MATERIAL SAFETY DATA SHEET
CARBON / LOW ALLOY STEEL

AMERICAN ALLOY STEEL
6230 NORTH HOUSTON ROSSLYN ROAD
P. O. BOX 40469
HOUSTON, TX 77240-0469
713-462-8081

HIS RATING

Health:	1	Flammability:	0	Reactivity:	0	Personal Protection Index:	B

NAPA RATING

Health:	1	Fire:	0	Reactivity	0	Specific Hazard:	N/A

SECTION I
PRODUCT IDENTITY

Product Name:	Carbon and Low Alloy Steel Plates, Bars, Forgings, Tubing, and Castings
MSDS Date:	January 23, 2006
Category:	Steel Products

SECTION 2
HAZARDOUS INGREDIENTS AND EXPOSURE LIMITS

Chemical Name:	CAS Number:	% Weight	OSHA-PEL (mg/cu.m)	ACGIH-TLV (mg/cu.m)
Iron (Fe)	7439-89-6	Balance	10 - Iron Oxide Fume	5 - Iron Oxide Fume as Fe
ALLOYING ELEMENTS				
Aluminum (Al)	7429-90-5	0.00 - 0.20	10 - Total Dust 5 - Respirable Fraction	10 - Metal Dust as Al 5 - Fume as Al
Antimony(Sb)	7440-36-0	0.00 - 0.03	0.5	0.5
Arsenic(As)	7440-38-2	0.00 - 0.03	0.01	0.01 Carcinogen
Boron(B)	7440-42-8	0.00 - 0.03	15 - As Boron Oxide	10 - As Boron Oxide
Beryllium(Be)	7440-41-7	<0.09	0.002 As Beryllium 0.005 As Beryllium (Ceiling)	0.002 Carcinogen 0.01 Beryllium(Stel)
Cadmium(Cd)	7440.43-9	<0.09	0.005 As Cadmium 0.0025 (Cd) Action Level	0.01 Cd (A2 Carcinogen) 0.002 Desirables fraction
Calcium (Ca)	1305-78-8	<0.09	5 Oxide Dust	2 Oxide Dust
Carbon (C)	7440-44-0	0.00 - 1.50	15 - Total Dust 5 - Desirables Fraction	10 - Total Dust
Chromium (Cr)	7440-47-3	0.00 - 12.0	1 - Metal & Insoluble Salts 0.5 - Cr (II) & (III) Compounds	0.5 - Metal as Cr 0.5 - Cr (II) & (III) Compounds
Cobalt (Co)	7440-48-4	<0.09	0.01 Metal/Dust/Fume	As Cobalt (A3-Carcinogen)
Columbia's(Cb)	----------	0.00 - 1.00	None Established	None Established
Copper (Cu)	7440-50-8	0.00 - 0.40	1 – Dust as Cu 0.2 Fume	1- Dust 0.2 Fume
Lead (Pb)	7439-92-1	0.0 - 0.09	0.05 Dust/Fume	0.05 Dust/Fume Carcinogen
Magnesium (Mg)	7439-95-4	<0.9	Not Established	Not Established
Manganese(Mn)	7439-96-5	0.00 - 2.00	5 - Mn Compounds & Fumes	5 - Mn Dust & Compounds 1 - Mn Fume
Molybdenum(Mo)	7439-98-7	0.00 - 1.50	5 - Soluble Mo Compounds 15 - Insoluble Mo Compounds	5 - Soluble Mo Compounds 10 - Insoluble Mo Compounds
Niobium (Nb)	7440-03-1	<0.9	Not Established	Not Established
Nickel(Ni)	7440-02-0	0.00 - 10.0	1 – As Nickel	1.5- As Nickel
Nitrogen (N)	7727-37-9	<0.9	Simple Asphyxiation	Simple Asphyxiation

Phosphorus(P)	7723-14-0	0.00 - 0.25	0.1 - As Phosphorus	0.1 - As Phosphorus
Selenium (Se)	7782-4-2	<0.9	As Selenium	As Selenium
Silicon(Si)	7440-21-3	0.00 - 2.20	15 - Dust (5 - Fume)	10 - Total Dust
Sulfur(S)	7446-09-05	<0.9	13 - As Sulfur Dioxide	5.2- As Sulfur Dioxide 13- Sulfur Dioxide (Stel)
Vanadium(V)	7440-62-2	0.00 - 1.00	0.5 - Dust; 0.1 Fume	0.05 - Fume
Tin(Sn)	7723-14-0	0.00 -<0..9	2	2
Titanium(Ti)	7440-32-6	0.00 - <0.9	Not Established	Not Established
Tungsten (W)	7440-33-7	<0.9	Not Established	5 Insoluble Compounds 10 Insoluble Compounds
Vanadium(V)	7440-62-2	<0.9	0.5 Oxide Dust Ceiling 0.1 Oxide Fume Ceiling	0.05 Oxide Dust/Fume
Zinc(Zn)	7440-66-6	0.00 -0.01	5 Oxide Fume 10 Oxide Dust 10 Oxide Fume (STEL)	10 Oxide Dust 5 Oxide Fume

NOTE: No permissible exposure limits (PEL) or threshold limit values (TLV) exist for steel. The above listing is a summary of elements used in alloying steel. Various grades of steel will contain different combinations of these elements and or trace elements. *Exact specifications can be found by calling American Alloy Steel and asking for a specification sheet.*

SECTION 3 HAZARDS IDENTIFICATION

WARNING! WELDING, SAWING, BRAZING, GRINDING, AND MACHINING MAY CAUSE DUSTS AND/OR FUME TO BE RELEASED. MAY BE HARMFUL IF INHALED. MAY IRRITATE THE EYES, SKIN, AND RESPIRATORY TRACT. MOLTEN MATERIAL MAY CAUSE THERMAL BURNS.

POTENTIAL HEALTH EFFECTS
Note: Steel products in their solid state under normal conditions, do not present an inhalation, ingestion or skin hazard. However, operations resulting in fume or particulate formation such as welding, sawing, brazing, grinding and machining may present health hazards. Molten steel also is hazardous.

EYE CONTACT
Dust or particulates may cause mechanical irritation including pain, tearing, and redness. Scratching of the cornea can occur if the eye is rubbed. Fumes may be irritating. Contact with the heated material may cause thermal burns.

SKIN CONTACT
Dusts or particulates may cause mechanical irritation due to abrasion. Coated steel may cause skin irritation sensitive individuals (see section 16 for additional information). Some components in this product are capable of causing an allergic reaction, possibly resulting in burning, itching and skin eruptions. Contact with heated material may cause thermal burns.

INHALTION
Dusts may cause irritation of the nose, throat, and lungs. Excessive inhalation of metallic fumes and dust may result in metal fume fever, an influenza-like illness. It is characterized by a sweet or metallic taste in the mouth, accompanied by dryness and irritation of the throat, cough, shortness of breath, pulmonary edema, general malaise, weakness, fatigue, muscle and joint pains, blurred vision, fever and chills. Typical symptoms last from 12 to 48 hours.

INJESTION
Not expected to be acutely toxic via ingestion based on the physical and chemical properties of the product. Swallowing of excessive amounts of the dust may cause irritation, nausea, and diarrhea.

CHRONIC OR SPECIAL TOXIC EFFECTS
Repeated exposure to fine dusts may inflame the nasal mucosa and cause changes to the lung. In addition, a red brown pigmentation of the eye and/or skin may occur. Welding fumes have been associated with adverse health effects, contains components that may cause cancer or reproductive effects. The following components are listed by NTP, OSHA, or IARC as carcinogens: Nickel, chromium (hexavalent), cobalt, lead, cadmium, antimony (trioxide), arsenic, beryllium.
See Section 11, for additional, specific information on effects noted above.

TARGET ORGANS

Overexposure to specific components of this product that are generated in dusts or fumes may caused adverse effects to the following organs or systems: Eyes, skin, liver, kidney, central nervous system, cardiovascular system, respiratory system.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE
Diseases of the skin such as eczema may be aggravated by exposure. Also, disorders of the respiratory system including asthma, bronchitis, and emphysema. Long-term inhalation exposure to agents that cause pneumonia's or dust may act synergistically with inhalation of oxide fumes or dust of this product.

SECTION 4 FIRST AID MEASURES

EYE CONTACT- In case of overexposure to dusts or fumes, immediately flush the eyes with plenty of water for at lease 15 minutes, occasionally lifting the eye lids. Get medical attention if irritation persists. Thermal burns should be treated as medical emergencies.

SKIN CONTACT- In case of overexposure to dust or particulates, wash with soap and plenty of water. Get medical attention irritation develops or persists. If thermal burn occurs, flush area with cold water and get immediate medical attention.

IHALATION- In case of overexpose to dusts or fumes, remove to fresh air. Get immediate medical attention if symptoms described in this MSDS develop.

INGESTION- Not considered an ingestion hazard. However, if excessive amounts of dust or particulates are swallowed, treat symptomatically and supportively. Get medical attention.

NOTES TO PHYSICIAN- Inhalation of metal fume or metal oxides may produce an acute febrile state, with leukocytosis. Treatment is symptomatic, and conditions is self limited in 24-48 hours. Chronic exposure to dust may result in pneumonia's of mixed type.

SECTION 5 FIRE FIGHTING MEASURES

FLASH POINT METHOD: Not applicable

FLAMMABLE LIMITS (% VOLUME IN AIR): Not applicable

AUTOIGNITION TEMPERATURE: Not Applicable

EXTINGUISHING MEDIA: For Molten meta, use dry powder or sand.

SPECIAL FIRE FIGHTING PROCEDURES: Do not use water on molten metal. Firefighters should not enter confined spaces without wearing NIOSH/MSHA approved positive pressure breathing apparatus (SCBA) with full face mask and full protective equipment.

UNUSUAL FIRE OR EXPLOSION HAZARDS: Steel products do not present fire or explosion hazard.

SECTION 6 ACCIDENTAL RELEASE MEASURES

PRECAUTIONS IF MATERIAL IS SPILLED OR RELEASED: Emergency response is unlikely unless in the form of dust. Avoid inhalation, eye, or skin contact of dusts by using appropriate precautions outlined in this MSDS see Section 8. Fine turnings and small chips should be swept or vacuumed and placed into appropriate disposable containers. Keep fine dust or powder away from sources of ignition. Scrap should be reclaimed for recycling. Prevent materials from entering drains, sewers, or waterways.

ENVIRONMENTAL PRECAUTIONS: Some grades of steel may contain reportable quantities of alloying elements. See Section 15 for additional information.

WASTE DISPOSAL METHODS: Dispose used or unused product in accordance with applicable, Federal, State and local regulations.

SECTION 7 HANDLING AND STORAGE

STORAGE TEMPERATURES: Stable under normal temperatures and pressures.
PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING: Store away from strong oxidizers. Dusts or powders may form explosive mixtures with air. Avoid breathing dusts or fumes.

SECTION 8 EXPOSURE CONTROLS/PERSONAL PROTECTION

Operations with potential for generating high concentrations of airborne particulates or fumes should be evaluated and controlled as necessary.

EYE PROTECTION: Use safety glasses. Dust resistant safety goggles are recommended under circumstances where particles could cause mechanical injury such as grinding or cutting. Face shields should be used when welding or cutting.

SKIN: Appropriate protective gloves should be worn as necessary. Good personal hygiene practices should be followed including cleansing exposed skin several times daily with soap and water, and laundering or dry cleaning soiled work cloths.

RESPIRATORY PROTECTION: NIOSH/MSHA approved dust/fume/mist respirator should be used to avoid excessive exposure. See Section 2 for component material information exposure limits. If such concentrations are sufficiently high that this respirator is inadequate, or high enough to cause oxygen deficiency, use a positive pressure self contained breathing apparatus (SCBA). Follow all applicable respirator use, fitting, and training standards and regulations.

VENTILATION: Provide general and or local exhaust ventilation to control airborne levels of dust or fumes below exposure limits.

EXPOSURE GUIDELINES: No permissible exposure limits (PEL) or threshold limit values (TLV) exist for steel. See Section 2 for component materials. Various grades of steel will contain different combinations of these elements. Trace elements may also be present in minute amounts.

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE AND ODOR: Reddish or Grey in color

BOILING POINT: Not applicable

MELTING POINT: Approximately 2800 Deg F

PH: NOT Applicable

SPECIFIC GRAVITY (AT 15.6 DEG C) Not applicable

DENSITY (AT 15.6 DEG C) Not applicable

VAPOR PESSSURE: Not Applicable

VAPOR DENSITY: (AIR = 1) Not Applicable

% VOLATILE, BY VOLUME: Not applicable

SOLUBILITY IN WATER: Insoluble

EVAPORATION RATE (BUTYL ACETATE=1): Not applicable

OTHER PHYSICAL AND CHEMICAL DATA: None

SECTION 10 STABILTY AND REACTIVITY

STABILITY: Stable

CONDITIONS TO AVOID: Steel at temperatures above the melting point may liberate fumes containing oxides of iron and alloying elements. Avoid generation of airborne fumes.

HAZARDOUS POLYMERIZATION: Will not occur

INCOMPATIBILTIY (MATERIALS TO AVOID): Reacts with strong acids to from hydrogen gas. Do not store near strong oxidizers.

HAZARDOUS DECOMPOSITON PRODUCTS: Metallic fumes may be produced during welding, burning, grinding and possibly machining or any situation with the potential for thermal decomposition. Refer to ANSI Z49.1

SECTION 11 TOXICOLOGICAL INFORMATION

The primary component of this product is iron. Long term exposure to iron dusts or fumes can result in a condition called siderosis which is considered to be a benign pneumoconiosis. Symptoms may include chronic bronchitis, emphysema, and shortness of breath upon exertion. Penetration of iron particles in the skin or eye may cause an exogenous or ocular siderosis which may be characterized by a red brown pigmentation of the affected area. Ingestion overexposures to iron may affect the gastrointestinal, nervous, and hematopoietic system and the liver. Iron and steel founding, but not iron or iron oxide, has been listed as potentially carcinogenic by IARC.

When this product is welded, fumes are generated. Welding fumes may be different in composition from the original welding product, with the chief component being ordinary oxides of the metal being welded. Chronic health effects (including cancer) have been associated with the fumes and dusts of individual component metals (see above), and welding fumes as a general category have been listed by IARC as a carcinogen (Group 2B). There is also limited evidence that welding fumes may cause adverse reproductive and fetal effects. Evidence is stronger where welding materials contain known reproductive toxins, e.g. Lead which may be present in the coating of this product.

Breathing fumes or dusts of this product may result in metal fume fever, which is an illness produced by inhaling metal oxides. These oxides are produced by heating various metals including cadmium, zinc, magnesium, copper, antimony, nickel, cobalt, manganese, tin, lead, beryllium, silver, chromium, aluminum, selenium, iron and arsenic. The most common agents involved are zinc and copper.

This product may contain small amounts of manganese. Prolonged exposure to manganese dusts or fumes is associated with "manganism", a Parkinson-like syndrome characterized by a variety of neurological symptoms including muscle spasms, gait disturbances, tremors, and psychoses.

This product may contain small amounts of cadmium. Primary target organs for cadmium overexposure are the lung and the kidney. Because of its cumulative nature, chronic cadmium poisoning can cause serious disease which takes many years to develop and may continue to progress despite cessation of causing a painful osteomalacia called "Itai-Itai" in postmenopausal women, and has caused developmental effects and /or reproductive effects in male and female animals. Cadmium is a listed carcinogen by NTP, OSHA, and IARC Group 1.

This product may contain small amounts of chromium. Prolonged and repeated overexposure to chromium dust or fumes may cause skin ulcers, nasal irritation and ulceration, kidney damage and cancer of the respiratory system. Chromium is skin sensitizer. Cancer is generally attributed to the hexavalent (+6) form of chromium which is listed as a carcinogen by NTP and IARC Group 1.

This product may contain small amounts of nickel. Prolonged and repeated contact with nickel may cause sensitization dermatitis. Inhalation of nickel compounds has caused lung damage as well as sinus, nasal and lung cancer in laboratory animals. Nickel is a listed carcinogen by NTP and IARC Group 1.

This product may contain small amounts of vanadium. Adverse effects from dermal, inhalation or parenteral exposure to various compounds have been reported. The major target for vanadium pentoxide toxicity is the respiratory tract. Fumes or dust can cause severe eye and respiratory irritation, and systemic effects. Chronic bronchitis, green tongue, conjunctivitis, pharyngitis, rales, chronic productive cough, and tightness of the c chest have been reported following overexposure.

Allergic reactions resulting form skin and inhalation exposures have also been reported. A statistical association between vanadium air levels and lung cancer has been suggested, but vanadium currently is not regarded as a human carcinogen.

This product may contain small amounts of lead. Lead can accumulate in the body. Consequently, exposure to fumes or dust may produce signs of polyneuritis, diminished vision and peripheral neuropathy, such as tingling and loss of feeling in fingers, arms and legs. Lead is a known reproductive and developmental toxin. It is also associated with the central nervous system disorders, anemia, kidney disfunction and neurobehavioral abnormalities. The brain is a major target organ for lead exposure. Elemental lead is listed as an IARC 2B carcinogen.

This product may contain small amounts of copper. Copper dust and fume can irritate the eyes, nose and throat causing coughing, wheezing, nosebleeds, ulcers and metal fume fever. Other effects from repeated inhalation of copper fume include a metallic or sweet taste, and discoloration of skin, teeth or hair. Copper also may cause an allergic skin reaction. Overexposure to copper can effect the liver.

SECTION 12 ECOLOGICAL INFORMATION

AQUATIC ECOTOXICOLOGICAL DATA: No specific information available on this product.

ENVIRONMENTAL FATE DATA: No specific information available on this product.

SECTION 13 DISPOSABLE CONSIDERATIONS

Recovery and reuse, rather than disposal, should be the ultimate goal of handling efforts. Disposal in accordance with Federal, state and local health and environmental regulations. Prevent materials from entering drains, sewers, or waterways.

SECTION 14 TRANSPORT INFORMATION

DOT PROPER SHIPPING NAME: Not Regulated

DOT HAZARD CLASSIFICATION: Not Regulated

UN/NA NUMBER: Not Regulated

DOT PACKING GROUP: Not Applicable

LABELING REQUIREMENTS: Not Applicable

PLACARDS: Not Applicable

DOT HAZARDOUS SUBSTANCE: Not Applicable

DOT MARINE POLLUTANT: Not applicable

SECTION 15 REGULATORY INFORMATION

This product is not hazardous under the criteria of the Federal OSHA Hazard Communication Standard 29 CFR 1910.1200. However, dusts and fumes from this product may be hazardous.

CALIFORNIA PROPOSITION 65
This product contains chemicals (antimony[oxide], arsenic, beryllium, chromium [hexavalent], cobalt, cadmium, lead, nickel) known to the State of California to cause cancer and chemicals (cadmium, lead known to the State of California to cause birth defects or other reproductive harm.

REGULATORY LISTS
Some components of this product may be specifically listed by individual states; other product-specific health and safety data in other sections of the MSDS may also be applicable for state requirements. For details on your regulatory requirements, you should contact the appropriate agency in your state.

TOXIC SUBSTANCES CONTROL ACT (TSCA)
Components of this product are listed on the TSCA Inventory.

COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION AND LIBILITY ACT (CERCLA)
Steel is not reportable, however, it contains hazardous substances that may be reportable if released in pieces with diameters less than or equal to 0.004 inches (RQ marked with a "*").

CHEMICAL NAME	REPORTABLE QUANTITY (IN LBS)
Antimony	5000*
Arsenic	1*
Beryllium	10*
Cadmium	10*
Chromium	5000*
Copper	5000*
Lead	10*
Nickel	100*
Phosphorus	1
Selenium	100*
Zinc	1000*

SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986 (SARA), TITLE III

SECTION 311/312 HAZARD CATEGORIES: Immediate Health Effect, Delayed Health Effect
This product contains the following EPCRA Section 313 chemicals subject to the reporting requirements of Section 313 of the Emergency Planning and Community Right-To-Know Act of 1986 (40 CFR 372):

SECTION 313 REPORTABLE INGREDIENTS:

CHEMICAL NAME	CAS NUMBER	CONCENTRATION % BY WEIGTH	REPORTABLE
Aluminum	7429-90-5	<0.10	No < 1%
Antimony	7440-36-0	<0.9	No < 1%
Arsenic	7440-38-2	<0.09	No < 0.1%
Beryllium	7440-43-9	<0.09	No < 0.1%
Cadmium	7440-43-9	<0.09	No < 0.1%
Chromium	7440-47-3	0.01 – 1.0	Yes > 0.1%
Cobalt	7440-48-4	<0.09	No < 0.1%
Copper	7440-50-8	<0.9	No > 1%
Lead	7439-92-1	0.0 – 0-09	No < 0.1%
Manganese	7439-96-5	0.2 - 2	Yes > 1%
Nickel	7440-02-0	0.01 - 1.0	Yes > 0.1%
Phosphorus	7723-14-0	<0.9	No < 1%
Selenium	7782-49-2	<0.9	No < 1%
Vanadium	7440-62-2	<0.9	No < 1%
Zinc	7440-66-6	<0.9	No < 1%

Concentrations based on analytical data and process knowledge of typical products distributed.

Section 16 Other Information & Liability Disclaimer

This product may be coated with a variety of materials, including oils, paints, galvanization, etc. that are not included in this MSDS. During welding precautions should be taken for airborne contaminants that may originate from components of the welding rod. Arc or spark generated when welding or burning could be a source of ignition or combustion of flammable materials. The information in this Material Safety Data Sheet (MSDS) was obtained from sources which we believer are reliable, however, the information is provided without any representation of 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, ore expense arising out of or in any way connected with the handling, storage, use, or disposal of this product.

Compliance with any Federal, State, and Local Laws and regulations remains the responsibility of the user. The user has the responsibly to provide a safe work place, to examine all aspects of its operation and to determine if or where precautions in addition to those described herein are required.