



Earle M. Jorgensen Company

Material Safety Data Sheet

Company EMJ 3050 E. Birch Brea, California 92621	Issue Date November 1, 1995	Identification STLS
Trade Name (Common Name or Synonym) Stainless Steel	Emergency Phone Number (714) 579-8823	or contact your nearest EMJ office
Chemical Name: Examples: 304, 347, 17-4, 410	Form Bar, Sheet, Plate, Tubing, Structural, and Forgings	

I. INGREDIENTS

Material or Component	CAS Number	% Weight	Exposure Limits	
			OSHA PEL (mg/m ³)	ACGIH TLV (mg/m ³)
Base Metal Iron (Fe)	7439-89-6	39-81	10 (Fe ₂ O ₃ Fume)	5.0 (Fe ₂ O ₃ Fume)
Alloying Elements				
Carbon (C)	7440-44-0	0.5 Max	None Listed	None Listed
Manganese (Mn)	7439-96-5	10.0 Max	5.0 as Manganese	1.0 as Manganese
Phosphorous (P)	7723-14-0	0.001 - 0.2	0.1 as Phosphorous	0.1 as Phosphorous
Sulfur (S)	7704-34-9	0.001 - 0.35	13 (Sulfur Dioxide)	5 (Sulfur Dioxide)
Silicon (Si)	7440-21-3	2.0 Max	None Listed	None Listed
Chromium (Cr)	7440-47-3	10 - 27	1.0 as Chromium	0.5 as Chromium
Nickel (Ni)	7440-02-0	0 - 22	1.0 as Nickel	1.0 as Nickel
Selenium (Se)	7782-49-2	0 - 0.35	0.2 as Selenium	0.2 as Selenium
Columbium (Cb)	7440-03-1			
Tantalum (Ta)	7440-25-7	10 x C % Wt	5.0 as Tantalum	5.0 as Tantalum
Copper (Cu)	7440-50-8	0.04 - 4	0.2 as Copper	0.2 as Copper
Molybdenum (Mo)	7439-98-7	0 - 4	5.0 Soluble Compds	5.0 Soluble Compds
Aluminum (Al)	7429-90-5	0 - 2	None Listed	5.0 as welding fumes
Titanium (Ti)	7440-32-6	0.70 Max	15 as Ti O ₂	10 as total dust

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

II. PHYSICAL DATA

Material is (At Normal Conditions): <input type="checkbox"/> Liquid <input checked="" type="checkbox"/> Solid <input type="checkbox"/> Gas <input type="checkbox"/> Other			Appearance and Odor Gray-Black With Metallic Lustre — Odorless
Acidity/Alkalinity ph = NA	Melting Point 2700°F Boiling Point NA °F	Specific Gravity (H ₂ O = 1) — Approx 8 Solubility in water (% by weight) — NA	Vapor Pressure (mm Hg at 20°C) NA

III. PERSONAL PROTECTIVE EQUIPMENT

Respiratory Protection NIOSH approved dust/mist/fume respirator should be used during welding or burning if OSHA PEL or TLV is exceeded.	Hands, Arms, and Body Use appropriate protective clothing such as welders aprons & gloves when welding or burning. Check local codes.
Eyes and 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 for protection depending on the operation and safety codes.

IV. 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, seek medical attention.

V. HEALTH/SAFETY INFORMATION

HEALTH

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.

Effects of overexposure are as follows:

Acute: Excessive inhalation of all metallic fumes and dusts may result in irritation of eyes, nose, and throat. Also high concentrations of fumes and dusts of iron-oxide, manganese, copper, & selenium may result in 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 (iron-oxide) - Pulmonary effects, siderosis.

Manganese - Bronchitis, pneumonitis, lack of coordination, central nervous system.

Chromium - Various forms of dermatitis, inflammation and/or ulceration of upper respiratory tract, and possibly 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.

Selenium - Nasal and bronchial irritation, gastro-intestinal disturbances, garlic odor of breath.

Copper - Pulmonary effects, nasal and paranasal sinus, skin and liver.

Vanadium - May affect lungs. May affect blood pressure as vanadium pentoxide.

Cobalt - Inhalation of cobalt dust may cause an asthma-like disease with cough and dyspnea.

Molybdenum - Pain in joints, hands, knees and feet.

Medical conditions generally aggravated by exposure would be dermatitis and pulmonary disease or disorders.

Occupational Exposure Limits

Chromium and nickel have been identified by the International Agency for Research on Cancer (IARC) and the National Toxicology Program (NTP) as potential carcinogens. See Ingredients Section I.

FIRE AND EXPLOSION

Flash Point	NA	°F	Auto Ignition Temperature	NA	°F	Flammable Limits in Air	Extinguishing Media
						Lower NA % Upper NA %	NA
Fire and Explosion Hazards			Steel products in their natural state do not present a fire or explosion hazard.			Extinguishing Media Not to be Used NA	

REACTIVITY

Stability <input checked="" type="checkbox"/> Stable <input type="checkbox"/> Unstable		Incompatibility (Materials to Avoid) Stable under normal conditions of use, storage and transport. Reacts with strong acids to form hydrogen gas. At temperatures above melting point, metallic oxide fumes may be liberated.
Conditions to Avoid Non-ventilated areas when cutting, welding, burning, or brazing; avoid generation of airborne dusts and fumes.		Keep Area Well Ventilated
Hazardous Decomposition Products Metallic oxides.		

VI. ENVIRONMENTAL

Spill or leak procedures	Special Precautions: Use good housekeeping practices to prevent accumulation of dust and to keep airborne dust to a minimum. Avoid breathing metal fumes or dust.
NA	
Waste Disposal Method	Dust, etc. — follow federal, state, and local regulations regarding disposal.

VII. ADDITIONAL INFORMATION

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, 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. 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.



Earle M. Jorgensen Company

Material Safety Data Sheet

Company EMJ 3050 E. Birch Brea, California 92621	Issue Date November 1, 1995	Identification AL
Trade Name (Common Name or Synonym) Aluminum Alloys	Emergency Phone Number (714) 579-8823	or contact your nearest EMJ office
Chemical Name Aluminum	Form Bar, Sheet, Plate, Tubing, Structural, and Forgings	

I. INGREDIENTS

Material or Component	CAS Number	% Weight	Exposure Limits	
			1984-85 ACGIH TLV (mg/m ³)	OSHA 1910.1000 PEL (mg/m ³)
Base Metal 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 - 10.00	0.1	0.1
Copper (Cu)	7440-50-8	< 1.0 - 10.00	0.2 as fume	0.1 as fume
Iron (Fe)	1309-37-1	< 1.0 - 10.00	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)	1309-48-4	< 1.0 - 10.00	10.0 as fume	15.0 as fume
Manganese (Mn)	7439-96-5	< 1.0 - 10.00	1.0 as fume	5.0 ceiling
Silicon (Si)	7440-21-3	< 1.0 - 10.00	10.0 as total dust	Not established
Tin (Sn)	7440-31-5	< 1.0 - 10.00	2.0 as oxide and metal	2.0 as inorganic compounds
Zinc (Zn)	1314-13-2	< 1.0 - 10.00	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.

II. PHYSICAL DATA

Material is (At Normal Conditions): <input type="checkbox"/> Liquid <input checked="" type="checkbox"/> Solid <input type="checkbox"/> Gas <input type="checkbox"/> Other			Appearance and Odor Metallic Appearance — No odor	
Acidity/Alkalinity ph = NA	Approx Melting Point 900-1200°F Boiling Point NA °F	Specific Gravity (H ₂ O = 1) — 2.5 - 2.9 Solubility in water (% by weight) — Nil	Vapor Pressure (mm Hg at 20°C) NA	

III. 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.

IV. EMERGENCY MEDICAL PROCEDURES

Skin Contact: Remove particles thoroughly by washing with soap and water.

Eye Contact: Flush with water thoroughly. Get medical attention if irritation persists.

V. HEALTH/SAFETY INFORMATION

HEALTH

For standard operations (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 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 Chromium and nickel have been identified by the International Agency for Research on See Ingredients Section I. Cancer (IARC) and the National Toxicology Program (NTP) as potential carcinogens.

FIRE AND EXPLOSION

Flash Point	NA	°F	Auto Ignition Temperature	NA	°F	Flammable Limits in Air	Extinguishing Media
						Lower NA %	
						Upper NA %	Dry powder or sand

Fire and Explosion Hazards

Small chips, fine turnings, and dust may ignite readily. Damp aluminum dust may spontaneously heat with liberation of hydrogen to form explosive air mixtures. Molten aluminum may explode on contact with water or certain metal oxides (e.g., oxides of copper, iron, and lead).

Extinguishing Media Not to be Used

Do not use water or halogen on dust fires.

REACTIVITY

Stability

☒ Stable ☐ Unstable

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 VII.

VI. ENVIRONMENTAL

Spill or leak procedures

NA

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.

VII. 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.

Disclaimer

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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.



Earle M. Jorgensen Company

Material Safety Data Sheet

Company EMJ 3050 E. Birch Brea, California 92621	Issue Date November 1, 1995	Identification C Alloy & Tool
Trade Name (Common Name or Synonym) Carbon, Alloy, and Tool Steels	Emergency Phone Number (714) 579-8823 or contact your nearest EMJ office	
Chemical Name Steel	Form Bar, Sheet, Plate, Tubing, Structural, and Forgings	

I. INGREDIENTS

Material or Component	CAS Number	% Weight	Exposure Limits	
			OSHA PEL (mg/m ³)	ACGIH TLV (mg/m ³)
Base Metal Iron (Fe)	7439-89-6	Balance	10 (Fe ₂ O ₃ Fume)	5.0 (Fe ₂ O ₃ Fume)
Alloying Elements Aluminum (Al)	7429-90-5	0.10 - 1.8	None Listed	5.0 as welding fume
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
Cobalt (Co)	7440-48-4	8 Max.	0.1 as cobalt and fume	0.05 as fume
Copper (Cu)	7440-50-8	0.04 - 0.7	0.2 as copper; 1.0 as dust	0.2 as fume; 1.0 as dust
Lead (Pb)	7439-92-1	0.15 - 0.35	0.05 as fume & dust	0.15 as dust and 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 compds	10 as insoluble compds
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 Phosphorous	0.1 as Phosphorous
Silicon (Si)	7440-21-3	0.15 - 2.20	None Listed	10 total dust
Sulfur (S)	7704-34-9	0.001 - 0.35	13 sulfur dioxide	5 sulfur dioxide
Tungsten (W)	7440-33-7	0 - 18	None Listed	5 insoluble compds
Vanadium (V)	7440-62-2	0.01 - 1.0	0.5 dust; 0.1 fume	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.

II. PHYSICAL DATA

Material is (At Normal Conditions): <input type="checkbox"/> Liquid <input checked="" type="checkbox"/> Solid <input type="checkbox"/> Gas <input type="checkbox"/> Other			Appearance and Odor Gray-Black With Metallic Luster — Odorless
Acidity/Alkalinity ph = NA	Approx Melting Point 2750°F Boiling Point NA °F	Specific Gravity (H ₂ O = 1) — 7 Solubility in water (% by weight) — NA	Vapor Pressure (mm Hg at 20°C) NA

III. PERSONAL PROTECTIVE EQUIPMENT

Respiratory Protection NIOSH approved dust/mist/fume respirator should be used during welding or burning if OSHA PEL or TLV is exceeded.	Hands, Arms, and Body Use appropriate protective clothing such as welders aprons & gloves when welding or burning. Check local codes.
Eyes and 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 for protection depending on the operation and safety codes.

IV. 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, seek medical attention.

V. HEALTH/SAFETY INFORMATION

HEALTH

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.

Effects of overexposure are as follows:

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, manganese, copper, zinc, & lead may result in 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 (iron-oxide) - Pulmonary effects, siderosis.

Manganese - Bronchitis, pneumonitis, lack of coordination, central nervous system.

Chromium - Various forms of dermatitis, inflammation and/or ulceration of upper respiratory tract, and possibly 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, nasal and paranasal sinus, skin and liver.

Vanadium - May affect lungs. May affect blood pressure as vanadium pentoxide.

Cobalt - Inhalation of cobalt dust may cause an asthma-like disease with cough and dyspnea.

Molybdenum - Pain in joints, hands, knees and feet.

Tungsten - Some evidence of pulmonary 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.

Medical conditions generally aggravated by exposure would be dermatitis and pulmonary disease or disorders.

Occupational Exposure Limits

Chromium and nickel have been identified by the International Agency for Research on See Ingredients Section I. Cancer (IARC) and the National Toxicology Program (NTP) as potential carcinogens.

FIRE AND EXPLOSION

Flash Point	NA	°F	Auto Ignition Temperature	°F	Flammable Limits in Air	Extinguishing Media
			NA	°F	Lower NA % Upper NA %	NA
Fire and Explosion Hazards			Steel products in their natural state do not present a fire or explosion hazard.			Extinguishing Media Not to be Used NA

REACTIVITY

Stability <input checked="" type="checkbox"/> Stable <input type="checkbox"/> Unstable	Incompatibility (Materials to Avoid)	Stable under normal conditions of use, storage and transport. Reacts with strong acids to form hydrogen gas. At temperatures above melting point, metallic oxide fumes may be liberated.
Conditions to Avoid	Keep Area Well Ventilated Non-ventilated areas when cutting, welding, burning, or brazing; avoid generation of airborne dusts and fumes.	
Hazardous Decomposition Products	Metallic oxides.	

VI. ENVIRONMENTAL

Spill or leak procedures	Special Precautions: Use good housekeeping practices to prevent accumulation of dust and to keep airborne dust to a minimum. Avoid breathing metal fumes or dust.
Waste Disposal Method	Dust, etc. — follow federal, state, and local regulations regarding disposal.

VII. ADDITIONAL INFORMATION

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