPPER: Irritation of eyes, nose and throat, metal fume fever.
IRON: Pulomany effects, siderosis.
Maganese: Bronchitis, pneymonitis, lack of coordination.

Molybdenum: Respiratory tract irritation, possible liver/kidney damage, bone deformity.
NICKEL: Lesions of the skin and mucous membranes, possibly cancer of nose or lungs, bronchogenic carcinoma.
PHOSPHOROUS: Necrosis of the mandible.
SELENIUM: Nasal and bronchial irritation, gastro-intestinal disturbances, garlic breath odor.
SULFUR: Edema of the lungs.
TITANIUM: No chronic debilitating symptoms indicated.
COLUMBIUM/TANTALUM: No chronic debilitating symptoms indicated.
Occupational Exposure Limits: See products ingredients Section 2. Chromium and Nickel have been identified by the International Agency for Research on Cancer and/or the National Toxicology Program as potential cancer causing agents.
EMERGENCY MEDICAL PROCEDURES: Inhalation: Remove to fresh air; if condition continues, consult a physician.
Eye Contact: Flush thoroughly with running water to remove particulate; obtain medical attention.
Skin Contact: Remove particles by washing thoroughly with soap and water. Seek medical attention if condition persists.
Ingestion: If significant amounts of metal are ingested, consult physician. If condition is voluntary, psychotherapy is advised.
OCCUPATIONAL PROTECTIVE MEASURES: Respiratory Protection: Appropriate dust/mist/fume respirator should be used to avoid excessive inhalation of particulates. If exposure limits are reached or exceeded, use NIOSH approved equipment.
Hands, Arms, and Body: Protective gloves should be worn as required for welding, burning, ro handling operations.
Eyes & Face: Safety Glasses should be worn when grinding or cutting. Face shields should be worn when welding or burning.
Other clothing and Equipment: As required depending on operations and safety codes.

VI. REACTIVITY DATA

Stability: Stable under normal conditions of use, storage and transportation.
INCOMPATIBILITY (Materials to avoid): Stainless steel at temperatures above the melting point may liberate fumes containing oxides of iron and alloying elements. Avoid generation of airborn fume and dust.

VII. SPILL, LEAK & DISPOSAL METHODS

Fine turnings and small chips should be swept or vacuumed. Scrap metal can be reclaimed for rescue. Used or unused product should be disposed of in accordance with federal, state, or local laws and regulations.

VIII. ADDITIONAL PRECAUTIONS

Minimize and control operations producing airborn dust and fume. Provide adequate local and general exhaust ventilation. Maintain good housekeeping.

IX. DISCLAIMER

This MSDS is intended for use solely in safety education and environmental health training and not for specification purposes.

The information in this MSDS was obtained from usually reliable sources and is provided without and representation or warranty, express or implied regarding the accuracy or correctness. The conditions or methods of handling, storage, use and disposal of the product are beyond our control and may be beyond our knowledge. Heckmann Building Products Inc. assumes no responsibility and expressly disclaims liability for loss, damage, or expense arising out of or in any way connected with the handling, storage, use or disposal of the product.

Heckmann Building Products Inc.
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708-865-2403

MATERIAL SAFETY DATA SHEET
PLAIN STEEL, MILL GALVANIZED STEEL, HOTDIP GALVANIZED AFTER FABRICATION, ELECTRO GALV. (Carbon, Alloy Steels) **revised June 30, 2000**

I. PRODUCT INFORMATION

Company: Heckmann Building Products Inc.,
1501 N. 31st Avenue
Melrose Park, IL 60160 708-865-2403

Trade Name: Plain Steel, Mill Galvanized Steel.

Chemical Name: Steel

Form: Masonry Anchors & Ties, Flashings, Rounds, Steel Building Anchors.

II. PRODUCT INGREDIENTS

MATERIAL	CAS NUMBER	% WEIGHT	Exposure Limits OSHA PEL (mg/m3)	ACGIH TLV(mg/3m)
Base Metal Iron (Fe)	7439-89-6	Balance	10 (Fe,o,Fume)	5.0 (Fe,O,Fume)
Alloying Elements				
Carbon (C)	7440-44-0	0.01-1.5	None Listed	None Listed
Chromium (Cr)	7440-47-3	0.01-12	1.0 as chrome	0.5 as chrome
Copper (Cu)	7440-50-8	0.04-0.7	0.2 as copper	0.2 as fume
			1.0 as dust	1.0 as dust
Lead (Pb)	7439-92-1	0.15-0.35	0.05 as fume	0.15 as dust & fume
Manganese (Mn)	7439-96-5	0.05-2.0	5 as manganese	5 as dust 1 as fume
Molybdenum (Mo)	7439-98-7	0.01-1.10	15 as insoluble	10 as insoluble comp.
Nickel (Ni)	7440-02-0	0.01-10	1.0 as Nickel	1.0 as Nickel
Phosphorous (P)	7723-14-0	0.15 Max	0.1 as Phos	0.1 as Phosphorous
Silicon (Si)	7440-21-3	0.15-2.2	None Listed	10 total dust
Sulphur (S)	7704-34-09	0.001-0.35	13 sulfur dioxide	5 sulfur dioxide
Tungsten (W)	7440-33-7	0.0-18	None Listed	5 insoluble compounds
Vanadium (V)	7440-62-2	0.01-1.0	0.5 as dust	0.05 dust and fume
Zinc (Zn) Coating	1314-13-2	10 Max	5.0 as fume	5.0 as fume

Note: The above listing is a summary of elements used in alloying steel. Various grades of steel will contain different combinations of these elements. Trace elements may also be present in minute amounts.

III. PHYSICAL DATA

PHYSICAL FORM: Solid under normal conditions. BOILING POINT: Not applicable.
APPEARANCE & ODOR: Grey-Black with Metallic Luster Odorless. VAPOR PRESSURE: Not applicable.
SPECIFIC GRAVITY (H2O = 1): 7 VAPOR DENSITY: Not applicable.
MELTING POINT: 2750 degrees F ACIDITY/ALKANITY: Not applicable.
SOLUBILITY IN WATER % by weight: Not applicable.
% VOLITILE BY VOLUME: Not applicable.

IV. PERSONAL PROTECTIVE EQUIPMENT

RESIRATORY PROTECTION: NIOSH approved dust/mist/fume respirator should be used during welding or burning if OSHA PEL or TLV is exceeded.
HANDS, ARMS, BODY: Use appropriate protective clothing such as welders aprons & gloves when welding or burning. Check local codes.
EYES & FACE: Safety glasses should always be worn when grinding or cutting: face shields should be worn when welding or burning.
OTHER CLOTHING AND EQUIPMENT: As required. (Makes sense, doesn't it!)

V. EMERGENCY MEDICAL PROCEDURES

INHALATION: Remove to fresh air; if condition continues, consult physician.
EYE CONTACT: Immediately flush well with running water to remove particulate; get medical attention.
SKIN CONTACT: If irritation develops, remove clothing and wash well with soap and water. If condition persists, seek medical attention.
INGESTION: If significant amounts of metal are ingested, consult physician.

VI. HEALTH & SAFETY INFORMATION

Steel products in the natural state do not present an inhalation, ingestion, or contact health hazard. However, operations such as welding, burning, sawing, brazing, grinding, and possibly machining, which results in elevating the temperature of the product to or above its melting point or results in the generation of airborne particulates may present hazards. The above operations
should be performed in well ventilated areas. The major exposure hazard is inhalation.
Acute: Excessive inhalation of metallic fumes and dusts may result in irritation of eyes, nose and throat. Also high concentrations of fumes and dusts of iron-oxide, maganese, copper, zinc, and lead may result in the dreaded metal fume fever.
Typical symptoms consist of a metallic taste in the mouth, dryness and irritation of the throat, chills and fever, and usually last from 12 to 48 hours.
Chronic: Chronic and prolonged inhalation of high concentrations of fumes or dust of the following elements may lead to the conditions listed opposite the element:

IRON: Pulmonary effects, siderosis.

MANGANESE: Bronchitis, pheumonitis, lack of coordination.

CHROMIUM: Various forms of dermatitis, inflammation and/or ulceration of upper respiratory tract, and possible cancer of nasal passages and lungs. Based on available information, there does not appear to be any evidence that exposure to welding fume induces human cancer.

NICKEL: Same as Chromium.

COPPER: Pulmonary effects.

VANADIUM: No reported cases of exposure to vanadium.

MOLYBDENUM: Pain in the joints, hands, knees, and feet.

TUNGSTEN: Some evidence of pulomonary involvement such as cough.

LEAD: Prolonged exposures can cause behavioral changes, kidney damage, periphery neuropathy characterized by decreased hand-grip strength and adverse reproductive effects.

ZINC: None reported.

VII. FIRE AND EXPLOSION

FLASH POINT: Not Applicable.
AUTO IGNITION TEMPERATURE: Not Applicable.
LIMITS IN AIR: Not Applicable.
FIRE AND EXPLOSION HAZARDS: None
EXTINGUISHING MEDIA NOT TO BE USED: None.

VIII. REACTIVITY

Material is stable under normal conditions.
INCOMPATIBILITY: Reacts with strong acids to form hydrogen gas.
Conditions to avoid: Keep area well ventilated when cutting, welding, burning, or brazing. Avoid generation of airborne dusts and fumes.
HAZARDOUS DECOMPOSITION PRODUCTS: Metallic oxides.

IX. ENVIRONMENTAL

Spill or lead procedures: Not applicable. Special Precautions: Use good housekeeping practices to prevent accumulation of dust and to keep airborne dust to a minimum. Waste Disposal Method: Dust, etc - follow federal, state, and local regulations regarding disposal.

X. DISCLAIMER

The information in this MSDS was obtained from sources which we believe are reliable. However, the information is provided without any representation or warranty, expressed or implied regarding the accuracy or correctness.

The conditions or methods of handling, storage, use and disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage, or expense arising out of or in any way connected with the handling, storage, use or disposal of the product.

Heckmann Building Products Inc.
1501 N. 31st Avenue
Melrose Park, IL 60160-2911
708-865-2403

MATERIAL SAFETY DATA SHEET
COPPER PRODUCTS revised June 30, 2000

I. PRODUCT INFORMATION

Company: Heckmann Building Products Inc.,
1501 N. 31st Avenue
Melrose Park, IL 60160
708-865-2403
Trade Name: Copper (OFHC)(DHP)(ETP) Electrolytic Tough Pitch Alloy 110.
Chemical Name: Copper (Cu)
Form: Anchors, Flashings, Misc. Steel Building Products.

II. PRODUCT INGREDIENTS

Base Metal Copper is the prime Ingredient. 99.9% Copper plus silver (less than .1% Ag). Copper, Dust 1 Mg/m3, Fume 0.1 Mg/m3. If exposure to copper dust/fume is kept below copper TLV, all trace elements should not pose any health risk.

III. PHYSICAL DATA

PHYSICAL FORM: Solid under normal conditions BOILING POINT: Not applicable
APPEARANCE & ODOR: Gold/Copper color odorless metal
VAPOR PRESSURE: Not applicable
SPECIFIC GRAVITY (H2O = 1): 8.9 VAPOR DENSITY: Not applicable
MELTING POINT: Approx. 1949 degrees F ACIDITY/ALKANITY: Not applicable
SOLUBILITY IN WATER (% by weight) Not applicable
% VOLITILE BY VOLUME: Not applicable

IV. FIRE AND EXPLOSION DATA

FLASH POINT: Not applicable AUTO IGNITION TEMPERATURE: Not applicable
FLAMMABLE LIMITS IN AIR: Not applicable.

V. ENVIRONMENTAL HEALTH & SAFETY INFORMATION

Effect of Overdose : Fume and dust - sneezing, congestion, nausea, metallic taste, chills, fever. Not known to be carcinogenic.
EMERGENCY AND FIRST AID PROCEDURES: Skin: Flush thoroughly with water.
Eyes: Flush with water, call physician.
Ingestion: Drink water, induce vomiting, call physician.
Inhalation: Remove victim to fresh air, call physician.

VI. REACTIVITY DATA

Stability: Stable under normal conditions of use, storage and transportation.
Incompatibility (Materials to avoid): Reacts with strong acids to form hydrogen gas. Avoid acetylene and chlorine.
Hazardous Decomposition Products: Copper Fume
Hazardous Polymerization: Will not occur.

VII. SPILL, LEAK & DISPOSAL METHODS

Steps to be taken in case material is released or spilled: DUST or FUME: wear respirator following OSHA use instructions and shovel up, or vacuum and place in an approved DOT container and seal. Wash contaminated clothing. Used or unused product should be disposed of in accordance with federal, state or local laws and regulations.

VIII. DISCLAIMER

The information in this MSDS was obtained from sources which we believe are reliable. However, the information is provided without any representation or warranty, expressed or implied regarding the accuracy or correctness.

The conditions or methods of handling, storage, use and disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage, or expense arising out of or in any way connected with the handling, storage, use or disposal of the product.

Heckmann Building Products Inc.
1501 N. 31st Avenue
Melrose Park, IL 60160-2911
708-865-2403

MATERIAL SAFETY DATA SHEET
PLASTIC WEEP TUBES

1. PRODUCT IDENTIFICATION

Company: 1501 N. 31st Avenue
Melrose Park, IL 60160 708-865-2403
Trade name: Plastic Weep Tubes
Chemical Name: "TENITE" Butyrate Formulas 264, 285, 409, 530, 550, 565, 566, 567, B2149-92B, B2249-95A
Formula: Mixture

2. PRODUCT INGREDIENTS

A: COMPONENTS:	% WEIGHT	CAS REG. NO.
Cellulose acetate butyrate	>75	9004-36-8
Bis(2-ethulhexyl) adipate	<25	103-23-1

See section 5 for information on exposure limits

B: PRECAUTIONARY LABEL STATEMENTS:
FIRST AID: If burned by contact with molten material cool as quickly as possible with water and see a physician for treatment of burn.
Note To Physicians: Burns should be treated as thermal burns. The plastic will come off as healing occurs; therefore, immediate removal from the skin is not necessary.
NOTICE: Refer to NPPA Pamphlet No. 654, "Prevention of Fire and Dust Explosions in the Chemical, Dye, Pharmaceutical, and Plastics Industries" if this material is to be reduced to or collected as a powder.

3. PHYSICAL DATA

Appearance and Odor: Hollow tubes with low odor.
Softening Point: >125 degrees C. (>257 degrees F)
Specific Gravity (H201): >1.0
Solubility in Water: Negligible.

4. FIRE & EXPLOSION HAZARD DATA

FLASH POINT: Not Applicable: Nonvolatile, combustible.
EXTINGUISHING AGENT: Water spray, dry chemical, or Co2.
SPECIAL FIRE-FIGHTING PROCEDURES: Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Refer to MFPA Pamphlet No. 654 "Prevention of Fire and Dust Explosions in the Chemical, Dye, Pharmaceutical and Plastics Industries", if this material is to be reduced to or collected as a powder.

5. REACTIVITY DATA

STABILITY: Stable
INCOMPATIBILITY: Oxidizing materials can cause a reaction.
HAZARDOUS DECOMPOSITION PRODUCTS: As with other organic material, combustion will produce carbon dioxide and probably carbon monoxide.
HAZARDOUS POLYMARIZATION: Will not occur.

6. ENVIRONMENTAL HEALTH & SAFETY INFORMATION

A: EXPOSURE LIMITS
Threshold Limit Value (TLV): Not established
OSHA Permissible Exposure Limit (PEL) Not Established
B: EXPOSURE EFFECTS
Inhalation: Low hazard for usual industrial handling.
Eyes: Low hazard for usual industrial handling
Skin: Molten material will produce thermal burns.
C: FIRST AID
Skin: If burned by contact with molten material, cool as quickly as possible with water and see a phycian for treatment of burn. Treatment should be as with thermal burns. The plastic will come off as healing occurs, therefore, immediate removal from the skin is not necessary.
D: TOXICITY DATA
Toxicity data for the components of these materials are as follows:
CELLULOSE ACETATE BUTYRATE

TEST	Species	Result	Toxicity Class
Acute oral LD 50	Rat	>6400 mg/kg	Nontoxic
Dermal LO 50	Guinea Pig	>1000 mg/kg	
Skin irritation	Guinea Pig	Very slight	
Skin sensitization	None		

Feeding Study No. 1:Rats fed diets containing 20% of the compound for 7 days consumed approx. 16 g/kg/day with a maximum daily intake of 18.5 g/kg/day. The animals showed no ill effect from this massive dosage.
Feeding Study No. 2: Rats were fed diets containing 1.0% and 5.0% of the compound for 99 days. No biologically significant effects were noted in feed intake, weight gain, clinical signs, hematology, gross pathology, or histopathology. Feeding Study No. 3: Dogs were fed 50 to 150 g/d y of the compound for 4 months without toxic effect. Only side effect noted was that the dogs would eat Frisbee's when thrown to them instead of retrieving them.

In Rats, intratracheal injection of cellulose acetate butyrate dust suspended in 0.25 mL of water gave no evidence of specific pulmonary reaction as judged by the histological appearance of the lungs at 10 days and 14 days after injection.

bIS(2-ETHYLHEXYL)aDIPATE

TEST	Species	Result	Toxicity
Acute oral LD 50	Rat	9100 mg/kg	Nontoxic
Dermal LD 50	Rabbit	16.3 ml/kg	Nontoxic
Skin Irritation	Rabbit	Slight	
Eye irritation	Rabbit	Slight	

Rats exposed to saturated vapor of he material for 8 hours showed no mortality.
Rats fed levels o 0,5, 2.0, or 5.0% of the material in their diet for a month showed definite growth effect at 5%, but not at the lower levels. No changes in hematology, urine, or histopathology were noted at the lower levels. Similarly, except for a slight transient loss in appetite, no changes in these same parameters were observed in dogs fed 2 g/kg of the material in their diet for 2 months. Rats fed doses of 0.16 to 4,74 g/kg/day in their diet showed deaths at 4.71 g/kg; no effects were observed on growth, appetite liver and kidney weights, or histopathology at 0.16 g/kg.

7. VENTILATION AND PERSONAL PROTECTION

A: Ventilation: Good ventilation (typically 10 air changes per hour) should be sufficient to control airborn levels. Ventilation rates should be matched to conditions. Supplementary local exhaust ventilation or respiratory protection may be needed in special circumstances such as mechanical generation of dust, overheating, etc.
B: Respiratory Protection: If respiratory protection is needed, an appropriate NIOSH-approved respirator for dust or fume should be worn. If respirators are used, a program should be established to assure compliance with OSHA Standard 20 CFR 1910,13A
C: Skin & Eye Protection: Safety glasses with side shields (or goggles) are recommended for any type of industrial chemical handling. Gloves should be worn to protect against thermal burns. Good industrial hygiene practice could be followed which includes minimizing skin contact.

8. SPECIAL STORAGE AND HANDLING PRECAUTIONS

Keep from contact with oxidizing materials.

9. SPILL, LEAK, & DISPOSAL PRACTICES

Steps to be taken in case material is released or spilled: Collect and contain for salvage or disposal.
Waste Disposal Method: Incineration or landfill, Observe all federal, state, and local laws concerning health and environment.

10. ENVIRONMENTAL EFFECTS DATA
These materials have not been tested for environmental effects.

11. TRANSPORTATION
DOT Hazard Classification: Not regulated by DOT.

12. REFERENCES
A. File data, Material Safety Program, Eastman Chemicals Division, Eastman Kodak Company, Kingsport, Tenn.
B. Unpublished data, Health and Environment Laboratories, Eastman Kodak Company.
C. AM IHD HYG ASSOC Q 20, 93-96 (1949)

13. HAZARD RATINGS

	HEALTH	FLAMMABILITY	REACTIVITY
MMIS RATING:	0	1	0
NFPA RATING:	0	1	0

Notice: These ratings involve data and interpretations that may vary from company to company and are intended only for rapid, general identification of the magnitude of the specific hazard. TO DEAL ADEQUATELY WITH THE SAFE HANDLING OF THIS MATERIAL, ALL THE INFORMATION CONTAINED IN THIS MSDS MUST BE CONSIDERED. The customer is responsible for determining the proper personal protective equipment needed for its particular use of this material.
**Hazardous Material Identification System's HMIS Revised
RAW MATERIALS RATING MANUAL, National Paint & Coatings Association Fall 1984
NFPA 704 Standard System for the Identification of the Fire Hazards of materials, national fire protection association 1933.

Heckmann Building Products Inc.
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MATERIAL SAFETY DATA SHEET
Aluminum Alloys

1. PRODUCT IDENTIFICATION

Company: 1501 N. 31st Avenue
Melrose Park, IL 60160 708-865-2403
Trade name: Aluminum
Form: Bar, Sheet, Plate, Tubing, Structurals, and Forgings

2. PRODUCT INGREDIENTS

			Exposure Limits	
Material or Component	**CAS Number**	**% Weight**	**1984-85 ACGIH TLV (mg/m^3)**	**OSHA 1910.000 PEL (mg/m^3)**
Base Material				
Aluminum (Al)	7429-90-5	90-99.7	10.0 as metal dust and oxide 5.0 as welding fume	Not established Not Established
Alloying Elements				
Cobalt (Co)	7440-48-4	<1.0 – 10.0	0.1	0.1
Copper (Cu)	7440-50-8	<1.0 – 10.0	0.2 as fume	0.1 as fume
Iron (Fe)	1309-37-1	<1.0 – 10.0	5.0 as fume	10.0 as fume
Lead (Pb)	7439-92-1	<0.2 – 0.7	0.15 as dust and fume	0.05 as dust and fume
Magnesium (Mg)	1309-46-4	<1.0 – 10.0	10.0 as fume	15.0 as fume
Manganese (Mn)	7439-96-5	<1.0 – 10.0	1.0 as fume	5.0 calling
Silicon (Si)	7440-21-3	<1.0 – 10.0	10.0 as total dust	Not established
Tin (Sn)	7440-31-5	<1.0 – 10.0	2.0 as oxide and metal	2.0 as inorganic compounds
Zinc (Zn)	1314-13-2	<1.0 – 10.0	5.0 as fume	5.0 as fume

Note: Aluminum alloys will be comprised of various combinations of the elements shown here. In addition,. Other alloying elements may be present in minute quantities.

3. PHYSICAL DATA

Material is Solid.	Metallic Appearance – No odor.
PH = N/A	Melting Point 900° – 1200° F. (approx.)
Specific Gravity (H20 = 1) – 2.5 – 2.9 Soulbility in water (% by weight) - Nil	Vapor Pressure = N/A

4. PERSONAL PROTECTIVE EQUIPMENT

Respiratory Protection: Appropriate respirator depending upon potential airborne contaminants and their concentrations. If exposure limits are reached or exceeded use NIOSH approved respiration equipment.	Hands, Arms, and Body: Appropriate gloves, especially for sheet and coil.
Eyes and Face: Safety glasses or shield as appropriate.	Other Clothing and Equipment. As needed depending on operation and safety codes.

5. EMERGENCY MEDICAL PROCEDURES

Skin Contact: Remove particies thoroughly by washing with soap and water. Eye Contact: Flush with water thoroughly. Get medical attention if irritation persists.

6. HEALTH AND SAFETY INFORMATION

HEALTH
For standard operation (e.g. melting, cutting, grinding), aluminum alloys present a low health risk by inhalation and are usually considered a nuisance dust. Toxicity by ingestion – none expected. Skin and eyes – not an irritant. Welding and plasma cutting of alloys high in copper (2000 and 7000 series) may present the potential for overexposure to copper fume which can result in upper respiratory tract irritation, nausea, and the dreaded metal fume fever. Nickel and chromium are other alloying elements considered hazardous as fume; however, they do not present a carcinogenic or other health concerns due to their low concentrations of the chemical form in which they are present. Overexposure to lead fumes over an extended period of time can result in such toxic effects as central nervous system disturbances, renal changes, peripheral neuropathy, gastrointestinal disturbances, anemia, and chromosomal changes.
Medical conditions generally aggravated by exposure would be dermatitis and pulmonary disease or disorders.
Occupational Exposure Limits: See ingredients Section 1. Chromium and nickel have been identified by the International Agency for Research on Cancer (IARC) and the National Toxicology Program (NTP) as potential carcinogens.
FIRE AND EXPLOSION
Flash Point = N/A Auto Ignition Temperature = N/A Flammable Limits in Air N/A Extinguishing Method: Dry Powder or sand
REACTIVITY
Stability = Stable Incompatibility (Materials to Avoid) = Reacts with strong acids to form hydrogen gas.
Conditions to Avoid: Aluminum products under normal conditions are stable during use, storage, and transportation. Halogen acids and sodium hydroxide in contact with aluminum may generate explosive mixtures of hydrogen. Finely divided aluminum, such as small chips and fines, will form explosive mixtures in air. It will also form explosive mixtures in air in the presence of bromates, iodates, or ammonium nitrate. Strong oxidizers cause violent reactions with considerable heat generation.
Hazardous Decomposition Products : See additional information Section VIII

VII. ENVIRONMENTAL

Spill or leak procedures: N/A
Waste Disposal Method: Used or unused product should be tested to determine hazard status and disposal requirements under federal, state, or local laws and regulations.

VIII. ADDITIONAL INFORMATION

Other Precautions:

1. Do not touch cast aluminum metal or heated aluminum product without knowing metal temperature. Aluminum experiences no color change during heating. Burns could result.
2. Aluminum powder must be packaged and shipped as a flammable solid.
3. Hard alloy ingots in the 2000 and 7000 series must be stress relieved to prevent explosion when sawed.
4. The welding of aluminum alloys may generate carbon monoxide, carbon dioxide, ozone, nitrogen oxides, infrared radiation, and ultraviolet radiation.

The information contained herein is furnished without warranty of any kind. Users should consider these data only as a supplement to other information gathered by them and must make independent determinations of suitability and completeness of information from all sources to assure proper use and disposal of these materials and the safety and health of employees and customers.

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MATERIAL SAFETY DATA SHEET
700 Alloy Series

PRODUCT IDENTIFICATION
Company: 1501 N. 31st Avenue
Melrose Park, IL 60160 708-865-2403
Trade name: Breakaway Firewall Anchors

SUBSTANCE IDENTIFICATION
Substance: Zinc Strip – 700 Alloy Series (700,710, 720, & 750)
Synonyms: Zinc Coil, Strip Zinc Material

HAZARDOUS COMPONENTS
Hazardous Component(s): Contains no hazardous chemical as defined by 29 CFR 1910.1200.
Exposure Limits: N/A

PHYSICAL/CHEMICAL CHARACTERISTICS
Description: Bluish-White Metal
Specific Gravity: 7.1 (H_20 = 1)
Melting Point: 790 degrees F
Solubility in Water: Insoluble

FIRE AND EXPLOSION DATA
Fire and Explosion Hazard: Negligible fire hazard when exposed to heat or flame. Excessive exposure to fumes from zinc and other alloy metals may produce flu-like symptoms of metal fume fever.
Fire Fighting Media: Smother with suitable dry power (NFPA class D Fire)
Fire Fighting: Use self-contained breathing apparatus.

REACTIVITY
Reactivity: Stable under normal temperatures and pressures.
Incompatibilities: Acids and alkalis react to evolve hydrogen gas.
Decomposition: Oxides/fumes from metals.
Polymerization: Hazardous polymerization has not been reported to occur under normal temperatures and pressures.

HEALTH EFFECTS AND FIRST AID
Inhalation: Excessive exposure to fumes from zinc and other alloy metals may produce flu-like symptoms of metal fume fever.
First Aid: Remove from exposure area to fresh air immediately and refer patient to a physician.
Skin Contact: N/A
Ingestion: N/A
Carcinogens: Contains no substance found to be carcinogenic by NTP, IARC, or OSHA in quantities greater than 0.12% by weight.

PRECAUTIONS FOR SAFE HANDLING AND USE
Storage and Disposal: Observe all Federal, State, and Local regulations when storing or disposing of this substance. For assistance, contact the District Director of the Environmental Protection Agency.
Protective Equipment:
Ventilation – Provide local exhauset or process enclosure ventilation to meet published exposure limits.
Respirator – The specific respirator selected must be based on contamination levels found in the work place, must not exceed the working limits of the respirator and be jointly approved by the national institute for occupational safety and health and the mine safety and health administration (NIOSH-MSHA).
Clothing – Appropriate for operation.
Gloves – Appropriate for operation.
Eye Protection – Appropriate for operation.

ADDITIONAL INFORMATION
This product or components of the product is subject to the reporting requirements of Section 313, Title II of the Superfund Amendments and Reauthorization Act of 1986 (SARA), 40 CFR Part 372. Zinc (fume or dust) is subject to SARA Section 313 reporting if the required threshold is reached. RQ = 1000 pound.
The Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), 40 CFR 302 also requires certain manufacturers to report on annual emissions of specific toxic chemical categories.
For more information contact the SARA Hotline at 800-424-9346 or EPCRA Hotline at 800-535-0202

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MATERIAL SAFETY DATA SHEET
#85 Cell Vents

Important Note: This material safety data sheet (MSDS) conforms to the U.S. Department of Labor Occupational Safety and Health Administration requirements in 29 CFR 1910.1200 and is an integral part of any "Right to Know" program. This information should be read by the customer and made available to anyone who ahs reason to use or to come in contact with this product.

Section 1 – Product Identification
Product Name: #85 Cell Vents
Chemical Name(s) and/or synonym(s): Polypropylene Copolymer
Chemical Family: Proprietary Formula

Section 2 – Hazardous Components
Chemical Name(s): C.A.S.# % TLV PEL

Important Note: Pigments, additives and stabilizers are fully encapsulated in resin and are not expected to cause any hazardous conditions when processed in accordance with good manufacturing practices.
Any substance listed in section 2 are those identified as being present at a concentration of 1.0% or greater, or 0.1% or greater if the substance is on the list of potential carcinogens cited in the OSHA HAZARD COMMUNICATION STANDARDS or by the respective manufacturer. Where a proprietary ingredient shows, the identity of this substance may be made available as provided in 20 CFR 1910.1200.

Section 3 – Physical Data
Specific Gravity ($H^2$0-1.0): .90 - .96
Physical Form: Opaque, Fluted Sheets
Solubility in Water: Essentially insoluble in water.

Section 4 – Fire and Explosion Data
Fire Extinguishing Media: Carbon Dioxide, Foam, Dry Chemical, Water Spray.
Special Fire Fighting Procedures: Recommend NIOSH approved self-contained breathing apparatus.
Unusual Fire and Explosion Hazards: Decomposition and combustion products may be hazardous.

Section 5 – Health Hazard Data
Effects of Acute Overexposure: None expected.
Emergency First Aid Procedures: If burned by molten material, cool as quickly as possible with water and see a physician for removal of adhering material and treatment of burn.
Smoke or Dust Inhalation: Remove to fresh air and consult a physician.

Section 6 – Reactivity Data
Stability: Stable material.
Conditions to Avoid: None known.
Incompatibility (material to avoid contact with): None known.
Hazardous Decomposition By-Products: Thermal decomposition and burning may produce Carbon Monoxide, Carbon Dioxide.
Hazardous Polymerization: Will not occur.

Section 7 – Spill or Leak Procedures
Steps to be taken in case material is released or spilled: Sweep up and return to container or discard if contaminated.
Waste Disposal Method: Solid waste disposal in accordance with Federal, State, and Local Regulations.

Section 8 – Special Protection Information
Respiratory Protection: Particulate Mask. If dusting occurs, use chemical respirator.
Ventilation: Local exhaust, good building ventilation.
Special Ventilation Requirements: None, however dust creation should be minimized.
Hand/Skin Protection: Cloth gloves to prevent cuts and scrapes from edges.
Eye Protection: Safety glasses or chemical goggles.
Other Protective Equipment: None needed.

Section 9 – Special Precautions or Comments
Precautions to take in handling and storage: None. Normal bulk storage and handling of plastic. Do not expose materials to excessive heat, cold, or moisture.
Shipping Designation: Plastic rectangular units, flat.
D.O.T. Class/Number required: Not regulated.

Material Safety Data Sheet

Product Name: WROUGHT ALUMINUM PRODUCTS, 3xxx SERIES ALLOYS **ID: 665**

* * * Section 1 - Chemical Product and Company Identification * * *

Chemical Formula: Mixture
Product Use: Various fabricated aluminum parts and products.
Other Designations: 3xxx Series Alloys, 3xxx Cladding, 0033, 0333CU, 3003F, 3003-C06C, 3005, 3030-C98C, 3104BLND, C08A, C77A, C15B, C20B, C35B, C46B, C56B, C59B, C91B, C92B, C93B, C94B, C13C, C02D, C06D, C13D, C14D, C18D, C48D, C06E, C17E, C19E, C23E, C26E, C27E, C35E, C47E, C48E, C54E, C57E, C58E, C59E, C70E, C71E, C72E, C73E, C12H, C26H, C27H, C29H, C38H, C39H, C44H, C58H, C76H, C03N, C05N, C31N, C32N, C34N, C35N, C38N, C156, C162, C189, C229, C300, C301, C784, C786, C98C, CH14, CK32, CU54, CU55, 3PORC, Alclad 3003, Alclad 3004, Clad 3003, KB11, MC365, MC369, MC370, MC371, MC372, MC373, MC374, MC378, MC380, MC382, MC386, MC387, MC389, MC392, MC395, MC396, MC398, MC399, MC400, MC401, MC402, MC403, MC404, MC405, MC406, MC413, MC414, MC424, MC425, MD52, MD176, MD189, MD228, MD229, MD239, MD240, MD241, MD243, MD263RB, MD263RH, MD263RL, MD267, MD268, MD271, MD272, MD276, MD278, MD281, MD285, MD286, MD287, MD288, MD289, MD291, MD297, MD299, MD305, MD306, MD307, MD308, MD310, MD311, MD312, MD313, MD314, MD315, MD321, MD324, MD327, MD329, MD330, MD333, MD334, MD338, MD339, MD340, MD341, MD347, MD350, MD351, MD352, MD354, MD355, MD356, MD357, MD359, MD360, MD362, MN363, MN381, MN397, MN421, MN422, MN423, MN427, MN428, RA108, RA135, RA169, RA173, RA190, RA203, RA211, RA220, RA236, RA240, RA245, RA254, RA258, RA259, RA261, RA263, RA264, RA269, RA270, X301.

Alcoa Inc.
201 Isabella Street
Pittsburgh, PA 15212-5858

Phone: Health and Safety: 1-412-553-4649

Emergency Information: USA: Chemtrec: 1-800-424-9300 or 1-703-527-3887 Alcoa: 1-412-553-4001
Website: For a current MSDS, refer to Alcoa websites: www.alcoa.com or Internally at my.alcoa.com EHS Community

* * * Section 2 - Hazards Identification * * *

EMERGENCY OVERVIEW

Solid. Silvery. 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 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 (e.g. rust).

Dust and fume from processing can cause irritation of eyes, skin and upper respiratory tract and metal fume fever.

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 health effects listed below are not likely to occur unless processing of this product generates dust or fumes.

Eyes: Dust or fume from processing: Can cause irritation.

Skin

Contact with residual oil/oil coating: Can cause irritation. Prolonged or repeated contact with the skin can cause dermatitis.

Dust or fume from processing: Can cause sensitization and allergic contact dermatitis.

Inhalation

Health effects from mechanical processing (e.g., cutting, grinding): Can cause irritation of respiratory tract. **Chronic overexposures:** Can cause respiratory sensitization, scarring of the lungs (pulmonary fibrosis), central nervous system effects, secondary Parkinson's disease and reproductive harm in males.

Additional health effects from elevated temperature processing (e.g., welding, melting): **Acute overexposures:** Can cause nausea, fever, chills, shortness of breath and malaise (metal fume fever), bronchitis, reduced ability of the blood to carry oxygen (methemaglobin) and the accumulation of fluid in the lungs (pulmonary edema). **Chronic overexposures:** Can cause scarring of the lungs (pulmonary fibrosis).

Carcinogenicity and Reproductive Hazard

Product as shipped: Does not present any cancer or reproductive hazards.

Dust and fumes from mechanical processing: Can present a cancer hazard (nickel). Can present a reproductive hazard for males (manganese).

Dust and fumes from welding or elevated temperature processing: Can present a cancer hazard (nickel compounds, hexavalent chromium, welding fumes). Can present a reproductive hazard for males (manganese).

Medical Conditions Aggravated By Exposure to Product, Components or Compounds Formed During Processing

Dust or fume from processing: Asthma, chronic lung disease, skin rashes and secondary Parkinson's disease.

* * * Section 3 - Composition / Information on Ingredients * * *

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

CAS #	Component	Percent
7429-90-5	Aluminum	>92
7439-95-4	Magnesium	<2.8
7439-96-5	Manganese	<2
7440-21-3	Silicon	<1.9
7440-66-6	Zinc	<1.8
7440-47-3	Chromium	<0.6
7440-02-0	Nickel	0-0.05

Component Information: Additional compounds which may be formed during processing are listed in Section 8.

* * * Section 4 - First Aid Measures * * *

First Aid: Eyes

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

First Aid: Skin

Dust or fume from processing or contact with lubricant/residual oil: Wash skin with soap and water for at least 15 minutes. Consult a physician if irritation persists.

First Aid: Inhalation

Dust or fume from processing: 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 5 - Fire Fighting Measures * * *

Flammable/Combustible 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. Dust accumulation on the floor, ledges and beams can present a risk of ignition, flame propagation and secondary explosions.

* 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.
* 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, copper oxide). Moisture entrapped by molten metal can be explosive. Contact of molten aluminum with other 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

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

Unsuitable Extinguishing Media

DO NOT USE:
* Halogenated agents on small chips, dusts or fines.
* Water around molten metal.

These agents will react with the burning material.

Fire Fighting Equipment/Instructions

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

* * * Section 6 - Accidental Release Measures * * *

Small/Large Spill

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 7 - Handling and Storage * * *

Handling/Storage

Product should be kept dry. 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 Fumes

If processing of these products includes operations where dust or 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. 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. (See Section 15).

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.

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 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°F and then hold at that temperature for 6 hours.

* * * Section 8 - Exposure Controls / Personal Protection * * *

Engineering Controls

If dust or fumes are generated through processing: Use with adequate explosion-proof ventilation to meet the limits listed in Section 8, Exposure Guidelines.

Personal Protective Equipment

Respiratory Protection

If dust or fumes are generated through 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, Exposure Guidelines. Suggested respiratory protection: P95

Eye Protection: Wear safety glasses/goggles to avoid eye contact.

Skin Protection

Wear impervious gloves to avoid repeated or prolonged skin contact with residual oils and to avoid any skin injury.

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).

Minimize breathing **oil vapors and mist**. Remove oil contaminated clothing; launder or dry-clean before reuse. Remove oil contaminated shoes and thoroughly clean and dry before reuse. Cleanse skin thoroughly after contact, before breaks and meals, and at the end of the work period. Oil coating is readily removed from skin with waterless hand cleaners followed by a thorough washing with soap and water.

Exposure Guidelines

A: General Product Information

Alcoa recommends an Occupational Exposure Limit for **Nickel Compounds** of 0.1 mg/m3 TWA.
Alcoa recommends an Occupational Exposure Limit for **Chromium (VI) Compounds [both soluble and insoluble forms]** of 0.25 ug/m3 TWA as chromium.
Alcoa recommends an Occupational Exposure Limit for **Oil Mist** of 0.5 mg/m3 TWA.
Alcoa recommends Occupational Exposure Limits for **Manganese** of 0.05 mg/m3 TWA (total particulate) and 0.02 mg/m3 TWA (respirable fraction).

B: Component Exposure Limits

Aluminum (7429-90-5)

ACGIH 10 mg/m3 TWA (metal dust)
OSHA 15 mg/m3 TWA (total dust); 5 mg/m3 TWA (respirable fraction)

Manganese (7439-96-5)

ACGIH 0.2 mg/m3 TWA
OSHA 5 mg/m3 Ceiling (fume)

Silicon (7440-21-3)
OSHA 15 mg/m3 TWA (total dust); 5 mg/m3 TWA (respirable fraction)
Chromium (7440-47-3)
ACGIH 0.5 mg/m3 TWA
OSHA 1 mg/m3 TWA
Nickel (7440-02-0)
ACGIH 1.5 mg/m3 TWA (inhalable fraction)
OSHA 1 mg/m3 TWA

C: Exposure Limits for Additional Compounds Which May Be Formed During Processing
Alumina (non-fibrous) (1344-28-1)
ACGIH 10 mg/m3 TWA (particulate matter containing no asbestos and <1% crystalline silica)
OSHA 15 mg/m3 TWA (total dust); 5 mg/m3 TWA (respirable fraction)
Magnesium oxide fume (1309-48-4)
ACGIH 10 mg/m3 TWA (inhalable fraction)
OSHA 15 mg/m3 TWA (total particulate)
Manganese inorganic compounds (Not Available)
ACGIH 0.2 mg/m3 TWA (as Mn) (related to Manganese compounds, inorganic)
OSHA 5 mg/m3 Ceiling (as Mn)
Zinc oxide (1314-13-2)
ACGIH 2 mg/m3 TWA (respirable fraction)
ACGIH 10 mg/m3 STEL (respirable fraction)
OSHA 5 mg/m3 TWA (fume); 15 mg/m3 TWA (total dust); 5 mg/m3 TWA (respirable fraction)
Chromium (II) compounds (Not Available)
OSHA 0.5 mg/m3 TWA (as Cr)
Chromium (III) compounds (Not Available)
ACGIH 0.5 mg/m3 TWA (as Cr)
OSHA 0.5 mg/m3 TWA (as Cr)
Chromium (VI) compounds- water soluble (Not Available)
ACGIH 0.05 mg/m3 TWA (as Cr)
Chromium (VI) compounds (certain water insoluble forms) (Not Available)
ACGIH 0.01 mg/m3 TWA (as Cr)
OSHA 5 µg/m3 TWA
OSHA 2.5 µg/m3 Action Level (as Cr.); 5 µg/m3 TWA (as Cr. Cancer hazard - See 29 CFR 1910.1026)
Nickel insoluble compounds (Not Available)
ACGIH 0.2 mg/m3 TWA (inhalable fraction, as Ni) (related to Nickel insoluble inorganic compounds (NOS))
OSHA 1 mg/m3 TWA (as Ni)
Oil mist, mineral (8012-95-1)
ACGIH 5 mg/m3 TWA (sampled by method that does not collect vapor)
ACGIH 10 mg/m3 STEL
OSHA 5 mg/m3 TWA
Ozone (10028-15-6)
ACGIH 0.05 ppm TWA (heavy work); 0.08 ppm TWA (moderate work); 0.10 ppm TWA (light work); 0.20 ppm TWA (heavy, moderate or light workloads, <=2 hours)
OSHA 0.1 ppm TWA; 0.2 mg/m3 TWA
Nitrogen dioxide (10102-44-0)
ACGIH 3 ppm TWA
ACGIH 5 ppm STEL
OSHA 5 ppm Ceiling; 9 mg/m3 Ceiling
Nitric oxide (10102-43-9)
ACGIH 25 ppm TWA
OSHA 25 ppm TWA; 30 mg/m3 TWA

* * * Section 9 - Physical & Chemical Properties * * *

Physical State:	Solid: sheet, plate, wire, rod, bar, extrusion, forgings, etc.	**Appearance:**	Silvery
Boiling Point:	Not applicable	**Melting Point:**	Range: generally 1150-1220ºF (621-660ºC)
Vapor Pressure:	Not applicable	**Vapor Density:**	Not applicable
Solubility in Water:	None	**Specific Gravity:**	See Density
Density:	Range: generally 2.70-2.75 g/cm3 (0.098-0.099 lb/in3)	**pH Level:**	Not applicable
Odor:	None	**Odor Threshold:**	Not applicable
Octanol-Water Coefficient:	Not applicable		

* * * Section 10 - Chemical Stability & 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 nitrates (e.g., ammonium nitrate and fertilizers containing nitrate) particularly 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 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).

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.

* * * Section 11 - Toxicological Information * * *

Health Effects Associated with Individual Ingredients

Chromium dust and mist Can cause irritation of eyes, skin and respiratory tract. **Chromium and trivalent chromium** IARC/NTP: Not classified by IARC.

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 alloys** IARC/NTP: Reviewed but not recommended for listing by the NTP. Listed as possibly carcinogenic to humans by IARC (Group 2B)*.

Manganese dust or 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.

Silicon, inert dusts Chronic overexposures: Can cause chronic bronchitis and narrowing of the airways.

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

Some products are supplied with a lubricant/oil coating or have residual oil from the manufacturing process. **Oil** Can cause irritation of skin. Skin contact (prolonged or repeated): Can cause dermatitis.

Health Effects Associated with Individual Compounds Formed During Processing
(The following could be expected if welded, remelted or otherwise processed at elevated temperatures.)

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, the accumulation of fluid in the lungs (pulmonary edema), lung damage, kidney damage, lung cancer, nasal cancer and cancer of the gastrointestinal tract. IARC/NTP: Listed as "known to be a human carcinogen" by the NTP. Listed as carcinogenic to humans by IARC (Group 1)*.

Nickel compounds Associated with lung cancer, cancer of the vocal cords and nasal cancer. IARC/NTP: Listed as "known to be a human carcinogen" by the NTP. Listed as carcinogenic to humans by IARC (Group 1)*.

Magnesium oxide fumes Can cause irritation of eyes and respiratory tract. Acute overexposures: Can cause nausea, fever, chills, shortness of breath and malaise (metal fume fever).

Manganese oxide fumes Can cause irritation of eyes, skin and respiratory tract. Acute overexposures: Can cause nausea, fever, chills, shortness of breath and malaise (metal fume fever).

Zinc oxide fumes Can cause irritation of upper respiratory tract. Acute overexposures: Can cause nausea, fever, chills, shortness of breath and malaise (metal fume fever). **Zinc oxide dust** Expected to be a low health risk by inhalation.

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

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

If the product is heated well above ambient temperatures or machined, oil vapor or mist may be generated. **Oil vapor and mist** Can cause irritation of respiratory tract. Acute overexposures: Can cause bronchitis, headache, central nervous system effects (nausea, dizziness and loss of coordination) and drowsiness (narcosis).

Welding, plasma arc cutting, and arc spray metalizing can generate ozone. **Ozone** Can cause irritation of eyes, nose and upper respiratory tract. Acute overexposures: Can cause shortness of breath, tightness of chest, headache, cough, nausea and narrowing of airways. Effects are reversible on cessation of exposure. Acute overexposures (high concentrations): Can cause respiratory distress, respiratory tract damage, bleeding and the accumulation of fluid in the lungs (pulmonary edema). Effects can be delayed up to 1-2 hours. Additional information: Studies with experimental animals by inhalation have found genetic damage, reproductive harm, blood cell damage, lung damage and death.

Welding fumes IARC/NTP: Listed as possibly carcinogenic to humans by IARC (Group 2B)*.

Plasma arc cutting can generate oxides of nitrogen. **Oxides of nitrogen (NO and NO_2)** Can cause irritation of eyes, skin and respiratory tract. Acute overexposures: Can cause reduced ability of the blood to carry oxygen (methemaglobin). Can cause cough, shortness of breath, the accumulation of fluid in the lungs (pulmonary edema) and death. Effects may be delayed up to 2-3 weeks. **Nitrogen dioxide (NO_2)** Chronic overexposures: Can cause scarring of the lungs (pulmonary fibrosis).

Acute Toxicity of Ingredients/Formed Compounds

A: General Product Information

No information available for product.

B: Component Analysis - LD50/LC50

Magnesium (7439-95-4)
Oral LD50 Rat: 230 mg/kg

Manganese (7439-96-5)
Oral LD50 Rat: 9 g/kg

Silicon (7440-21-3)
Oral LD50 Rat: 3160 mg/kg

Nickel (7440-02-0)
Oral LD50 Rat: >9000 mg/kg

C: Formed Compound Toxicity - LD50s/LC50s

Alumina (non-fibrous) (1344-28-1)
Oral LD50 Rat: >5000 mg/kg

Zinc oxide (1314-13-2)
Oral LD50 Rat: >5000 mg/kg

Oil mist, mineral (8012-95-1)
Oral LD50 Mouse: 22 g/kg

Ozone (10028-15-6)
Inhalation LC50 Rat: 4800 ppb/4H

Nitrogen dioxide (10102-44-0)
Inhalation LC50 Rat: 88 ppm/4H

Nitric oxide (10102-43-9)
Inhalation LC50 Rat: 1068 mg/m3/4H

Carcinogenicity of Ingredients

A: Ingredient Carcinogenicity - IARC/NTP

Component	CAS	IARC 1	IARC 2A	IARC 2B	IARC 3	IARC 4	NTP K	NTP RA
Chromium	7440-47-3	No	No	No	Yes	No	No	No
Nickel	7440-02-0	No	No	Yes	No	No	No	No

B: Ingredient Carcinogenicity - ACGIH

Chromium (7440-47-3)
ACGIH A4 - Not Classifiable as a Human Carcinogen

Nickel (7440-02-0)
ACGIH A5 - Not Suspected as a Human Carcinogen

C: Ingredient References

Chromium (7440-47-3)
IARC Monograph 49 [1990] (listed under Chromium and Chromium compounds) Supplement 7 [1987]

Nickel (7440-02-0)
IARC Monograph 49 [1990], Supplement 7 [1987]

Carcinogenicity of Compounds Formed During Processing

A: Formed Compound Carcinogenicity - IARC/NTP

Component	CAS	IARC 1	IARC 2A	IARC 2B	IARC 3	IARC 4	NTP K	NTP RA
Chromium (III) compounds	Not Available	No	No	No	Yes	No	No	No
Chromium (VI) compounds (certain water insoluble forms)	Not Available	Yes	No	No	No	No	Yes	No
Nickel compounds	Not Available	Yes	No	No	No	No	Yes	No
Oil mist, mineral	8012-95-1	No	No	No	Yes	No	No	No
Welding fumes (NOC)	Not Available	No	No	Yes	No	No	No	No

B: Formed Compound Carcinogenicity - ACGIH

Alumina (non-fibrous) (1344-28-1)
ACGIH A4 - Not Classifiable as a Human Carcinogen

Magnesium oxide fume (1309-48-4)
ACGIH A4 - Not Classifiable as a Human Carcinogen

Chromium (III) compounds (Not Available)
ACGIH A4 - Not Classifiable as a Human Carcinogen

Chromium (VI) compounds- water soluble (Not Available)
ACGIH A1 - Confirmed Human Carcinogen

Chromium (VI) compounds (certain water insoluble forms) (Not Available)
ACGIH A1 - Confirmed Human Carcinogen

Nickel insoluble compounds (Not Available)
ACGIH A1 - Confirmed Human Carcinogen (related to Nickel, inorganic compounds, insoluble (NOS))

Ozone (10028-15-6)
ACGIH A4 - Not Classifiable as a Human Carcinogen (heavy, moderate, or light workloads)

Nitrogen dioxide (10102-44-0)
ACGIH A4 - Not Classifiable as a Human Carcinogen

C: Formed Compound References

Chromium (III) compounds (Not Available)
IARC Monograph 49 [1990] (listed under Chromium and Chromium compounds) Supplement 7 [1987]

Chromium (VI) compounds (certain water insoluble forms) (Not Available)
IARC Monograph 49 [1990] (evaluated as a group)

Nickel compounds (Not Available)
IARC Monograph 49 [1990] (evaluated as a group)

Oil mist, mineral (8012-95-1)
IARC Supplement 7 [1987], Monograph 33 [1984]

Welding fumes (NOC) (Not Available)
IARC Monograph 49 [1990]

Descriptions of IARC and NTP Classifications

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

IARC 2A: The agent is probably carcinogenic to humans. Generally includes agents for which there is limited evidence of carcinogenicity in humans and sufficient evidence of carcinogenicity in experimental animals.

IARC 2B: The agent is possibly carcinogenic to humans. Generally includes agents for which there is limited evidence in humans and less than sufficient evidence in experimental animals.

IARC 3: The agent is not classifiable as to its carcinogenicity to humans. Generally includes agents for which there is inadequate evidence in humans and inadequate or limited evidence in experimental animals.

IARC 4: The agent is probably not carcinogenic to humans. Generally includes agents for which there is evidence suggesting lack of carcinogenicity in humans and in experimental animals.

NTP K: Known to be a human carcinogen.

NTP RA: Reasonably anticipated to be a human carcinogen.

* * * Section 12 - Ecological Information * * *

Ecotoxicity

A: General Product Information

No information available for product.

B: Component Analysis - Ecotoxicity - Aquatic Toxicity

Zinc (7440-66-6)

96 Hr LC50 Pimephales promelas: 6.4 mg/L
96 Hr EC50 Selenastrum capricornutum: 30 µg/L
72 Hr EC50 water flea: 5 µg/L

Nickel (7440-02-0)
96 Hr LC50 Oncorhynchus mykiss: 31.7 mg/L (adult); 96 Hr LC50 Pimephales promelas: 3.1 mg/L; 96 Hr LC50 Brachydanio rerio: >100 mg/L
72 Hr EC50 freshwater algae (4 species): 0.1 mg/L; 72 Hr EC50 Selenastrum capricornutum: 0.18 mg/L
96 Hr EC50 water flea: 510 µg/L

Environmental Fate: No information available for product.

* * * Section 13 - Disposal Considerations * * *

Disposal Instructions

Reuse or recycle material whenever possible. Material may be disposed of at an industrial landfill.

US EPA Waste Number & Descriptions

A: General Product Information

RCRA Status: Must be determined at time material is disposed. If material is disposed as waste, it must be characterized under RCRA according to 40 CFR, Part 261, or state equivalent in the U.S.

B: Component Waste Numbers

RCRA waste codes other than described under Section A may apply depending on use of product. Refer to 40 CFR 261 or state equivalent in the U.S.

* * * Section 14 - Transportation Information * * *

Special Transportation

	PSN #1	PSN #2	PSN #3	PSN #4
Notes:	(1)			
Proper Shipping Name:	Not regulated			
Hazard Class:	-			
UN NA Number:	-			
Packing Group:	-			
RQ:	-			
Other - Tech Name:	-			
Other - Marine Pollutant:	-			

Notes:

(1) When "Not regulated," enter the proper freight classification, "MSDS Number," and "Product Name" on the shipping paperwork.

Canadian TDG Hazard Class & PIN:	Not regulated

* * * Section 15 - Regulatory Information * * *

US Federal Regulations

A: General Product Information

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 that 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.

B: Component Analysis

This material contains one or more of the following chemicals required to be identified under SARA Section 302 (40 CFR 355 Appendix A), SARA Section 313 (40 CFR 372.65) and/or CERCLA (40 CFR 302.4).

Aluminum (7429-90-5)
SARA 313: 1.0 % de minimis concentration (dust or fume only)

Manganese (7439-96-5)
SARA 313: 1.0 % de minimis concentration

Zinc (7440-66-6)
SARA 313: 1.0 % de minimis concentration (dust or fume only)
CERCLA: 1000 lb final RQ (no reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is equal to or exceeds 0.004 inches); 454 kg final RQ (no reporting of releases of this hazardous substance is required if the diameter of the solid metal released is equal to or exceeds 0.004 inches)

Chromium (7440-47-3)
CERCLA: 5000 lb final RQ (no reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is equal to or exceeds 0.004 inches); 2270 kg final RQ (no reporting of releases of this hazardous material is required if the diameter of the pieces of the solid metal released is equal to or exceeds 0.004 inches)

Nickel (7440-02-0)
CERCLA: 100 lb final RQ (no reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is equal to or exceeds 0.004 inches); 45.4 kg final RQ (no reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is equal to or exceeds 0.004 inches)

SARA 311/312 Physical and Health Hazard Categories:

Immediate (acute) Health Hazard:	Yes, if particulates/fumes generated during processing.
Delayed (chronic) Health Hazard:	Yes, if particulates/fumes generated during processing.
Fire Hazard:	No
Sudden Release of Pressure:	No
Reactive:	Yes, if molten

State Regulations

A: General Product Information

PENNSYLVANIA "Special Hazardous Substance": Chromium, Chromium compounds, hexavalent; Mineral oils; Nickel.

Chemical(s) known to the State of California to cause cancer: Chromium (hexavalent compounds), Nickel (metallic) and nickel compounds.

B: Component Analysis - State

The following components appear on one or more of the following state hazardous substances lists:

Component	CAS #	CA	FL	MA	MN	NJ	PA
Aluminum	7429-90-5	Yes	No	Yes	Yes	Yes	Yes
Magnesium	7439-95-4	Yes	No	Yes	No	Yes	Yes
Manganese	7439-96-5	Yes	No	Yes	Yes	Yes	Yes
Silicon	7440-21-3	No	No	Yes	Yes	Yes	Yes
Zinc	7440-66-6	Yes	No	Yes	No	Yes	Yes
Chromium	7440-47-3	Yes	No	Yes	Yes	Yes	Yes
Nickel	7440-02-0	Yes	No	Yes	Yes	Yes	Yes

The following statement(s) are provided under the California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65):
WARNING! This product contains a chemical known to the state of California to cause cancer.

Other Regulations

A: General Product Information: Material meets the criteria for inclusion in WHMIS D2A

B: Component Analysis - WHMIS IDL

The following components are identified under the Canadian Hazardous Products Act Ingredient Disclosure List:

Component	CAS #	Minimum Concentration
Aluminum	7429-90-5	1 %
Manganese	7439-96-5	1 %
Chromium	7440-47-3	0.1 %

C: Component Analysis - Inventory

Component	CAS #	TSCA	DSL	EINECS	AUST.	MITI
Aluminum	7429-90-5	Yes	Yes	Yes	Yes	No
Magnesium	7439-95-4	Yes	Yes	Yes	Yes	No
Manganese	7439-96-5	Yes	Yes	Yes	Yes	No
Silicon	7440-21-3	Yes	Yes	Yes	Yes	No
Zinc	7440-66-6	Yes	Yes	Yes	Yes	No
Chromium	7440-47-3	Yes	Yes	Yes	Yes	No
Nickel	7440-02-0	Yes	Yes	Yes	Yes	No

Inventory information

MITI Inventory: Pure metals are not specifically listed by CAS or MITI number on the MITI Inventory. However, the class of compounds for each of these metals is listed.

* * * Section 16 - Other Information * * *

MSDS History

Original: March 16, 1990
Supersedes: August 20, 2003
Revised: September 29, 2006

MSDS Status

09/28/2006: Reviewed on a periodic basis in accordance with Alcoa policy.
Changes in Sections 1, 2, 3, 4, 5, 7, 8, 9, 10, 11, 12 & 15.
08/14/2003: Reviewed on a periodic basis in accordance with Alcoa policy. Changes in Sections 1, 2, 3, 8 and 15.

Prepared By

Hazardous Materials Control Committee
Preparer: Jon N. Peace, 412-553-2293/Stephanie Williams, 412-553-1479

MSDS System Number

115951

Other Information

* Aluminum Association's Bulletin F-1, "Guidelines for Handling Aluminum Fines Generated During Various Aluminum Fabricating Operations." The Aluminum Association, 900 19th Street, N.W., Washington, DC 20006.
* Aluminum Association, "Guidelines for Handling Molten Aluminum, The Aluminum Association, 900 19th Street, N.W., Washington, DC 20006.
* NFPA 65, Standard for Processing and Finishing of Aluminum (NFPA phone: 800-344-3555)
* NFPA 651, Standard for Manufacture of Aluminum and Magnesium Powder
* NFPA 70, Standard for National Electrical Code (Electrical Equipment, Grounding and Bonding)
* NFPA 77, Standard for Static Electricity
* Guide to Occupational Exposure Values-2006, Compiled by the American Conference of Governmental Industrial Hygienists (ACGIH).
* Documentation of the Threshold Limit Values and Biological Exposure Indices, Sixth Edition, 1991, Compiled by the American Conference of Governmental Industrial Hygienists, Inc. (ACGIH).
* NIOSH Pocket Guide to Chemical Hazards, U.S. Department of Health and Human Services, February 2004.
* Patty's Industrial Hygiene and Toxicology: Volume II: Toxicology, 4th ed., 1994, Patty, F. A.; edited by Clayton, G. D. and Clayton, F. E.: New York: John Wiley & Sons, Inc.
* expub, www.expub.com, Expert Publishing, LLC.

Key-Legend:

ACGIH	American Conference of Governmental Industrial Hygienists
AICS	Australian Inventory of Chemical Substances
CAS	Chemical Abstract Service
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)
ECOIN	European Core Inventory
EPA	Environmental Protection Act
IARC	International Agency for Research on Cancer
LC_{50}	Lethal concentration (50 percent kill)
LC_{Lo}	Lowest published lethal concentration
LD_{50}	Lethal dose (50 percent kill)
LD_{Lo}	Lowest published lethal dose
NFPA	National Fire Protection Association
NIOSH	National Institute for Occupational Safety and Health
NTP	National Toxicology Program
OEL	Occupational Exposure Limit
OSHA	Occupational Safety and Health Administration
PEL	Permissible Exposure Limit
PIN	Product Identification Number
RCRA	Resource Conservation and Recovery Act
SARA	Superfund Amendments and Reauthorization Act
STEL	Short Term Exposure Limit
TCLP	Toxic Chemicals Leachate Program
TDG	Transportation of Dangerous Goods
TLV	Threshold Limit Value
TSCA	Toxic Substance Control Act
TWA	Time Weighted Average
atm	atmosphere
cm	centimeter
g, gm	gram
in	inch
kg	kilogram
lb	pound
m	meter
mg	milligram
ml, ML	milliliter
mm	millimeter
n.o.s.	not otherwise specified
ppb	parts per billion
ppm	parts per million
psia	pounds per square inch absolute
u	micron
ug	microgram

INFORMATION HEREIN IS GIVEN IN GOOD FAITH AS AUTHORITATIVE AND VALID; HOWEVER, NO WARRANTY, EXPRESS OR IMPLIED, CAN BE MADE.

This is the end of MSDS # 665

WROUGHT ALUMINUM PRODUCTS

3xxx SERIES ALLOYS

⚠ CAUTION

Physical Hazards: Non-combustible as supplied. Small chips, fine turnings and dust from processing may be readily ignitable. Explosion potential may be present when: (1) dusts or fines are dispersed in the air, (2) fines, dust or molten aluminum are in contact with certain metal oxides (e.g. rust) or (3) chips, fines, dust or molten aluminum are in contact with water or moisture.

If coated with oil, may cause skin irritation/dermatitis by contact. Avoid skin contact.

Health Hazards: EYES: Dust or fume from processing: Can cause irritation. SKIN: Contact with residual oil/oil coating: Can cause irritation. Prolonged or repeated contact with the skin can cause dermatitis. Dust or fume from processing: Can cause sensitization and allergic contact dermatitis. INHALATION: Health effects from mechanical processing (e.g., cutting, grinding): Can cause irritation of respiratory tract. Additional health effects from elevated temperature processing (e.g., welding, melting): **Acute overexposures:** Can cause nausea, fever, chills, shortness of breath and malaise (metal fume fever).

WARNING: Chromium (hexavalent compounds), Nickel (metallic) and nickel compounds are chemicals known to the State of California to cause cancer.

Precautions: Avoid generating dust. Use with adequate ventilation. Keep material dry. Use appropriate personal protective equipment (safety glasses/gloves) to avoid injury. Use appropriate NIOSH approved respiratory protection (P95) if concentrations exceed the permissible limits.

Fire Fighting: 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. These agents will react with the burning material.

First Aid (dust or fume from processing): 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.

Read Alcoa Material Safety Data Sheet No. 665 for more information about use and disposal.

Emergency Phone: (412) 553-4001.

INGREDIENTS:	CAS NUMBERS:	INGREDIENTS:	CAS NUMBERS:
Aluminum	(7429-90-5)	Zinc	(7440-66-6)
Magnesium	(7439-95-4)	Chromium	(7440-47-3)
Manganese	(7439-96-5)	Nickel	(7440-02-0)
Silicon	(7440-21-3)		

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ALCOA

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