

## STEEL AND WHMIS

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### 1. PRODUCT / COMPANY INFORMATION

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Importer / Supplier / Distributor:

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### 2. WHMIS OVERVIEW

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Workplace Hazardous Materials Information System (WHMIS) is the result of a consultative process involving labour, industry and federal and provincial governments. The process began in the early 1980's and resulted in the law, which was implemented starting October 31, 1988. The law is aimed at giving Canadian workers the "right to know" more about the safety and health hazards of the workplace. This law applies nationally in every province and territory.

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### 3. COMPONENTS

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The three components of the information delivery system in WHMIS are:

- (I) Warning labels on containers of hazardous materials.
- (II) Material Safety Data Sheets (MSDS) for each product. These detail information about the hazardous material.
- (III) Employee training on what WHMIS is and how to work safely with hazardous materials.

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### 4. STEEL IN RELATION TO WHMIS

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Steel in its natural state poses no health hazard. Operations such as welding, burning, or grinding may pose acute or chronic health hazards through the release of controlled products from the steel substrate or from the coating material itself.

The attached M.S.D.S's describe various grades of steel and the health effects which could result from overexposure to fumes or dust generated from welding, burning, or grinding; preventative measures to prevent exposure and emergency procedures to follow.

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### 5. STEEL COATINGS

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Steel can be coated with a variety of metallic and non-metallic materials. The concentration of these materials is such that they need not be disclosed on the MSDS. A general description of the health effects and precautionary measures to follow are presented below for both metallic and non-metallic coatings.

#### **Non-Metallic Steel Coatings**

##### *DRY LUBRICANTS*

This class of coatings includes materials composed of borates and carbonates. These materials are skin, eye and respirator irritants; the quantity of material, which would appear in steel, would not pose a high inhalation hazard. Protective measures for skin and eyes should be addressed.

##### *PETROLIUM BASED LUBRICANTS AND COATINGS*

This class of coating is oil with carrying viscosities and / or various additives as minor components. These components include:

- (I) Corrosion Inhibitors (Sulphonates)
- (II) Emulsifiers (Fatty Acids)
- (III) Detergents (Sulphonates)
- (IV) Antioxidants (Amines)

These materials are eye, skin and respiratory irritants. The primary concern in regards to this class of coating is skin contact. Lighter kerosene type materials may cause de - fatting of tissue, redness, and possibly dermatitis upon prolonged contact. Heavier - type oils can block pores leading to acne like inflammation (oil acne).

Protective measures for skin and eyes should be taken. Good personal hygiene practices should be followed (i.e. washing hands or other affected areas with mild soap and water).

## **METALLIC COATINGS**

This group of coatings would only pose a health hazard if welding, burning or grinding were to take place in an uncontrolled manner.

### **ZINC**

Products which may have zinc as a coating include Galvanized, Galvalume, Galvanneal or Zincrometal.

### **TIN**

Products, which may have tin as a coating, include Tin Mill Material or Tin Plate.

### **CHROMIUM**

Products that may have chromium as a coating include Zincrometal, Tin Mill or Tin Plate material. Chromium may be found in a variety of forms, which include chromium metal, chromium (III) oxide and chromium (VI) compounds. Dust and fumes of chromium metal and chromium (III) oxide generated during welding and grinding are classed as respiratory irritants. Prolonged inhalation overexposures to certain hexavalent chromium (VI) compounds have been linked with an increased risk of cancer. The International Agency for Research (IARC) has listed certain chromium (VI) compounds as Group 1 compounds (i.e. carcinogenic to humans). The low chromium content of those steel grades referenced on the MSDS would indicate that the chromium hazard would be minimal at best. Chromium coated materials may cause skin irritation and / or dermatitis upon prolonged contact to sensitive individuals.

## **PRECAUTIONARY MEASURES FOR METALLIC COATINGS**

Since the primary hazard of metallic coatings result from the overexposure through inhalation of metal fumes or dust during welding, burning or grinding, a brief overview of precautions to be taken, especially during welding, burning or grinding is given.

Welding operations generally involve the melting of a metal in the presence of a flux or shielding gas by means of a flame or metal arc. The composition of the welding fumes and gases formed are dependant upon the base metal, welding consumable and fluxes and metal surface coatings.

Welding fumes are generated when the filler metal and (to a lesser extent) the base metal becomes vaporized. Rapid condensation of the metal vapor backs into a fine particulate material, namely welding fumes.

The key precautions to investigate in order to protect welders as a result of welding fume generated general or local ventilation and / or proper approved respiratory protection. Various sources may be consulted to obtain more information on these topics such as the Canadian Welding Institute, Ministry of Labour, Local Safety Association Office or the texts listed at the end of this overview (the list is by no means exhaustive but is intended only for informational purposes).

Other hazards are created due to the welding process include ultraviolet radiation from the welding arc which could affect eyes, as well as infrared radiation that generates heat. Thus, proper eye and skin protection will also be required. The type and degree of protection is dependant upon the welding process, which is being carried out.

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## **6. REFERENCE SOURCES**

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- (I) "Safety in Welding, Cutting and Allied Processes" (CAN / CSA-W117.2-M87) - Canadian Standards Association - Rexdale, Ontario
- (II) "The Welding Environment" - American Welding Society - Miami, Florida
- (III) "Selection, Care and Use of Respirators" (Z94.4 - M1982) Canadian Standards Association - Rexdale, Ontario
- (IV) "Industrial Ventilation - A Manual for Recommended Practice" - American Conference of Governmental Industrial Hygienists