

Section 1. Chemical Product and Company Identification

| | | |
|-----------------------------|---|-----------------------------------|
| Product name | Classification | Classification |
| Blueshield: | CSA: | AWS: |
| 640-308L; | ER308L; | ER308L; |
| 640-308HiSil; | ER308LSi; | ER308LSi; |
| 640-309L; | ER309L; | ER309L; |
| 640-309LHiSil; | ER309LSi; | ER309LSi; |
| 640-316L; | ER316L; | ER316L; |
| 640-316LHiSil; | ER316LSi; | ER316LSi; |
| Description | : GMAW Stainless Consumables | Generic Code : AL-T-013-0 |
| In case of emergency | : 1-514-878-1667 | Date of issue : 01/15/2011 |
| Supplier | : Air Liquide Canada Inc. 1250, René-Lévesque West, Suite 1700 Montreal, QC H3B 5E6 | |

Section 2. Hazards Identification

| | |
|---|--|
| Physical state and Appearance | : Solid. |
| Emergency overview | : These hazards relate to welding fumes (electrodes in use) and not to the electrodes as sold. WARNING! ELECTRIC SHOCK can kill. FUMES AND GASES can be dangerous to your health. ARC RAYS can injure eyes and burn skin. MAY BE HARMFUL IF INHALED. CAUSES RESPIRATORY TRACT, EYE AND SKIN IRRITATION. MAY CAUSE ALLERGIC SKIN REACTION. CONTAINS MATERIAL THAT CAN CAUSE TARGET ORGAN DAMAGE. CANCER HAZARD - CONTAINS MATERIAL WHICH CAN CAUSE CANCER. Do not handle until all safety precautions have been read and understood. Obtain special instructions before use. Use only with adequate ventilation. Do not eat, drink or smoke when using this product. Avoid contact with eyes, skin and clothing. Keep container tightly closed. Use personal protective equipment as required. Wash thoroughly after handling. |
| Routes of entry | : Absorbed through skin. Dermal contact. Eye contact. Inhalation. |
| Potential acute health effects | |
| Eyes | : Very hazardous by the following route of exposure: of eye contact (irritant). Inflammation of the eye is characterized by redness, watering and itching. |
| Skin | : Hazardous by the following route of exposure: of skin contact (corrosive, irritant, sensitizer). Skin contact may produce burns. Skin inflammation is characterized by itching, scaling, reddening or, occasionally, blistering. |
| Inhalation | : Hazardous by the following route of exposure: of inhalation (lung irritant). |
| Ingestion | : Since the product (welding fumes) is a gas and that it is mostly probable that it will be inhaled more than ingested, please consider first to look at the preventive measures in case of inhalation. |
| Potential chronic health effects | : Carcinogenic effects(*) : Classified None. by NIOSH [Chromium]. Classified A4 by ACGIH, 3 by IARC [Chromium]. Classified + by NIOSH [Nickel]. Classified 2B by IARC, Classified 2 by NTP [Nickel]. Classified A5 by ACGIH [Nickel]. Classified 1 by NTP, + by NIOSH [Silica crystalline quartz]. Classified A2 by ACGIH, 2A by IARC [Silica crystalline quartz]. MUTAGENIC EFFECTS : Not available. TERATOGENIC EFFECTS : Not available. |
| Medical conditions aggravated by over-exposure | : Repeated exposure to the fumes emitted while using this material may produce general deterioration of health. |
| (*) See Abbreviations (section 16). | |

Section 3. Composition, Information on Ingredients

| Name | CAS # | % by weight | UN number |
|------------------------------|------------|-------------|----------------|
| Iron | 7439-89-6 | 45 - 80 | Not regulated. |
| Chromium, Metal | 7440-47-3 | 11 - 32 | Not regulated. |
| Nickel | 7440-02-0 | 4 - 37 | Not regulated. |
| Molybdenum | 7439-98-7 | 0.01 - 4 | Not regulated. |
| Manganese | 7439-96-5 | 0.5 - 2.5 | Not regulated. |
| Silica, Crystalline - Quartz | 14808-60-7 | 0.1 - 1 | Not regulated. |

The fumes emitted by the electrodes, in use, are hazardous. This MSDS is written for workers using these electrodes.

See Section 8 for Exposure Limits of the oxides found in the welding fumes.

Section 4. First Aid Measures

- Eye contact** : Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 20 minutes. Get medical attention immediately.
- Skin contact** : Wash with soap and water. Get medical attention if irritation develops.
- Inhalation** : If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.
- Ingestion** : Do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. If potentially dangerous quantities of this material have been swallowed, call a physician immediately.

Section 5. Fire Fighting Measures

- Flammability of the product** : Non-flammable. Emits toxic fumes when heated.
- Explosibility** : Non-explosive in the presence of open flames, sparks and static discharge, of shocks, of heat.
- Fire-fighting media and instructions** : Use extinguishing media suitable for surrounding materials.

Section 6. Accidental Release Measures

- Small/Large Spill and Leak** : Use appropriate tools to transfer the spilled solid to a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and dispose of according to local and regional authority requirements.

Section 7. Handling and Storage

- Handling** : Avoid breathing dusts, vapors or fumes from burning materials. Use only with adequate ventilation. Avoid contact with eyes, skin and clothing. Do not ingest. Keep container closed. Wash thoroughly after handling.
- Storage** : All filler metals in their original, unopened containers should be kept in a relatively dry storage area at temperatures between 15°C (60°F) and 30°C (80°F) and 50% maximum relative humidity.

Section 8. Exposure Controls, Personal Protection

- Engineering controls** : Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits. If user operations generate dust, fumes or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

Personal protection

- Eyes** : Safety glasses with side shields. Face shield with radiation shielding.
- Body** : Full suit. (Fire resistant.)
- Respiratory** : Dust respirator. Be sure to use an approved/certified respirator or equivalent. Wear a canister breathing apparatus (respirator) or a supplied-air respirator, when required, to weld in a confined space or when room exhaust or ventilation does not keep exposure below the acceptable values.
- Hands** : Gloves. (Fire resistant.)
- Feet** : Metal cap, safety boots.

| Occupational exposure limits | | TWA (8 hours) | | | STEL (15 mins) | | | Ceiling | | | |
|------------------------------|-----------------|---------------|-------------------|-------|----------------|-------------------|-------|---------|-------------------|-------|-----------|
| Ingredient | List name | ppm | mg/m ³ | Other | ppm | mg/m ³ | Other | ppm | mg/m ³ | Other | Notations |
| Chromium, measured as Cr | US ACGIH 2/2010 | - | 0.5 | - | - | - | - | - | - | - | [a][A] |
| | AB 4/2009 | - | 0.5 | - | - | - | - | - | - | - | [3] |
| | BC 10/2009 | - | 0.5 | - | - | - | - | - | - | - | |
| Chromium, as Cr | ON 7/2010 | - | 0.5 | - | - | - | - | - | - | - | |
| | QC 6/2008 | - | 0.5 | - | - | - | - | - | - | - | |
| Nickel | US ACGIH 2/2010 | - | 1.5 | - | - | - | - | - | - | - | [b] |
| | AB 4/2009 | - | 1.5 | - | - | - | - | - | - | - | |
| Nickel, as Ni | BC 10/2009 | - | 0.05 | - | - | - | - | - | - | - | [B] |
| | ON 7/2010 | - | 1 | - | - | - | - | - | - | - | [c] |
| | QC 6/2008 | - | 1 | - | - | - | - | - | - | - | |
| Molybdenum, as Mo | US ACGIH 2/2010 | - | 10 | - | - | - | - | - | - | - | [b] |
| | | - | 3 | - | - | - | - | - | - | - | [d][C] |
| | AB 4/2009 | - | 3 | - | - | - | - | - | - | - | [e][C] |
| Molybdenum | | - | 10 | - | - | - | - | - | - | - | |
| | BC 10/2009 | - | 10 | - | - | - | - | - | - | - | [f] |
| Molybdenum, as Mo | | - | 3 | - | - | - | - | - | - | - | [e] |
| | ON 7/2010 | - | 10 | - | - | - | - | - | - | - | [b] |
| | | - | 3 | - | - | - | - | - | - | - | [d] |
| Manganese, as Mn | US ACGIH 2/2010 | - | 0.2 | - | - | - | - | - | - | - | [D] |
| | AB 4/2009 | - | 0.2 | - | - | - | - | - | - | - | |
| | BC 10/2009 | - | 0.2 | - | - | - | - | - | - | - | [D] |
| | ON 7/2010 | - | 0.2 | - | - | - | - | - | - | - | |
| | QC 6/2008 | - | 1 | - | - | 3 | - | - | - | - | [g][D] |
| Quartz (SiO ₂) | US ACGIH 2/2010 | - | 0.025 | - | - | - | - | - | - | - | [d] |
| | AB 4/2009 | - | 0.025 | - | - | - | - | - | - | - | [h] |
| | BC 10/2009 | - | 0.025 | - | - | - | - | - | - | - | [e] |
| | ON 7/2010 | - | 0.1 | - | - | - | - | - | - | - | [i] |
| | QC 6/2008 | - | 0.1 | - | - | - | - | - | - | - | [j] |
| Iron | US ACGIH | - | 10 | - | - | - | - | - | - | - | [k] |

[3]Skin sensitization

Form: [a]Inorganic [b]Inhalable fraction. See Appendix C, paragraph A. Inhalable Particulate Mass TLVs (IPM-TLVs) for those materials that are hazardous when deposited anywhere in the respiratory tract. [c]Inhalable fraction: means that size fraction of the airborne particulate deposited anywhere in the respiratory tract and collected during air sampling with a particle size-selective device that, (a) meets the ACGIH particle size-selective sampling criteria for airborne particulate matter; and (b) has the cut point of 100 µm at 50 per cent collection efficiency. [d]Respirable fraction; see Appendix C [e]Respirable [f]Inhalable [g]fume [h]Respirable particulate [i]Respirable fraction: means that size fraction of the airborne particulate deposited in the gas-exchange region of the respiratory tract and collected during air sampling with a particle size-selective device that, (a) meets the ACGIH particle size-selective sampling criteria for airborne particulate matter; and (b) has the cut point of 4 µm at 50 per cent collection efficiency. [j]Respirable dust. [k]Inhalable particle.

Notes: [A]measured as Cr [B]as Ni [C]as Mo [D]as Mn

Section 9. Physical and Chemical Properties

Physical state and Appearance : Solid.
Color : Gray.
Odor : Odorless.
Melting/freezing point : 1500°C (2732°F)
Specific gravity : Weighted average: 6.72 (Water = 1)
Solubility : Insoluble in the following materials: cold water, hot water.

Section 10. Stability and Reactivity

Stability and reactivity : The product is stable.
Hazardous decomposition products : Metallic oxides. Carbon oxides (CO, CO₂). Arc radiation can support the production of ozone and nitrogen oxides.
Hazardous polymerization : Will not occur.

Section 11. Toxicological Information

| Product/ingredient name | Result | Species | Dose | Exposure |
|-------------------------|-----------|---------|--------|----------|
| Manganese | LD50 Oral | Rat | 9 g/kg | - |

Chronic effects and other toxic effects on humans : **CARCINOGENIC EFFECTS:** See Section 2.
Contains material which causes damage to the following organs: blood, kidneys, lungs, liver, upper respiratory tract, skin, central nervous system (CNS), eye, lens or cornea, nose/sinuses.
Acute exposure to welding fumes may result in discomfort such as: dizziness, nausea or dryness of nose, throat or the eyes.

Section 12. Ecological Information

Ecotoxicity data

| Product/ingredient name | Result | Species | Exposure |
|-------------------------|---|--|--|
| Iron | Acute LC50 33000 to 100000 ug/L Marine water Acute LC50 0.56 ppm Fresh water | Crustaceans - Crangon crangon Fish - Cyprinus carpio - Juvenile (Fledgling, Hatchling, Weanling) - 3.5 cm | 48 hours 96 hours |
| Chromium | Acute LC50 50 to 65 ug/L Fresh water | Crustaceans - Simocephalus vetulus - <24 hours | 48 hours |
| Nickel | Acute LC50 22 ug/L Fresh water Acute LC50 14.3 ppm Fresh water Acute EC50 1000 ug/L Marine water Acute IC50 0.31 mg/L Marine water | Daphnia - Daphnia magna - <24 hours Fish - Cyprinus carpio Daphnia - Daphnia magna - <24 hours Crustaceans - Americamysis bahia - Juvenile (Fledgling, Hatchling, Weanling) - <48 hours | 48 hours 96 hours 48 hours 48 hours |
| Molybdenum Manganese | Acute LC50 47.5 ng/L Fresh water Acute LC50 800 mg/L Fresh water Acute EC50 40000 ug/L Fresh water Chronic NOEC 28000 ug/L Fresh water | Fish - Heteropneustes fossilis Fish - Oncorhynchus mykiss - 20 mm Daphnia - Daphnia magna Daphnia - Daphnia magna | 96 hours 96 hours 48 hours 48 hours |

Products of degradation : Some metallic oxides.

Section 13. Disposal Considerations

Waste information : Waste must be disposed of in accordance with federal, state and local environmental control regulations. Recycle, if possible.
Consult your local or regional authorities.

Section 14. Transport Information

No transport class is found applicable to this product.

Section 15. Regulatory Information

- HCS Classification** : These hazards relate to welding fumes (electrodes in use) and not to the electrodes as sold.
- Irritating material
Sensitizing material
Carcinogen
Target organ effects
- U.S. Federal regulations** : **United States inventory (TSCA 8b)**: All components are listed or exempted.
- SARA 302/304/311/312 extremely hazardous substances**: No products were found.
SARA 302/304 emergency planning and notification: No products were found.
SARA 302/304/311/312 hazardous chemicals: Nickel; Manganese; Molybdenum
SARA 311/312 MSDS distribution - chemical inventory - hazard identification: Iron: Fire hazard; Nickel: Fire hazard, Immediate (acute) health hazard, Delayed (chronic) health hazard; Manganese: reactive, Immediate (acute) health hazard, Delayed (chronic) health hazard; Molybdenum: Immediate (acute) health hazard, Delayed (chronic) health hazard
Clean Water Act (CWA) 307: Chromium; Nickel
Clean Water Act (CWA) 311: No products were found.
Clean Air Act (CAA) 112 regulated flammable substances: No products were found.
Clean Air Act (CAA) 112 regulated toxic substances: No products were found.
- SARA 313**
- | | | |
|--|-------------------|---------|
| Form R - Reporting requirements | : Chromium, Metal | 20-25 |
| | Nickel | 4-37 |
| | Manganese | 0.5-2.5 |
| Supplier notification | : Chromium | 20-25 |
| | Nickel | 4-37 |
| | Manganese | 0.5-2.5 |
- State regulations**
- Massachusetts** : The following components are listed: CHROMIUM; NICKEL; MOLYBDENUM; MANGANESE
- New York** : The following components are listed: Chromium; Nickel
- New Jersey** : The following components are listed: CHROMIUM; NICKEL; MOLYBDENUM; MANGANESE; SILICA, QUARTZ; QUARTZ (SiO2)
- Pennsylvania** : The following components are listed: CHROMIUM; NICKEL; MOLYBDENUM; MANGANESE; QUARTZ (SiO2)
- WARNING**: This product contains a chemical known to the State of California to cause cancer.
- WHMIS (Canada)** : These hazards relate to welding fumes (electrodes in use) and not to the electrodes as sold.
- Class D-2A: Material causing other toxic effects (Very toxic).
Class D-2B: Material causing other toxic effects (Toxic).
CEPA Toxic substances: None of the components are listed.
Canadian ARET: None of the components are listed.
Canadian NPRI: The following components are listed: Chromium; Nickel; Manganese
Alberta Designated Substances: None of the components are listed.
Ontario Designated Substances: None of the components are listed.
Quebec Designated Substances: None of the components are listed.

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

- Label requirements** : See Section 2.
- Hazardous Material Information System (U.S.A.)** : Health: 2* Fire: 0 Reactivity: 0
- National Fire Protection Association (U.S.A.)** : Health: 2 Fire: 0 Reactivity: 0 Other: None
- References** : - 29CFR Part 1910.1200 OSHA MSDS Requirements. - 49CFR Table List of Hazardous Materials, UN#, Proper Shipping Names, PG. - Canadian Transport of Dangerous Goods, Regulations and Schedules, Clear Language version 2005. - CRC Handbook of chemistry and physics, 67th edition. CRC Press inc., Boca Raton, Florida. - Manufacturer's Material Safety Data Sheet. ANSI Z400.1, MSDS Standard, 2004. ANSI Z49.1 Safety in Welding and Cutting, The American Welding Society, P.O. Box 351040, Miami, FL 33135. Canadian Standard Association, CSA W117.2, Code for Safety in Welding and Cutting, 2003.
- Abbreviations and acronyms** : **ACGIH: American Conference of Governmental Industrial Hygiene.**
ACGIH A2--Suspected Human Carcinogen.
ACGIH-A4-Not Classifiable as a Human Carcinogen.
ACGIH-A5-Not suspected as a Human Carcinogen.
IARC: International Agency for Research on Cancer.
IARC 2A: Probable for human.
IARC 2B: Possible for human.
IARC 3: Not classifiable for human.
NIOSH: National Institute of Occupational Safety and Health.
NIOSH +: Proven.
NIOSH: None.
NTP: National Toxicology program.
NTP 1: Known to be human carcinogens.
NTP 2: Reasonably Anticipated to be human carcinogens.
- Responsible name** : Atrion Regulatory Services, Inc.
- Date of previous issue** : 01/30/2008
- Version** : 4

Notice to reader

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