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**FICHE SIGNALÉTIQUE / MATERIAL SAFETY DATA SHEET**

SE CONFORME A LA LOI C-70 SUR LES PRODUITS DANGEREUX ET AU CODE CANADIEN DU TRAVAIL  
 COMPLIES WITH BILL C-70 HAZARDOUS PRODUCT ACT AND THE CANADA LABOUR CODE

**SECTION 1 – IDENTIFICATION**



NOM DU PRODUIT ET / OU NUMÉRO - PRODUCT NAME AND / OR NUMBER	
<b>STARWELD 45</b>	
TYPE DE PRODUIT – PRODUCT TYPE	
<b>ÉLECTRODE</b>	

**SECTION 2 – INGREDIENTS DANGEREUX\***

**HAZARDOUS INGREDIENTS\***

INGRÉDIENTS**	ÉCHELLE DES CONCENTRATIONS RANGE OF %	NO. ACNOR CAS NO.	LIMITE D'EXPOSITION EXPOSURE LIMIT (Mg / m³) CAHIG SEA*** ACGIH TLV
→FER ELEMENTAIRE / IRON ELEMENTAL	60 – 90	7439846	5.0
→DIOXYDE DE TITANE / TITANIUM DIOXYDE	10 – 30	1344098	10.5
→SILICE CRYSTALLINE QUARTZ/SILICA CRYSTALLINE QUARTZ	0.1 - 1	14808607	3.0
→FLUORURE DE CALCIUM / CALCIUM FLUORIDE	7 – 13	7784755	2.5 (FUME)
→ALPHA ALUMINE / ALPHA ALUMINA	0.5 – 1.5	1344281	10.0
→SILICATE DE SODIUM / SODIUM SILICA	7 – 13	1344098	NOT LISTED
→MICA / MICA	3-7	12001262	3.0
→MANGANESE ELEMENTAIRE / MANGANESE ELEMENTAL	3 – 7	7439965	1.0
→ZIRCON / ZIRCON	1 – 5	14940682	NOT LISTED
→SILICATE DE POTASSIUM / POTASSIUM SILICATE	7 – 13	1312761	NOT LISTED

\*CETTE SECTION SE RAPPORTE AUX MATÉRIAUX CONSTITUANT LE PRODUIT MANUFACTURÉ. LES FUMÉES LES GAZ QUI PEUVENT SE PRODUIRE DURANT LE SOUDAGE SONT COUVERTS À LA SECTION 5 LE TERME "DANGEREUX" DOIT ÊTRE INTERPRÉTÉ TEL QUE DÉTERMINÉ DANS LA LOI C-70, PARTIE I, MAIS N'IMPLIQUE PAS NÉCESSAIREMENT QU'IL Y A DANGER  
 \*\* LES INGRÉDIENTS À INDICE TOXIQUE MENTIONNÉS CI-DESSUS SONT ÉNUMÉRÉS DANS LA LOI C-70, CHAPITRE 30, PARTIE II, SECTION 13 DE LA "LOI SUR LES PRODUITS DANGEREUX" OU OSHA 29 CFR 1910, 1200.  
 \*\*\* LES SEUILS D'EXPOSITION ADMISSIBLES (SEA) SONT PUBLIÉS PAR "CONFÉRENCE AMÉRICAINE DES HYGIENISTES INDUSTRIELS GOUVERNEMENTAUX" (CAHIG). TOUTEFOIS, LES SEUILS D'EXPOSITION CANADIENNES PEUVENT DIFFÉRER SELON VOTRE JURIDICTION (PROVINCIALE, TERRITORIALE OU FÉDÉRALE). VOTRE COMPAGNIE DOIT LÉGALEMENT RESPECTER CES SEUILS D'EXPOSITION APPLICABLES MÊME SI CEUX-CI NE SONT PAS ÉNUMÉRÉS SUR CETTE FICHE SIGNALÉTIQUE. VOIR SECTION 6.

THIS SECTION COVERS MATERIALS FROM WHICH THIS PRODUCT IS MANUFACTURED. THE FUMES AND GASES PRODUCED DURING NORMAL USE OF THIS PRODUCT ARE COVERED BY SECTION 5 THE TERM "HAZARDOUS" SHOULD BE INTERPRETED AS A TERM REQUIRED AND DEFINED IN BILL C-70, PART I; BUT DOES NOT NECESSARILY IMPLY THE EXISTENCE OF ANY HAZARD.  
 \*\* HAZARDOUS INGREDIENTS LISTED ABOVE COMPLIES TO BILL C-70, CHAPTER 30, PART II, SECTION 13 OF THE "HAZARDOUS PRODUCTS ACT" OR OSHA 29 CFR 1910, 1200.  
 \*\*\*COMMON EXPOSURE LIMITS, TLVs (THRESHOLD LIMIT VALUES) ARE PUBLISHED BY THE AMERICAN CONFERENCE OF GOVERNMENTAL INDUSTRIAL HYGIENISTS (ACGIH) HOWEVER, CANADIAN LEGAL EXPOSURE LIMITS CAN BE DIFFERENT DEPENDING ON YOUR JURISDICTION (PROVINCIAL, TERRITORIAL OR FEDERAL). YOUR COMPANY MUST FOLLOW THE APPLICABLE LEGAL LIMITS, WHICH ARE NOT NECESSARILY THOSE LISTED ON MSDS. SEE ALSO SECTION 6.

# WELDING FILLER ALLOYS, THERMAL SPRAY MATERIAL, FLUXES AND CHEMICAL AIDS

## SECTION 3 - PHYSICAL/CHEMICAL CHARACTERISTICS

Not applicable for arc welding electrodes and brazing rods. For fluxes, chemical aids and other materials see SECTION 2.

## SECTION 4 - FIRE AND EXPLOSION

For welding filler alloy and fluxes :

Welding arc sparks and brazing flames can ignite combustibles and flammables. Refer to CSAW 117.2 for fire prevention during the use of welding and allied procedures. Certain chemical aids may be flammable or explosive. See SECTION 2.

For thermal spray and chemical aids :

Non-flammable under normal working conditions. Certain metals or polymer powder dust may present a fire or explosion hazard under favorable conditions of particle size, dispersion and strong ignition source. Refer to AWS C2.1 'Recommended Safe Practices For Thermal Spraying' for more detail. Certain chemical aids may be flammable or explosive. See SECTION 2.

## HAZARD DATA

## SECTION 5 - REACTIVITY DATA

### HAZARDOUS DECOMPOSITION PRODUCTS

Fumes and gases cannot be classified simply. The composition and quantity of both are dependent upon the material being deposited, the metal welded, the welding process and electrodes used. Other conditions which also influence the composition and quantity of the fumes and gases to which workers may be exposed include : coatings on the metal being welded (such as paint, plating or galvanizing), the number of welders and the volume of the work area, the quality and amount of ventilation, the position of the worker's head with respect to the fume plume, as well as the presence of contaminants in the atmosphere such as chlorinated hydrocarbon vapors from cleansing and degreasing activities.

During thermal spraying, the fume and gas decomposition products generated are different in percent and form from the ingredients listed in SECTION 2. Decomposition products of normal operation include those originating from volatilization, reaction, or oxidation of the materials shown in SECTION 2, plus those from the base metal and coating, etc.

Reasonably expected constituents of the fume would include complex oxides of the metals and vapours from polymers as listed in SECTION 2.

Gaseous reaction products may include carbon monoxide and carbon dioxide. Ozone and nitrogen oxides may be formed by the radiation from the arc.

One recommended way to determine the composition and quantity of fumes, gases and dusts to which workers are exposed is to take an air sample inside the welder's helmet if worn or in the worker's breathing zone. See : ANSI/AWS F1.1 available from the American Welding Society, P.O Box 351040, Miami, Florida, 33135, 'Evaluating Contaminants in the Welding Environment-A sampling strategy guide' which gives additional advice on sampling.

Certain welding fluxes and chemical aids may be corrosive to certain material, skin and eyes.

## SECTION 6 - TOXICOLOGICAL PROPERTIES / HEALTH HAZARD DATA

### THRESHOLD LIMIT VALUE

The ACGIH recommended general limit for welding fume NOC (Not Otherwise Classified) is 5 mg/m<sup>3</sup>. ACGIH - 1985 (or latest date) preface states, The TLV-TWA should be used as guides in the control of health hazards and should not be used as fine lines between safe and dangerous concentrations.

### PRIMARY ROUTES OF ENTRY

Fumes and gases may be inhaled. Skin or eye contact may occur with fluxes, chemical aids and other materials.

### EFFECTS OF OVEREXPOSURE

Electric arc welding and thermal spraying may create one or more of the following health hazards. Fumes and Gases can be dangerous to your health.

**short-term exposure to welding fumes**, gases and dusts may result in discomfort such as dizziness, nausea or dryness or irritation of nose, throat or eyes.

**BARIUM** - Aching eyes, rhinitis, frontal headache, wheezing, laryngeal spasms, salivation, anorexia.

**CADMIUM** - Dusts and fumes of cadmium affect the respiratory tract, can cause frontal headache, pain chest, vomiting, diarrhoea, may affect the kidneys and may cause metal fume fever. Severe exposure can be fatal.

**CHROMIUM** - Inhalation of fume with chromium compound can cause irritation of the respiratory system, damage to the lungs and asthma like symptoms. Swallowing chromium salts can cause severe injury or death. Dusts on the skin can form ulcers. Eyes may be burned by chromium compounds. Allergic reactions likely in some people from chromium compounds.

**COPPER** - Metal fume fever can be caused by fresh copper oxide fumes.

**FLUORIDES** - Fluoride compounds evolved may cause skin and eye burns and/or pulmonary edema bronchitis.

**MANGANESE - MANGANESE DIOXIDE** - Toxicity caused by inhalation of the dust or fumes. Nausea, allergic reaction.

**NICKEL - NICKEL OXIDE** - Metallic taste, nausea, tightness in chest, fever, allergic reactions. Allergic reactions likely in about 10% of workers.

**POLYMERS** - Can react with other materials and on overheating can form toxic fumes such as chlorides.

**SILICON - SILICON OXIDE** - Possible eye irritant. Remove by irrigating eyes with copious amounts of water.

**SILVER** - Salts of silver are corrosive. Ulceration and eye burns are treated by using copious amounts of water.

**TIN** - Eye, skin and respiratory system irritation from fumes.

**ZINC** - Chills, breathing difficulties, fever, cough, muscular pain, nausea and vomiting.

**Long term overexposure** may lead to siderosis (iron deposits in lungs) and may affect pulmonary functions.

**BARIUM** - Long term exposure to soluble barium compounds may cause nervous disorders and may have deleterious effects on the heart and circulatory system and musculature.

**CADMIUM** - Continued exposure symptoms may be inflammation of the nose and throat, bleeding, nausea, anemia, anorexia, insomnia, liver and kidney disorders. Cadmium causes "ITAI - ITAI" disease by forcing body to excrete calcium and thus weakens the bones.

**CHROMIUM** - Studies have shown that chromate production workers exposed to hexavalent chromium compounds have an excess of lung cancers. Chromium compound are required by OSHA to be considered carcinogenic. Absorption of chromium compound through the skin can cause systemic poisoning primarily affecting the kidneys and liver. Good practice requires the reduction of employee exposure to chromium materials.

**COPPER** - No adverse long term effects due to copper and copper oxide have been reported in literature.

**FLUORIDES** - Repeated exposure to fluorides can cause serious bone erosion.

**MANGANESE - MANGANESE DIOXIDE** - Long term overexposure to manganese compounds may affect the central nervous system. Symptoms include muscular weakness, tremors similar to Parkinson's disease. Behavioral changes and changes in handwriting may also appear. Employees exposed to manganese compounds should get quarterly medical examinations for early detection of manganese poisoning.

**NICKEL - NICKEL OXIDE** - Long term overexposed to nickel compounds may cause lung fibrosis or pneumoconiosis. Studies of the nickel refinery workers indicated a higher incidence of lung and nasal cancers. Nickel and its compounds are required to be considered as carcinogenic by OSHA although the International Agency for Research on Cancer States that specific nickel compounds that may be carcinogenic to humans cannot be identified.

**POLYMERS** - Can react with other materials and on overheating can form toxic fumes such as chlorides.

**SILICON - SILICON OXIDE** - Prolonged exposure to dust can cause a pulmonary fibrosis (silicosis).

**SILVER** - Silver and silver compounds pigments the skin, eyes and respiratory tract.

**TIN** - No significant long-term effects.

**ZINC** - Severe and prolonged overexposure to zinc oxide may cause pulmonary edema and pneumonia.

**ARC RAYS** - Can injure eyes and burn skin.

**ELECTRIC SHOCK** can kill.

**RADIATION** - Arc and flame produces radiation (visual and non-visual) that can injure eyes or burn exposed skin.

**NOISE** - Some equipment may produce excessive sound levels or frequency requiring ear protection.

Certain fluxes and chemical aids can burn skin, eyes and may develop allergies.

## SECTION 7 - EMERGENCY AND FIRST AID PROCEDURES

Remove to well-ventilated area and apply artificial respiration if needed. Wash eyes and/or skin with water. Call for medical aid. Employ first-aid techniques recommended by the Red Cross or St John's Ambulance.

### CARCINOGENICITY

Nickel, chromium, cadmium and their compounds and oxides are considered by the International Agency for Research on Cancer (IARC) and National Toxicology Program (NTP) as known or probable human carcinogens.

## SECTION 8 - PREVENTIVE MEASURES

PRECAUTIONS FOR SAFE HANDLING AND USE APPLICABLE CONTROL MEASURES.

Read and understand the manufacturer's instructions and the precautionary label on the product.

**RESPIRATORY PROTECTION** - Use CSA approved respirable fume respirator or air supplied respirator when working in confined space or where local exhaust or ventilation does not keep exposure below the recommended exposure limit. Refer to CSA Z94.4 'Selection, Care and Use of Respirators'.

**VENTILATION** - Use enough general ventilation and local exhaust at the work site to keep the fumes, gases and dusts from the worker's breathing zone and the general area. Train the worker to keep his head out of the fumes.

**EYE PROTECTION** - Wear helmet or use face shield with filter lens. Provide protective screens and flash goggles if necessary, to shield others. As a rule, start with a shade that is too dark to see the work zone. Then go to the next lighter shade which gives sufficient view of the weld zone.

**OTHER PROTECTIVE EQUIPMENT** - wear hand, head and body protection which helps to prevent injury from radiation, flames, sparks and electrical shock. See CSA W117.2. At a minimum, this includes gloves and a protective face shield, and may include arm protectors, aprons, hats, shoulder protection, as well as dark substantial clothing. Train the worker not to touch live electrical parts and to insulate himself from work and ground. Additional protection for fluxes, cleaners, acid and alkalin chemicals may be required to prevent skin or eye contact.

**PROCEDURE FOR CLEANUP OF SPILLS** - Not applicable.

**WASTE DISPOSAL METHOD** - Prevent waste from contaminating surrounding environment. Discard any product, residue, disposable container or liner in an environmentally acceptable manner, in full compliance with federal, provincial and local regulations.

**NOTE** : For references or information contact : Canadian Center of Occupational Health and Safety (CCOHS), tel.: 1 (905) 572-2981.

## SECTION 9 - PREPARATION INFORMATION

Prepared by : Starweld, 1-514-422-8698

Department : Technical Service

Preparation date : See page 1 of this msds