

Section 1. Chemical Product and Company Identification

Product name	Classification	Classification
Blueshield: CRYSTAL 4043; CRYSTAL 5356; CRYSTAL 4047	CSA: ER4043; ER5356; ER4047;	AWS: ER4043; ER5356; ER4047;
Description	: Aluminium Wire for GMAW (MIG).	Generic Code : AL-J-012-0
In case of emergency	: 1-514-878-1667	Date of issue : 01/30/2008
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. CANCER HAZARD CONTAINS MATERIAL WHICH CAN CAUSE CANCER CAUSES EYE AND SKIN IRRITATION. CONTAINS MATERIAL WHICH CAUSES DAMAGE TO THE FOLLOWING ORGANS: BLOOD, KIDNEYS, LUNGS, RESPIRATORY TRACT, SKIN, CENTRAL NERVOUS SYSTEM. MAY BE HARMFUL IF INHALED OR SWALLOWED. MAY CAUSE ALLERGIC SKIN REACTION. Avoid contact with eyes. Avoid breathing dusts. Avoid contact with skin and clothing. Use only with adequate ventilation. Wash thoroughly after handling.
Routes of entry	: Dermal contact. Eye contact. Inhalation.
Potential acute health effects	
Eyes	: May cause eye irritation.
Skin	: May cause slight transient irritation.
Inhalation	: Hazardous by the following route of exposure: of inhalation.
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]. 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
Aluminum	7429-90-5	70 - 100	UN1309
Silicon Powder, Amorphous	7440-21-3	7 - 10	UN1346
Copper	7440-50-8	3 - 5	Not applicable.
Magnesium	7439-95-4	1 - 3	UN1418
Manganese	7439-96-5	1 - 3	Not applicable.
Chromium, Metal	7440-47-3	< 0.5	Not applicable.

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 the following materials or conditions: open flames, sparks and static discharge, heat and shocks and mechanical impacts.
- 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.

Exposure limits

Product name	Exposure limits
Copper oxide	NIOSH REL (United States, 12/2001). TWA: 0.1 mg/m ³ , (Cu) 10 hour(s). Form: Fume ACGIH TLV (United States). TWA: 1 mg/m ³ 8 hour(s). Form: Dust (Cu) OSHA PEL (United States). TWA: 1 mg/m ³ 8 hour(s). Form: Dust (Cu)
Aluminum Oxide	ACGIH TLV (United States, 1/2006). TWA: 10 mg/m ³ 8 hour(s). NIOSH REL (United States, 12/2001). TWA: 5 mg/m ³ , (Al) 10 hour(s). OSHA PEL (United States, 11/2006). TWA: 5 mg/m ³ 8 hour(s). Form: Respirable fraction
Chromium (III) oxide	ACGIH TLV (United States, 1/2006). TWA: 0.5 mg/m ³ , (Cr) 8 hour(s). Form: Inorganic NIOSH REL (United States, 12/2001). TWA: 0.5 mg/m ³ , (Cr) 10 hour(s). OSHA PEL (United States, 11/2006). TWA: 0.5 mg/m ³ , (Cr) 8 hour(s).
Chromium trioxide (VI)	ACGIH TLV (United States, 1/2006). TWA: 0.05 mg/m ³ , (Cr) 8 hour(s). Form: Soluble OSHA PEL (United States, 11/2006). TWA: 1 mg/m ³ , (Cr) 8 hour(s).
Manganese oxide	ACGIH TLV (United States, 1/2006). TWA: 0.2 mg/m ³ , (Mn) 8 hour(s). NIOSH REL (United States, 12/2001). STEL: 3 mg/m ³ , (Mn) 15 minute(s). TWA: 1 mg/m ³ , (Mn) 10 hour(s). OSHA PEL (United States, 11/2006). CEIL: 5 mg/m ³ , (Mn)

Consult local authorities for acceptable exposure limits.

Section 9. Physical and Chemical Properties

- Physical state and Appearance** : Solid.
- Color** : Reddish-brown. Grayish-white.
- Odor** : Odorless.
- Melting/freezing point** : 1540 to 2030°C (2804 to 3686°F)
- Specific gravity** : Not available.
- 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** : Under normal conditions of storage and use, hazardous polymerization will not occur.

Section 11. Toxicological Information

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.
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

<u>Ingredient name</u>	<u>Species</u>	<u>Period</u>	<u>Result</u>
Aluminum	Oncorhynchus mykiss (LC50)	96 hour(s)	0.12 mg/l
Copper	Daphnia magna (EC50)	48 hour(s)	0.0318 mg/l
	Pimephales promelas (LC50)	96 hour(s)	0.0094 mg/l
Manganese	Daphnia magna (EC50)	48 hour(s)	40 mg/l

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.**

Contains material which can cause cancer.
Irritating material
Target organ effects

U.S. Federal regulations : **United States inventory (TSCA 8b):** All components are listed or exempted.

Clean Water Act (CWA) 307: Copper; Chromium

Clean Water Act (CWA) 311: No products were found.

Clean Air Act (CAA) 112 accidental release prevention: 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 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: Aluminum; Silicon; Manganese; Copper; Magnesium

SARA 311/312 MSDS distribution - chemical inventory - hazard identification: Aluminum: Fire hazard, reactive; Silicon: Fire hazard, Immediate (acute) health hazard; Manganese: reactive, Immediate (acute) health hazard, Delayed (chronic) health hazard; Copper: Immediate (acute) health hazard; Magnesium: Fire hazard, reactive

SARA 313

Form R - Reporting requirements : Aluminum 60 - 100
Copper 1 - 5
Manganese 1 - 5

Supplier notification : Aluminum 60 - 100
Copper 1 - 5
Manganese 1 - 5

State regulations : **Massachusetts Substances:** The following components are listed: Aluminum; Silicone; Copper; Magnesium;Manganese
New Jersey Hazardous Substances: The following components are listed: Aluminum; Silicon; Copper; Magnesium;Manganese
New York Acutely Hazardous Substances: The following components are listed: Copper
Pennsylvania RTK Hazardous Substances: The following components are listed: Aluminum; Silicon; Copper;
Magnesium;Manganese

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: Aluminum; Copper;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 CPR and the MSDS contains all the information required by the CPR.

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 Part1910.1200 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 Z400.5, 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 : **ACGIH: American Conference of Governmental Industrial Hygiene.**

ACGIH-A4-Not Classifiable as a Human Carcinogen.

IARC: International Agency for Research on Cancer.

IARC 3: Not classifiable for human.

NIOSH: National Institute of Occupational Safety and Health.

NIOSH: None.

Responsible name : Atrion Regulatory Services, Inc.

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