

# SAFETY DATA SHEET (SDS)



## Copper Alloys

<b>1</b>	<b>Identification</b>
<b>1.1</b>	<b>GHS product identifier</b> <b>Trade names:</b> 600, 603 PHB, 604 C, 606, 656, Deoxidized Copper, 610 Aluminum Bronze, 618 Aluminum Bronze, Low Fuming Industrial Bronze, PCO 102, PCO 105, PCO 115, PCO HP
<b>1.2</b>	<b>Other means of identification:</b> N. App.
<b>1.3</b>	<b>Recommended use of the chemical and restriction on use:</b> Used for covered arc welding electrode for gas metal arch welding, shielded metal arc welding, torch brazing, as applicable. Do not weld near flammable or combustible materials.
<b>1.4</b>	<b>Supplier:</b> Arctec Alloys Limited 4304 - 10 St. N.E., Calgary, Alberta, T2E 6K3 Phone: (403) 250-9355
<b>1.5</b>	<b>Emergency phone number:</b> HealthLink 24/7 (Alberta Health Services): 800-624-2356 Out-of-province or internet phone users: 866-408-5465
<b>2</b>	<b>Hazard(s) Identification</b>
<b>2.1</b>	<b>Classification of the substance or mixture:</b> Class: Carcinogenicity <span style="float: right;">Category: 1A</span> Class: Reproductive Toxicity <span style="float: right;">Category: 2</span> Class: Germ Cell Mutagenicity <span style="float: right;">Category: 1B</span> Class: Respiratory Sensitization <span style="float: right;">Category: 1</span> Class: Skin Sensitization <span style="float: right;">Category: 1</span> Class: Specific Target Organ Toxicity – (repeated exposure) <span style="float: right;">Category: 1</span> Target Organs: Lungs, Kidneys, Liver, Respiratory System, Nerves, Blood, Eyes, Skin  
<b>2.2</b>	<b>GHS label elements:</b> <b>Signal Word:</b> Danger <b>Hazard Statements:</b> H315 Causes skin irritation. H317 May cause an allergic skin reaction. H319 Causes serious eye irritation. H331 Toxic if inhaled. H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled. H340 May cause genetic defects. H350 May cause cancer. H361 Suspected of damaging fertility or the unborn child. H372 Causes damage to organs through prolonged or repeated exposure. H410 Very toxic to aquatic life with long-lasting effects.  <b>Precautionary Statements:</b> P201 Obtain special instructions before use. P202 Do not handle until all safety precautions have been read and understood. P260 Do not breathe dust/fume/gas/mist/vapours/spray. P264 Wash hands thoroughly after handling.

P270 Do not eat, drink or smoke when using this product.  
P272 Contaminated work clothing should not be allowed out of the workplace.  
P280 Wear protective gloves/protective clothing/eye protection/face protection.  
P283 Wear fire resistant or flame retardant clothing.  
P284 In case of inadequate ventilation wear respiratory protection.  
**Response Statements:**  
P308 + P313 If exposed or concerned, get medical advice/attention.  
P314 Get medical attention if you feel unwell.  
P332 + P352 IF SKIN irritation occurs: Wash with plenty of water.  
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do. Continue rinsing.  
P337 + P313 If eye irritation persists: Get medical attention.

**2.3 Other hazards which do not result in classification:**  
Persons with pacemakers should not go near welding or cutting operations until they have consulted their doctor and obtained information from the manufacturer of the device.  
Heat: Spatter and melting metal can cause burn injuries and start fires.  
Radiation: Arc rays can severely damage eyes or skin.  
Electricity: Electric shock can kill.

**3 Composition/Information on Ingredients**

Chemical Name	SDS# and Weight %												CAS Number	EINECS Number
	600	603	604C	606	656, Deox	610	618	Ind Bro	PCO 102	PCO 105	PCO 115	PCO HP		
Aluminum	<0.1	<0.1	<0.1	1-11	<0.1	5-10	7-13	<0.1	<0.1	<0.1	<0.1	<0.1	7429-90-5	231-072-3
Aluminum fluoride	1-11	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	7784-18-1	232-051-1
Barium carbonate	<0.1	<0.1	1-11	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	513-77-9	208-167-3
Calcium fluoride	<0.1	<0.1	1-11	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	7789-75-5	232-188-7
Chromium	<0.1	<0.1	<0.1	<0.1	5-35	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	7440-47-3	231-157-5
Copper	60-100	40-70	60-100	40-70	<0.1	60-100	60-100	40-70	60-100	60-100	60-100	60-100	7440-50-8	231-159-6
Cryoflux (mix of fluorides)	<0.1	10-30	<0.1	5-15	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	15096-52-3	239-148-8
Graphite	<0.1	<0.1	1-11	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	7782-42-5	231-955-3
Iron	<0.1	1-5	<0.1	1-11	40-90	1-5	1-5	<0.1	<0.1	<0.1	<0.1	<0.1	7439-89-6	231-096-4
Manganese	1-11	<0.1	<0.1	1-11	0-5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	7439-96-5	231-105-1
Molybdenum	<0.1	<0.1	<0.1	<0.1	0-4	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	7439-98-7	231-107-2
Nickel	<0.1	1-5	<0.1	1-5	0-40	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	7440-02-0	231-111-4
Phosphorus	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	5-10	5-10	5-10	5-10	7723-14-0	918-594-3
Potassium kryolith (potassium fluoride)	<0.1	1-11	<0.1	1-11	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	7789-23-3	232-151-5
Silicon	<0.1	<0.1	<0.1	<0.1	0-1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	7440-21-3	231-130-8
Silver	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	1-5	5-10	10-30	<0.1	7440-22-4	231-131-3
Sodium fluoroaluminate	0.1-1.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	15096-52-3	237-410-6
Sodium fluoride	0.1-1.1	1-11	<0.1	1-11	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	1333-83-1	215-608-3
Sodium silicate	0.1-1.1	0.5-5	<0.1	0.5-5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	1344-09-8	215-687-4
Tin	0.1-1.1	1-5	1-11	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	7440-31-5	231-141-8
Zinc	<0.1	<0.1	<0.1	<0.1	<0.1	0.5-1	<0.05	40-70	<0.1	<0.1	<0.1	<0.1	7440-66-6	7440-66-6

**4 First Aid Measures**

**4.1 Description of necessary first-aid measures:**

<b>Inhalation:</b>	If breathing has stopped, perform artificial respiration. If no detectable pulse, begin Cardio Pulmonary Resuscitation (CPR). Obtain emergency medical assistance immediately! If breathing is difficult, provide fresh air and call Poison Center/doctor.
<b>Eye:</b>	For radiation burns due to arc flash, see doctor. To remove dusts or fumes, flush cautiously with water for at least fifteen minutes. Remove contact lenses if present and easy to do. If irritation persists, see a doctor.

	<b>Skin:</b>	For skin burns from arc radiation, promptly flush with cool water. Get medical attention for burns or irritations that persist. To remove dust or particles wash with water.			
	<b>Ingestion:</b>	Not applicable			
	<b>Electric Shock:</b>	Disconnect and turn off the power. Use a nonconductive material to pull victim away from contact with live parts or wires. If not breathing, begin artificial respiration. If no detectable pulse, begin Cardio Pulmonary Resuscitation (CPR). Obtain emergency medical assistance immediately!			
<b>4.2</b>	<b>Most important symptoms/effects, acute and delayed:</b> Asthma, chest pain, cough, wheezing, chest tightness.				
<b>4.3</b>	<b>Indication of immediate medical attention and special treatment needed:</b> Asthma, chest pain, cough, wheezing, chest tightness. For severe inhalation exposure, watch person for at least 48 hours in case pulmonary oedema develops.				
<b>4.4</b>	<b>General:</b> Move to fresh air and get medical assistance.				
<b>5</b>	<b>Fire Fighting Measures</b>				
<b>5.1</b>	<b>Suitable extinguishing media:</b> No specific recommendations for welding consumables. Welding arcs and sparks can ignite combustible and flammable materials. Use the extinguishing media recommended for the burning materials and fire situation.				
<b>5.2</b>	<b>Specific hazards arising from the substance or mixture:</b> Depends on burning materials. Smoke may contain toxic metal fumes such as chromium, nickel, manganese from welding consumables.				
<b>5.3</b>	<b>Special protective equipment or actions for fire-fighters:</b> Wear self-contained breathing apparatus.				
<b>6</b>	<b>Accidental Release Measures</b>				
<b>6.1</b>	<b>Personal precautions, protective equipment and emergency procedures:</b> Refer to Section 8				
<b>6.2</b>	<b>Environmental precautions:</b> Refer to Section 13				
<b>6.3</b>	<b>Methods and materials for containment and cleaning up:</b> Place in suitable container for appropriate disposal.				
<b>7</b>	<b>Handling and Storage</b>				
<b>7.1</b>	<b>Precautions for safe handling:</b> Wear gloves when handling welding consumables. Avoid exposure to fume and dust. Retain all warning and identity labels.				
<b>7.2</b>	<b>Conditions for safe storage, including any incompatibilities:</b> Store in a dry place. Keep separate from chemical substances such as acids and strong bases, which could cause chemical reactions.				
<b>7.3</b>	<b>Specific end use(s):</b> Welding.				
<b>8</b>	<b>Exposure Controls/Personal Protection</b>				
<b>8.1</b>	<b>Control parameters:</b>				
Exposure limits: Use industrial hygiene monitoring equipment to ensure that exposures do not exceed applicable regulatory exposure limits (see below). ACGIH TLVs are recommended limits – not regulatory limits. Unless noted, all values apply to 8-hour time weighted average exposures (TWA).					
	<b>Substance</b>	<b>CAS#</b>	<b>ACGIH TLV mg/m<sup>3</sup></b>	<b>Alberta OEL mg/m<sup>3</sup></b>	<b>BC EL mg/m<sup>3</sup></b>
	Aluminum - insoluble compounds	7429-90-5	1(R)	N.Av.	1(R)
	Aluminum - soluble compounds and alkyl	7429-90-5	N.Av.	2	N.Av.
	Aluminum metal	7429-90-5	1(R)	N.Av.	1(R)
	Aluminum oxide	1344-28-1	N.Av.	10	N.Av.
	Barium and soluble compounds, as Ba	7440-39-3	0.5	0.5	0.5
	Chromium (Cr) metal	7440-47-3	0.5(I)	0.5	0.5
	Chromium CrIII compounds	7440-47-3	0.003(I) (water-soluble)	0.5	0.5
	Chromium CrVI compounds - Water insoluble	7440-47-3	N.Av.	0.01	0.01
	Chromium CrVI compounds - Water soluble	7440-47-3	0.0002(I)	0.05	0.025
	Copper (fume)	7439-89-6	0.2	0.2	0.2
	Graphite	7782-42-5	2 (R)	2 (R)	2 (R)
	Iron oxide	1309-37-1	5(R)	5(R)	5
	Manganese	7439-96-5	0.02(R), 0.1(I)	0.2	0.02(R), 0.1(I)
	Molybdenum (metal and insoluble compounds)	7439-98-7	3(R), 10(I)	5	3(R), 10(I)
	Nickel compounds - Soluble inorganic	7440-02-0	0.1(I)	0.1	0.05

Nickel metal	7440-02-0	1.5(I)	1.5	0.05
Phosphorus (red)	7723-14-0	N.Av.	N.Av.	N.Av.
Silica (amorphous fume)	69012-64-2	N.Av.	N.Av.	4.0, 1.5(R)
Silicon	7440-21-3	N.Av.	N.Av.	10, 3(R) -PNOC
Silver - Metal, dust and fume	7440-22-4	0.1	0.1	0.1
Silver - Soluble compounds, as Ag	7440-22-4	0.01	0.01	N.Av.
Tin - Metal	7440-31-5	2	2	2
Tin - Organic compounds, as Sn	7440-31-5	0.1	0.1	0.1
Tin - Oxide and inorganic compounds	7440-31-5	2	2	2
Zinc oxide (fume)	1314-13-2	2 (R)	2 (R)	2 (R)

ACGIH TLVs: Threshold Limit Values according to American Conference of Governmental Industrial Hygienists.

Alberta OELs: Alberta Occupational Exposure Limits

BC ELs: British Columbia Exposure Limits

(R) Respirable fraction, (I) Inhalable fraction. If no (R) or (I) designation is shown, values refer to total particulate.

**8.2 Appropriate engineering controls:** Ensure sufficient local exhaust and general ventilation to keep exposures to welding fumes and gases below regulatory exposure limits. Use special care when welding painted or coated steels since hazardous substances from the coating may be emitted. If coating contains lead or mercury, remove before welding.

**8.3 Individual protection measures:** Wear hand, head, eye, hearing and body protection such as welder's gloves, helmet or face shield with filter lens, ear muffs/plugs, safety boots, apron, arm and shoulder protection. Keep protective clothing clean and dry. Check condition of protective clothing and equipment on a regular basis. Use respiratory protection (P100 air purifying or supplied air respirator as appropriate) where ventilation is not sufficient to keep exposures below regulatory limits. Never use air purifying respirators in oxygen deficient atmospheres.

## 9 Physical and Chemical Properties

**9.1** Information on basic physical and chemical properties:

Appearance, colour:	Solid (wire or rod), non-volatile with varying color.
Physical state:	Solid
Auto-ignition temperature:	Not available
Decomposition temperature:	Not available
Evaporation rate:	Not applicable
Explosive properties:	Not applicable
Flammability (solid, gas):	Not applicable
Flash point:	Not applicable
Initial boiling point and boiling range:	Not available
Melting point:	>1300 °C / >2300 °C
Freezing Point:	>1300 °C / >2300 °C
Odour:	None
Odour threshold:	Not applicable
Oxidising Properties:	Not applicable
Partition coefficient (n-octanol/water):	Not available
pH:	Not available
Relative density:	Not available
Solubility:	Not applicable
Upper / Lower flammability or explosive limits:	Not applicable
Vapour density:	Not applicable
Vapour pressure:	Not applicable
Viscosity:	Not applicable

## 10 Stability and Reactivity

**10.1 Reactivity:** May react with acids and strong bases producing gas.

**10.2 Chemical stability:** This product is stable under normal conditions.

**10.3 Possibility of hazardous reactions:** May react with acids and strong bases producing gas.

<b>10.4</b>	<b>Conditions to avoid:</b> Wet, acids, bases																																																																																															
<b>10.5</b>	<b>Incompatible materials:</b> Acids, bases																																																																																															
<b>10.6</b>	<b>Hazardous decomposition products:</b> When this product is used in a welding process, hazardous decomposition products include those from the volatilization, reaction or oxidation of the materials listed in Section 2 and those from the base metal coating. Carbon oxides, nitrogen oxides and ozone may also be produced. Allow cleaning solvents to dry off work before welding. Thermal decomposition products of halogenated cleaning solvents may be highly poisonous. The amount of fumes generated from manual metal arc welding varies with welding parameters and dimensions, but is generally no more than 5 to 15 g/kg consumable.																																																																																															
<b>11</b>	<b>Toxicological Information</b>																																																																																															
<b>11.1</b>	Likely Routes of Exposure: <input checked="" type="checkbox"/> Inhalation <input checked="" type="checkbox"/> Skin contact <input checked="" type="checkbox"/> Eye contact <input type="checkbox"/> Ingestion																																																																																															
	<b>Acute Toxicity:</b> Overexposure to welding fumes can cause irritation of eyes, nose, throat and lungs. It may result in metal fume fever (chills, fever, upset stomach, vomiting, throat irritation, muscle aches), dizziness, nausea, dryness or irritation of the nose, throat, lungs and eyes. Airway restriction with tightening of chest and cough may occur. Excessive exposure may cause delayed pulmonary oedema (after 24-48 hours), which may be fatal.																																																																																															
	Skin corrosion/irritation: Irritation																																																																																															
	Serious eye damage/ irritation: Irritation																																																																																															
	Respiratory and/or skin sensitization: Yes																																																																																															
	Germ cell mutagenicity: Not available																																																																																															
	Genotoxicity: Yes																																																																																															
	Carcinogenicity: Yes																																																																																															
	Reproductive toxicity: Yes																																																																																															
	STOT – Single Exposure: Not available																																																																																															
	STOT – Repeated Exposure: Yes – lungs and skin																																																																																															
	Harmful if inhaled: Yes																																																																																															
	Single exposure: Yes																																																																																															
	Aspiration hazard: No																																																																																															
	Repeated exposure: Yes																																																																																															
	Interactive effects: Not available																																																																																															
	<table border="1"> <thead> <tr> <th>Chemical Name</th> <th>CAS Number</th> <th>EINECS Number</th> <th>LC50, inhalation</th> <th>LD50, oral</th> </tr> </thead> <tbody> <tr> <td>Aluminum</td> <td>7429-90-5</td> <td>231-072-3</td> <td>N.Av.</td> <td>N.Av.</td> </tr> <tr> <td>Aluminum fluoride</td> <td>7784-18-1</td> <td>232-051-1</td> <td>N.Av.</td> <td>100 mg/kg, rat</td> </tr> <tr> <td>Barium carbonate</td> <td>513-77-9</td> <td>208-167-3</td> <td>N.Av.</td> <td>132 – 277 mg/kg, rat</td> </tr> <tr> <td>Calcium fluoride</td> <td>7789-75-5</td> <td>232-188-7</td> <td>N.Av.</td> <td>4250 mg/kg, rat</td> </tr> <tr> <td>Copper</td> <td>7440-50-8</td> <td>231-159-6</td> <td>N.Av.</td> <td>472 mg/kg, rat</td> </tr> <tr> <td>Cryoflux</td> <td>15096-52-3</td> <td>239-148-8</td> <td>N.Av.</td> <td>N.Av.</td> </tr> <tr> <td>Graphite</td> <td>7782-42-5</td> <td>231-955-3</td> <td>N.Av.</td> <td>&gt;2000 mg/kg, rat</td> </tr> <tr> <td>Iron</td> <td>7439-89-6</td> <td>231-096-4</td> <td>N.Av.</td> <td>750 mg/kg, rat</td> </tr> <tr> <td>Manganese</td> <td>7439-96-5</td> <td>231-105-1</td> <td>&gt;1500 mg/m3</td> <td>9000 mg/kg, rat</td> </tr> <tr> <td>Nickel</td> <td>7440-02-0</td> <td>231-111-4</td> <td>N.Av.</td> <td>&gt;9000 mg/kg, rat</td> </tr> <tr> <td>Phosphorus (red)</td> <td>7723-14-0</td> <td>231-768-7</td> <td>N.Av.</td> <td>&gt;15000 mg/kg, rat</td> </tr> <tr> <td>Potassium kryolith</td> <td>7789-23-3</td> <td>232-151-5</td> <td>N.Av.</td> <td>245 mg/kg, rat</td> </tr> <tr> <td>Silver</td> <td>7440-22-4</td> <td>231-131-3</td> <td>N.Av.</td> <td>&gt;5000 mg/kg, rat</td> </tr> <tr> <td>Sodium fluoroaluminate</td> <td>15096-52-3</td> <td>237-410-6</td> <td>N.Av.</td> <td>&gt;5000 mg/kg, rat</td> </tr> <tr> <td>Sodium fluoride</td> <td>1333-83-1</td> <td>215-608-3</td> <td>N.Av.</td> <td>31 mg/kg, rat</td> </tr> <tr> <td>Sodium silicate</td> <td>1344-09-8</td> <td>215-687-4</td> <td>N.Av.</td> <td>1100 – 1600 mg/kg, rat</td> </tr> <tr> <td>Tin</td> <td>7440-31-5</td> <td>231-141-8</td> <td>N.Av.</td> <td>2207 mg/kg</td> </tr> <tr> <td>Zinc</td> <td>7440-66-6</td> <td>7440-66-6</td> <td>N.Av.</td> <td>650 mg/kg, rat</td> </tr> </tbody> </table>	Chemical Name	CAS Number	EINECS Number	LC50, inhalation	LD50, oral	Aluminum	7429-90-5	231-072-3	N.Av.	N.Av.	Aluminum fluoride	7784-18-1	232-051-1	N.Av.	100 mg/kg, rat	Barium carbonate	513-77-9	208-167-3	N.Av.	132 – 277 mg/kg, rat	Calcium fluoride	7789-75-5	232-188-7	N.Av.	4250 mg/kg, rat	Copper	7440-50-8	231-159-6	N.Av.	472 mg/kg, rat	Cryoflux	15096-52-3	239-148-8	N.Av.	N.Av.	Graphite	7782-42-5	231-955-3	N.Av.	>2000 mg/kg, rat	Iron	7439-89-6	231-096-4	N.Av.	750 mg/kg, rat	Manganese	7439-96-5	231-105-1	>1500 mg/m3	9000 mg/kg, rat	Nickel	7440-02-0	231-111-4	N.Av.	>9000 mg/kg, rat	Phosphorus (red)	7723-14-0	231-768-7	N.Av.	>15000 mg/kg, rat	Potassium kryolith	7789-23-3	232-151-5	N.Av.	245 mg/kg, rat	Silver	7440-22-4	231-131-3	N.Av.	>5000 mg/kg, rat	Sodium fluoroaluminate	15096-52-3	237-410-6	N.Av.	>5000 mg/kg, rat	Sodium fluoride	1333-83-1	215-608-3	N.Av.	31 mg/kg, rat	Sodium silicate	1344-09-8	215-687-4	N.Av.	1100 – 1600 mg/kg, rat	Tin	7440-31-5	231-141-8	N.Av.	2207 mg/kg	Zinc	7440-66-6	7440-66-6	N.Av.	650 mg/kg, rat
Chemical Name	CAS Number	EINECS Number	LC50, inhalation	LD50, oral																																																																																												
Aluminum	7429-90-5	231-072-3	N.Av.	N.Av.																																																																																												
Aluminum fluoride	7784-18-1	232-051-1	N.Av.	100 mg/kg, rat																																																																																												
Barium carbonate	513-77-9	208-167-3	N.Av.	132 – 277 mg/kg, rat																																																																																												
Calcium fluoride	7789-75-5	232-188-7	N.Av.	4250 mg/kg, rat																																																																																												
Copper	7440-50-8	231-159-6	N.Av.	472 mg/kg, rat																																																																																												
Cryoflux	15096-52-3	239-148-8	N.Av.	N.Av.																																																																																												
Graphite	7782-42-5	231-955-3	N.Av.	>2000 mg/kg, rat																																																																																												
Iron	7439-89-6	231-096-4	N.Av.	750 mg/kg, rat																																																																																												
Manganese	7439-96-5	231-105-1	>1500 mg/m3	9000 mg/kg, rat																																																																																												
Nickel	7440-02-0	231-111-4	N.Av.	>9000 mg/kg, rat																																																																																												
Phosphorus (red)	7723-14-0	231-768-7	N.Av.	>15000 mg/kg, rat																																																																																												
Potassium kryolith	7789-23-3	232-151-5	N.Av.	245 mg/kg, rat																																																																																												
Silver	7440-22-4	231-131-3	N.Av.	>5000 mg/kg, rat																																																																																												
Sodium fluoroaluminate	15096-52-3	237-410-6	N.Av.	>5000 mg/kg, rat																																																																																												
Sodium fluoride	1333-83-1	215-608-3	N.Av.	31 mg/kg, rat																																																																																												
Sodium silicate	1344-09-8	215-687-4	N.Av.	1100 – 1600 mg/kg, rat																																																																																												
Tin	7440-31-5	231-141-8	N.Av.	2207 mg/kg																																																																																												
Zinc	7440-66-6	7440-66-6	N.Av.	650 mg/kg, rat																																																																																												

	<p><b>Chronic Toxicity:</b>  Repeated exposure to welding fumes may cause a progressive lung disease (mixed-dust pneumoconiosis) which impairs breathing. Lung fibrosis has been reported in workers after long term aluminum exposure. Inhalation of barium compounds may cause irritation and baritosis, a benign deposition of dust in the lungs. Swallowing of barium compounds can cause gastrointestinal problems and adverse effects on the nervous system, potentially with serious problems with heart function and paralysis. HEXAVALENT CHROMIUM COMPOUNDS AND CERTAIN NICKEL COMPOUNDS ARE CONFIRMED OR SUSPECTED CARCINOGENS. Kidney and liver damage may also occur. Chromium and nickel compounds can cause allergic skin rash. Inhalation of hexavalent chromium compounds can cause asthma and bronchitis. Inhalation of copper fume may cause metal fume fever and nasal congestion, ulceration and perforation. Exposure to fluorides can cause eye, nose and throat irritation and fluorosis, a potentially crippling bone disease. Graphite inhalation can cause dust bronchitis, deposition in the lungs, and may increase the risk of lung cancer. Although inhalation of iron is not especially toxic in comparison to many other metals, it will deposit in the lungs possibly causing siderosis. This may lead to breathlessness, coughing and decreased lung function. Deposition can also occur in the eyes, and in some cases may lead to cataracts and night blindness.</p> <p>Manganese exposure can cause neurological damage including: slowness, changes in gait, changes in handwriting, muscle spasm, cramps, tremors, slurred speech, and behavioral changes. These may become permanent with long term overexposure. Molybdenum trioxide is classified as probably carcinogenic to humans by the IARC (Group 2A). Soluble molybdenum compounds are classified as animal carcinogens by the ACGIH (A3). Animal experiments and human experience suggest that inhalation of molybdenum and compounds can cause lung inflammation and damage. No information was found for harmful effects of red phosphorus. Silica fume may cause "ferro-alloy disease", which is characterized by recurrent fever over a period of 3 to 12 weeks. Lung damage may occur, but is thought not to progress further unlike silicosis produced by crystalline silica. Crystalline silica exposure can lead to progressive irreversible lung damage (silicosis) and increase the risk of lung cancer. Silicates can cause irritation of the eyes, nose and throat, likely leading long term to bronchitis. Sodium silicate can cause irritation of the eyes, nose and throat, likely leading long term to bronchitis. Overexposure to silver can cause argyria, which can turn the skin a blue or grey color. Exposure to tin dust and fume can result in irritation of the eyes and lungs. Deposition of tin in the lungs is not thought to cause serious health effects. Tungsten may cause lung fibrosis, with cough and difficulty breathing. Zinc fume exposure may cause metal fume fever with cough, chills, fever, shortness of breath, chest pain, nausea and vomiting.</p>
<b>12</b>	<b>Ecological Information</b>
<b>12.1</b>	<b>Toxicity:</b> Not available
<b>12.2</b>	<b>Persistence and degradability:</b> Not available
<b>12.3</b>	<b>Bioaccumulative potential:</b> Not available
<b>12.4</b>	<b>Mobility in soil:</b> Not available
<b>12.5</b>	<b>Results of PBT and vPvB assessment:</b> Not available
<b>12.6</b>	<b>Other adverse effects:</b> Not available
<b>12.7</b>	<b>Other:</b> Welding consumables and materials could degrade / weather into components originating from the consumables or from the materials used in the welding process. Avoid exposure to conditions that could lead to accumulation in soils or groundwater. Nickel is harmful to the environment, harmful to aquatic organisms, and may cause long-term adverse effects in the aquatic environment.
<b>13</b>	<b>Disposal Considerations</b>
<b>13.1</b>	<p><b>Disposal and waste treatment methods:</b> Reuse or recycle where possible. Discard any product, residue, disposable container or liner in an environmentally acceptable manner, in full compliance with federal, provincial and local regulations. Use recycling procedures if available.</p> <p><b>USA RCRA:</b> Unused products or product residue containing chromium, silver are considered hazardous wastes if discarded: RCRA Hazardous Waste Codes D007, D011. Nickel and Manganese Hazardous waste Codes N.Av. Residues from welding consumables and processes could degrade and accumulate in soils and groundwater. See also Section 8 for exposure controls while handling.</p>
<b>14</b>	<b>Transportation Information</b>
<b>14.1</b>	<b>UN number:</b> Not applicable



14.2	<b>UN proper shipping name:</b> Not applicable
14.3	<b>Transport hazard class(es):</b> Not applicable
14.4	<b>Packing group:</b> Not applicable
14.5	<b>Environmental hazards:</b> Not applicable
14.6	<b>Special precautions for user:</b> Not applicable
14.7	<b>Transport in bulk according to Annex II of MARPOL and the IBC Code:</b> Not applicable
15	<b>Regulatory Information</b>
15.1	<p><b>Safety health and environmental regulations /legislation specific for the substance or mixture (applies to the airborne emissions during use).</b></p> <p><b>Canada:</b>  Class: Carcinogenicity Category: 1A  Class: Reproductive Toxicity Category: 2  Class: Germ Cell Mutagenicity Category: 1B  Class: Respiratory Sensitization Category: 1  Class: Skin Sensitization Category: 1  Class: Specific Target Organ Toxicity – (repeated exposure) Category: 1  Target Organs: Lungs, Kidneys, Liver, Respiratory System, Nerves, Blood, Eyes, Skin  Canadian Environmental Protection Act (CEPA): All constituents of this product are on the Domestic Substances List (DSL).</p> <p><b>USA:</b>  Under the OSHA Hazard Communication Standard, this product is considered hazardous.  This product contains or produces a chemical known to the state of California to cause cancer and birth defects (or other reproductive harm). (California Health &amp; Safety Code § 25249.5 et seq.) United States EPA Toxic Substance Control Act: All constituents of this product are on the TSCA inventory list or are excluded from listing.</p> <p><b>CERCLA/SARA Title III Reportable Quantities (RQs):</b>  Product is a solid solution in the form of a solid article: Chromium RQ 5000 lbs; Copper RQ 5000 lbs; Manganese RQ N.Av; Nickel RQ 100 lbs; Silver RQ 1000 lbs; Zinc RQ 1000 lbs. Spills or releases resulting in the loss of any ingredient at or above its RQ require immediate notification to the National Response Center and to your Local Emergency Planning Committee.  The following metallic components are listed as SARA 313 “Toxic Chemicals” and potentially subject to annual SARA 313 reporting (shown with de minimis concentrations): Chromium, 1.0%; Copper, 1.0%; Silver, 1.0%; Zinc, 1.0%. See Section 3 for weight %.</p>
15.2	<p><b>Other:</b> Read and understand the manufacturer's instructions, your employer's safety practices and the health and safety instructions on the label. Observe all applicable regulations. Take precautions when welding and protect yourself and others. WARNING: Welding fumes and gases are hazardous to your health and may damage lungs and other organs. Use adequate ventilation. ELECTRIC SHOCK can kill. ARC RAYS and SPARKS can injure eyes and burn skin. Wear correct hand, head, eye and body protection.</p>
16	<b>Other Information</b>
16.1	<p><b>USA:</b> American National Standard Z49.1. “Safety in Welding and Cutting”, ANSI/AWS F1.5. Methods for Sampling and analyzing Gases from Welding and Allied Processes., ANSI/AWS F1.1 “Method for Sampling Airborne Particles Generated by Welding and Allied Processes”, AWSF3.2M/F3.2 “Ventilation Guide for Weld Fume”, American Welding Society, 550 North Le Jeune Road, Miami Florida, 33135. Safety and Health Fact Sheets available from AWS at <a href="http://www.aws.org">www.aws.org</a>  OSHA Publication 2206 (29 C.F.R. 1910), U.S. Government Printing Office, Superintendent of Documents, P.O. Box 371954, Pittsburgh, PA 15250-7954.  American Conference of Governmental Hygienists (ACGIH), Threshold Limit Values and Biological Exposure Indices, 6500 Glenway Ave., Cincinnati, Ohio 45211, USA.  NFPA 51B “Standard for Fire Prevention During Welding, Cutting and Other Hot Work” published by the National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02169</p> <p><b>Canada:</b> CSA Standard CAN/CSA-W117.2-01 “Safety in Welding, Cutting and Allied Processes”</p>

<b>16.2</b>	This SDS has been prepared by Arctec Alloys Limited based on information obtained from sources believed to be accurate and reliable. However, this information is provided without any representation or warranty, expressed or implied, regarding accuracy or completeness thereof. The conditions or methods of handling, storage, use and disposal of the product are beyond the control and knowledge of Arctec Alloys Limited. For this and other reasons Arctec Alloys Limited does not assume responsibility, and expressly disclaims liability for loss, damage or expense arising from it or in any way connected with the handling, storage, use or disposal of the product.
-------------	--