SAFETY DATA SHEET

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name: Stay Silv® White Brazing Flux

Other means of identification

SDS number: 200000007166

Recommended use and restriction on use

Recommended use: Metal Brazing

Restrictions on use: Not known. Read this SDS before using this product.

Manufacturer/Importer/Supplier/Distributor Information

Company Name: The Harris Products Group
Address: 4501 Quality Place
          Mason, OH 45040-1971
          USA
Telephone: +1 (513) 754-2000
Contact Person: Safety Data Sheet Questions: custservmason@jwharris.com

Emergency telephone number:

USA/Canada/Mexico  +1 (888) 609-1762
Americas/Europe    +1 (216) 383-8962
Asia Pacific       +1 (216) 383-8966
Middle East/Africa +1 (216) 383-8969

3E Company Access Code: 333988

2. HAZARDS IDENTIFICATION


Hazard Classification

Health Hazards
- Acute toxicity (Oral) Category 4
- Acute toxicity (Dermal) Category 3
- Acute toxicity (Inhalation - dust and mist) Category 4
- Toxic to reproduction Category 2

Label Elements

Hazard Symbol:

Signal Word: Danger
Hazard Statement: Toxic in contact with skin. Harmful if swallowed or if inhaled Suspected of damaging fertility or the unborn child.

Precautionary Statements: 

Prevention: Wear protective gloves/protection clothing/eye protection/face protection. Avoid breathing dust/fume/gas/mist/vapours/spray. Use only outdoors or in a well-ventilated area. Wash thoroughly after handling. Do not eat, drink or smoke when using this product. Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Use personal protective equipment as required.

Response: IF INHALED: Remove person to fresh air and keep comfortable for breathing. IF ON SKIN: Wash with plenty of water/… IF SWALLOWED: Call a POISON CENTRE/doctor/… if you feel unwell. Rinse mouth. Call a POISON CENTRE/doctor if you feel unwell. Specific measures (see this label). Take off immediately all contaminated clothing. Wash contaminated clothing before reuse.

Storage: Store locked up.

Disposal: Dispose of contents/container to an appropriate treatment and disposal facility in accordance with applicable laws and regulations, and product characteristics at time of disposal.

Other hazards which do not result in GHS classification: Heat rays (infrared radiation) from flame or hot metal can injure eyes. Overexposure to brazing fumes and gases can be hazardous. Read and understand the manufacturer’s instructions, Safety Data Sheets and the precautionary labels before using this product.

Substance(s) formed under the conditions of use: Fumes produced from use of this product may contain the following constituent(s) and/or their complex metallic oxides as well as solid particles or other constituents from the solder, brazing consumable, flux material or base metal, or base metal coating not listed below. Hydrogen fluoride, a possible decomposition product, is extremely corrosive and a poison by all routes of entry. Hydrogen fluoride can penetrate the skin and produce burns, which may not be immediately painful or visible; the burns impact the lower layers of skin and bone tissue. Hydrogen fluoride exposures involving 20 percent of the body or more can be fatal through systemic fluoride poisoning.

<table>
<thead>
<tr>
<th>Chemical Identity</th>
<th>CAS-No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbon dioxide</td>
<td>124-38-9</td>
</tr>
<tr>
<td>Carbon monoxide</td>
<td>630-08-0</td>
</tr>
<tr>
<td>Nitrogen dioxide</td>
<td>10102-44-0</td>
</tr>
<tr>
<td>Ozone</td>
<td>10028-15-6</td>
</tr>
</tbody>
</table>

3. COMPOSITION / INFORMATION ON INGREDIENTS

Reportable Hazardous Ingredients 
Mxtures
<table>
<thead>
<tr>
<th>Chemical Identity</th>
<th>CAS number</th>
<th>Content in percent (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Potassium difluorodihydroxyborate(1-)</td>
<td>85392-66-1</td>
<td>50 - &lt;100%</td>
</tr>
<tr>
<td>Potassium fluoride</td>
<td>7789-23-3</td>
<td>25 - &lt;50%</td>
</tr>
</tbody>
</table>

* All concentrations are percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

**Composition Comments:**

The term “Hazardous Ingredients” should be interpreted as a term defined in Hazard Communication standards and does not necessarily imply the existence of a welding hazard. The product may contain additional non-hazardous ingredients or may form additional compounds under the condition of use. Refer to Sections 2 and 8 for more information.

4. **FIRST AID MEASURES**

**Ingestion:**

Avoid hand, clothing, food, and drink contact with fluxes, metal fume or powder which can cause ingestion of particulate during hand to mouth activities such as drinking, eating, smoking, etc. If ingested, do not induce vomiting. Contact a poison control center. Unless the poison control center advises otherwise, wash out mouth thoroughly with water. If symptoms develop, seek medical attention at once. Call a POISON CENTRE/doctor if you feel unwell. Rinse mouth. Never give liquid to an unconscious person. Do not induce vomiting without advice from poison control center.

**Inhalation:**

Move to fresh air if breathing is difficult. If breathing has stopped, perform artificial respiration and obtain medical assistance at once.

**Skin Contact:**

Immediately flush with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash contaminated clothing before reuse. Destroy or thoroughly clean contaminated shoes. Call a POISON CENTRE/doctor if you feel unwell.

**Eye contact:**

Immediately flush with plenty of water for at least 15 minutes. If easy to do, remove contact lenses. Call a POISON CENTRE/doctor if you feel unwell.

**Most important symptoms/effects, acute and delayed**

**Symptoms:**

Short-term (acute) overexposure to fumes and gases from welding and allied processes may result in discomfort such as metal fume fever, dizziness, nausea, or dryness or irritation of nose, throat, or eyes. May aggravate pre-existing respiratory problems (e.g. asthma, emphysema). Long-term (chronic) overexposure to fumes and gases from welding and allied processes can lead to siderosis (iron deposits in lung), central nervous system effects, bronchitis and other pulmonary effects. Refer to Section 11 for more information.

**Hazards:**

The hazards associated with welding and its allied processes such as soldering and brazing are complex and may include physical and health hazards such as but not limited to electric shock, physical strains, radiation burns (eye flash), thermal burns due to hot metal or spatter and potential health effects of overexposure to fumes, gases or dusts potentially generated during the use of this product. Refer to Section 11 for more information.

**Indication of immediate medical attention and special treatment needed**

**Treatment:**

Treat symptomatically.

5. **FIRE-FIGHTING MEASURES**
General Fire Hazards: As shipped, this product is nonflammable. However, welding arc and sparks as well as open flames and hot surfaces associated with brazing and soldering can ignite combustible and flammable materials. Read and understand American National Standard Z49.1, “Safety in Welding, Cutting and Allied Processes” and National Fire Protection Association NFPA 51B, “Standard for Fire Prevention during Welding, Cutting and Other Hot Work” before using this product.

Suitable (and unsuitable) extinguishing media
Suitable extinguishing media: Use fire-extinguishing media appropriate for surrounding materials.

Unsuitable extinguishing media: Do not use water jet as an extinguisher, as this will spread the fire.

Specific hazards arising from the chemical: During fire, gases hazardous to health may be formed.

Special protective equipment and precautions for firefighters
Special fire fighting procedures: Use standard firefighting procedures and consider the hazards of other involved materials.

Special protective equipment for fire-fighters: Selection of respiratory protection for fire fighting: follow the general fire precautions indicated in the workplace. Self-contained breathing apparatus and full protective clothing must be worn in case of fire.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures: Evacuate area. See Section 8 of the SDS for Personal Protective Equipment. Keep unauthorized personnel away.

Methods and material for containment and cleaning up: Absorb spill with vermiculite or other inert material, then place in a container for chemical waste. Dike far ahead of larger spill for later recovery and disposal.

Notification Procedures: Dike for later disposal. Prevent entry into waterways, sewer, basements or confined areas. Stop the flow of material, if this is without risk.

Environmental Precautions: Do not contaminate water sources or sewer. Prevent further leakage or spillage if safe to do so.

7. HANDLING AND STORAGE

Precautions for safe handling: Prevent abrading consumable materials or creating dust. Provide appropriate exhaust ventilation at places where fume or dust is formed. Wear appropriate personal protective equipment. Observe good industrial hygiene practices.

Conditions for safe storage, including any incompatibilities:
Store locked up.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Control Parameters

### Occupational Exposure Limits: US

<table>
<thead>
<tr>
<th>Chemical Identity</th>
<th>Type</th>
<th>Exposure Limit Values</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Potassium difluorodihydroxyborate(1-) - Inhalable fraction.</td>
<td>STEL</td>
<td>6 mg/m³</td>
<td>US. ACGIH Threshold Limit Values (02 2014)</td>
</tr>
<tr>
<td></td>
<td>TWA</td>
<td>2 mg/m³</td>
<td>US. ACGIH Threshold Limit Values (02 2014)</td>
</tr>
<tr>
<td>Potassium fluoride - as F</td>
<td>TWA</td>
<td>2.5 mg/m³</td>
<td>US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) (02 2006)</td>
</tr>
<tr>
<td>Potassium fluoride - Dust.</td>
<td>TWA</td>
<td>2.5 mg/m³</td>
<td>US. OSHA Table Z-2 (29 CFR 1910.1000) (02 2006)</td>
</tr>
</tbody>
</table>

### Occupational Exposure Limits: Canada

<table>
<thead>
<tr>
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<th>Source</th>
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<tbody>
<tr>
<td>Potassium difluorodihydroxyborate(1-) - as F</td>
<td>TWA</td>
<td>2.5 mg/m³</td>
<td>Canada. Alberta OELs (Occupational Health &amp; Safety Code, Schedule 1, Table 2) (07 2009)</td>
</tr>
<tr>
<td>Potassium difluorodihydroxyborate(1-) - Inhalable fraction.</td>
<td>STEL</td>
<td>6 mg/m³</td>
<td>Canada. Manitoba OELs (Reg. 217/2006, The Workplace Safety And Health Act) (03 2013)</td>
</tr>
<tr>
<td></td>
<td>TWA</td>
<td>2 mg/m³</td>
<td>Canada. Manitoba OELs (Reg. 217/2006, The Workplace Safety And Health Act) (03 2013)</td>
</tr>
<tr>
<td>Potassium fluoride - as F</td>
<td>TWA</td>
<td>2.5 mg/m³</td>
<td>Canada. Alberta OELs (Occupational Health &amp; Safety Code, Schedule 1, Table 2) (07 2009)</td>
</tr>
<tr>
<td></td>
<td>TWA</td>
<td>2.5 mg/m³</td>
<td>Canada. Alberta OELs (Occupational Health &amp; Safety Code, Schedule 1, Table 2) (07 2009)</td>
</tr>
<tr>
<td></td>
<td>TWA</td>
<td>2.5 mg/m³</td>
<td>Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended) (07 2007)</td>
</tr>
<tr>
<td></td>
<td>TWA</td>
<td>2.5 mg/m³</td>
<td>Canada. Manitoba OELs (Reg. 217/2006, The Workplace Safety And Health Act) (03 2011)</td>
</tr>
<tr>
<td></td>
<td>TWA</td>
<td>2.5 mg/m³</td>
<td>Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents) (11 2010)</td>
</tr>
<tr>
<td></td>
<td>8 HR ACL</td>
<td>2.5 mg/m³</td>
<td>Canada. Saskatchewan OELs (Occupational Health and Safety Regulations, 1996, Table 21) (05 2009)</td>
</tr>
<tr>
<td></td>
<td>15 MIN ACL</td>
<td>5 mg/m³</td>
<td>Canada. Saskatchewan OELs (Occupational Health and Safety Regulations, 1996, Table 21) (05 2009)</td>
</tr>
<tr>
<td></td>
<td>TWA</td>
<td>2.5 mg/m³</td>
<td>Canada. Quebec OELs. (Ministry of Labor - Regulation Respecting the Quality of the Work Environment) (12 2008)</td>
</tr>
</tbody>
</table>

### Occupational Exposure Limits: Mexico

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<thead>
<tr>
<th>Chemical Identity</th>
<th>Type</th>
<th>Exposure Limit Values</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Potassium fluoride - as F</td>
<td>VLE-PPT</td>
<td>2.5 mg/m³</td>
<td>Mexico. OELs. (NOM-010-STPS-2014 Chemical Pollutants at the Workplace;</td>
</tr>
</tbody>
</table>
### Biological Limit Values: US

<table>
<thead>
<tr>
<th>Chemical Identity</th>
<th>Exposure Limit Values</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Potassium fluoride (Fluoride: Sampling time: Prior to shift.)</td>
<td>2 mg/l (Urine)</td>
<td>ACGIH BEI (03 2013)</td>
</tr>
<tr>
<td>Potassium fluoride (Fluoride: Sampling time: End of shift.)</td>
<td>3 mg/l (Urine)</td>
<td>ACGIH BEI (03 2013)</td>
</tr>
</tbody>
</table>

### Biological Limit Values: Mexico

<table>
<thead>
<tr>
<th>Chemical Identity</th>
<th>Exposure Limit Values</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Potassium fluoride (fluorides: Sampling time: Prior to shift.)</td>
<td>3 mg/g (Creatinine in urine)</td>
<td>MX IBE (06 2012)</td>
</tr>
<tr>
<td>Potassium fluoride (fluorides: Sampling time: End of shift.)</td>
<td>10 mg/g (Creatinine in urine)</td>
<td>MX IBE (06 2012)</td>
</tr>
</tbody>
</table>

### Additional exposure limits under the conditions of use: US

<table>
<thead>
<tr>
<th>Chemical Identity</th>
<th>Type</th>
<th>Exposure Limit Values</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbon dioxide</td>
<td>TWA</td>
<td>5,000 ppm</td>
<td>US. ACGIH Threshold Limit Values (12 2010)</td>
</tr>
<tr>
<td></td>
<td>STEL</td>
<td>30,000 ppm</td>
<td>US. ACGIH Threshold Limit Values (12 2010)</td>
</tr>
<tr>
<td></td>
<td>PEL</td>
<td>5,000 ppm 9,000 mg/m3</td>
<td>US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) (02 2006)</td>
</tr>
<tr>
<td></td>
<td>STEL</td>
<td>30,000 ppm 54,000 mg/m3</td>
<td>US. NIOSH: Pocket Guide to Chemical Hazards (2005)</td>
</tr>
<tr>
<td></td>
<td>REL</td>
<td>5,000 ppm 9,000 mg/m3</td>
<td>US. NIOSH: Pocket Guide to Chemical Hazards (2005)</td>
</tr>
<tr>
<td>Carbon monoxide</td>
<td>TWA</td>
<td>25 ppm</td>
<td>US. ACGIH Threshold Limit Values (12 2010)</td>
</tr>
<tr>
<td></td>
<td>PEL</td>
<td>50 ppm 55 mg/m3</td>
<td>US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) (02 2006)</td>
</tr>
<tr>
<td></td>
<td>REL</td>
<td>35 ppm 40 mg/m3</td>
<td>US. NIOSH: Pocket Guide to Chemical Hazards (2005)</td>
</tr>
<tr>
<td></td>
<td>Ceil_Time</td>
<td>200 ppm 229 mg/m3</td>
<td>US. NIOSH: Pocket Guide to Chemical Hazards (2005)</td>
</tr>
<tr>
<td>Nitrogen dioxide</td>
<td>TWA</td>
<td>0.2 ppm</td>
<td>US. ACGIH Threshold Limit Values (02 2012)</td>
</tr>
<tr>
<td></td>
<td>Ceiling</td>
<td>5 ppm 9 mg/m3</td>
<td>US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) (02 2006)</td>
</tr>
<tr>
<td></td>
<td>STEL</td>
<td>1 ppm 1.8 mg/m3</td>
<td>US. NIOSH: Pocket Guide to Chemical Hazards (2005)</td>
</tr>
<tr>
<td>Ozone</td>
<td>PEL</td>
<td>0.1 ppm 0.2 mg/m3</td>
<td>US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) (02 2006)</td>
</tr>
<tr>
<td></td>
<td>Ceil_Time</td>
<td>0.1 ppm 0.2 mg/m3</td>
<td>US. NIOSH: Pocket Guide to Chemical Hazards (2005)</td>
</tr>
<tr>
<td></td>
<td>TWA</td>
<td>0.05 ppm</td>
<td>US. ACGIH Threshold Limit Values (03 2014)</td>
</tr>
<tr>
<td></td>
<td>TWA</td>
<td>0.20 ppm</td>
<td>US. ACGIH Threshold Limit Values (03 2014)</td>
</tr>
<tr>
<td></td>
<td>TWA</td>
<td>0.10 ppm</td>
<td>US. ACGIH Threshold Limit Values (03 2014)</td>
</tr>
<tr>
<td></td>
<td>TWA</td>
<td>0.08 ppm</td>
<td>US. ACGIH Threshold Limit Values (03 2014)</td>
</tr>
</tbody>
</table>

### Additional exposure limits under the conditions of use: Canada

<table>
<thead>
<tr>
<th>Chemical Identity</th>
<th>Type</th>
<th>Exposure Limit Values</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbon dioxide</td>
<td>STEL</td>
<td>30,000 ppm 54,000 mg/m3</td>
<td>Canada. Alberta OELs (Occupational)</td>
</tr>
<tr>
<td>Substance</td>
<td>Exposure Period</td>
<td>Limit</td>
<td>Source</td>
</tr>
<tr>
<td>----------------------------</td>
<td>-----------------</td>
<td>---------------</td>
<td>----------------------------------------------------------------------</td>
</tr>
<tr>
<td>Carbon monoxide</td>
<td>TWA</td>
<td>25 ppm</td>
<td>29 mg/m³ Canada. Alberta OELs (Occupational Health &amp; Safety Code, Schedule 1, Table 2) (07 2009)</td>
</tr>
<tr>
<td></td>
<td>STEL</td>
<td>100 ppm</td>
<td>290 mg/m³ Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended) (07 2007)</td>
</tr>
<tr>
<td></td>
<td>TWA</td>
<td>25 ppm</td>
<td>29 mg/m³ Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents) (11 2010)</td>
</tr>
<tr>
<td></td>
<td>STEL</td>
<td>30,000 ppm</td>
<td>30,000 mg/m³ Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents) (11 2010)</td>
</tr>
<tr>
<td>Carbon monoxide</td>
<td>TWA</td>
<td>25 ppm</td>
<td>29 mg/m³ Canada. Quebec OELs. (Ministry of Labor - Regulation Respecting the Quality of the Work Environment) (12 2008)</td>
</tr>
<tr>
<td></td>
<td>STEL</td>
<td>50 ppm</td>
<td>50 mg/m³ Canada. Quebec OELs. (Ministry of Labor - Regulation Respecting the Quality of the Work Environment) (12 2008)</td>
</tr>
<tr>
<td>Nitrogen dioxide</td>
<td>STEL</td>
<td>5 ppm</td>
<td>9.4 mg/m³ Canada. Alberta OELs (Occupational Health &amp; Safety Code, Schedule 1, Table 2) (07 2009)</td>
</tr>
<tr>
<td>Exposure Level</td>
<td>Concentration</td>
<td>Mass Concentration</td>
<td>Source</td>
</tr>
<tr>
<td>----------------</td>
<td>---------------</td>
<td>--------------------</td>
<td>--------</td>
</tr>
<tr>
<td><strong>TWA</strong></td>
<td>3 ppm</td>
<td>5.6 mg/m³</td>
<td>Canada, Alberta OELs (Occupational Health &amp; Safety Code, Schedule 1, Table 2) (07 2009)</td>
</tr>
<tr>
<td><strong>CEILING</strong></td>
<td>1 ppm</td>
<td></td>
<td>Canada, British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended) (07 2007)</td>
</tr>
<tr>
<td><strong>TWA</strong></td>
<td>0.2 ppm</td>
<td></td>
<td>Canada, Manitoba OELs (Reg. 217/2006, The Workplace Safety And Health Act) (03 2012)</td>
</tr>
<tr>
<td><strong>STEL</strong></td>
<td>5 ppm</td>
<td></td>
<td>Canada, Ontario OELs. (Control of Exposure to Biological or Chemical Agents) (11 2010)</td>
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<tr>
<td><strong>TWA</strong></td>
<td>3 ppm</td>
<td></td>
<td>Canada, Ontario OELs. (Control of Exposure to Biological or Chemical Agents) (11 2010)</td>
</tr>
<tr>
<td><strong>8 HR ACL</strong></td>
<td>3 ppm</td>
<td></td>
<td>Canada, Saskatchewan OELs (Occupational Health and Safety Regulations, 1996, Table 21) (05 2009)</td>
</tr>
<tr>
<td><strong>15 MIN ACL</strong></td>
<td>5 ppm</td>
<td></td>
<td>Canada, Saskatchewan OELs (Occupational Health and Safety Regulations, 1996, Table 21) (05 2009)</td>
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<tr>
<td><strong>TWA</strong></td>
<td>3 ppm</td>
<td>5.6 mg/m³</td>
<td>Canada, Quebec OELs. (Ministry of Labor - Regulation Respecting the Quality of the Work Environment) (12 2008)</td>
</tr>
<tr>
<td><strong>Ozone</strong></td>
<td>STEL</td>
<td>0.3 ppm</td>
<td>Canada, Alberta OELs (Occupational Health &amp; Safety Code, Schedule 1, Table 2) (07 2009)</td>
</tr>
<tr>
<td><strong>TWA</strong></td>
<td>0.1 ppm</td>
<td>0.2 mg/m³</td>
<td>Canada, Alberta OELs (Occupational Health &amp; Safety Code, Schedule 1, Table 2) (07 2009)</td>
</tr>
<tr>
<td><strong>TWA</strong></td>
<td>0.05 ppm</td>
<td></td>
<td>Canada, British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended) (07 2007)</td>
</tr>
<tr>
<td><strong>TWA</strong></td>
<td>0.1 ppm</td>
<td></td>
<td>Canada, British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended) (07 2007)</td>
</tr>
<tr>
<td><strong>TWA</strong></td>
<td>0.08 ppm</td>
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<td>Canada, British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended) (07 2007)</td>
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<td>0.2 ppm</td>
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<td><strong>STEL</strong></td>
<td>0.3 ppm</td>
<td>0.6 mg/m³</td>
<td>Canada, Ontario OELs. (Control of Exposure to Biological or Chemical Agents) (07 2010)</td>
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<td>Canada, Saskatchewan OELs (Occupational Health and Safety Regulations, 1996, Table 21) (05 2009)</td>
</tr>
<tr>
<td><strong>CEILING</strong></td>
<td>0.1 ppm</td>
<td>0.2 mg/m³</td>
<td>Canada, Quebec OELs. (Ministry of Labor - Regulation Respecting the Quality of the Work Environment) (12 2008)</td>
</tr>
<tr>
<td><strong>TWA</strong></td>
<td>0.20 ppm</td>
<td></td>
<td>Canada, Manitoba OELs (Reg. 217/2006, The Workplace Safety And Health Act)</td>
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</table>
### Additional exposure limits under the conditions of use: Mexico

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<tr>
<th>Chemical Identity</th>
<th>Type</th>
<th>Exposure Limit Values</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbon dioxide</td>
<td>VLE-CT</td>
<td>30,000 ppm</td>
<td>Mexico. OELs. (NOM-010-STPS-2014 Chemical Pollutants at the Workplace; Assessment and Control) (04 2014)</td>
</tr>
<tr>
<td></td>
<td>VLE-PPT</td>
<td>5,000 ppm</td>
<td>Mexico. OELs. (NOM-010-STPS-2014 Chemical Pollutants at the Workplace; Assessment and Control) (04 2014)</td>
</tr>
<tr>
<td>Carbon monoxide</td>
<td>VLE-PPT</td>
<td>25 ppm</td>
<td>Mexico. OELs. (NOM-010-STPS-2014 Chemical Pollutants at the Workplace; Assessment and Control) (04 2014)</td>
</tr>
<tr>
<td>Nitrogen dioxide</td>
<td>VLE-PPT</td>
<td>0.2 ppm</td>
<td>Mexico. OELs. (NOM-010-STPS-2014 Chemical Pollutants at the Workplace; Assessment and Control) (04 2014)</td>
</tr>
<tr>
<td>Ozone</td>
<td>VLE-P</td>
<td>0.1 ppm</td>
<td>Mexico. OELs. (NOM-010-STPS-2014 Chemical Pollutants at the Workplace; Assessment and Control) (04 2014)</td>
</tr>
</tbody>
</table>

### Appropriate Engineering Controls

**Ventilation:** Use enough ventilation and local exhaust at the arc, flame or heat source to keep the fumes and gases from the worker's breathing zone and the general area. Train the operator to keep their head out of the fumes. **Keep exposure as low as possible.**

**Individual protection measures, such as personal protective equipment**

**Exposure Guidelines:** Threshold Limit Values (TLVs) and Biological Exposure Indices (BEIs) are values published by the American Conference of Government Industrial Hygienists (ACGIH). ACGIH Statement of Positions Regarding the TLVs® and BEIs® states that the TLV-TWA should be used as a guide in the control of health hazards and should not be used to indicate a fine line between safe and dangerous exposures. See Section 10 for information on potential fume constituents of health interest.

Threshold Limit Values are figures published by the American Conference of Government Industrial Hygienists. Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level. An eye wash and safety shower must be available in the immediate work area.

**Eye/face protection:**

Wear helmet, face shield or eye protection with filter lens shade number 2 for torch soldering and 3-4 for torch brazing, and follow the recommendations as specified in ANSI Z49.1, Section 4, based on your process details. Shield others by providing appropriate screens and eye protection. Wear safety glasses with side shields (or goggles).

**Skin Protection**

**Hand Protection:**

Wear protective gloves. Suitable gloves can be recommended by the glove supplier.

**Other:**

**Protective Clothing:** Wear hand, head, and body protection which help to
prevent injury from radiation, open flames, hot surfaces, sparks and electrical shock. See Z49.1. At a minimum, this includes welder's gloves and a protective face shield when welding, and may include arm protectors, aprons, hats, shoulder protection, as well as dark substantial clothing when welding, brazing and soldering. Wear dry gloves free of holes or split seams. Train the operator not to permit electrically live parts or electrodes from contacting the skin... or clothing or gloves if they are wet. Insulate yourself from the work piece and ground using dry plywood, rubber mats or other dry insulation. Wear chemical-resistant gloves, footwear, and protective clothing appropriate for the risk of exposure. Contact health and safety professional or manufacturer for specific information.

Respiratory Protection: Keep your head out of fumes. Use enough ventilation and local exhaust to keep fumes and gases from your breathing zone and the general area. An approved respirator should be used unless exposure assessments are below applicable exposure limits.

Hygiene measures: Do not eat, drink or smoke when using the product. Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. Determine the composition and quantity of fumes and gases to which workers are exposed by taking an air sample from inside the welder's helmet if worn or in the worker's breathing zone. Improve ventilation if exposures are not below limits. See ANSI/AWS F1.1, F1.2, F1.3 and F1.5, available from the American Welding Society, www.aws.org. Wash contaminated clothing before reuse. Avoid contact with skin. Observe good industrial hygiene practices. Wash hands before breaks and immediately after handling the product. Wash hands after handling. Do not handle until all safety precautions have been read and understood. Obtain special instructions before use.

9. PHYSICAL AND CHEMICAL PROPERTIES

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>Brazing flux.</td>
</tr>
<tr>
<td>Physical state</td>
<td>Paste</td>
</tr>
<tr>
<td>Form</td>
<td>Paste</td>
</tr>
<tr>
<td>Color</td>
<td>White</td>
</tr>
<tr>
<td>Odor</td>
<td>No data available.</td>
</tr>
<tr>
<td>Odor threshold</td>
<td>No data available.</td>
</tr>
<tr>
<td>pH</td>
<td>No data available.</td>
</tr>
<tr>
<td>Melting point/freezing point</td>
<td>No data available.</td>
</tr>
<tr>
<td>Initial boiling point and boiling range</td>
<td>No data available.</td>
</tr>
<tr>
<td>Flash Point</td>
<td>No data available.</td>
</tr>
<tr>
<td>Evaporation rate</td>
<td>No data available.</td>
</tr>
<tr>
<td>Flammability (solid, gas)</td>
<td>No data available.</td>
</tr>
<tr>
<td>Upper/lower limit on flammability or explosive limits</td>
<td></td>
</tr>
<tr>
<td>Flammability limit - upper (%)</td>
<td>No data available.</td>
</tr>
<tr>
<td>Flammability limit - lower (%)</td>
<td>No data available.</td>
</tr>
<tr>
<td>Explosive limit - upper (%)</td>
<td>No data available.</td>
</tr>
<tr>
<td>Explosive limit - lower (%)</td>
<td>No data available.</td>
</tr>
<tr>
<td>Vapor pressure</td>
<td>No data available.</td>
</tr>
<tr>
<td>Vapor density</td>
<td>No data available.</td>
</tr>
</tbody>
</table>
Density: 1.6 g/cm³
Relative density: No data available.
Solubility(ies): No data available.
Solubility in water: No data available.
Solubility (other): No data available.
Partition coefficient (n-octanol/water): No data available.
Auto-ignition temperature: No data available.
Decomposition temperature: No data available.
Viscosity: No data available.

10. STABILITY AND REACTIVITY

Reactivity: The product is non-reactive under normal conditions of use, storage and transport.

Chemical Stability: Material is stable under normal conditions.

Possibility of hazardous reactions: None under normal conditions.

Conditions to avoid: Avoid heat or contamination.


Hazardous Decomposition Products:

Fumes and gases from welding and its allied processes such as brazing and soldering cannot be classified simply. The composition and quantity of both are dependent upon the metal to which the joining or hot work is applied, the process, procedure - and where applicable - the electrode or consumable used. Other conditions which also influence the composition and quantity of the fumes and gases to which workers may be exposed include: coatings on the metal being welded or worked (such as paint, plating, or galvanizing), the number of operators and the volume of the work area, the quality and amount of ventilation, the position of the operator's head with respect to the fume plume, as well as the presence of contaminants in the atmosphere (such as chlorinated hydrocarbon vapors from cleaning and degreasing activities.)

In cases where an electrode or other applied material is consumed, the fume and gas decomposition products generated are different in percent and form from the ingredients listed in Section 3. Decomposition products of normal operation include those originating from the volatilization, reaction, or oxidation of the materials shown in Section 3, plus those from the base metal and coating, etc., as noted above. Reasonably expected fume constituents produced during arc welding and brazing include the oxides of iron, manganese and other metals present in the welding consumable or base metal. Hexavalent chromium compounds may be in the welding or brazing fume of consumables or base metals which contain chromium. Gaseous and particulate fluoride may be in the fume of consumables or flux materials which contain fluoride. Gaseous reaction products may include carbon monoxide and carbon dioxide. Ozone and nitrogen oxides may be formed by the radiation from the arc associated with welding.

11. TOXICOLOGICAL INFORMATION
Information on likely routes of exposure

Inhalation: Inhalation is the primary route of exposure. In high concentrations, dust, vapors, fumes or mists may irritate nose, throat and mucus membranes.

Skin Contact: Toxic in contact with skin.

Eye contact: HEAT RAYS (INFRARED RADIATION) from flame or hot metal can injure eyes.

Ingestion: Avoid ingestion - wear gloves and other appropriate personal protection - wash hands thoroughly following use or handling. Harmful if swallowed.

Symptoms related to the physical, chemical and toxicological characteristics

Inhalation: Short-term (acute) overexposure to fumes and gases from brazing and soldering may result in discomfort such as metal fume fever, dizziness, nausea, or dryness or irritation of nose, throat, or eyes. May aggravate pre-existing respiratory problems (e.g. asthma, emphysema). Long-term (chronic) overexposure to fumes and gases from brazing and soldering can lead to siderosis (iron deposits in lung), central nervous system effects, bronchitis and other pulmonary effects. Products which contain lead or cadmium have additional specific health hazards - refer to Sections 2, 8 and 11 of this SDS. Depending on specific product composition, some products may produce hazardous concentrations of airborne oxides of cadmium, lead, zinc or fluoride compounds. Use adequate ventilation and respiratory protection during use. Avoid breathing fumes. Avoid ingestion - wear gloves and other appropriate personal protection - wash hands thoroughly following use or handling. Inhalation of fumes may cause upper respiratory tract irritation and systemic poisoning with early symptoms including headache, coughing, and a metallic taste as well as metal fume fever. Chronic cadmium exposure causes lung and kidney damage. Chronic exposure to lead causes damage to lungs, liver, kidney, nervous system as well as blood and musculoskeletal disorders. Exposures to high levels of cadmium or lead dust or fume may be immediately dangerous to life or health and can cause delayed pneumonitis with fever and chest pain, and pulmonary edema resulting in death.

Information on toxicological effects

Acute toxicity (list all possible routes of exposure)

Oral
Product: ATEmix
Specified substance(s):
- Potassium difluorodihydroxyborate
- Potassium fluoride
LD 50 (Rat): 875 mg/kg
LD 50 (Rat): 245 mg/kg

Dermal
Product: ATEmix
1,000 mg/kg

Inhalation
Product: ATEmix
Specified substance(s):
- Potassium fluoride
LC 50 (Rat, 4 h): 1 mg/l

Repeated dose toxicity
Product: No data available.

Skin Corrosion/Irritation
Product: Not classified

Serious Eye Damage/Eye Irritation
Product: Not classified

Respiratory or Skin Sensitization
Product: Respiratory Sensitization: Not classified
Skin Sensitization: Not classified

Carcinogenicity
Product: Not classified

IARC Monographs on the Evaluation of Carcinogenic Risks to Humans:
No carcinogenic components identified

US. National Toxicology Program (NTP) Report on Carcinogens:
No carcinogenic components identified

No carcinogenic components identified

Germ Cell Mutagenicity
In vitro
Product: Not classified

In vivo
Product: Not classified

Reproductive toxicity
Product: Suspected of damaging fertility or the unborn child.

Specific Target Organ Toxicity - Single Exposure
Product: Not classified

Specific Target Organ Toxicity - Repeated Exposure
Product: Not classified

Aspiration Hazard
Product: No data available.

Symptoms related to the physical, chemical and toxicological characteristics under the condition of use

Additional toxicological Information under the conditions of use:

Acute toxicity
Inhalation
Specified substance(s):
Carbon dioxide LC Lo (Human, 5 min): 90000 ppm
Carbon monoxide LC 50 (Rat, 4 h): 1.300 mg/l
Nitrogen dioxide LC 50 (Rat, 4 h): 88 ppm
Ozone LC Lo (Human, 30 min): 50 ppm

Other effects:
Specified substance(s):
Carbon dioxide Asphyxia
Carbon monoxide Carboxyhemoglobinemia
Nitrogen dioxide Lower respiratory tract irritation
12. ECOLOGICAL INFORMATION

Ecotoxicity
Acute hazards to the aquatic environment:
Fish
Product: Not classified

Aquatic Invertebrates
Product: Not classified

Chronic hazards to the aquatic environment:
Fish
Product: Not classified

Specified substance(s):
Potassium fluoride NOAEL (Oncorhynchus mykiss, 21 d): 4 mg/l

Aquatic Invertebrates
Product: Not classified

Specified substance(s):
Potassium fluoride NOAEL (Daphnia magna, 21 d): 14.1 mg/l NOAEL (Daphnia magna, 21 d): 3.7 mg/l

Toxicity to Aquatic Plants
Product: No data available.

Persistence and Degradability
Biodegradation
Product: No data available.

Bioaccumulative potential
Bioconcentration Factor (BCF)
Product: No data available.

Mobility in soil: No data available.

13. DISPOSAL CONSIDERATIONS

General information: The generation of waste should be avoided or minimized whenever possible. When practical, recycle in an environmentally acceptable, regulatory compliant manner. Dispose of non-recyclable products in accordance with all applicable Federal, State, Provincial, and Local requirements.

Disposal instructions: Discharge, treatment, or disposal may be subject to national, state, or local laws.

Contaminated Packaging: Dispose of contents/container to an appropriate treatment and disposal facility in accordance with applicable laws and regulations, and product characteristics at time of disposal.

14. TRANSPORT INFORMATION

DOT
UN Number: NOT DG REGULATED
UN Proper Shipping Name:
Transport Hazard Class(es) Class: NR
Label(s): –
Packing Group: –
Marine Pollutant: No

IMDG
UN Number: 
UN Proper Shipping Name: NOT DG REGULATED
Transport Hazard Class(es) Class: NR
Label(s): –
EmS No.: –
Packing Group: –
Marine Pollutant: No

IATA
UN Number: 
Proper Shipping Name: NOT DG REGULATED
Transport Hazard Class(es): Class: NR
Label(s): –
Packing Group: –
Marine Pollutant: No
Cargo aircraft only: Allowed.

TDG
UN Number: 
UN Proper Shipping Name: NOT DG REGULATED
Transport Hazard Class(es): Class: NR
Label(s): –
Packing Group: –
Marine Pollutant: No

15. REGULATORY INFORMATION

US Federal Regulations
TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)
None present or none present in regulated quantities.

US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)
None present or none present in regulated quantities.

CERCLA Hazardous Substance List (40 CFR 302.4):
None present or none present in regulated quantities.

Superfund Amendments and Reauthorization Act of 1986 (SARA)
Hazard categories
Immediate (Acute) Health Hazards
Delayed (Chronic) Health Hazard
Acute toxicity (any route or exposure)
Reproductive toxicity

SARA 302 Extremely Hazardous Substance
None present or none present in regulated quantities.

SARA 304 Emergency Release Notification
None present or none present in regulated quantities.
SARA 311/312 Hazardous Chemical

<table>
<thead>
<tr>
<th>Chemical Identity</th>
<th>Threshold Planning Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Potassium difluorodihydroxyborate(1-)</td>
<td>10000 lbs</td>
</tr>
<tr>
<td>Potassium fluoride</td>
<td>10000 lbs</td>
</tr>
</tbody>
</table>

SARA 313 (TRI Reporting)
None present or none present in regulated quantities.

Clean Water Act Section 311 Hazardous Substances (40 CFR 117.3)
None present or none present in regulated quantities.

Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130):
None present or none present in regulated quantities.

US State Regulations

US. California Proposition 65
No ingredient regulated by CA Prop 65 present.

WARNING: 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 & Safety Code Section 25249.5 et seq.)

US. New Jersey Worker and Community Right-to-Know Act

<table>
<thead>
<tr>
<th>Chemical Identity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Potassium fluoride</td>
</tr>
</tbody>
</table>

US. Massachusetts RTK - Substance List
No ingredient regulated by MA Right-to-Know Law present.

US. Pennsylvania RTK - Hazardous Substances

<table>
<thead>
<tr>
<th>Chemical Identity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Potassium fluoride</td>
</tr>
</tbody>
</table>

US. Rhode Island RTK

<table>
<thead>
<tr>
<th>Chemical Identity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Potassium difluorodihydroxyborate(1-)</td>
</tr>
<tr>
<td>Potassium fluoride</td>
</tr>
</tbody>
</table>

Canada Federal Regulations

List of Toxic Substances (CEPA, Schedule 1)
Not Regulated

Export Control List (CEPA 1999, Schedule 3)
Not Regulated

National Pollutant Release Inventory (NPRI)

Canada. National Pollutant Release Inventory (NPRI) Substances, Part 5, VOCs with Additional Reporting Requirements

| NPRI PT5 | Not Regulated |

Canada. Canadian Environmental Protection Act (CEPA). National Pollutant Release Inventory (NPRI) (Parts 1-4)

| NPRI     | Not Regulated |

Greenhouse Gases
Not Regulated

Controlled Drugs and Substances Act
CA CDSI Not Regulated
CA CDSII  Not Regulated  
CA CDSIII Not Regulated  
CA CDSIV Not Regulated  
CA CSVV Not Regulated  
CA CDSVII Not Regulated  
CA CDSVIII Not Regulated

Precursor Control Regulations
Not Regulated

Mexico. Substances subject to reporting for the pollutant release and transfer registry (PRTR): not applicable

Inventory Status:
- Australia AICS: On or in compliance with the inventory
- Canada DSL Inventory List: One or more components are not listed or are exempt from listing.
- EINECS, ELINCS or NLP: On or in compliance with the inventory
- Japan (ENCS) List: One or more components are not listed or are exempt from listing.
- China Inv. Existing Chemical Substances: On or in compliance with the inventory
- Korea Existing Chemicals Inv. (KECI): One or more components are not listed or are exempt from listing.
- Canada NDSL Inventory: One or more components are not listed or are exempt from listing.
- Philippines PICCS: One or more components are not listed or are exempt from listing.
- US TSCA Inventory: One or more components are not listed or are exempt from listing.
- New Zealand Inventory of Chemicals: On or in compliance with the inventory
- Japan ISHL Listing: One or more components are not listed or are exempt from listing.
- Japan Pharmacopoeia Listing: One or more components are not listed or are exempt from listing.
- Mexico INSOQ: One or more components are not listed or are exempt from listing.
- Ontario Inventory: One or more components are not listed or are exempt from listing.
- Taiwan Chemical Substance Inventory: One or more components are not listed or are exempt from listing.

16. OTHER INFORMATION

Definitions:

Revision Date: 03/21/2018

Further Information: Additional information is available by request.

Disclaimer:
The Lincoln Electric Company urges each end user and recipient of this SDS to study it carefully. See also www.lincolnelectric.com/safety. If necessary, consult an industrial hygienist or other expert to understand this information and safeguard the environment and protect workers from potential hazards associated with the handling or use of this product. This information is believed to be accurate as of the revision date shown above. However, no warranty, expressed or implied, is given. Because the conditions or methods of use are beyond Lincoln Electric’s control, we assume no liability resulting from the use of this product. Regulatory requirements are subject to change and may differ between various locations. Compliance with all applicable Federal, State, Provincial, and local laws and regulations remain the responsibility of the user.

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