

Section 1. Chemical Product and Company Identification

Product name Blueshield 620-308L; 620P-308L; 622-316L; 622P-316L; 624-309L; 624P-309L	Classification CSA: E308L-17; E308L-17; E316L-17; E316L-17; E309L-17; E309L-17; SMAW Stainless Consumables 1-514-878-1667	Classification AWS: E308L-17; E308L-17; E316L-17; E316L-17; E309L-17; E309L-17; Generic Code : AL-T-011-0 Date of issue : 01/13/2014
Description In case of emergency Supplier	: SMAW Stainless Consumables : 1-514-878-1667 : Air Liquide Canada Inc., 1250, René-Lévesque Ouest, Suite 1700, Montréal, QC H3B 5E6	

Section 2. Hazards Identification

Physical state and Appearance Emergency overview	: Solid. : 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 MAY CAUSE TARGET ORGAN DAMAGE, BASED ON ANIMAL DATA. 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	: 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	:

Carcinogenicity

Product/ingredient name	ACGIH	OSHA	IARC	NTP	EU
Titanium dioxide	A4	-	2B	-	Carc. 2, H351
Crystalline silica respirable	A2	-	1	Known to be a human carcinogen.	Carc. 1A, H350
nickel	A5	-	2B	Reasonably anticipated to be a human carcinogen.	Carc. 2, H351
Calcium fluoride	A4	-	3	-	-

Mutagenic effects Not available.

Teratogenic effects: Not available.

Medical conditions aggravated by over-exposure : Pre-existing skin disorders and disorders involving any other 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
Iron	7439-89-6	0.01 - 67.5	Not available.
Titanium dioxide	13463-67-7	20 - 34	Not available.
Chromium	7440-47-3	10 - 23.5	Not available.
Crystalline silica respirable	14808-60-7	9 - 18	Not available.
Calcium carbonate	471-34-1	6 - 10	Not available.
Aluminium oxide	1344-28-1	4 - 10	Not available.
Nickel	7440-02-0	0.01 - 11.2	Not available.
Calcium fluoride	7789-75-5	2 - 4	Not available.
Dipotassium oxide	12136-45-7	1.5 - 3.5	UN2033
Manganese	7439-96-5	0.5 - 2.5	Not available.
Molybdenum	7439-98-7	0.01 - 2.75	Not regulated.

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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. 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. If necessary: **Neutralize the residue with a dilute solution of acetic acid.** 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. Avoid prolonged or repeated contact with skin. 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.

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
Titanium dioxide	US ACGIH 6/2013	-	10	-	-	-	-	-	-	-	
	AB 4/2009	-	10	-	-	-	-	-	-	-	
	BC 7/2013	-	3	-	-	-	-	-	-	-	[a]
	ON 1/2013	-	10	-	-	-	-	-	-	-	[b]
	QC 12/2012	-	10	-	-	-	-	-	-	-	[c]
	US ACGIH 6/2013	-	10	-	-	-	-	-	-	-	[d]
Chromium, measured as Cr	US ACGIH 6/2013	-	0.5	-	-	-	-	-	-	-	[e]
	AB 4/2009	-	0.5	-	-	-	-	-	-	-	[3]
	BC 7/2013	-	0.5	-	-	-	-	-	-	-	
Chromium, as Cr	ON 1/2013	-	0.5	-	-	-	-	-	-	-	[e]
	QC 12/2012	-	0.5	-	-	-	-	-	-	-	
Crystalline silica respirable	US ACGIH 6/2013	-	0.025	-	-	-	-	-	-	-	[f]
	AB 4/2009	-	0.025	-	-	-	-	-	-	-	[g]
	BC 7/2013	-	0.025	-	-	-	-	-	-	-	[h]
	ON 1/2013	-	0.1	-	-	-	-	-	-	-	[i]
	QC 12/2012	-	0.1	-	-	-	-	-	-	-	[j]
Aluminium oxide	US ACGIH 6/2013	-	1	-	-	-	-	-	-	-	[f]
	AB 4/2009	-	10	-	-	-	-	-	-	-	
	BC 7/2013	-	1	-	-	-	-	-	-	-	[h]
	ON 1/2013	-	1	-	-	-	-	-	-	-	[f]
Aluminium oxide, as Al	QC 12/2012	-	10	-	-	-	-	-	-	-	[d]

Nickel	US ACGIH 6/2013	-	1.5	-	-	-	-	-	-	[k]
	AB 4/2009	-	1.5	-	-	-	-	-	-	
Nickel, as Ni	BC 7/2013	-	0.05	-	-	-	-	-	-	
	ON 1/2013	-	1	-	-	-	-	-	-	[l]
Nickel	QC 12/2012	-	1	-	-	-	-	-	-	
	US ACGIH 6/2013	-	2.5	-	-	-	-	-	-	
	AB 4/2009	-	2.5	-	-	-	-	-	-	
	BC 7/2013	-	2.5	-	-	-	-	-	-	
	ON 1/2013	-	2.5	-	-	-	-	-	-	
Calcium fluoride, as F	QC 12/2012	-	2.5	-	-	-	-	-	-	
	US ACGIH 6/2013	-	0.1	-	-	-	-	-	-	[k]
	US ACGIH 6/2013	-	0.2	-	-	-	-	-	-	[f]
	AB 4/2009	-	0.2	-	-	-	-	-	-	
	BC 7/2013	-	0.2	-	-	-	-	-	-	
Manganese, as Mn	ON 1/2013	-	0.2	-	-	-	-	-	-	
	QC 12/2012	-	1	-	3	-	-	-	-	[m]
	US ACGIH 6/2013	-	10	-	-	-	-	-	-	[k]
	US ACGIH 6/2013	-	3	-	-	-	-	-	-	[f]
	AB 4/2009	-	3	-	-	-	-	-	-	[h]
Molybdenum, as Mo		-	10	-	-	-	-	-	-	
	BC 7/2013	-	10	-	-	-	-	-	-	[n]
	BC 7/2013	-	3	-	-	-	-	-	-	[h]
	ON 1/2013	-	10	-	-	-	-	-	-	[k]
Molybdenum	ON 1/2013	-	3	-	-	-	-	-	-	[f]
	US ACGIH	-	10	-	-	-	-	-	-	[o]
Molybdenum, as Mo	AB 4/2009	-	10	-	-	-	-	-	-	[3]
	QC 12/2012	-	10	-	-	-	-	-	-	[d]

[3]Skin sensitization

Form: [a]Respirable dust [b]Total dust [c]total dust [d]Total dust. [e]Inorganic [f]Respirable fraction [g]Respirable particulate [h]Respirable [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 fraction [l]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. [m]fume [n] Inhalable [o]Inhalable particle.

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: 5.1 [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 ₂) 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
Calcium carbonate	LD50 Oral	Rat	6450 mg/kg	-
Calcium fluoride	LD50 Oral	Rat	4250 mg/kg	-
Manganese	LD50 Oral	Rat	9 g/kg	-

Chronic effects and other toxic effects on humans : **CARCINOGENIC EFFECTS:** Classified + (Proven.) by NIOSH [Titanium dioxide]. Classified 2B (Possible for humans.) by IARC, 3 (Possible for humans.) by European Union [Titanium dioxide]. Classified A4 (Not classifiable for humans or animals.) by ACGIH [Titanium dioxide]. Classified A4 (Not classifiable for humans or animals.) by ACGIH, 3 (Not classifiable for humans.) by IARC [Chromium]. Classified 1 (Proven for humans.) by IARC, 1 (Known to be human carcinogens.) by NTP, + (Proven.) by NIOSH, 1 (Proven for humans.) by European Union [Crystalline silica respirable]. Classified A2 (Suspected for humans.) by ACGIH [Crystalline silica respirable]. Classified A4 (Not classifiable for humans or animals.) by ACGIH [Aluminium oxide]. Classified + (Proven.) by NIOSH [Nickel]. Classified 2B (Possible for humans.) by IARC, 3 (Possible for humans.) by European Union [Nickel]. Classified 2 (Reasonably anticipated to be human carcinogens.) by NTP [Nickel]. Classified A5 (Not suspected for humans.) by ACGIH [Nickel]. Classified A4 (Not classifiable for humans or animals.) by ACGIH, 3 (Not classifiable for humans.) by IARC [Calcium fluoride]. Classified A4 (Not classifiable for humans or animals.) by ACGIH [Manganese]. Contains material which may cause damage to the following organs: blood, kidneys, lungs, the nervous system, liver, gastrointestinal tract, upper respiratory tract, skin, eyes, bones, central nervous system (CNS), nose/sinuses, teeth.

Very hazardous by the following route of exposure: of eye contact (irritant).

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

Section 12. Ecological Information

Ecotoxicity data

Product/ingredient name	Result	Species	Exposure
Iron	Acute EC50 3700 µg/l Fresh water Acute LC50 33000 to 100000 µg/l Marine water	Aquatic plants - Lemna minor Crustaceans - Crangon crangon	4 days 48 hours
Titanium dioxide	Acute LC50 6.48 µg/l Marine water Chronic NOEC 100 mg/l Marine water Acute EC50 5.83 mg/l Fresh water	Fish - Periophthalmus waltoni - Adult Algae - Glenodinium halli Algae - Pseudokirchneriella subcapitata - Exponential growth phase	96 hours 72 hours 72 hours
	Acute LC50 3 mg/l Fresh water	Crustaceans - Ceriodaphnia dubia - Neonate	48 hours
	Acute LC50 5.5 ppm Fresh water	Daphnia - Daphnia magna - Juvenile (Fledgling, Hatchling, Weanling)	48 hours
	Acute LC50 1000 mg/l Fresh water Acute LC50 >1000000 µg/l Marine water Chronic NOEC 0.984 mg/l Fresh water	Fish - Pimephales promelas Fish - Fundulus heteroclitus Algae - Pseudokirchneriella subcapitata - Exponential growth phase	96 hours 96 hours 72 hours
Chromium	Acute EC50 0.2 ppm Marine water Acute EC50 5 ppm Marine water Acute EC50 35000 µg/l Fresh water Acute LC50 45 µg/l Fresh water Acute LC50 22 µg/l Fresh water Acute LC50 13.9 ppm Fresh water Chronic NOEC 50 mg/l Marine water Chronic NOEC 0.19 µg/l Fresh water	Algae - Bacillariophyta Algae - Macrocystis pyrifera - Young Aquatic plants - Lemna minor Crustaceans - Ceriodaphnia reticulata Daphnia - Daphnia magna Fish - Anguilla rostrata Algae - Glenodinium halli Fish - Cyprinus carpio	72 hours 4 days 4 days 48 hours 48 hours 96 hours 72 hours 4 weeks
Calcium carbonate	Acute LC50 56000 ppm Fresh water Chronic NOEC 61 mg/g Fresh water	Fish - Gambusia affinis - Adult Fish - Oncorhynchus mykiss - Juvenile (Fledgling, Hatchling, Weanling)	96 hours 28 days
Nickel	Acute EC50 2 ppm Marine water Acute EC50 450 µg/l Fresh water Acute EC50 1000 µg/l Marine water Acute IC50 0.31 mg/l Marine water	Algae - Macrocystis pyrifera - Young Aquatic plants - Lemna minor Daphnia - Daphnia magna Crustaceans - Americamysis bahia - Juvenile (Fledgling, Hatchling, Weanling)	4 days 4 days 48 hours 48 hours
	Acute LC50 47.5 ng/L Fresh water Chronic NOEC 100 mg/l Marine water Chronic NOEC 3.5 µg/l Fresh water	Fish - Heteropneustes fossilis Algae - Glenodinium halli Fish - Cyprinus carpio	96 hours 72 hours 4 weeks
Dipotassium oxide	Acute LC50 917600 µg/l Fresh water	Fish - Labeo rohita	96 hours
Manganese	Acute EC50 31000 µg/l Fresh water Acute LC50 29000 µg/l	Aquatic plants - Lemna minor Daphnia - Daphnia magna	4 days 48 hours
Molybdenum	Acute LC50 28 mg/l Fresh water Acute LC50 200000 µg/l Acute LC50 800 mg/l Fresh water Chronic NOEC 500 mg/l Marine water	Fish - Pimephales promelas Daphnia - Daphnia magna Fish - Oncorhynchus mykiss Algae - Glenodinium halli	96 hours 48 hours 96 hours 72 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.

Irritating material
Sensitizing material
Carcinogen
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.

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: Chromium; Nickel

[SARA 313](#)

	Product name	CAS number	%
Form R - Reporting requirements	Chromium	7440-47-3	10 - 23.5
	Aluminium oxide	1344-28-1	4 - 10
	Nickel	7440-02-0	0.01 - 11.2
	Manganese	7439-96-5	0.5 - 2.5
Supplier notification	Chromium	7440-47-3	10 - 23.5
	Aluminium oxide	1344-28-1	4 - 10
	Nickel	7440-02-0	0.01 - 11.2
	Manganese	7439-96-5	0.5 - 2.5

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: TITANIUM DIOXIDE; CHROMIUM; SILICA, CRYSTALLINE, QUARTZ; ALUMINUM OXIDE; NICKEL; MANGANESE; MOLYBDENUM
 - New York** : The following components are listed: Chromium; Nickel
 - New Jersey** : The following components are listed: TITANIUM DIOXIDE; TITANIUM OXIDE (TiO₂); CHROMIUM; SILICA, QUARTZ; QUARTZ (SiO₂); ALUMINUM OXIDE; alpha-ALUMINA; NICKEL; FLUORIDES; POTASSIUM OXIDE; MANGANESE; MOLYBDENUM
 - Pennsylvania** : The following components are listed: TITANIUM OXIDE (TiO₂); CHROMIUM; QUARTZ (SiO₂); ALUMINUM OXIDE (Al₂O₃); NICKEL; MANGANESE; MOLYBDENUM

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: The following components are listed: Inorganic fluorides

Canadian ARET: None of the components are listed.

Canadian NPRI: The following components are listed: Chromium (and its compounds); Aluminum oxide (fibrous forms only); Nickel (and its compounds); Calcium fluoride; 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

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Notice to reader

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