

## Section 1. Chemical Product and Company Identification

<b>Product name</b> Blueshield	<b>Classification</b> <b>CSA:</b> CRYSTAL 4043; ER4043; CRYSTAL 5356; ER5356; CRYSTAL 4047; ER4047;	<b>Classification</b> <b>AWS:</b> ER4043; ER5356; ER4047;
<b>Description</b>	: Aluminium Wire for GMAW (MIG).	<b>Generic Code</b> : AL-J-012-0
<b>In case of emergency</b>	: 1-514-878-1667	<b>Date of issue</b> : 01/13/2014
<b>Supplier</b>	: Air Liquide Canada Inc., 1250, René-Lévesque Ouest, Suite 1700, Montréal, 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. MAY CAUSE RESPIRATORY TRACT, EYE AND SKIN IRRITATION. CONTAINS MATERIAL THAT MAY CAUSE TARGET ORGAN DAMAGE, BASED ON ANIMAL DATA.  
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. Wash thoroughly after handling.

**Routes of entry** : Dermal contact. Eye contact. Inhalation.

**Potential acute health effects**

- Eyes** : 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). Skin contact may produce burns.
- 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** :

### Carcinogenicity

Not available.

**Mutagenic effects** Not available.

**Teratogenic effects**: Not available.

**Medical conditions aggravated by over-exposure** : Pre-existing disorders involving any target organs mentioned in this MSDS as being at risk may be aggravated by over-exposure to this product.

(\*) See Abbreviations (section 16).

## Section 3. Composition, Information on Ingredients

Name	CAS #	% by weight	UN number
Aluminium	7429-90-5	87 - 98	UN1396
Silicon	7440-21-3	4 - 13	UN1346
Copper	7440-50-8	0.1 - 6	UN3077
magnesium	7439-95-4	0.1 - 5	Not available.
Manganese	7439-96-5	<1.5	Not available.
Chromium	7440-47-3	<0.5	Not available.

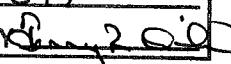
The fumes emitted by the electrodes, in use, are hazardous. This MSDS is written for workers using these electrodes.

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

**APPROVED MATERIAL**

MAY 14 2015

MSDS # 10899

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## Section 4. First Aid Measures

- Eye contact** : Check for and remove any contact lenses. Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical attention immediately.
- Skin contact** : In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Clean shoes thoroughly before reuse. Get medical attention immediately.
- Inhalation** : Move exposed person to fresh air. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.
- Ingestion** : Wash out mouth with water. Do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention 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 an extinguishing agent suitable for the surrounding fire.

## 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 contact with eyes. Avoid breathing dust. Do not get on skin or clothing. Keep container closed. Use only with adequate ventilation. Wash thoroughly after handling. Avoid contact of spilled material and runoff with soil and surface waterways.
- 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 only with adequate ventilation. If user operations generate dust, fumes, gas, vapor or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.

- 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.

<b>Occupational exposure limits</b>		TWA (8 hours)			STEL (15 mins)			Ceiling			Notations
Ingredient	List name	ppm	mg/m <sup>3</sup>	Other	ppm	mg/m <sup>3</sup>	Other	ppm	mg/m <sup>3</sup>	Other	
Aluminium	US ACGIH 6/2013	-	1	-	-	-	-	-	-	-	[a]
	AB 4/2009	-	10	-	-	-	-	-	-	-	[3] [b]
	BC 7/2013	-	1	-	-	-	-	-	-	-	[c]
	ON 1/2013	-	1	-	-	-	-	-	-	-	[a]
Aluminium, as Al Silicon	QC 12/2012	-	10	-	-	-	-	-	-	-	[d]
	BC 7/2013	-	3	-	-	-	-	-	-	-	[d]
	BC 7/2013	-	10	-	-	-	-	-	-	-	[e]
	ON 1/2013	-	10	-	-	-	-	-	-	-	[e]
Copper, as Cu	QC 12/2012	-	10	-	-	-	-	-	-	-	[f]
	US ACGIH 6/2013	-	1	-	-	-	-	-	-	-	[g]
	US ACGIH 6/2013	-	0.2	-	-	-	-	-	-	-	[h]
	AB 4/2009	-	1	-	-	-	-	-	-	-	[i]
	BC 7/2013	-	0.2	-	-	-	-	-	-	-	[h]
Copper	ON 1/2013	-	1	-	-	-	-	-	-	-	[j]
	ON 1/2013	-	0.2	-	-	-	-	-	-	-	[h]
	ON 1/2013	-	1	-	-	-	-	-	-	-	[k]
Copper, as Cu	QC 12/2012	-	1	-	-	-	-	-	-	-	[l]
	QC 12/2012	-	0.2	-	-	-	-	-	-	-	[m]
Manganese, as Mn	US ACGIH 6/2013	-	0.1	-	-	-	-	-	-	-	[n]
	US ACGIH 6/2013	-	0.2	-	-	-	-	-	-	-	[a]
	AB 4/2009	-	0.2	-	-	-	-	-	-	-	
	BC 7/2013	-	0.2	-	-	-	-	-	-	-	
	ON 1/2013	-	0.2	-	-	-	-	-	-	-	
Chromium, measured as Cr Chromium, as Cr	QC 12/2012	-	1	-	-	3	-	-	-	-	[m]
	US ACGIH 6/2013	-	0.5	-	-	-	-	-	-	-	[o]
	AB 4/2009	-	0.5	-	-	-	-	-	-	-	[3]

Chromium	BC 7/2013	-	0.5	-	-	-	-	-	-	-	-	[o]
Chromium, as Cr	ON 1/2013	-	0.5	-	-	-	-	-	-	-	-	
Chromium	QC 12/2012	-	0.5	-	-	-	-	-	-	-	-	

[3]Skin sensitization

Form: [a]Respirable fraction [b]Metal Dust [c]Respirable [d]Respirable dust [e]Total dust [f]Total dust. [g]Dust and mist [h]Fume [i]Dusts and Mists [j] Dusts and mists [k]dust and mists [l]dusts & mists [m]fume [n]Inhalable fraction [o]Inorganic

## 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 and hot water.

## Section 10. Stability and Reactivity

Stability and reactivity : The product is stable.  
 Hazardous decomposition products : Metallic oxides. carbon oxides (CO, CO<sub>2</sub>) 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

Product/ingredient name	Result	Species	Dose	Exposure
Silicon	LD50 Oral	Rat	3160 mg/kg	-
Manganese	LD50 Oral	Rat	9 g/kg	-

Chronic effects and other toxic effects on humans : **CARCINOGENIC EFFECTS:** Classified A4 (Not classifiable for humans or animals.) by ACGIH [Aluminium]. Classified A4 (Not classifiable for humans or animals.) by ACGIH [Manganese]. Classified A4 (Not classifiable for humans or animals.) by ACGIH, 3 (Not classifiable for humans.) by IARC [Chromium].  
 Contains material which may cause damage to the following organs: blood, kidneys, lungs, the nervous system, liver, gastrointestinal tract, upper respiratory tract, skin, eyes, central nervous system (CNS).

Hazardous by the following route of exposure: of skin contact (corrosive), of eye contact (irritant), of inhalation.

## Section 12. Ecological Information

Ecotoxicity data

Product/ingredient name	Result	Species	Exposure	
Aluminium	Acute LC50 38000 µg/l	Daphnia - Daphnia magna	48 hours	
	Acute LC50 120 µg/l Fresh water	Fish - Oncorhynchus mykiss - Embryo	96 hours	
	Chronic NOEC 9 mg/l Fresh water	Aquatic plants - Ceratophyllum demersum	3 days	
	Copper	Acute EC50 1100 µg/l Fresh water	Aquatic plants - Lemna minor	4 days
		Acute EC50 2.1 µg/l Fresh water	Daphnia - Daphnia longispina - Juvenile (Fledgling, Hatchling, Weanling)	48 hours
	Acute IC50 13 µg/l Fresh water	Algae - Pseudokirchneriella subcapitata - Exponential growth phase	72 hours	
	Acute IC50 5.4 mg/l Marine water	Aquatic plants - Plantae - Exponential growth phase	72 hours	
	Acute LC50 0.072 µg/l Marine water	Crustaceans - Amphipoda - Adult	48 hours	
	Acute LC50 7.56 µg/l Marine water	Fish - Periopthalmus waltoni - Adult	96 hours	
	Chronic NOEC 2.5 µg/l Marine water	Algae - Nitzschia closterium - Exponential growth phase	72 hours	
Manganese	Chronic NOEC 7 mg/l Fresh water	Aquatic plants - Ceratophyllum demersum	3 days	
	Chronic NOEC 0.02 mg/l Fresh water	Crustaceans - Cambarus bartonii - Mature	21 days	
	Chronic NOEC 2 µg/l Fresh water	Daphnia - Daphnia magna	21 days	
	Chronic NOEC 0.8 µg/l Fresh water	Fish - Oreochromis niloticus - Juvenile (Fledgling, Hatchling, Weanling)	6 weeks	
	Manganese	Acute EC50 31000 µg/l Fresh water	Aquatic plants - Lemna minor	4 days
		Acute LC50 29000 µg/l	Daphnia - Daphnia magna	48 hours
		Acute LC50 28 mg/l Fresh water	Fish - Pimephales promelas	96 hours

Products of degradation : Not applicable.

## 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.**  
Target organ effects

**U.S. Federal regulations** : **U.S. CDR Exempt/Partial exemption:** Not determined  
**United States inventory (TSCA 8b):** All components are listed or exempted.  
**SARA 302/304:** No products were found.  
**SARA 311/312 Hazards identification:** Delayed (chronic) health hazard  
**Clean Water Act (CWA) 307:** Copper; Chromium

### SARA 313

	Product name	CAS number	%
<b>Form R - Reporting requirements</b>	Aluminium	7429-90-5	87 - 98
	Copper	7440-50-8	0.1 - 6
	Manganese	7439-96-5	<1.5
<b>Supplier notification</b>	Aluminium	7429-90-5	87 - 98
	Copper	7440-50-8	0.1 - 6
	Manganese	7439-96-5	<1.5

SARA 313 notifications must not be detached from the MSDS and any copying and redistribution of the MSDS shall include copying and redistribution of the notice attached to copies of the MSDS subsequently redistributed.

**State regulations** : **Massachusetts** : The following components are listed: ALUMINUM; SILICON DUST; MAGNESIUM; COPPER; MANGANESE  
**New York** : The following components are listed: Copper  
**New Jersey** : The following components are listed: ALUMINUM; SILICON; MAGNESIUM; COPPER; MANGANESE  
**Pennsylvania** : The following components are listed: ALUMINUM; SILICON; MAGNESIUM; COPPER FUME; MANGANESE  
None of the components are listed.

**WHMIS (Canada)** : **These hazards relate to welding fumes (electrodes in use) and not to the electrodes as sold.**  
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: Aluminium (fume or dust only); Copper (and its compounds); Manganese (and its compounds)  
**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 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 Z400.1, 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-A1-Confirmed Human Carcinogen.  
ACGIH-A2-Suspected Human Carcinogen.  
ACGIH-A3-Animal 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 1: Proven.  
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.  
**EU: European Union**  
Carc. 1A : May cause cancer (Known)  
Carc. 1B : May cause cancer (Presumed)  
Carc. 2 : Suspected of causing cancer  
**NTP: National Toxicology program.**  
NTP 1: Known to be human carcinogens.  
NTP 2: Reasonably Anticipated to be human carcinogens.

**Responsible name** : IHS  
**Date of previous issue** : 01/15/2011  
**Version** : 5

**Notice to reader**

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