# MATERIAL SAFETY DATA SHEET

## 1. Product and Company Identification

| | |
|---|---|
| **Material name** | **Stay-Silv® Black Brazing Flux** |
| **Version #** | 03 |
| **Issue date** | 09-June-2011 |
| **Revision date** | 12-Sept-2014 |
| **Supersedes date** | 23-July-2014 |
| **CAS #** | Mixture |
| **MSDS Number** | 0134 |
| **Product use** | Metal brazing operations. |
| **Manufacturer information** | |
| **Manufacturer/Supplier** | Harris Products Group<br>4501 Quality Place<br>Mason, Ohio 45040 US<br>custservmason@jwharris.com |
| **Telephone number** | 513-754-2000 |
| **Emergency Telephone Numbers** | 1-888-609-1762 (US, Canada, Mexico only)<br><br>Please quote 333988 |

## 2. Hazards Identification

| | |
|---|---|
| **Physical state** | Solid. |
| **Appearance** | Black paste. |
| **Emergency overview** | CAUTION<br><br>May cause eye burns. Prolonged or repeated contact with the product may irritate the skin. Causes digestive tract burns. Dust is irritating to the eyes and respiratory tract. Harmful if inhaled, absorbed through skin, or swallowed. Possible adverse reproductive and developmental effects. |
| **OSHA regulatory status** | This product is considered hazardous under 29 CFR 1910.1200 (Hazard Communication). |
| **Potential health effects** | |
| **Routes of exposure** | Inhalation. Ingestion. Skin contact. Eye contact. |
| **Eyes** | May cause eye burns. Risk of serious damage to eyes. |
| **Skin** | Prolonged or repeated contact with the product may irritate the skin. Harmful if absorbed through the skin. 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. |
| **Inhalation** | Harmful by inhalation. Dust irritating to respiratory tract. Prolonged inhalation may be harmful. |
| **Ingestion** | Harmful if swallowed. Ingestion may produce burns to the lips, oral cavity, upper airway, esophagus and possibly the digestive tract. |
| **Target organs** | Skin. Bone. Kidneys. |
| **Chronic effects** | Can cause adverse reproductive effects - such as birth defects, miscarriages, or infertility. Sterility. Prolonged overexposure to fluorides may increase fluoride content of bones and teeth, and may result in fluorosis, and brittleness of bones. Prolonged or repeated contact may dry skin and cause dermatitis. Edema. Kidney injury may occur. Refer to Section 11 Toxicological Information for more details. |
| **Signs and symptoms** | Contact with this material may cause burns to the eyes. Symptoms include itching, burning, redness, and tearing of eyes. Prolonged or repeated contact with the product may cause irritation of skin. Itching, redness, burning of skin. Edema. Symptoms of overexposure may be headache, dizziness, tiredness, nausea and vomiting. |
| **Potential environmental effects** | The product may affect the acidity (pH-factor) in water with risk of harmful effects to aquatic organisms. |

## 3. Composition / Information on Ingredients

| Components | CAS # | Percent |
|---|---|---|
| Potassium fluoborate | 14075-53-7 | 20 - 40 |
| Potassium tetraborate | 12045-78-2 | 20 - 40 |
| Potassium difluorodihydroxyborate | 85392-66-1 | < 20 |

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

## 4. First Aid Measures

**First aid procedures**

**Eye contact** Immediately rinse eyes with water. Remove any contact lenses, and continue flushing eyes with running water for at least 15 minutes. Hold eyelids apart to ensure rinsing of the entire surface of the eye and lids with water. Get immediate medical attention.

**Skin contact** Remove contaminated clothes and rinse skin thoroughly with water for at least 15 minutes. A 2.5 pct calcium gluconate gel applied topically after skin has been thoroughly washed will help reduce severity of symptoms. Get medical attention if irritation develops and persists.

**Inhalation** Remove person from contaminated area to fresh air. Apply artificial respiration if needed. Call a physician if symptoms develop or persist.

**Ingestion** Do NOT induce vomiting. Immediately rinse mouth and drink a cupful of water. Never give anything by mouth to an unconscious person. Get medical attention immediately.

**Notes to physician** Treat symptomatically.

**General advice** Show this safety data sheet to the doctor in attendance.

## 5. Fire Fighting Measures

**Flammable properties** The product is not flammable.

**Extinguishing media**

**Suitable extinguishing media** Use fire-extinguishing media appropriate for surrounding materials. Water spray, foam, dry powder or carbon dioxide.

**Protection of firefighters**

**Specific hazards arising from the chemical** Fire may produce irritating, corrosive and/or toxic gases.

**Protective equipment and precautions for firefighters** Self-contained breathing apparatus and full protective clothing must be worn in case of fire.

**Fire fighting equipment/instructions** Move containers from fire area if you can do so without risk.

**Specific methods** Use standard firefighting procedures and consider the hazards of other involved materials.

**Hazardous combustion products** Hydrogen fluoride, fluorine-, boron- and potassium-containing compounds.

## 6. Accidental Release Measures

**Personal precautions** Keep unnecessary personnel away. Avoid inhalation of dust from the spilled material. Wear protective clothing as described in Section 8 of this MSDS. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing.

**Environmental precautions** Prevent further leakage or spillage if safe to do so. Do not contaminate water.

**Methods for containment** Stop leak if you can do so without risk. Prevent entry into waterways, sewer, basements or confined areas. Local authorities should be advised if significant spillages cannot be contained.

**Methods for cleaning up** Should not be released into the environment. Prevent product from entering drains. Do not allow material to contaminate ground water system.

Large Spills: Sweep up and place into a proper container for disposal. Avoid the generation of dusts during clean-up.

Small Spills: Wipe up spilled material and place in a suitable container for disposal.

Never return spills in original containers for re-use. Following product recovery, flush area with water. Clean surface thoroughly to remove residual contamination. This material and its container must be disposed of as hazardous waste. For waste disposal, see Section 13 of the MSDS.

**Other information** Clean up in accordance with all applicable regulations.

## 7. Handling and Storage

**Handling** Keep formation of airborne dusts to a minimum. Provide appropriate exhaust ventilation at places where dust is formed. Avoid inhalation of dust and fumes. Avoid contact with skin and eyes. Wear appropriate personal protective equipment (See Section 8). Do not get this material on clothing. Do not eat, drink or smoke when using the product. Wash thoroughly after handling. Avoid release to the environment.

**Storage** Store in tightly closed original container in a dry, cool and well-ventilated place. Store in a closed container away from incompatible materials. Do not store in container made of glass or silicate-based material. Keep away from food, drink and animal feedingstuffs. Keep out of the reach of children.

## 8. Exposure Controls / Personal Protection

**Occupational exposure limits**

**US. ACGIH Threshold Limit Values**

| Components | Type | Value | Form |
|---|---|---|---|
| Fluorides (CAS 16984-48-8) | TWA | 2.5 mg/m3 | |
| Potassium fluoborate (CAS 14075-53-7) | STEL | 6 mg/m3 | Inhalable fraction. |
| | TWA | 2 mg/m3 | Inhalable fraction. |
| Potassium tetraborate (CAS 12045-78-2) | STEL | 6 mg/m3 | Inhalable fraction. |
| | TWA | 2 mg/m3 | Inhalable fraction. |

**US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)**

| Components | Type | Value |
|---|---|---|
| Fluorides (CAS 16984-48-8) | PEL | 2.5 mg/m3 |
| Potassium fluoborate (CAS 14075-53-7) | PEL | 2.5 mg/m3 |

**US. OSHA Table Z-2 (29 CFR 1910.1000)**

| Components | Type | Value | Form |
|---|---|---|---|
| Fluorides (CAS 16984-48-8) | TWA | 2.5 mg/m3 | Dust. |
| Potassium fluoborate (CAS 14075-53-7) | TWA | 2.5 mg/m3 | Dust. |

**Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2)**

| Components | Type | Value |
|---|---|---|
| Fluorides (CAS 16984-48-8) | TWA | 2.5 mg/m3 |
| Potassium fluoborate (CAS 14075-53-7) | TWA | 2.5 mg/m3 |

**Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended)**

| Components | Type | Value | Form |
|---|---|---|---|
| Fluorides (CAS 16984-48-8) | TWA | 2.5 mg/m3 | |
| Potassium fluoborate (CAS 14075-53-7) | TWA | 2.5 mg/m3 | |

**Canada. Manitoba OELs (Reg. 217/2006, The Workplace Safety And Health Act)**

| Components | Type | Value | Form |
|---|---|---|---|
| None | | | |

**Canada. Manitoba OELs (Reg. 217/2006, The Workplace Safety And Health Act)**

| Components | Type | Value | Form |
|---|---|---|---|
| Fluorides (CAS 16984-48-8) | TWA | 2.5 mg/m3 | |
| Potassium fluoborate (CAS 14075-53-7) | STEL | 6 mg/m3 | Inhalable fraction. |
| Potassium tetraborate (CAS 12045-78-2) | STEL | 6 mg/m3 | Inhalable fraction. |
| | TWA | 2 mg/m3 | Inhalable fraction. |

**Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents)**

| Components | Type | Value | Form |
|---|---|---|---|
| Fluorides (CAS 16984-48-8) | TWA | 2.5 mg/m3 | |
| Potassium fluoborate (CAS 14075-53-7) | STEL | 6 mg/m3 | Inhalable fraction. |
| Potassium tetraborate (CAS 12045-78-2) | STEL | 6 mg/m3 | Inhalable fraction. |
| | TWA | 2 mg/m3 | Inhalable fraction. |

**Canada. Quebec OELs. (Ministry of Labor - Regulation Respecting the Quality of the Work Environment)**

| Components | Type | Value |
|---|---|---|
| Fluorides (CAS 16984-48-8) | TWA | 2.5 mg/m3 |
| Potassium fluoborate (CAS 14075-53-7) | TWA | 2.5 mg/m3 |

**Mexico. Occupational Exposure Limit Values**

| Components | Type | Value |
|---|---|---|
| Fluorides (CAS 16984-48-8) | TWA | 2.5 mg/m3 |
| Potassium fluoborate (CAS 14075-53-7) | TWA | 2.5 mg/m3 |

**Biological limit values**

**ACGIH Biological Exposure Indices**

| Components | Value | Determinant | Specimen | Sampling Time |
|---|---|---|---|---|
| Fluorides (CAS 16984-48-8) | 3 mg/l | Fluoride | Urine | * |
| | 2 mg/l | Fluoride | Urine | * |
| Potassium fluoborate (CAS 14075-53-7) | 3 mg/l | Fluoride | Urine | * |
| | 2 mg/l | Fluoride | Urine | * |

* - For sampling details, please see the source document.

**Exposure guidelines** No exposure standards allocated.

**Engineering controls** Provide adequate ventilation. Observe Occupational Exposure Limits and minimize the risk of inhalation of dust. Shower, hand and eye washing facilities near the workplace are recommended.

**Personal protective equipment**

**Eye / face protection** Wear safety glasses with side shields (or goggles).

**Skin protection** Chemical resistant clothing is recommended.

**Respiratory protection** Use a respirator when local exhaust or ventilation is not adequate to keep exposures below the TLV. In a confined space a supplied respirator may be required. Selection and use of respiratory protective equipment should be in accordance with OSHA General Industry Standard 29 CFR 1910.134; or in Canada with CSA Standard Z94.4.

**Hand protection** Wear protective gloves (i.e. latex, nitrile, neoprene).

**General hygiene considerations** 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.

## 9. Physical & Chemical Properties

**Appearance** Black paste.

| | |
|---|---|
| **Physical state** | Solid. |
| **Form** | Paste. |
| **Color** | Black. |
| **Odor** | Odorless. |
| **Odor threshold** | Not available. |
| **pH** | Not available. |
| **Vapor pressure** | Not available. |
| **Vapor density** | Not available. |
| **Boiling point** | Not available. |
| **Melting point/Freezing point** | Not available. |
| **Solubility (water)** | Moderate. |
| **Specific gravity** | 1.5 - 1.7 |
| **Flash point** | Not available. |
| **Flammability limits in air, upper, % by volume** | Not available. |
| **Flammability limits in air, lower, % by volume** | Not available. |
| **Auto-ignition temperature** | Not available. |

## 10. Chemical Stability & Reactivity Information

| | |
|---|---|
| **Chemical stability** | Material is stable under normal conditions. |
| **Conditions to avoid** | Contact with incompatible materials. |
| **Incompatible materials** | Strong oxidizing agents. Strong acids. Halogenated compounds. Silicate-based materials. |
| **Hazardous decomposition products** | Hydrogen fluoride, fluorine-, boron- and potassium-containing compounds. |
| **Possibility of hazardous reactions** | Hazardous polymerization does not occur. |

## 11. Toxicological Information

**Toxicological data**

| Components | Species | Test Results |
|---|---|---|
| Potassium difluorodihydroxyborate (CAS 85392-66-1) | | |
| **Acute** | | |
| *Oral* | | |
| LD50 | Rat | 744 mg/kg |
| Potassium fluoborate (CAS 14075-53-7) | | |
| **Acute** | | |
| *Oral* | | |
| LD50 | Intraperitoneal - Rat | 240 mg/kg |
| Potassium tetraborate (CAS 12045-78-2) | | |
| **Acute** | | |
| *Oral* | | |
| LD50 | Rat | 3500 - 4100 mg/kg |

| | |
|---|---|
| **Sensitization** | Not classified. |
| **Acute effects** | May cause eye burns. Prolonged or repeated contact with the product may irritate the skin Dust irritates the respiratory system, and may cause coughing and difficulties in breathing. Harmful if inhaled, absorbed through skin, or swallowed. |
| **Local effects** | Risk of serious damage to eyes. Prolonged or repeated contact with the product may irritate the skin. Causes respiratory tract irritation. |
| **Chronic effects** | Prolonged exposure may cause chronic effects. May cause damage to the kidneys. Repeated exposure to fluorides may cause excessive calcification of the bone and calcification of ligaments of the ribs, pelvis and spinal column. Exposure to extremely high levels of fluorides can cause abdominal pain, diarrhea, muscular weakness, and convulsions. In extreme cases it can cause loss of consciousness and death. |

**Subchronic effects** Kidney injury may occur.

**Carcinogenicity** This product is not considered to be a carcinogen by IARC, ACGIH, NTP, or OSHA.

**ACGIH Carcinogens**

| | |
|---|---|
| Potassium difluorodihydroxyborate (CAS 85392-66-1) | A4 Not classifiable as a human carcinogen. |
| Potassium tetraborate (CAS 12045-78-2) | A4 Not classifiable as a human carcinogen. |

**IARC Monographs. Overall Evaluation of Carcinogenicity**

Not listed

**OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)**

Not listed.

**Epidemiology** No epidemiological data is available for this product.

**Mutagenicity** No data available to indicate product or any components present at greater than 0.1% are mutagenic or genotoxic.

**Reproductive effects** Possible reproductive hazard.

**Teratogenicity** May cause birth defects. Avoid exposure to women during early pregnancy.

**Symptoms and target organs** Contact with this material may irritate the skin, eyes and mucous membranes. May cause eye burns. Symptoms include itching, burning, redness, and tearing of eyes. Itching, redness, burning of skin. Symptoms of overexposure may be headache, dizziness, tiredness, nausea and vomiting. Target organs: Skin. Bones. Kidney.

**Further information** Symptoms may be delayed.

## 12. Ecological Information

**Ecotoxicological data**

| Components | | Species | Test Results |
|---|---|---|---|
| Potassium difluorodihydroxyborate (CAS 85392-66-1) | | | |
| **Aquatic** | | | |
| Fish | LC50 | Brachydinio rerio | 750 mg/l, 96 hours |

**Ecotoxicity** The product is not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment. Large amounts of the product may affect the acidity (pH-factor) in water with possible risk of harmful effects to aquatic organisms.

**Environmental effects** An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.

**Aquatic toxicity** Not classified.

**Persistence and degradability** No data is available on the degradability of this product.

**Bioaccumulation / accumulation** No data available.

**Mobility in environmental media** The product is partly soluble in water. May spread in the aquatic environment.

**Other adverse effects** No data available.

## 13. Disposal Considerations

**Disposal instructions** Do not allow this material to drain into sewers/water supplies. Dispose in accordance with all applicable regulations.

**Waste from residues / unused products** Dispose of in accordance with local regulations.

**Contaminated packaging** Empty containers should be taken to an approved waste handling site for recycling or disposal.

## 14. Transport Information

**DOT** Product not regulated as Dangerous Good

**IATA** Product not regulated as Dangerous Good

**IMDG** Product not regulated as Dangerous Good

**TDG** Product not regulated as Dangerous Good

## 15. Regulatory Information

**US federal regulations**

This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.
All components are on the U.S. EPA TSCA Inventory List.

CERCLA/SARA Hazardous Substances - Not applicable.

**TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)**

Not regulated.

**Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List**

Not regulated.

**CERCLA (Superfund) reportable quantity (lbs) (40 CFR 302.4)**

None

**Superfund Amendments and Reauthorization Act of 1986 (SARA)**

**Hazard categories**

Immediate Hazard - Yes
Delayed Hazard - Yes
Fire Hazard - No
Pressure Hazard - No
Reactivity Hazard - No

**SARA 302 Extremely hazardous substance**

Not listed.

**SARA 311/312 Hazardous chemical**

Yes

**Drug Enforcement Administration (DEA) (21 CFR 1308.11-15)**

Not controlled

**Canadian regulations**

This product has been classified in accordance with the hazard criteria of the CPR and the MSDS contains all the information required by the CPR.

**WHMIS status**

Controlled

**WHMIS classification**

D2B - TOXIC

**WHMIS labeling**

**Inventory status**

| Country(s) or region | Inventory name | On inventory (yes/no)* |
|---|---|---|
| Australia | Australian Inventory of Chemical Substances (AICS) | Yes |
| Canada | Domestic Substances List (DSL) | Yes |
| Canada | Non-Domestic Substances List (NDSL) | Yes |
| China | Inventory of Existing Chemical Substances in China (IECSC) | Yes |
| Europe | European Inventory of Existing Commercial Chemical Substances (EINECS) | Yes |
| Europe | European List of Notified Chemical Substances (ELINCS) | No |
| Korea | Existing Chemicals List (ECL) | No |
| New Zealand | New Zealand Inventory | Yes |
| Philippines | Philippine Inventory of Chemicals and Chemical Substances (PICCS) | Yes |
| United States & Puerto Rico | Toxic Substances Control Act (TSCA) Inventory | Yes |

*A "Yes" indicates this product complies with the inventory requirements administered by the governing country(s).
A "No" indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(s).

**State regulations** This product does not contain a chemical known to the State of California to cause cancer, birth defects or other reproductive harm.

**US - California Hazardous Substances (Director's): Listed substance**

Potassium fluoborate (CAS 14075-53-7) Listed.

**US - California Proposition 65 - Carcinogens & Reproductive Toxicity (CRT): Listed substance**

Not listed.

**US. Massachusetts RTK - Substance List**

Not regulated.

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

Potassium tetraborate (CAS 12045-78-2)

**US. Pennsylvania Worker and Community Right-to-Know Law**

Potassium fluoborate (CAS 14075-53-7)

**Mexico regulations** This safety data sheet was prepared in accordance with the Official Mexican Standard (NOM-018-STPS-2000).

## 16. Other Information

**Further information** HMIS® is a registered trade and service mark of the NPCA.

**HMIS® ratings** Health: 3*
Flammability: 0
Physical hazard: 0

**NFPA ratings**


**Disclaimer** The information in the sheet was written based on the best knowledge and experience currently available.

**Prepared by** Not available.