

Section 1 MANUFACTURER / PRODUCT IDENTIFICATION

Republic Engineered Products, Inc. 3770 Embassy Parkway Akron, OH 44333-8367 (330) 670-3000 24 hr. Emergency Contact : CHEMTREC U.S.A. - (800) 424-9300 International - (703) 527-3887 (collect)	Product form: Blooms Billets Hot Rolled Bars Cold Finished Bars	Product type: Carbon Steel Leaded Carbon Steel Alloy Steel Leaded Alloy Steel
---	--	--

Section 2 INGREDIENTS AND OCCUPATIONAL EXPOSURE LIMITS

Component Material / Symbol	CAS No.	% Weight (< less than)				Exposure limits: (mg/m ³)	
						OSHA PEL	ACGIH TLV**
Product Type		Carbon Steel	Carbon Steel - Leaded grades	Alloy Steel	Alloy Steel - Leaded grades		
Iron / Fe (base metal)	7439-69-6	97-99	97-99	86-99	86-99	10.0 fume (Fe ₂ O ₃)	5.0 (Fe ₂ O ₃)
Alloying Elements							
Aluminum / Al	7429-90-5	<0.01-0.15	<0.01-0.15	<0.01-0.15	<0.01-0.15	15.0 total / 5.0 respirable	10
Bismuth / Bi	7440-69-9	<.01-.15	<0.01	<0.01-.15	<0.01-.15	not established	not established
Boron / B	7440-42-8	<0.01	<0.01	<0.01	<0.01	15.0 (boron oxide)	10
Calcium / Ca	7440-70-2	<0.01-0.07	<0.01-0.07	<0.01-0.07	<0.01-0.07	5.0 (as CaO)	2
Carbon / C	1333-86-4	<0.01-1.30	<0.01-1.30	<0.01-1.30	<0.01-1.30	3.5 (carbon black)	3.5
Chromium* / Cr	7440-47-3	<0.01	<0.01	<0.01-3.50	<0.01-3.50	1	0.5
Columbium / Cb	7440-03-1	<0.01-0.25	<0.01-0.25	<0.01-0.05	<0.01-0.05	not established	not established
Copper / Cu	7440-50-8	<0.01-1.00	<0.01-1.00	<0.01-1.00	<0.01-1.00	1.0 dust / 0.1 fume	1.0 dust / 0.2 fume
Lead / Pb	7439-92-1	<0.01	0.15-0.35	<0.01	0.15-0.35	0.05	0.05
Manganese* / Mn	7439-96-5	0.20-1.65	0.20-1.65	0.20-2.50	0.20-2.50	5.00 (ceiling limit)	0.2
Molybdenum / Mo	7439-98-7	<0.01	<0.01	<0.01-1.10	<0.01-1.10	5.0 soluble / 15.0 insoluble	5.0 soluble / 10.0 insoluble
Nickel* / Ni	7440-02-0	<0.01	<0.01	<0.01-4.00	<0.01-4.00	1	0.05
Phosphorus / P	7723-14-0	<0.01-0.04	<0.01-0.04	<0.01-0.15	<0.01-0.15	0.10 (yellow)	0.1
Selenium / Se	7782-49-2	<0.01	<0.01	<0.01-0.08	<0.01-0.08	0.2	0.2
Silicon / Si	7440-21-3	<0.01	<0.01	<0.01-3.00	<0.01-3.00	15.0 total / 5.0 respirable	10.0 total / 5.0 respirable
Sulfur / S	7440-34-9	<0.01-0.40	<0.01-0.40	<0.01-0.40	<0.01-0.40	(SO ₂) 13.0	5.0/13.0 STEL
Tellurium / Te	13494-80-9	<0.01	<0.01	<0.01-0.03	<0.01-0.03	0.1	0.1
Tin / Sn	7440-31-5	<0.01-0.05	<0.01-0.05	<0.01-0.05	<0.01-0.05	2	2
Titanium / Ti	7440-32-6	<0.01	<0.01	<0.01-0.30	<0.01-0.30	15.0 (TiO ₂)	10
Vanadium / V	7440-62-6	<0.01-0.25	<0.01-0.25	<0.01-0.50	<0.01-0.50	0.5dust/0.1fume (V ₂ O ₅) (ceiling)	0.05 dust/fume (V ₂ O ₅)

* Section #313 supplier notification: The chemicals identified with an asterisk are subject to the reporting requirements of Section #313 of the Emergency Planning and Community Right-to-know Act of 1986 (40 CFR 372)

** Lesser of ACGIH - TLV Adopted Value or value indicated by Notice of Intended Changes.

Note: The component materials listed above are used in the alloying of Republic Engineered Products, LLC steel products (or enter the products as constituents of raw materials). All commercial metals contain small amounts of various other elements such as antimony, arsenic, cadmium, cobalt, magnesium, mercury, tantalum, zinc, and zirconium. The concentrations of these trace elements varies from less than 0.01% to 0.1% by weight up to a total of less than 1.0%.

Section 3 PHYSICAL DATA

Normal physical state: Solid Appearance: Gray-Black with Dull or Metallic Luster
Melting Point: 2,400 - 2,800°F Specific Gravity (H₂O = 1): Approx. 7.8
Boiling Point: N/A Vapor Pressure: N/A Evaporation Rate: N/A
Vapor Density: N/A AutoignitionTemp.: N/A

Section 4 FIRE & EXPLOSION DATA

Flammability: Product is not flammable in shipped form.

Fire and Explosion Hazards: Steel products do not present fire or explosion hazards under normal conditions. Fine metal particles such as those produced by grinding or sawing can burn. High concentrations of metallic dust in air may present an explosion hazard.

Section 5 REACTIVITY DATA

Stability: Stable Incompatible Materials: Reacts with strong acids to form hydrogen gas.

Hazardous Decomposition Products: Metallic dust or fumes may be produced during welding, burning, grinding, and possibly machining. Steel at temperatures above the melting point may liberate fumes containing oxides of iron and alloying elements. Leaded steel heated above approximately 900°F may liberate lead fume.

Section 6 HEALTH HAZARD DATA

Steel products, in their usual physical form, do not pose a health hazard.

Hazardous dust or fume may be produced during further processing by the end user. Operations such as burning, welding, sawing, brazing, grinding, forging, and machining that produce metal fines and dust or result in elevated temperatures in the product should be evaluated by an industrial hygienist to determine employee exposures. The primary route of entry for particulates is inhalation. Particle ingestion is also possible through contamination of food, drink, tobacco products, and cosmetics. Skin contact may result in adverse health effects associated with component materials.

Potential adverse health effects of excessive exposure to the component materials listed in Section 2 are listed in the attached Health Hazard Table.

WHMIS (Canadian) Product Classification: D-2-B.

Coating oils – Steel coated with oil may result in a mild skin irritation upon prolonged and repeated contact. Wear gloves and/or wash skin following contact to prevent skin irritation.

Section 7 FIRST AID AND EMERGENCY MEDICAL PROCEDURES

Inhalation: Remove from excessive exposure levels. Consult a physician if signs or symptoms of adverse health effects are observed.

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

Skin Contact: Remove particles by washing thoroughly with soap and water. Consult a physician if signs or symptoms of adverse skin reactions are observed.

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

Section 8 PRECAUTIONS AND CONTROL MEASURES FOR SAFE USE AND HANDLING

When airborne emissions may occur due to further processing, employee exposure should be evaluated by an industrial hygienist or safety professional and safe work practices should be established in accordance with the evaluation.

Ventilation: Ventilation should be sufficient to maintain exposure below applicable limits for component materials.

Respiratory Protection: When ventilation controls are not sufficient to lower exposures below applicable limits, use a NIOSH-approved respirator which protects against dust and metal fume.

Skin Protection: Use protective gloves and/or other personal protective equipment as specified by a safety professional when welding, burning, or handling steel products.

Eye and Face Protection: Use appropriate eye and face protection for airborne particulates, flying sparks, injurious light radiation, and other hazards associated with further processing operations.

Spill or Leak Procedures: Fine turnings, chips, and dust should be swept or vacuumed.

Waste Disposal Methods: Used or unused product should be recycled or disposed of in accordance with Federal, State, and Local regulations.

DISCLAIMER:

The information in this MSDS was obtained from sources 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.

HEALTH HAZARD TABLE (Source: NIOSH Pocket Guide to Chemical Hazards 11/2/99)

Component Material	Exposure Routes	Target Organs	Symptoms
Iron (Iron oxide dust and fume as Fe)	inhalation	Respiratory system	Benign pneumoconiosis with X-ray shadows indistinguishable from fibrotic pneumoconiosis (siderosis)
Aluminum	inhalation, ingestion, skin and/or eye contact	Skin, respiratory system	irritation skin, respiratory system; pulmonary fibrosis
Bismuth	Not listed as hazardous for occupational exposures.		
Boron (Boron oxide)	inhalation, ingestion, skin and/or eye contact	Eyes, skin, respiratory system	irritation eyes, skin, respiratory system; cough; conjunctivitis; skin erythema (skin redness)
Calcium (Calcium oxide)	inhalation, ingestion, skin and/or eye contact	Eyes, skin, respiratory system	Irritation eyes, skin, upper respiratory tract; ulcer, perforation nasal septum; pneumonia; dermatitis
Carbon (carbon black)	inhalation, skin and/or eye contact	Respiratory system, eyes	Cough; irritation eyes
Chromium (metal)	inhalation, ingestion, skin and/or eye contact	Eyes, skin, respiratory system	Irritation eyes, skin; lung fibrosis. NIOSH considers all Cr(VI) compounds (including chromic acid, tert-butyl chromate, zinc chromate, and chromyl chloride) to be potential occupational carcinogens.
Columbium	Not listed as hazardous for occupational exposures.		
Copper (fume / dusts and mists as Cu)	inhalation, ingestion, skin and/or eye contact	Eyes, skin, respiratory system, liver, kidneys	Irritation eyes, upper respiratory system; nose, pharynx; nasal septum perforation; metal fume fever: chills, muscle ache, nausea, fever, dry throat, cough, weakness, lassitude (weakness, exhaustion); metallic or sweet taste; discoloration skin, hair; dermatitis; in animals: lung, liver, kidney damage; anemia (kidneys - increase(d) risk with Wilson's disease)
Lead	inhalation, ingestion, skin and/or eye contact	Eyes, gastrointestinal tract, central nervous system, kidneys, blood, gingival tissue	weakness, lassitude (weakness, exhaustion), insomnia; facial pallor; anorexia, weight loss, malnutrition; constipation, abdominal pain, colic; anemia; gingival lead line; tremor; paralysis wrist, ankles; encephalopathy; kidney disease; irritation eyes; hypotension; mood and personality changes; retarded mental development; and irreversible nephropathy. May cause retarded development of the new-born. Danger of cumulative effect.
Manganese (Manganese compounds and fume as Mn)	Inhalation, ingestion	Respiratory system, central nervous system, blood, kidneys	Parkinson's; asthenia, insomnia, mental confusion; metal fume fever: dry throat, cough, chest tightness, dyspnea (breathing difficulty), rales, flu-like fever; low-back pain; vomiting; malaise (vague feeling of discomfort); fatigue; kidney damage
Molybdenum	inhalation, ingestion, skin and/or eye contact	Eyes, respiratory system, liver, kidneys	In animals: irritation eyes, nose, throat; anorexia, diarrhea, weight loss; listlessness; liver, kidney damage
Nickel	inhalation, ingestion, skin and/or eye contact	Nasal cavities, lungs, skin	sensitization dermatitis, allergic asthma, pneumonitis; [Potential occupational carcinogen] Cancer Site [lung and nasal cancer]
Phosphorus (yellow)	inhalation, ingestion, skin and/or eye contact	Eyes, skin, respiratory system, liver, kidneys, jaw, teeth, blood	irritation eyes, respiratory tract; eye, skin burns; abdominal pain, nausea, jaundice; anemia; cachexia; dental pain, salivation, jaw pain, swelling
Selenium	inhalation, ingestion, skin and/or eye contact	Eyes, skin, respiratory system, liver, kidneys, blood, spleen	irritation eyes, skin, nose, throat; visual disturbance; headache; chills, fever; dyspnea (breathing difficulty), bronchitis; metallic taste, garlic breathing, gastrointestinal disturbance; dermatitis; eye, skin burns; in animals: anemia; liver necrosis, cirrhosis; kidney, spleen damage
Silicon	inhalation, ingestion, skin and/or eye contact	Eyes, skin, respiratory system	irritation eyes, skin, upper respiratory system; cough
Sulfur (Sulfur dioxide - SO ₂)	inhalation, skin and/or eye contact	Eyes, skin, respiratory system	irritation eyes, nose, throat; rhinorrhea (discharge of thin nasal mucous); choking, cough; reflex bronchoconstriction
Tellurium	inhalation, ingestion, skin and/or eye contact	Skin, central nervous system, blood	Garlic breathing, sweating; dry mouth, metallic taste; somnolence (sleepiness, unnatural drowsiness); anorexia, nausea, no sweating; dermatitis; in animals: central nervous system, red blood cell changes
Tin	inhalation, skin and/or eye contact	Eyes, skin, respiratory system	irritation eyes, skin, respiratory system; in animals: vomiting, diarrhea, paralysis with muscle twitching
Titanium (Titanium dioxide - TiO ₂)	inhalation Symptoms	Respiratory system	Lung fibrosis; [Potential occupational carcinogen] Cancer Site [in animals: lung tumors]
Vanadium (dust and fume)	inhalation, ingestion, skin and/or eye contact	Eyes, skin, respiratory system	irritation eyes, skin, throat; green tongue, metallic taste, eczema; cough; fine rales, wheezing, bronchitis, dyspnea (breathing difficulty)

