

# MATERIAL SAFETY DATA SHEET

ISSUE DATE: 05/20/88

REVISED DATE: 03/17/16

Supersedes Any Previous M.S.D.S. On This Product.

EMERGENCY TELEPHONE NUMBER: CHEM-TEL, INC. 1-800-255-3924

## I. IDENTIFICATION

**PRODUCT NAME:** Carbon Steel Products

**PRODUCT CLASS:** Steel

DUCTMATE INDUSTRIES, INC.

210 Fifth Street

Charleroi, PA 15022

## II. HAZARDOUS INGREDIENTS

<u>MATERIAL:</u>	<u>% WEIGHT</u>	<u>OSHA PEL</u>	<u>ACGIH TLV</u>
Iron	>97.0	10 mg/M3 (Iron oxide fume)	5 mg/M3 (Iron oxide dust & fume)
Aluminum	0.01 – 0.5	15 mg/M3 – Total dust 5 mg/M3 – Respirable fraction	10 mg/M3 – Metal Dust 5 mg/M3 – Welding fume
Boron	≤0.003 (Max)	15 mg/M3 – Total dust (as Boron oxide)	10 mg/M3 – Boron oxide
Calcium	0.10 (Max)	5 mg/M3 Calcium oxide	2 mg/M3 – Calcium oxide
Carbon	0.60 (Max)	15 mg/M3 – Total dust (PNOR) <sup>3</sup> 5mg/M3 – Respirable fraction (PNOR)	10 mg/M3 – Inhalable fraction <sup>4</sup> (PNOR) <sup>5</sup> 3 mg/M3 – Respirable fraction <sup>6</sup> (PNOS)
Chromium*	≤ 0.5 (Max)	1.0 mg/M3 (Chromium metal)	0.5 mg/M3 - Chromium metal & Cr III compounds
Columbium	≤ 0.15 (Max)	15 mg/M3 – Total dust (PNOR) 5 mg/M3 – Respirable fraction (PNOR)	10 mg/M3 - Inhalable fraction (PNOS) 3 mg/M3 – Respirable fraction (PNOS)
Copper	0.50 (Max)	0.1 mg/M3 – Fume (as Cu) 1 mg/M3 – Dusts & mists (as Cu)	0.1 mg/M3 – Fume 1 mg/M3 – Dusts & mists (as Cu)
Manganese	2.0 (Max)	5 mg/M3 (C) - Fume & Mn compounds	0.2 mg/M3
Molybdenum	≤ 0.25 (Max)	15 mg/M3 – Total dust (as Mo)	10 mg/M3 – Metal and insoluble compounds (Inhalable fraction) 3 mg/M3 – Metal & insoluble fraction (Respirable fraction)
Nickel*	≤ 0.3 (Max)	1.0 mg/M3 – Metal & insoluble compounds (as Ni)	1.5 mg/M3 – Elemental nickel (as Ni) 0.2 mg/M3 – Insoluble compounds (NOS) <sup>7</sup>
Phosphorus	0.15 (Max)	0.1 mg/M3	0.1 mg/M3
Silicon	≤ 1.00 (Max)	15 mg/M3 -Total dust 5 mg/M3 – Respirable fraction	10 mg/M3
Sulfur	≤ 0.04 (Max)	15 mg/M3 Total dust (PNOR) 5 mg/M3 – Respirable fraction (PNOR)	10 mg/M3 – Inhalable fraction (PNOS) 3 mg/M3 – Respirable fraction (PNOS)
Tin	≤ 0.01 (Max)	2 mg/M3 – Tin metal (as Sn)	2 mg/M3 – Inorganic compounds (except oxides) (as Sn)
Titanium	≤ 0.15 (Max)	15 mg/M3 – total dust (PNOR) 5 mg/M3 – Respirable fraction (PNOR)	10 mg/M3 (Titanium dioxide)
Vanadium	≤ 0.15 (Max)	0.5 mg/M3 (C) – Respirable fractions as V <sub>2</sub> O <sub>5</sub> 0.1 mg/M3 (C) - Fume (as V <sub>2</sub> O <sub>5</sub> )	0.05 mg/M3 – Dust or fume (as V <sub>2</sub> O <sub>5</sub> )

### Notes:

All commercial steel products contain small amounts of various elements in addition to those specified. These small quantities frequently referred to as “trace” or “residual” elements, generally originate in the raw materials used. Individual trace elements vary in concentration by weight, and may include antimony, arsenic, cadmium, cobalt, lead, and zirconium.

OSHA Permissible Exposure Limits (PELs) are 8-hours 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.

Threshold Limit Values (TLV) established by the American Conference of Governmental Industrial Hygienists (ACGIH) are 8-hour TWA concentrations unless otherwise noted.

PNOR (Particulates Not Otherwise Regulated). All inert or nuisance dusts, whether mineral, inorganic or organic, not listed specifically by substance name are covered by PNOR limit which is the same as the inter or nuisance dust limit of 15 mg/M3 for total dust and 5 mg/M3 for the respirable fraction.

Inhalable fraction. The concentration of inhalable particulate for the application of this TLV is to be determined from the fraction passing a size-selector with the characteristics defined in the ACGIH TLVs and BELs Appendix D, paragraph A.

PNOS (Particulates Not Otherwise Specified). Particulates identified under the PNOS heading are “nuisance dusts” containing no asbestos and <1% crystalline silica. A TWA-TLV of 10 mg/M3 for inhalable particulate and 3 mg/M3 for respirable particulate has been recommended.

Respirable fraction. The concentration of respirable dust for the application of this limit is to be determined from the reaction passing a size-selector with the characteristics defined in the ACGIH TLVs and BELs Appendix D, paragraph C.

\*Suspect Carcinogen by NTP and IARC

### III. PHYSICAL DATA

**APPEARANCE:** Metallic Gray, Odorless

**SPECIFIC GRAVITY:** 7.85

**MELTING POINT:** 2750° F

### IV. HEALTH HAZARD DATA

**ROUTE OF EXPOSURE:** Inhalation of dusts or fumes.

**EFFECTS OF OVEREXPOSURE:**

**Acute Effect:** Excessive exposure to high concentrations of dust may cause irritation of the eyes skin and mucous membranes of the upper respiratory tract. Excessive inhalation of metal fumes 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) which come on a few hours after large exposures and usually last 12 to 48 hours.

**Chronic Effects:** Only after six to ten years of exposure to iron dust or fume does one present any signs of pneumoconiosis (i.e. siderosis). Physical examinations of those exposed to iron dust have not indicated any disability.

Excessive and repeated inhalation of chromium fume or dust may cause severe irritation, ulceration or cancer in the respiratory system. It is generally believed that the hexavalent forms of chromium (Cr + 6) are responsible for these effects. It is uncertain whether metallic chromium in dust form can cause the same effects noted above.

Excessive and prolonged inhalation of manganese (generally over two years exposure) can cause damage to the central nervous system. The pathology resembles Parkinson Disease. Also, workers routinely exposed to high concentrations of manganese display an unusually high incidence of respiratory disease.

Molybdenum has caused eye, skin, nose, and throat irritation in animals.

Excessive inhalation of nickel fumes have been associated with respiratory cancer. Nickel is a potential sensitizer and may cause allergic reactions.

Boron oxide dusts and fumes may cause upper respiratory tract and eye irritation, dryness of the mouth, nose or throat, and sore throat and productive cough.

Repeated and prolonged inhalation of calcium may cause inflammation of the respiratory passages, ulcers of the mucous membranes, and possible perforation of the nasal septum. Repeated or prolonged skin contact may cause dermatitis.

Chronic inhalation of high concentrations of carbon may cause pulmonary disorders.

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.

Exposure to dust and fume of tin (oxide) is recognized to result in a benign pneumoconiosis called stannosis.

Vanadium dusts cause a persistent cough, which can develop after five hours of exposure and may last up to ten days.

Pulmonary irritation also results from vanadium, but there are no deviations in pulmonary function or other laboratory tests.

### V. EMERGENCY AND FIRST AID

**INHALATION:** If acute overexposure to dusts or fumes occurs, remove victim from the adverse environment and seek medical attention.

**SKIN CONTACT:** Remove contaminated clothing. Wash area of contact thoroughly with soap and water. If irritation persists, seek medical attention.

**EYE CONTACT:** Flush immediately with running water for fifteen minutes. If irritation persists, seek medical attention.

**INGESTION:** N/A

### VI. FIRE AND EXPLOSION HAZARD DATA

**FLASH POINT:** N/A

**EXTINGUISHING MEDIA:** Not applicable for solid product. Use extinguishers appropriate for surrounding material.

**SPECIAL PROCEDURES:** Firemen should wear equipment to protect against noxious fumes.

### VII. SPILL OR LEAK PROCEDURES

Minimal problems with spills of this product would occur because of its solid form. However, if there is a spill of dust, clean up using methods which avoid dust generation and the use of water, such as vacuum. If airborne dust is generated during the cleanup, use an appropriate NIOSH- approved respirator.

Waste Disposal Method: Dispose of in accordance with appropriate federal, state and local regulations.

### VIII. SPECIAL PROTECTION

**VENTILATION:** Local exhaust ventilation should be provided to keep worker exposures within allowable limits.

**RESPIRATORY PROTECTION:** Use NIOSH/MSHA approved organic vapor respirators when vapor concentrations exceed the TLV.

**EYE PROTECTION:** Personal protective equipment should be worn when there is a reasonable probability of injury.

**PROTECTIVE GLOVES:** As needed.

### IX. CARCINOGENIC ASSESSMENT

IARC, NTP and OSHA do not list steel products as carcinogens. The International Agency for Research on Cancer (IARC) identifies nickel, certain nickel compounds and welding fumes as Group 2B carcinogens that are possibly carcinogenic to humans. IARC lists chromium metal and trivalent chromium compounds as Group 3 carcinogens, not classifiable as to their human carcinogenicity. Hexavalent chromium compounds are listed by IARC as Group 1 carcinogens that are carcinogenic to humans.

## **X. REACTIVITY DATA**

**STABILITY:** Stable under normal conditions of handling and use.

**CONDITIONS TO AVOID:** Poor ventilation. Storage with strong acids or calcium hypochlorite.

**INCOMPATIBILITY:** Strong acids (produce hydrogen gas). Iron oxide dusts in contact with calcium hypochlorite evolve oxygen and may cause an explosion.

**HAZARDOUS DECOMPOSITION PRODUCT:** Thermal oxidative decomposition of steel products can produce fumes containing oxides of iron and manganese as well as other elements. If present, the resin on the product line may yield noxious gases such as oxides of carbon upon thermal oxidative decomposition.

**HAZARDOUS POLYMERIZATION:** Will not occur.

## **XI. SPECIAL PRECAUTIONS**

**HANDLING AND STORAGE:** Operations with the potential for generating high concentrations of airborne particulates should be evaluated and controlled as necessary. Practice good housekeeping Avoid breathing metal fumes and/or dust.

Store away from acids and incompatible materials.

This information is taken from sources or based upon data believed to be reliable; however, DUCTMATE INDUSTRIES, INC. makes no warranty as to the absolute correctness or sufficiency of any of the foregoing or that additional or other measures may not be required under particular conditions.