

## Section 1. Chemical Product and Company Identification

<b>Product name</b>	<b>Classification</b>	<b>Classification</b>
Blueshield	<b>CSA:</b>	<b>AWS:</b>
MNR SILVER45	-	-
<b>Description</b>	: Silver based rod for brazing MNR.	<b>Generic Code</b> : AL-MNR-007-0
<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.  
 VERY TOXIC TO AQUATIC ORGANISMS. MAY BE HARMFUL IF INHALED. CAUSES 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. Ingestion.

**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). 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** :

### Carcinogenicity

Product/ingredient name	ACGIH	OSHA	IARC	NTP	EU
Potassium fluoride	A4	-	3	-	-

**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
Silver	7440-22-4	43 - 53	Not available.
Potassium tetrafluoroborate	14075-53-7	25 - 45	Not available.
Copper	7440-50-8	25 - 35	UN3077
Boron potassium oxide (B4K2O7), tetrahydrate	12045-78-2	5 - 25	Not available.
Boric acid	10043-35-3	10 - 15	Not available.
Potassium fluoride	7789-23-3	7 - 18	UN1812

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**

APR 22 2014

MSDS # 10942

APPROVED BY *[Signature]*

## 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** : Explosive in the presence of the following materials or conditions: metals.  
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.

## 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>		<b>TWA (8 hours)</b>			<b>STEL (15 mins)</b>			<b>Ceiling</b>			<b>Notations</b>
<b>Ingredient</b>	<b>List name</b>	<b>ppm</b>	<b>mg/m<sup>3</sup></b>	<b>Other</b>	<b>ppm</b>	<b>mg/m<sup>3</sup></b>	<b>Other</b>	<b>ppm</b>	<b>mg/m<sup>3</sup></b>	<b>Other</b>	
Silver	US ACGIH 6/2013	-	0.1	-	-	-	-	-	-	-	[a]
	AB 4/2009	-	0.1	-	-	-	-	-	-	-	
Silver, as Ag	BC 7/2013	-	0.01	-	-	0.03	-	-	-	-	
	ON 1/2013	-	0.1	-	-	-	-	-	-	-	[b]
Potassium tetrafluoroborate	QC 12/2012	-	0.1	-	-	-	-	-	-	-	
	US ACGIH 6/2013	-	2	-	-	6	-	-	-	-	[c]
	BC 7/2013	-	2	-	-	6	-	-	-	-	[d]
	ON 1/2013	-	2	-	-	6	-	-	-	-	[c]
Copper, as Cu	US ACGIH 6/2013	-	1	-	-	-	-	-	-	-	[e]
	US ACGIH 6/2013	-	0.2	-	-	-	-	-	-	-	[f]
	AB 4/2009	-	1	-	-	-	-	-	-	-	[g]
	-	-	0.2	-	-	-	-	-	-	-	[f]
	BC 7/2013	-	1	-	-	-	-	-	-	-	[f]
Copper	-	-	0.2	-	-	-	-	-	-	-	[f]
	ON 1/2013	-	1	-	-	-	-	-	-	-	[f]
Copper, as Cu	QC 12/2012	-	1	-	-	-	-	-	-	-	[j]
	QC 12/2012	-	0.2	-	-	-	-	-	-	-	[k]
Boric acid	US ACGIH 6/2013	-	2	-	-	6	-	-	-	-	[c]
	BC 7/2013	-	2	-	-	6	-	-	-	-	[d]
	ON 1/2013	-	2	-	-	6	-	-	-	-	[c]
Potassium fluoride, as F	US ACGIH 6/2013	-	2.5	-	-	-	-	-	-	-	
	AB 4/2009	-	2.5	-	-	-	-	-	-	-	
	BC 7/2013	-	2.5	-	-	-	-	-	-	-	
	ON 1/2013	-	2.5	-	-	-	-	-	-	-	
	QC 12/2012	-	2.5	-	-	-	-	-	-	-	
Boron potassium oxide (B4K2O7),	US ACGIH 1/2011	-	2	-	-	6	-	-	-	-	[l]

tetrahydrate

Form: [a]Dust and fumes [b]Metallic form [c]Inhalable fraction [d]Inhalable [e]Dust and mist [f]Fume [g]Dusts and Mists [h]Dusts and mists [i]dust and mists [j]dusts & mists [k]fume [l]Inorganic borate compounds

## Section 9. Physical and Chemical Properties

Physical state and Appearance : Solid.  
 Color : Green.  
 Odor : Odorless.  
 Melting/freezing point : 871°C (1599.8°F)  
 Specific gravity : Weighted average: 7.25 [Water = 1]  
 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
Potassium tetrafluoroborate	LD50 Oral	Rat	5854 mg/kg	-
Boric acid	LD50 Dermal	Rabbit	>2000 mg/kg	-
	LD50 Oral	Rat	2500 mg/kg	-
Potassium fluoride	LD50 Oral	Rat	245 mg/kg	-

Chronic effects and other toxic effects on humans : **CARCINOGENIC EFFECTS:** Classified A4 (Not classifiable for humans or animals.) by ACGIH [Potassium tetrafluoroborate]. Classified A4 (Not classifiable for humans or animals.) by ACGIH [Boric acid]. Classified A4 (Not classifiable for humans or animals.) by IARC, 3 (Not classifiable for humans.) by IARC [Potassium fluoride].  
 Contains material which may cause damage to the following organs: kidneys, the nervous system, the reproductive system, liver, mucous membranes, gastrointestinal tract, upper respiratory tract, skin, bones, eye, lens or cornea, nose/sinuses, ovary, teeth, testes.

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

## Section 12. Ecological Information

### Ecotoxicity data

Product/ingredient name	Result	Species	Exposure	
Silver	Acute EC50 1.4 µg/l Marine water	Algae - Chroomonas sp.	4 days	
	Acute EC50 0.24 µg/l Fresh water	Daphnia - Daphnia magna	48 hours	
	Acute LC50 11 µg/l Fresh water	Crustaceans - Ceriodaphnia reticulata	48 hours	
	Acute LC50 2.13 µg/l Fresh water	Fish - Pimephales promelas	96 hours	
	Chronic NOEC 5 mg/l Marine water	Algae - Glenodinium halli	72 hours	
	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 - Periophthalmus waltoni - Adult	96 hours	
Chronic NOEC 2.5 µg/l Marine water		Algae - Nitzschia closterium - Exponential growth phase	72 hours	
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		
Boric acid	Acute LC50 84.28 mg/l Marine water	Crustaceans - Americamysis bahia - Juvenile (Fledgling, Hatchling, Weanling)	48 hours	
	Acute LC50 133000 µg/l Fresh water	Daphnia - Daphnia magna - Neonate	48 hours	
	Acute LC50 100000 µg/l Fresh water	Fish - Ptychocheilus lucius - Juvenile (Fledgling, Hatchling, Weanling)	96 hours	
	Chronic NOEC 6000 µg/l Fresh water	Daphnia - Daphnia magna	21 days	
	Chronic NOEC 2100 µg/l Fresh water	Fish - Oncorhynchus mykiss	87 days	

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.  
Irritating material  
Target organ effects

**U.S. Federal regulations** : **TSCA 8(a) CDR Exempt/Partial exemption:** Not determined  
**United States inventory (TSCA 8b):** All components are listed or exempted.  
**Commerce control list precursor:** Potassium fluoride  
**SARA 302/304:** No products were found.  
**SARA 311/312 Hazards identification:** Immediate (acute) health hazard, Delayed (chronic) health hazard  
**Clean Water Act (CWA) 307:** Silver; Copper; Zinc

### SARA 313

	Product name	CAS number	%
Form R - Reporting requirements	Silver	7440-22-4	43 - 53
	Copper	7440-50-8	25 - 35
	Zinc	7440-66-6	25 - 35
Supplier notification	Silver	7440-22-4	43 - 53
	Copper	7440-50-8	25 - 35
	Zinc	7440-66-6	25 - 35

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: SILVER; COPPER; ZINC  
**New York** : The following components are listed: Silver; Copper; Zinc  
**New Jersey** : The following components are listed: SILVER; BORATE COMPOUNDS, Inorganic; COPPER; ZINC; BORATE COMPOUNDS, Inorganic; POTASSIUM FLUORIDE  
**Pennsylvania** : The following components are listed: SILVER; COPPER FUME; ZINC  
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:** The following components are listed: Inorganic fluorides  
**Canadian ARET:** None of the components are listed.  
**Canadian NPRI:** The following components are listed: Silver (and its compounds); Copper (and its compounds); Zinc (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  
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