
This product can cause eye irritation, or injury upon prolonged contact.

Skin Hazards

This product can produce irritation, particularly on abraded skin.
Prolonged exposure may cause dermatitis.

Ingestion Hazards

Some components of this product are potentially toxic if ingested, and may cause one or more of these symptoms and effects: nausea, vomiting, diarrhea, abdominal pain, gastrointestinal irritation, convulsions, tachycardia, cramps, and central nervous system depression.

Inhalation Hazards

Inhalation of the components and decomposition products of this product does not pose a significant risk to health when the product is used in accordance with instructions and appropriate protective measures (see Section #8). The components/decomposition products may cause one or more of the following symptoms and effects if exposure is excessively high and/or prolonged.

Acute exposure: Irritation to the nose, throat, and respiratory tract; cough, nose bleeds, nausea, vomiting, chest tightness, chills, fever, tearing, pneumonitis, and pulmonary edema.

Chronic exposure: Abdominal pain and cramps, liver and kidney damage, impaired pulmonary function, and fluorosis (a disease characterized by mottled teeth, osteosclerosis, and pain and loss of mobility in joints).

4. First Aid Measures

Eye

Flush affected areas with water for at least fifteen minutes. Seek medical assistance if necessary.

Skin

Remove contaminated clothing. Wash affected area with large quantities of water for at least five minutes. Seek medical attention if necessary. Launder or dry-clean clothing before reuse.

Ingestion

If subject is conscious, induce vomiting. Seek immediate medical assistance. Never attempt to give anything by mouth to an unconscious or convulsive person.

Inhalation

If signs and symptoms of toxicity are observed, remove subject from area, administer oxygen, and seek medical attention. Keep the subject warm and

at rest. Perform artificial respiration if breathing has stopped.

Note to Physician

Depending upon the dose, the component potassium fluoride may be toxic. Its concentration in the product is <300 gm/kg. Treat fluoride intoxication symptomatically. Intoxication may occur by ingestion and/or inhalation. No components are absorbed through the skin, although irritation or dermatitis may occur.

5. Fire Fighting Measures

Flash Point: Not Applicable (N/Appl.)
Autoignition Point: N/Appl.
Flammability Class: N/Appl.
Lower Explosive Limit: N/Appl.
Upper Explosive Limit: N/Appl.

Fire and Explosion Hazards

This product is non-flammable and non-explosive. If it is present in a fire or explosion, potential decomposition byproducts may include boron oxide, boron trifluoride, and hydrogen fluoride.

Fire Fighting Instructions

If fighting a fire in which this product is present, wear a self-contained breathing apparatus with full facepiece operated in pressure-demand or other positive pressure mode.

6. Accidental Release Measures

Isolate spilled material and transfer to impervious containers. Avoid contact with skin, eyes, and mucous membranes. Wear appropriate protective equipment (e.g., gloves, chemical goggles) during cleanup and disposal.

7. Handling and Storage

Handling Precautions

Avoid contact with skin and clothing.

Storage Precautions

Store in a dry place away from incompatible materials (see Section #10).

Work/Hygienic Practices

To minimize ingestion, wash hands and face before eating, drinking, applying cosmetics, or using tobacco.

8. Exposure Controls/Personal Protection

Engineering Controls

Use appropriate ventilation (e.g., dilution, local exhaust) adequate to maintain concentrations of all components and their byproducts to within their applicable standards.

Eye/Face Protection

Wear eye protection adequate to prevent eye contact with the product and injury from the hazards of brazing. Plastic-frame spectacles with side shields and filter lenses (shade #3/#4) are recommended.

Skin Protection

Wear appropriate protective gloves and clothing to prevent skin injuries from the hazards of brazing and/or for prolonged or repeated contact with the product. Avoid flammable fabrics.

Respiratory Protection

If an exposure level exceeds an applicable exposure standard, use a NIOSH-approved respirator having a configuration (type of facepiece, filter media, assigned protection factor, etc.) appropriate to the concentration of the contaminant(s) generated. For guidance on selection and use of respirators, consult American National Standard Z88.2 (ANSI, New York, NY 10036 USA).

Ingredient(s) - Exposure Limits

Boric acid

ACGIH TLVs: 2 mg/m³ TWA; 6 mg/m³ STEL No OSHA PEL(s)

Boron

No ACGIH TLV(s) No OSHA PEL(s)

Potassium fluoride

ACGIH TLV: 2.5 mg/m³ TWA (as F-). OSHA PEL: 2.5 mg/m³ TWA (as F-)

Potassium tetraborate tetrahydrate

No ACGIH TLV(s) No OSHA PEL(s)

9. Physical and Chemical Properties

Appearance: brown pastes

Odor: odorless

Chemical Type: mixture

Physical State: solid

Boiling Point: >212F./100C.

Specific Gravity: ca. 1.67

pH Factor: ca. 8.0

Solubility: soluble

Other physical properties (odor threshold, evaporation rate, vapor pressure, vapor density, oil-water partition coefficient, percent volatiles, percent VOCs) are not applicable to these products.

10. Stability and Reactivity

Stability: stable
Hazardous Polymerization: will not occur

Conditions to Avoid

Some components of the product may decompose at elevated temperatures.

Incompatible Materials

Acetic anhydride; alkali and alkali earth metals; zirconium; platinum; bromine trifluoride.

Hazardous Decomposition Products

Boron oxide, boron trifluoride, and/or hydrogen fluoride.

11. Toxicological Information

Carcinogenicity

These products contain no chemicals classified as potential or demonstrated carcinogens by IARC, NTP, or OSHA.

Reproductive Effects

In experimental animal studies, inorganic borate compounds and boric acid have been found to cause decreased sperm production and testicular effects in male rats, and developmental effects in fetuses of exposed female mice. No human reproductive effects attributable to occupational exposure to borates or boric acid have been established.

Mutagenicity

Inorganic fluoride compounds have been demonstrated to induce mutagenic changes in mammalian cell in culture. The significance of these findings to human health risks is unknown.

Conditions Aggravated by Overexposure

Pre-existing pulmonary diseases (e.g., bronchitis, asthma) may be aggravated by inhalation overexposure. Chronic overexposure by ingestion or inhalation may aggravate diseases of the liver, kidneys, and the skeletal, nervous, and gastrointestinal systems.

Ingredient(s) - Toxicological Data

Boric acid	LD50: 2,660 mg/kg (oral/rat).	LC50: No data available
Boron	LD50: 650 mg/kg (oral/rat)	LC50: No data available
Potassium fluoride		

Note: Lucas-Milhaupt, Inc. and Handy & Harman of Canada, Ltd. recommend use of safety glasses and protective gloves (Personal Protection Index "B") as standard PPE. HMIS recommends that its ratings be used only in conjunction with a fully implemented HMIS program, and that user-specific PPE codes be created only by the user, who is familiar with the actual conditions under which the product is used. Lucas-Milhaupt, Inc. and Handy & Harman of Canada, Ltd. cannot anticipate every condition of the product's use, and it is the user's responsibility to evaluate the health and safety hazards pertinent to its specific operations, and to determine the specific PPE required.

NFPA Ratings

Health - 3 Flammability - 0 Reactivity - 0

Revision Information

This MSDS supersedes a previous MSDS dated 02/16/2010.

Disclaimer

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Lucas Milhaupt, Inc.

Handy & Harman of Canada, Ltd.