CARBON STEEL BARS–LEADED GRADES

Safety Data Sheet (SDS)

Section 1 – Identification

1(a) Product Identifier used on Label: Carbon Steel Bars-Leaded Grades

1(b) Other means of identification: Refer to Section 16 for products covered

1(c) Recommended use of the chemical and restrictions on use: These products are sold to all steel-consuming industries including automotive, heavy machinery, energy, construction, packaging, and appliances. No restrictions known

1(d) Name, address, and telephone number:

Vulcan Threaded Products (dba Vulcan Steel Products) Phone number: 205-620-5100
10 Crosscreek Trail
Pelham, Al 35124

1(e) Emergency phone number: CHEMTREC (Day or Night): 1-800-424-9300

Section 2 – Hazard(s) Identification

2(a) Classification of the chemical: Carbon Steel Bars-Leaded Grades is considered as an article under Reach regulation REACH (REGULATION (EC) No 1907/2006) and is not subject to classification under CLP regulation (REGULATION (EC) No 1272/2008. However, **Carbon Steel Bars - Leaded Grades** is not exempted as an article under OSHA 29 CFR 1910.1200 Hazard Communication Standard due to its downstream use and therefore this product is considered a mixture and a hazardous material. The categories of Health Hazards as defined in "GLOBALLY HARMONIZED SYSTEM OF CLASSIFICATION AND LABELLING OF CHEMICALS (GHS), Third revised edition ST/SG/AC.10/30/Rev. 3" United Nations, New York and Geneva, 2009 have been evaluated. Refer to Section 3, 8 and 11 for additional information.

2(b) Signal word, hazard statement(s), symbols and precautionary statement(s):

Hazard Symbol	Hazard Classification	Signal Word	Hazard Statement(s)
	Carcinogenicity - 1B Reproductive Toxicity - 1 Single Target Organ Toxicity (STOT) Repeat Exposure - 1	**DANGER**	May cause cancer. May damage fertility or the unborn child. Causes damage to lungs and central nervous system through prolonged or repeated inhalation exposure.
	Acute Toxicity-Oral 4 STOT Single Exposure - 3		Harmful if swallowed. May cause respiratory irritation.
NA	Eye Irritation - 2B		Causes eye irritation.

Precautionary Statement(s)

Prevention	Response	Storage/Disposal
Do not breathe dusts / fume / gas / mist / vapor / spray. Wear protective gloves / protective clothing / eye protection / face protection. Use only outdoors or in well ventilated areas. Wash thoroughly after handling. Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Do not eat, drink or smoke when using this product.	If inhaled: Remove person to fresh air and keep comfortable for breathing. If exposed, concerned or feel unwell: Get medical advice/attention. If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention. If swallowed: Call a poison center/doctor if you feel unwell. Rinse mouth. Call a poison center/doctor if you feel unwell.	Dispose of contents in accordance with federal, state and local regulations. Store locked up.

2(c) Hazards not otherwise classified: None Known

2(d) Unknown acute toxicity statement (mixture): None Known

Section 3 – Composition/Information on Ingredients

3(a-c) Chemical name, common name (synonyms), CAS number and other identifiers, and concentration:

Chemical Name	CAS Number	EC Number	% weight
Iron	7439-89-6	231-096-4	97-99
Manganese	7439-96-5	231-105-1	0.2 – 1.65
Copper	7440-50-8	231-159-6	0.01 - 1.0
Lead	7440-48-7	231-100-4	0.15 - 0.35

EC - European Community

CAS - Chemical Abstract Service

Note: Commercial steel products contain small amounts of various constituents in addition to those listed. These small quantities are frequently referred to as "trace" or "residual" constituents that generally originate in the raw materials used.

Section 4 – First-aid Measures

4(a) Description of necessary measures:

- **Inhalation: Carbon Steel Bars-Leaded Grades** as sold/shipped is not a likely form of exposure. However, during further processing (welding, grinding, burning, etc.), If inhaled: Remove person to fresh air and keep comfortable for breathing. If exposed, concerned or feel unwell: Get medical advice/attention
- **Eye Contact: Carbon Steel Bars-Leaded Grades** as sold/shipped is not a likely form of exposure. However, during further processing (welding, grinding, burning, etc.), If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue Rinsing. If eye irritation persists: Get medical advice attention. If exposed, concerned or feel unwell: Get medical advice/attention.
- **Skin Contact: Carbon Steel Bars-Leaded Grades** as sold/shipped is not a likely form of exposure. If exposed, concerned or feel unwell: Get medical advice/attention.
- **Ingestion: Carbon Steel Bars-Leaded Grades** as sold/shipped is not a likely form of exposure. However, during further processing (welding, grinding, burning, etc.), If swallowed: Call a poison center/doctor if you feel unwell. Rinse mouth. If exposed, concerned or feel unwell: Get medical advice/attention.

4(b) Most important symptoms/effects, acute and delayed (chronic):

- **Inhalation: Carbon Steel Bars-Leaded Grades** as sold/shipped is not likely to present an acute or chronic health effect.
- **Eye: Carbon Steel Bars-Leaded Grades** as sold/shipped is not likely to present an acute or chronic health effect.
- **Skin: Carbon Steel Bars-Leaded Grades** as sold/shipped is not likely to present an acute or chronic health effect.
- **Ingestion: Carbon Steel Bars-Leaded Grades** as sold/shipped is not likely to present an acute or chronic health effect.

However, during further processing (welding, grinding, burning, etc.), individual components may illicit an acute or chronic health effect. Refer to Section 11-Toxicological Information.

4(c) Immediate Medical Attention and Special Treatment: None Known

Section 5 – Fire-fighting Measures

5(a) Suitable (and unsuitable) Extinguishing Media: Not Applicable for **Carbon Steel Bars-Leaded Grades** as sold/shipped. Use extinguishers appropriate for surrounding materials.

5(b) Specific Hazards arising from the chemical: Not Applicable for **Carbon Steel Bars-Leaded Grades** as sold/shipped. Do not use water on molten metal.

5(c) Special protective equipment and precautions for fire-fighters: Self-contained MSHA/NIOSH approved respiratory protection and full protective clothing should be worn when fumes and/or smoke from fire are present. Heat and flames cause emittance of acrid smoke and fumes. Do not release runoff from fire control methods to sewers or waterways. Firefighters should wear full face-piece self-contained breathing apparatus and chemical protective clothing with thermal protection. Direct water stream will scatter and spread flames and, therefore, should not be used.

Section 6 - Accidental Release Measures

6(a) Personal Precautions, Protective Equipment and Emergency Procedures: Not Applicable for **Carbon Steel Bars-Leaded Grades** as sold/shipped. For spills involving finely divided particles, clean-up personnel should be protected against contact with eyes and skin. If material is in a dry state, avoid inhalation of dust. Fine, dry material should be removed by vacuuming or wet sweeping methods to prevent spreading of dust. Avoid using compressed air. Do not release into sewers or waterways. Collect material in appropriate, labeled containers for recovery or disposal in accordance with federal, state, and local regulations.

6(b) Methods and materials for containment and clean up: Not Applicable for **Carbon Steel Bars-Leaded Grades** as sold/shipped. Collect material in appropriate, labeled containers for recovery or disposal in accordance with federal, state, and local regulations. Follow applicable OSHA regulations (29 CFR 1910.120) and all other pertinent state and federal requirements.

Section 7 - Handling and Storage

7(a) Precautions for safe handling: Not Applicable for **Carbon Steel Bars-Leaded Grades** as sold/shipped, however further processing (welding, burning, grinding, etc.) with the potential for generating high concentrations of airborne particulates should be evaluated and controlled as necessary. Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Use only outdoors or in well ventilated areas. Practice good housekeeping. Avoid breathing metal fumes and/or dust. Do not eat, drink or smoke when using this product.

7(b) Conditions for safe storage, including any incompatibilities: Store away from acids and incompatible materials. Store in well ventilated place. Keep container tightly closed. If feasible, store locked up.

Section 8 - Exposure Controls / Personal Protection

8(a) Occupational Exposure Limits (OELs): Carbon Steel Bars-Leaded Grades as sold/shipped in its physical form does not present an inhalation, ingestion or contact hazard, nor would any of the following exposure data apply. However, operations such as high temperature (burning, welding), sawing, brazing, machining and grinding may produce fumes and/or particulates. The following exposure limits are offered as reference, for an experience industrial hygienist to review.

Ingredients	OSHA PEL [1]	ACGIH TLV [2]	NIOSH REL [3]	IDLH [4]
Iron	10 mg/m³ (iron oxide fume)	5.0 mg/m³ (iron oxide, respirable fraction[5])	5.0 mg/m³ (iron oxide dust and fume)	2,500 mg/m³ (as Fe)

Section 8 - Exposure Controls / Personal Protection (continued)

8(a) Occupational Exposure Limits (OELs) (continued):

Ingredients	OSHA PEL [1]	ACGIH TLV [2]	NIOSH REL [3]	IDLH [4]
Copper	0.1 mg/m³ (as fume, Cu) 1.0 mg/m³ (as dusts & mists, Cu)	0.2 mg/m³ (as fume) 1.0 mg/m³ (as dusts & mists, Cu)	0.1 mg/m³ (as fume, Cu) 1.0 mg/m³ (as dusts & mists, Cu)	100 mg Cu/m^3
Lead	0.05 mg/m^3 (inorganic compounds, as Pb) [5] "AL" 0.03 mg/m^3	0.05 mg/m^3 (inorganic compounds, as Pb)	0.05 mg/m^3 (inorganic compounds, as Pb) [6]	100 mg/m^3
Manganese	"C" 5.0 mg/m³ (as fume & inorganic compounds, as Mn)	0.02 mg/m³ (as fume & inorganic compounds, as Mn, respirable fraction) 0.1 mg/m³ (as fume & inorganic compounds, as Mn, inhalation fraction)	1.0 mg/m³ (as fume & inorganic compounds, as Mn) "STEL" 3.0 mg/m³ (as fume & inorganic compounds, as Mn)	500 mg/m^3 (as Mn)

NE - None Established

1. OSHA PELs (Permissible Exposure Limits) are 8-hour TWA (time-weighted average) concentrations unless otherwise noted. A ("C") designation denotes a ceiling limit, which should not be exceeded during any part of the working exposure unless otherwise noted. A Short Term Exposure Limit (STEL) is defined as a 15-minute exposure, which should not be exceeded at any time during a workday. An Action level (AL) is used by OSHA and NIOSH to express a health or physical hazard. They indicate the level of a harmful or toxic substance/activity, which requires medical surveillance, increased industrial hygiene monitoring, or biological monitoring. Action Levels are generally set at one half of the PEL but the actual level may vary from standard to standard. The intent is to identify a level at which the vast majority of randomly sampled exposures will be below the PEL.
2. Threshold Limit Values (TLV) established by the American Conference of Governmental Industrial Hygienists (ACGIH) are 8-hour TWA concentrations unless otherwise noted. ACGIH TLVs are for guideline purposes only and as such are not legal, regulatory limits for compliance purposes. DSEN – May cause dermal sensitization. This notation is used to indicate the potential for dermal sensitization resulting from the interaction of an absorbed agent and ultraviolet light (i.e. photosensitization). RSEN – May cause respiratory sensitization.
3. The National Institute for Occupational Safety and Health Recommended Exposure Limits (NIOSH-REL)- Compendium of Policy and Statements. NIOSH, Cincinnati, OH (1992). NIOSH is the federal agency designated to conduct research relative to occupational safety and health. As is the case with ACGIH TLVs, NIOSH RELs are for guideline purposes only and as such are not legal, regulatory limits for compliance purposes.
4. The "immediately dangerous to life or health air concentration values (IDLHs)" are used by NIOSH as part of the respirator selection criteria and were first developed in the mid-1970's by NIOSH. The Documentation for Immediately Dangerous to Life or Health Concentrations (IDLHs) is a compilation of the rationale and sources of information used by NIOSH during the original determination of 387 IDLHs and their subsequent review and revision in 1994. Ca is designated as carcinogen.
5. OSHA considers "Lead" to mean metallic lead, all inorganic lead compounds (lead oxides and lead salts), and a class of organic compounds called soaps; all other lead compounds are excluded from this definition. The OSHA PEL and other OSHA requirements can be found in 29 CFR 1910.1025. The OSHA PEL (8-hour TWA) for lead in "non-ferrous foundries with less than 20 employees" is 0.075 mg/m^3.
6. NIOSH considers "Lead" to mean metallic lead, lead oxides, and lead salts (including organic salts such as lead soaps but excluding lead arsenate). The NIOSH REL for lead (8-hour TWA) is 0.05 mg/m^3; air concentrations should be maintained so that worker blood lead remains less than 0.060 mg Pb/100 g of whole blood.

8(b) Appropriate Engineering Controls: Use controls as appropriate to minimize exposure to metal fumes and dusts during handling operations. Provide general or local exhaust ventilation systems to minimize airborne concentrations. Local exhaust is necessary for use in enclosed or confined spaces. Provide sufficient general/local exhaust ventilation in pattern/volume to control inhalation exposures below current exposure limits.

8(c) Individual Protection Measures:

Respiratory Protection: Seek professional advice prior to respirator selection and use. Follow OSHA respirator regulations (29 CFR 1910.134) and, if necessary, use only a NIOSH-approved respirator. Select respirator based on its suitability to provide adequate worker protection for given working conditions, level of airborne contamination, and presence of sufficient oxygen. Concentration in air of the various contaminants determines the extent of respiratory protection needed. Half-face, negative-pressure, air-purifying respirator equipped with P100 filter is acceptable for concentrations up to 10 times the exposure limit. Full-face, negative-pressure, air-purifying respirator equipped with P100 filter is acceptable for concentrations up to 50 times the exposure limit. Protection by air-purifying negative-pressure and powered air respirators is limited. Use a positive-pressure-demand, full-face, supplied air respirator or self-contained breathing apparatus (SCBA) for concentrations above 50 times the exposure limit. If exposure is above the IDLH (Immediately dangerous to life or health) for any of the constituents, or there is a possibility of an uncontrolled release or exposure levels are unknown, then use a positive-demand, full-face, supplied air respirator with escape bottle or SCBA.

Warning! Air-purifying respirators both negative-pressure and powered-air do not protect workers in oxygen-deficient atmospheres.

- **Eyes**: Wear appropriate eye protection to prevent eye contact. For operations, which result in elevating the temperature of the product to or above its melting point or result in the generation of airborne particulates, use safety glasses to prevent eye contact. Contact lenses should not be worn where industrial exposures to this material are likely. Use safety glasses or goggles as required for welding, burning, sawing, brazing, grinding or machining operations.
- **Skin**: Wear appropriate personal protective clothing to prevent skin contact. Cut resistant gloves and sleeves should be worn when working with steel products. For operations, which result in elevating the temperature of the product to or above its melting point or result in the generation of airborne particulates, use protective clothing, and gloves to prevent skin contact. Protective gloves should be worn as required for welding, burning or handling operations. Contaminated work clothing must not be allowed out of the workplace.
- **Other protective equipment**: An eyewash fountain and deluge shower should be readily available in the work area.

Section 9 - Physical and Chemical Properties

9(a) Appearance (physical state, color, etc.): Solid, Steel-grey lustrous metal

9(b) Odor: Odorless

9(c) Odor Threshold: NA

9(d) pH: NA

9(j) Upper/lower Flammability or Explosive Limits: NA

9(k) Vapor Pressure: NA

9(l) Vapor Density (Air = 1): NA

9(m) Relative Density: 7.8

Section 9 - Physical and Chemical Properties (continued)

9(e) Melting Point/Freezing Point: 1316-1538 ºC

9(f) Initial Boiling Point and Boiling Range: ND

9(g) Flash Point: NA

9(h) Evaporation Rate: NA

9(i) Flammability (solid, gas): Non-flammable, non-combustible

9(n) Solubility(ies): Water Insoluble

9(o) Partition Coefficient n-octanol/water: ND

9(p) Auto-ignition Temperature: NA

9(q) Decomposition Temperature: ND

9(r) Viscosity: NA

NA - Not Applicable

ND - Not Determined for product as a whole

Section 10 - Stability and Reactivity

10(a) Reactivity: Not Determined (ND) for product in a solid form. Do not use water on molten metal.

10(b) Chemical Stability: Steel products are stable under normal storage and handling conditions.

10(c) Possibility of hazardous reaction: None Known

10(d) Conditions to Avoid: Storage with strong acids or calcium hypochlorite.

10(e) Incompatible Materials: Will react with strong acids to form hydrogen. Iron oxide dusts in contact with calcium hypochlorite evolve oxygen and may cause an explosion.

10(f) Hazardous Decomposition Products: Thermal oxidative decomposition of steel products can produce fumes containing oxides of iron, manganese, lead and copper as well as other alloying elements.

Section 11 - Toxicological Information

11(a-e) Information on toxicological effects: The following toxicity data has been determined for **Carbon Steel Bars-Leaded Grades** when further processed using the information available for its components applied to the guidance on the preparation of an SDS under the GHS requirements of OSHA and the EU CPL:

Hazard Classification	Hazard Category		Hazard Symbols	Signal Word	Hazard Statement
	EU	OSHA			
Acute Toxicity Hazard (covers Categories 1-5)	NA*	4 [a]		**Warning**	Harmful if swallowed.
Eye Damage/ Irritation (covers Categories 1, 2A and 2B)	NA*	2B [c]	No Pictogram	**Warning**	Causes eye irritation.
Carcinogenicity (covers Categories 1A, 1B and 2)	NA*	1B [g]		**Warning**	May cause cancer.
Toxic Reproduction (covers Categories 1A, 1B and 2)	NA*	1 [h]		**Warning**	May damage fertility or the unborn child.
Specific Target Organ Toxicity (STOT) Following Single Exposure (covers Categories 1-3)	NA*	3 [i]		**Warning**	May cause respiratory irritation.
STOT following Repeated Exposure (covers Categories 1 and 2)	NA*	1 [j]		**Danger**	Causes damage to lungs and central nervous system through prolonged or repeated inhalation exposure.

* Not Applicable - Steel products are considered articles and as such are not required to have an SDS or Hazard Classifications according to the criteria specified in REACH Regulation (EC) No 1907/2006] and CPL Regulation (EC) No 1272/2008. See above European Health classification of substances.

Toxicological data listed below are presented regardless to classification criteria. Individual hazard classification categories where the toxicological information has met or exceeded a classification criteria threshold are listed above.

a. No LC_{50} or LD_{50} has been established for **Carbon Steel Bars-Leaded Grades**. The following data has been determined for the components:

- **Iron:** Rat LD_{50} =98.6 g/kg (REACH)
  Rat LD_{50} =1060 mg/kg (IUCLID)
  Rat LD_{50} =984 mg/kg (IUCLID)
  Rabbit LD_{50} =890 mg/kg (IUCLID)
  Guinea Pig LD_{50} =20 g/kg (TOXNET)
  Human LD_{LO} =77 g/kg (IUCLID)
- **Lead Oxide:** Rat LD_{50} > 2000 mg/kg (REACH) (Oral), Rat LC_{50} >5.05 mg/L (REACH) No data (IUCLID)(Inhalation)
- **Copper:** Rat LD_{50} = 481 mg/kg (REACH)
  Rat LD_{50} > 2500 mg/kg (REACH)
- **Manganese:** Rat LD_{50} > 2000 mg/kg (REACH)
  Rat LD_{50} > 9000 mg/kg (NLM Toxnet)

b. No Skin (Dermal) Irritation data available for **Carbon Steel Bars-Leaded Grades** as a mixture or its components.

c. No Eye Irritation data available for **Carbon Steel Bars-Leaded Grades** as a mixture. The following Eye Irritation information was found for the components:

- **Iron:** Causes eye irritation.

d. No Dermal/Respiratory Sensitization data available for **Carbon Steel Bars-Leaded Grades** as a mixture or its components.

Section 11 - Toxicological Information (continued)

11(a-e) Information on toxicological effects (continued):

f. No Germ Cell Mutagenicity data available for **Carbon Steel Bars-Leaded Grades** as a mixture. The following Mutagenicity and Genotoxicity information was found for the components:

- **Iron:** IUCLID has found some positive and negative findings in vitro.

g. Carcinogenicity: IARC, NTP, and OSHA do not list **Carbon Steel Bars-Leaded Grades** as carcinogens. The following Carcinogenicity information was found for the components:

- **Welding Fumes:** IARC-2B, possibly carcinogenic to humans; NIOSH–Ca, potential occupational carcinogen.
- **Chromium (as metal and trivalent chromium compounds):** IARC-3 (organic & inorganic compounds), unclassifiable as to carcinogenicity in humans; ACGIH TLV-A4, not classifiable as a human carcinogen; EPA-D, not classifiable as to human carcinogenicity (CBD, cannot be determined).
- **Chromium (hexavalent):** IARC-1, carcinogen to humans; ACGIH TLV-A1, confirmed human carcinogen; NIOSH–Ca, potential occupational carcinogen; NTP–K, known to be a carcinogen; EPA-A, human carcinogen (by inhalation route of entry), EPA-K, cannot be determined, not classifiable as to human carcinogenicity.
- **Lead**: IARC-2A (inorganic compounds), probably carcinogenic to humans, and IARC-2B, possibly carcinogenic to humans; ACGIH-A3, confirmed animal carcinogen with unknown relevance to humans; NTP-R, reasonably anticipated to be a human carcinogen (RAHC); EPA-B2, probable human carcinogen.

h. No Toxic Reproduction data available for **Carbon Steel Bars-Leaded Grades** as a mixture. The following Toxic Reproductive information was found for the components:

- **Lead:** Male rats oral 60 day NOEL 250 mg/L. Effects on testes (lowest dose). Mouse Reproduction study effects at 0.5% only dose tested. Rat Teratology study LOEL 0.05% Birth weight, size and effects on testis. Reproductive, endocrine and growth effects have been reported.

i. No Specific Target Organ Toxicity (STOT) following a Single Exposure data available for **Carbon Steel Bars-Leaded Grades** as a mixture. The following STOT following a Single Exposure data was found for the components:

- **Iron**: Irritating to Respiratory tract.

j. No Specific Target Organ Toxicity (STOT) following Repeated Exposure data was available for **Carbon Steel Bars-Leaded Grades** as a whole. The following STOT following Repeated Exposure data was found for the components:

- **Copper:** Target organs affected - Skin, eyes liver, kidneys and respiratory tract.
- **Manganese**: Inhalation of metal fumes - Degenerative changes in human Brain; Behavioral: Changes in motor activity and muscle weakness (Whitlock *et al.*, 1966).
- **Lead:** Rat Oral 6 mo NOEL 0.0015 mg/kg CNS Testes and Kidney Effects. Rat inhalation – immunosuppression, Dermal – percutaneous absorption
- **Lead Oxide:** Lead effect include CNS, Reproduction Development.

The above toxicity information was determined from available scientific sources to illustrate the prevailing posture of the scientific community. The scientific resources includes: The American Conference of Governmental Industrial Hygienist (ACGIH) Documentation of the Threshold Limit Values (TLVs) and Biological Exposure indices (BEIs) with Other Worldwide Occupational Exposure Values 2018, The International Agency for Research on Cancer (IARC), The National Toxicology Program (NTP) updated documentation, the World Health Organization (WHO) and other available resources, the International Uniform Chemical Information Database (IUCLID), European Union Risk Assessment Report (EU-RAR), Concise International Chemical Assessment Documents (CICAD), European Union Scientific Committee for Occupational Exposure Limits (EU-SCOEL), Agency for Toxic Substances and Disease Registry (ATSDR), Hazardous Substance Data Bank (HSDB), and International Programme on Chemical Safety (IPCS).

The following health hazard information is provided regardless to classification criteria and is based on the individual component(s) and potential resultant components from further processing:

Acute Effects:

- **Inhalation:** Excessive exposure to high concentrations of dust may cause irritation to the eyes, skin and mucous membranes of the upper respiratory tract. Excessive inhalation of fumes of freshly formed metal oxide particles sized below 1.5 microns and usually between 0.02-0.05 microns from many metals can produce an acute reaction known as “metal fume fever”. Symptoms consist of chills and fever (very similar to and easily confused with flu symptoms), metallic taste in the mouth, dryness and irritation of the throat followed by weakness and muscle pain. The symptoms come on in a few hours after excessive exposures and usually last from 12 to 48 hours. Long-term effects from metal fume fever have not been noted. Freshly formed oxide fumes of manganese and copper have been associated with causing metal fume fever.
- **Eye:** Excessive exposure to high concentrations of dust may cause irritation to the eyes.
- **Skin:** Skin contact with dusts may cause irritation or sensitization, possibly leading to dermatitis. Skin contact with metallic fumes and dusts may cause physical abrasion.
- **Ingestion:** Ingestion of harmful amounts of this product as distributed is unlikely due to its solid insoluble form. Ingestion of dust may cause nausea or vomiting.

Acute Effects by component:

- **Iron and oxides:** Iron is harmful if swallowed, causes skin irritation, and causes eye irritation. Contact with iron oxide has been reported to cause skin irritation and serious eye damage. Particles of iron or iron compounds, which become imbedded in the eye, may cause rust stains unless removed fairly promptly.
- **Copper and oxides:** Copper may cause allergic skin reaction. Copper oxide is harmful if swallowed, causes skin and eye irritation, and may cause an allergic skin reaction.
- **Lead and lead oxides:** Acute exposure to lead can be manifested as abdominal pain, nausea, constipation, anorexia, or vomiting; and, in severe cases coma or death.
- **Manganese and oxides:** Manganese and Manganese oxide are harmful if swallowed.

Section 11 - Toxicological Information (continued)

Delayed (chronic) Effects by component:

- **Iron and oxides**: Chronic inhalation of excessive concentrations of iron oxide fumes or dusts may result in the development of a benign pneumoconiosis, called siderosis, which is observable as an X-ray change. No physical impairment of lung function has been associated with siderosis. Inhalation of excessive concentrations of ferric oxide may enhance the risk of lung cancer development in workers exposed to pulmonary carcinogens. Iron oxide is listed as a Group 3 (not classifiable) carcinogen by the International Agency for Research on Cancer (IARC).
- **Copper and oxides**: Inhalation of high concentrations of freshly formed oxide fumes and dusts of copper can cause metal fume fever. Chronic inhalation of copper dust has caused, in animals, hemolysis of the red blood cells, deposition of hemofuscin in the liver and pancreas, injury to lung cells and gastrointestinal symptoms.
- **Lead and lead oxides:** Lead compounds can be toxic when ingested or inhaled. Lead is a cumulative poison. The predominant effects of excessive exposure are anemia, nervous system disorders, and kidney damage. Nervous system disorders may be displayed as irritability, headaches, insomnia, convulsions, muscular tremors, or palsy of the extremities. Excessive exposure can have adverse effects on human reproduction. Lead interferes with normal function of the adult and developing central nervous system in humans. Lead interferes with different enzyme systems. For this reason, many organs or organ systems are potential targets for lead. Lead can damage fertility or the unborn child.
- **Manganese and oxides:** Chronic exposure to high concentrations of manganese fumes and dusts may adversely affect the central nervous system with symptoms including languor, sleepiness, weakness, emotional disturbances, spastic gait, mask-like facial expression and paralysis. Animal studies indicate that manganese exposure may increase susceptibility to bacterial and viral infections. Occupational overexposure (Manganese) is a progressive, disabling neurological syndrome that typically begins with relatively mild symptoms and evolves to include altered gait, fine tremor, and sometimes, psychiatric disturbances. May cause damage to lungs with repeated or prolonged exposure. Neurobehavioral alterations in worker populations exposed to MnO including: speed and coordination of motor function are especially impaired.

Section 12 - Ecological Information

12(a) Ecotoxicity (aquatic & terrestrial): No Data Available for **Carbon Steel Bars-Leaded Grades** as sold/shipped. However, individual components of the product when processed have been found to be toxic to the environment. Metal dusts may migrate into soil and groundwater and be ingested by wildlife as follows:

- **Iron Oxide**: LC_{50}: >1000 mg/L; Fish 48 h-EC_{50} > 100 mg/L (Currenta, 2008k); 96 h-$LC_0 \geq$ 50,000 mg/L Test substance: Bayferrox 130 red (95 – 97% Fe_2O_3; < 4% SiO_2 and Al_2O_3) (Bayer, 1989a)

12(b) Persistence & Degradability: No Data Available for **Carbon Steel Bars-Leaded Grades** as sold/shipped or individual components.

12(c) Bioaccumulative Potential: No Data Available for **Carbon Steel Bars-Leaded Grades** as sold/shipped or individual components.

12(d) Mobility (in soil): No Data Available for **Carbon Steel Bars-Leaded Grades** as sold/shipped. However, individual components of the product have been found to be absorbed by plants from soil.

12(e) Other adverse effects: None Known

Additional Information:

Hazard Category: Not Reported

Signal Word: No Signal Word

Hazard Symbol: No Symbol

Hazard Statement: No Statement

Section 13 - Disposal Considerations

Disposal: Steel scrap should be recycled whenever possible. Product dusts and fumes from processing operations should be recycled or classified by a competent environmental professional and disposed of in accordance with applicable federal, state or local regulations.

Container Cleaning and Disposal: Follow applicable Federal, state and local regulations. Observe safe handling precautions. European Waste Catalogue (EWC): 16-01-17 (ferrous metals), 12-01-99 (wastes not otherwise specified), 16-03-04 (off specification batches and unused products), or 15-01-04 (metallic packaging).

Please note this information is for Carbon Steel Bars-Leaded Grades in its original form. Any alterations can void this information.

Section 14 - Transport Information

14 (a-g) Transportation Information:

US Department of Transportation (DOT) under 49 CFR 172.101 **does not** regulate **Carbon Steel Bars-Leaded Grades** as a hazardous material. All federal, state, and local laws and regulations that apply to the transport of this type of material must be adhered to.

Shipping Name: Not Applicable (NA)	**Packaging Authorizations**	**Quantity Limitations**
Shipping Symbols: NA	**a) Exceptions:** NA	**a) Passenger, Aircraft, or Railcar:** NA
Hazard Class: NA	**b) Group:** NA	**b) Cargo Aircraft Only:** NA
UN No.: NA	**c) Authorization:** NA	**Vessel Stowage Requirements**
Packing Group: NA		**a) Vessel Stowage:** NA
DOT/ IMO Label: NA		**b) Other:** NA
Special Provisions (172.102): NA		**DOT Reportable Quantities**: NA

International Maritime Dangerous Goods (IMDG) and the Regulations Concerning the International Carriage of Dangerous Goods by Rail (RID) classification, packaging and shipping requirements follow the US DOT Hazardous Materials Regulation.

Section 14 - Transport Information

Regulations Concerning the International Carriage of Dangerous Goods by Road (ADR) does not regulate **Carbon Steel Bars-Leaded Grades** as a hazardous material.

Shipping Name: Not Applicable (NA) **Classification Code:** NA **UN No.:** NA **Packing Group:** NA **ADR Label:** NA **Special Provisions:** NA **Limited Quantities:** NA	**Packaging** **a) Packing Instructions:** NA **b) Special Packing Provisions:** NA **c) Mixed Packing Provisions:** NA	**Portable Tanks & Bulk Containers** **a) Instructions:** NA **b) Special Provisions:** NA

International Air Transport Association (IATA) does not regulate **Carbon Steel Bars-Leaded Grades** as a hazardous material.

	Passenger & Cargo Aircraft		**Cargo Aircraft Only:**	**Special Provisions:**
Shipping Name: Not Applicable (NA)	**Limited Quantity (EQ)**		**Pkg Inst:** NA	NA
Class/Division: NA	**Pkg Inst:** NA	**Pkg Inst:** NA		
Hazard Label (s): NA			**Max Net Qty/Pkg:** NA	**ERG Code:** NA
UN No.: NA	**Max Net Qty/Pkg:** NA	**Max Net Qty/Pkg:** NA		
Packing Group: NA				
Excepted Quantities (EQ): NA				

Pkg Inst – Packing Instructions Max Net Qty/Pkg – Maximum Net Quantity per Package ERG – Emergency Response Drill Code

Transport Dangerous Goods (TDG) Classification: Carbon Steel Bars-Leaded Grades does not have a TDG classification.

Section 15 - Regulatory Information

Regulatory Information: The following listing of regulations relating to a ***Vulcan Threaded Products*** *(dba Vulcan Steel Products)* product may not be complete and should not be solely relied upon for all regulatory compliance responsibilities. This product and/or its constituents are subject to the following regulations:

OSHA Regulations: Air Contaminant (29 CFR 1910.1000, Table Z-1, Z-2, Z-3): The product, **Carbon Steel Bars-Leaded Grades** as a whole is not listed. However, individual components of the product are listed: Refer to Section 8, Exposure Controls and Personal Protection

EPA Regulations: The product, **Carbon Steel Bars-Leaded Grades** is not listed as a whole. However, individual components of the product are listed:

Components	Regulations
Iron	TSCA, SDWA
Manganese	CERCLA, SARA 313, TSCA
Copper	CERCLA, CWA, SARA 313, TSCA, SDWA
Lead	CERCLA, CWA, SARA 313, TSCA, SDWA

SARA Potential Hazard Categories: Immediate Acute Health Hazard; Delayed Chronic Health Hazard

Regulations Key:

CAA	Clean Air Act (42 USC Sec. 7412; 40 CFR Part 61 [As of: 8/18/06])
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act (42 USC secs. 9601(14), 9603(a); 40 CFR Sec. 302.4, Table 302.4, Table 302.4 and App. A)
CWA	Clean Water Act (33 USC Secs. 1311; 1314(b), (c), (e), (g); 136(b), (c); 137(b), (c) [as of 8/2/06])
RCRA	Resource Conservation Recovery Act (42 USC Sec. 6921; 40 CFR Part 261 App VIII)
SARA	Superfund Amendments and Reauthorization Act of 1986 Title III Section 302 Extremely Hazardous Substances (42 USC secs. 11023, 13106; 40 CFR sec. 372.65) and Section 313 Toxic Chemicals (42 USC secs. 11023, 13106; 40 CFR sec. 372.65 [as of 6/30/05])
TSCA	Toxic Substance Control Act (15 U.S.C. s/s 2601 et seq. [1976])
SDWA	Safe Drinking Water Act (42 U.S.C. s/s 300f et seq. [1974])

Section 313 Supplier Notification: The product, **Carbon Steel Bars-Leaded Grades** contains the following toxic chemicals subject to the reporting requirements of section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR part 372:

CAS #	Chemical Name	Percent by Weight
7439-96-5	Manganese	5.0 max
7440-50-8	Copper	1.0 max
7439-92-1	Lead	0.35 max

State Regulations: The product, **Carbon Steel Bars-Leaded Grades** as a whole is not listed in any state regulations. However, individual components of the product are listed in various state regulations:

Pennsylvania Right to Know: Contains regulated material in the following categories:

- Hazardous Substances: Manganese, Chromium, Nickel, Copper
- Environmental Hazards: Manganese, Chromium, Nickel, Copper
- Special Hazardous Substance: Chromium, Nickel

California Prop. 65:  This product can expose you to chemicals including lead (lead compounds) which is known to the State of California to cause cancer and reproductive toxicity. For more information go to www.P65Warnings.ca.gov.

Section 15 - Regulatory Information (continued)

State Regulations (continued):

New Jersey: Contains regulated material in the following categories:

- Hazardous Substance: Manganese, Copper, Lead
- Environmental Hazard: Manganese, Copper, Lead
- Special Hazard: Manganese, Lead

Minnesota: Manganese, Lead

Massachusetts: Manganese compounds, Copper compounds, Lead

Other Regulations:

WHMIS Classification (Canadian): The product, **Carbon Steel Bar-Leaded Grades** is not listed as a whole. However individual components are listed.

Ingredients	WHMIS Classification
Iron	Combustible dusts - Category 1
Manganese	Reproductive toxicity - Category 2; Specific target organ toxicity - repeated exposure - Category 1; Combustible dusts
Copper	Combustible Dusts - Category 1
Lead	Carcinogenicity - Category 2; Reproductive toxicity - Category 1 - Toxic to the reproductive function Toxic to the development; Specific target organ toxicity - repeated exposure - Category 1

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations.

Section 16 - Other Information

Prepared By: Vulcan Threaded Products (dba Vulcan Steel Products)

Original Issue Date: 10/09/18 **Revised Date:** Original

Additional Information:

Hazardous Material Identification System (HMIS) Classification

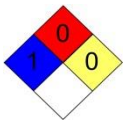
Health Hazard	**1**
Fire Hazard	**0**
Physical Hazard	**0**

HEALTH= **1**, * Denotes possible chronic hazard if airborne dusts or fumes are generated Irritation or minor reversible injury possible.

FIRE= **0**, Materials that will not burn.

PHYSICAL HAZARD= **0**, Materials that are normally stable, even under fire conditions, and will not react with water, polymerize, decompose, condense, or self-react. Non-explosives.

National Fire Protection Association (NFPA)



HEALTH = **1**, Exposure could cause irritation but only minor residual injury even if no treatment is given.

FIRE = **0,** Materials that will not burn.

INSTABILITY = **0**, Normally stable, even under fire exposure conditions, and are not reactive with water.

ABBREVIATIONS/ACRONYMS:

ACGIH	American Conference of Governmental Industrial Hygienists		**NIF**	No Information Found
BEIs	Biological Exposure Indices		**NIOSH**	National Institute for Occupational Safety and Health
CAS	Chemical Abstracts Service		**NTP**	National Toxicology Program
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act		**ORC**	Organization Resources Counselors
CFR	Code of Federal Regulations		**OSHA**	Occupational Safety and Health Administration
CNS	Central Nervous System		**PEL**	Permissible Exposure Limit
GI, GIT	Gastro-Intestinal, Gastro-Intestinal Tract		**PNOR**	Particulate Not Otherwise Regulated
HMIS	Hazardous Materials Identification System		**PNOC**	Particulate Not Otherwise Classified
IARC	International Agency for Research on Cancer		**PPE**	Personal Protective Equipment
LC50	Median Lethal Concentration		**ppm**	parts per million
LD50	Median Lethal Dose		**RCRA**	Resource Conservation and Recovery Act
LD $_{Lo}$	Lowest Dose to have killed animals or humans		**RTECS**	Registry of Toxic Effects of Chemical Substances
LEL	Lower Explosive Limit		**SARA**	Superfund Amendment and Reauthorization Act
µg/m^3	microgram per cubic meter of air		**SCBA**	Self-contained Breathing Apparatus
mg/m^3	milligram per cubic meter of air		**STEL**	Short-term Exposure Limit
mppcf	million particles per cubic foot		**TLV**	Threshold Limit Value
MSDS	Material Safety Data Sheet		**TWA**	Time-weighted Average
MSHA	Mine Safety and Health Administration		**UEL**	Upper Explosive Limit
NFPA	National Fire Protection Association			

Section 16 - Other Information (continued)

Disclaimer: This information is taken from sources or based upon data believed to be reliable. Our objective in sending this information is to help you protect the health and safety of your personnel and to comply with the OSHA Hazard Communication Standard and Title III of the Superfund Amendment and Reauthorization Act of 1986. **Vulcan Threaded Products** makes no warranty as to the absolute correctness, completeness, or sufficiency of any of the foregoing, or any additional, or other measures that may not be required under particular conditions. **Vulcan Threaded Products** MAKES NO WARRANTIES, EXPRESS OR IMPLIED, INCLUDING THE IMPLIED WARRANTY OF MERCHANTABILITY, OR ANY IMPLIED WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE, AND ANY IMPLIED WARRANTIES OTHERWISE ARISING FROM COURSE OF DEALING OR TRADE.

Products covered for Carbon Steel Bars-Leaded Grades include:

Carbon Steel Bar 12L14

Other Carbon Steel-Leaded Grades