



Product Name: ECOSMART® HIGH  
HEAT

Issue Date: 29.09.2023  
Revision Date: 11.07.2024  
Version: 2.0

# CHEMICAL PRODUCT SAFETY DATA SHEET

Prepared in accordance with GB/T 16483 and GB/T 17519.

## 1. PRODUCT AND COMPANY IDENTIFICATION

**Product Name:** ECOSMART® HIGH HEAT

### Other means of identification

**SDS number:** 200000021723  
**Issue Date:** 29.09.2023  
**Revision Date:** 11.07.2024  
**Version #:** 2.0

### 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:** Lincoln Electric do Brasil Industria e Comercio Lt  
**Address:** Rua Rosa Kasinski, 525  
Capuava - Mauá - SP CEP 09380-128  
Brazil  
**Telephone:** +55 11 4993-8111  
**Contact Person:** contato@harris-brastak.com.br

### 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

Classified according to the criteria of the Globally Harmonized System of Classification and Labeling of Chemicals (GHS).

### Emergency Overview

**Form:** Paste  
**Physical state:** Paste  
**Hazard Statement(s):** Open flames or hot surfaces from brazing or soldering operations can ignite combustible and flammable materials.

### Hazard Classification

#### Health Hazards

Acute toxicity (Oral)	Category 4
Skin Corrosion/Irritation	Category 1B
Serious Eye Damage/Eye Irritation	Category 1
Toxic to reproduction	Category 2

### Label Elements

**Hazard Symbol:**



**Signal Word:**

Danger

**Hazard Statement:**

Harmful if swallowed.  
Causes severe skin burns and eye damage.  
Suspected of damaging the unborn child.

**Precautionary Statements:**

**Prevention:**

Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Do not breathe dust/fume/gas/mist/vapors/spray. Wash face, hands and any exposed skin thoroughly after handling. Do not eat, drink or smoke when using this product. Wear protective gloves/ protective clothing/ eye protection/ face protection.

**Response:**

IF SWALLOWED: Rinse mouth. Do NOT induce vomiting. Call a POISON CENTER or doctor/ physician if you feel unwell. IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower]. Wash contaminated clothing before reuse. Specific treatment (see supplemental first aid instructions on this label). IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER or doctor/ physician. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. IF exposed or concerned: Get medical advice/attention.

**Storage:**

Store locked up.

**Disposal:**

Dispose of contents/ container to an approved facility in accordance with local, regional, national and international regulations.

**Other hazards which do not result in GHS classification:**

None.

**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.

Chemical Identity	CAS-No.
Carbon dioxide	124-38-9
Carbon monoxide	630-08-0
Nitrogen dioxide	10102-44-0



Ozone

10028-15-6

### 3. COMPOSITION / INFORMATION ON INGREDIENTS

#### Reportable Hazardous Ingredients Mixtures

Chemical Identity	CAS number	Content in percent (%)*
Potassium fluoroborate	14075-53-7	20 - <50%
Potassium tetraborate tetrahydrate	12045-78-2	20 - <50%
Potassium hydrogendifluoride	7789-29-9	10 - <20%
Silicon dioxide (amorphous)	7631-86-9	1 - <5%

\* 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 or allied process 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. Rinse mouth. Call a physician or poison control center immediately. Never give liquid to an unconscious person. Do not induce vomiting without advice from poison control center.

#### Inhalation:

Call a physician or poison control center immediately. Move to fresh air. Apply artificial respiration if victim is not breathing. If breathing is difficult, give oxygen.

#### Skin Contact:

Call a physician or poison control center immediately. 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.

#### Eye contact:

Immediately flush with plenty of water for at least 15 minutes. If easy to do, remove contact lenses. Call a physician or poison control center immediately.

#### 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 fire-fighters**

**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:** See Section 8 of the SDS for Personal Protective Equipment. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. 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.

Read and understand the manufacturer's instruction and the precautionary label on the product. See American National Standard Z49.1, "Safety In Welding, Cutting and Allied Processes" published by the American Welding Society, <http://pubs.aws.org> and OSHA Publication 2206 (29CFR1910), U.S. Government Printing Office, [www.gpo.gov](http://www.gpo.gov). Do not taste or swallow. Wash hands thoroughly after handling. Do not get in eyes. Do not handle until all safety precautions have been read and understood. Obtain special instructions before use. Use personal protective equipment as required. Do not get in eyes, on skin, on clothing.

Conditions for safe storage,  
including any incompatibilities:

Store locked up.

## 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

### Control Parameters

#### Occupational Exposure Limits: China

Chemical Identity	Type	Exposure Limit Values	Source
Potassium fluoroborate - as F	PC-TWA	2 mg/m <sup>3</sup>	China. OELs (Occupational Exposure Limits for Hazardous Agents in the Workplace) (GBZ 2.1) (03 2008)
Potassium hydrogendifluoride - as F	PC-TWA	2 mg/m <sup>3</sup>	China. OELs (Occupational Exposure Limits for Hazardous Agents in the Workplace) (GBZ 2.1) (2007)
Silicon dioxide (amorphous) - Total dust.	PC-TWA	8 mg/m <sup>3</sup>	China. OELs (Occupational Exposure Limits for Hazardous Agents in the Workplace) (GBZ 2.1) (08 2019)

#### Occupational Exposure Limits: US

Chemical Identity	Type	Exposure Limit Values	Source
Potassium fluoroborate - Inhalable fraction.	STEL	6 mg/m <sup>3</sup>	US. ACGIH Threshold Limit Values (02 2014)
	TWA	2 mg/m <sup>3</sup>	US. ACGIH Threshold Limit Values (02 2014)
Potassium fluoroborate - as F	TWA	2.5 mg/m <sup>3</sup>	US. ACGIH Threshold Limit Values (01 2021)
	PEL	2.5 mg/m <sup>3</sup>	US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) (01 2017)
Potassium fluoroborate - Dust.	TWA	2.5 mg/m <sup>3</sup>	US. OSHA Table Z-2 (29 CFR 1910.1000) (01 2017)
Potassium hydrogendifluoride - as F	PEL	2.5 mg/m <sup>3</sup>	US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) (02 2006)
	TWA	2.5 mg/m <sup>3</sup>	US. ACGIH Threshold Limit Values (2008)
Potassium hydrogendifluoride - Dust.	TWA	2.5 mg/m <sup>3</sup>	US. OSHA Table Z-2 (29 CFR 1910.1000) (02 2006)
Silicon dioxide (amorphous)	TWA	20 millions of particles per cubic foot of air	US. OSHA Table Z-3 (29 CFR 1910.1000) (2000)
	TWA	0.8 mg/m <sup>3</sup>	US. OSHA Table Z-3 (29 CFR 1910.1000) (2000)
Silicon dioxide (amorphous) - Inhalable particles.	TWA	10 mg/m <sup>3</sup>	US. ACGIH Threshold Limit Values (01 2021)
Silicon dioxide (amorphous) - Respirable particles.	TWA	3 mg/m <sup>3</sup>	US. ACGIH Threshold Limit Values (01 2021)
Silicon dioxide (amorphous) - Total dust.	TWA	50 millions of particles per cubic foot of air	US. OSHA Table Z-3 (29 CFR 1910.1000) (09 2016)
Silicon dioxide (amorphous) -	TWA	15 millions of	US. OSHA Table Z-3 (29 CFR 1910.1000) (09

Respirable fraction.		particles per cubic foot of air	2016)
	TWA	5 mg/m3	US. OSHA Table Z-3 (29 CFR 1910.1000) (09 2016)
Silicon dioxide (amorphous) - Total dust.	TWA	15 mg/m3	US. OSHA Table Z-3 (29 CFR 1910.1000) (09 2016)
Silicon dioxide (amorphous)	TWA	0.8 mg/m3	US. OSHA Table Z-3 (29 CFR 1910.1000) (09 2016)
	TWA	20 millions of particles per cubic foot of air	US. OSHA Table Z-3 (29 CFR 1910.1000) (09 2016)

#### Biological Limit Values: China

Chemical Identity	Exposure Limit Values	Source
Potassium fluoroborate (Fluoride: Sampling time: Prior to work shift.)	24 mmol/mol (Creatinine in urine)	CN BLV (08 2019)
Potassium fluoroborate (Fluoride: Sampling time: After work shift.)	42 mmol/mol (Creatinine in urine)	CN BLV (08 2019)
	7 mg/g (Creatinine in urine)	CN BLV (08 2019)
Potassium fluoroborate (Fluoride: Sampling time: Prior to work shift.)	4 mg/g (Creatinine in urine)	CN BLV (08 2019)
Potassium hydrogendifluoride (Fluoride: Sampling time: Prior to work shift.)	24 mmol/mol (Creatinine in urine)	CN BLV (08 2019)
Potassium hydrogendifluoride (Fluoride: Sampling time: After work shift.)	42 mmol/mol (Creatinine in urine)	CN BLV (08 2019)
	7 mg/g (Creatinine in urine)	CN BLV (08 2019)
Potassium hydrogendifluoride (Fluoride: Sampling time: Prior to work shift.)	4 mg/g (Creatinine in urine)	CN BLV (08 2019)

#### Biological Limit Values: ACGIH

Chemical Identity	Exposure Limit Values	Source
Potassium fluoroborate (Fluoride: Sampling time: End of shift.)	3 mg/l (Urine)	ACGIH BEI (01 2021)
Potassium fluoroborate (Fluoride: Sampling time: Prior to shift.)	2 mg/l (Urine)	ACGIH BEI (01 2021)
Potassium hydrogendifluoride (Fluoride: Sampling time: Prior to shift.)	2 mg/l (Urine)	ACGIH BEI (03 2013)
Potassium hydrogendifluoride (Fluoride: Sampling time: End of shift.)	3 mg/l (Urine)	ACGIH BEI (03 2013)

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

Chemical Identity	Type	Exposure Limit Values	Source
Carbon dioxide	PC-STEL	18,000 mg/m3	China. OELs (Occupational Exposure Limits for Hazardous Agents in the Workplace) (GBZ 2.1)
	PC-TWA	9,000 mg/m3	China. OELs (Occupational Exposure Limits for Hazardous Agents in the Workplace) (GBZ 2.1)
Carbon monoxide	MAC	15 mg/m3	China. OELs (Occupational Exposure Limits for Hazardous Agents in the Workplace) (GBZ 2.1)
	PC-STEL	30 mg/m3	China. OELs (Occupational Exposure Limits for Hazardous Agents in the Workplace) (GBZ 2.1)
	PC-TWA	20 mg/m3	China. OELs (Occupational Exposure Limits for Hazardous Agents in the Workplace) (GBZ 2.1)
	MAC	20 mg/m3	China. OELs (Occupational Exposure Limits for Hazardous Agents in the Workplace) (GBZ 2.1)
Nitrogen dioxide	PC-STEL	10 mg/m3	China. OELs (Occupational Exposure Limits for Hazardous Agents in the Workplace) (GBZ 2.1)
	PC-TWA	5 mg/m3	China. OELs (Occupational Exposure Limits for Hazardous Agents in the Workplace) (GBZ 2.1)
Ozone	MAC	0.3 mg/m3	China. OELs (Occupational Exposure Limits for Hazardous Agents in the Workplace) (GBZ 2.1)



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

Chemical Identity	Type	Exposure Limit Values	Source
Carbon dioxide	TWA	5,000 ppm	US. ACGIH Threshold Limit Values (12 2010)
	STEL	30,000 ppm	US. ACGIH Threshold Limit Values (12 2010)
	PEL	5,000 ppm 9,000 mg/m <sup>3</sup>	US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) (02 2006)
Carbon monoxide	TWA	25 ppm	US. ACGIH Threshold Limit Values (12 2010)
	PEL	50 ppm 55 mg/m <sup>3</sup>	US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) (02 2006)
Nitrogen dioxide	TWA	0.2 ppm	US. ACGIH Threshold Limit Values (02 2012)
	Ceiling	5 ppm 9 mg/m <sup>3</sup>	US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) (02 2006)
Ozone	PEL	0.1 ppm 0.2 mg/m <sup>3</sup>	US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) (02 2006)
	TWA	0.05 ppm	US. ACGIH Threshold Limit Values (03 2014)
	TWA	0.10 ppm	US. ACGIH Threshold Limit Values (03 2014)
	TWA	0.08 ppm	US. ACGIH Threshold Limit Values (03 2014)
	TWA	0.20 ppm	US. ACGIH Threshold Limit Values (02 2020)

#### 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

##### General information:

**Exposure Guidelines:** To reduce the potential for overexposure, use controls such as adequate ventilation and personal protective equipment (PPE). Overexposure refers to exceeding applicable local limits, the American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Values (TLVs) or the Occupational Safety and Health Administration's (OSHA) Permissible Exposure Limits (PELs). Workplace exposure levels should be established by competent industrial hygiene assessments. Unless exposure levels are confirmed to be below the applicable local limit, TLV or PEL, whichever is lower, respirator use is required. Absent these controls, overexposure to one or more compound constituents, including those in the fume or airborne particles, may occur resulting in potential health hazards. According to the ACGIH, TLVs and Biological Exposure Indices (BEIs) "represent conditions under which ACGIH believes that nearly all workers may be repeatedly exposed without adverse health effects." The ACGIH further 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 constituents which have some potential to present health hazards. Welding consumables and materials being joined may contain chromium as an unintended trace element. Materials that contain chromium may produce some amount of hexavalent chromium (CrVI) and other chromium compounds as a byproduct in the fume. In 2018, the American Conference of Governmental Industrial Hygienists (ACGIH) lowered the Threshold Limit Value (TLV) for hexavalent chromium from 50 micrograms per cubic meter of air (50 µg/m<sup>3</sup>) to 0.2 µg/m<sup>3</sup>. At these new limits, CrVI exposures at or above the TLV may be possible in cases where adequate ventilation is not provided. CrVI compounds are on the IARC and NTP lists as posing a lung cancer and sinus cancer risk. Workplace conditions are unique and welding fume exposures levels vary. Workplace exposure assessments must be conducted by a qualified professional, such as an industrial hygienist, to determine if exposures are below applicable limits and to make recommendations when necessary for preventing overexposures. 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 a full-face respirator, if needed. Wear safety glasses with side shields (or goggles) and a face shield.

**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](http://www.aws.org). Wash hands after handling. Do not get in eyes. Observe good industrial hygiene practices. Do not handle until all safety precautions have been read and understood. Obtain special instructions before use. Wash contaminated clothing before reuse. Do not get this material in contact with skin. Wash hands before breaks and immediately after handling the product.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

<b>Appearance:</b>	Brazing flux.
<b>Physical state:</b>	Paste
<b>Form:</b>	Paste
<b>Color:</b>	Black
<b>Odor:</b>	No data available.





<b>Odor threshold:</b>	No data available.
<b>pH:</b>	10
<b>Melting point/freezing point:</b>	No data available.
<b>Initial boiling point and boiling range:</b>	No data available.
<b>Flash Point:</b>	No data available.
<b>Evaporation rate:</b>	No data available.
<b>Flammability (solid, gas):</b>	No data available.
<b>Upper/lower limit on flammability or explosive limits</b>	
<b>Flammability limit - upper (%):</b>	No data available.
<b>Flammability limit - lower (%):</b>	No data available.
<b>Explosive limit - upper:</b>	No data available.
<b>Explosive limit - lower:</b>	No data available.
<b>Vapor pressure:</b>	No data available.
<b>Vapor density:</b>	No data available.
<b>Density:</b>	2.5 g/cm <sup>3</sup>
<b>Relative density:</b>	No data available.
<b>Solubility(ies)</b>	
<b>Solubility in water:</b>	No data available.
<b>Solubility (other):</b>	No data available.
<b>Partition coefficient (n-octanol/water):</b>	No data available.
<b>Auto-ignition temperature:</b>	No data available.
<b>Decomposition temperature:</b>	No data available.
<b>Viscosity:</b>	No data available.

## 10. STABILITY AND REACTIVITY

<b>Reactivity:</b>	The product is non-reactive under normal conditions of use, storage and transport.
<b>Chemical Stability:</b>	Material is stable under normal conditions.
<b>Possibility of hazardous reactions:</b>	None under normal conditions.
<b>Conditions to avoid:</b>	Avoid heat or contamination.
<b>Incompatible Materials:</b>	Strong acids. Strong oxidizing substances. Strong bases.
<b>Hazardous Decomposition Products:</b>	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

### General information:

The International Agency for Research on Cancer (IARC) has determined welding fumes and ultraviolet radiation from welding are carcinogenic to humans (Group 1). According to IARC, welding fumes cause cancer of the lung and positive associations have been observed with cancer of the kidney. Also according to IARC, ultraviolet radiation from welding causes ocular melanoma. IARC identifies gouging, brazing, carbon arc or plasma arc cutting, and soldering as processes closely related to welding. Read and understand the manufacturer's instructions, Safety Data Sheets and the precautionary labels before using this product.

### Information on likely routes of exposure

- Inhalation:** Inhalation is the primary route of exposure. In high concentrations, vapors, fumes or mists may irritate nose, throat and mucus membranes.
- Skin Contact:** Causes severe skin burns.
- Eye contact:** Causes serious eye damage. 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: 699.79 mg/kg

###### **Dermal**

**Product:** Not classified for acute toxicity based on available data.

###### **Inhalation**

**Product:** Not classified for acute toxicity based on available data.

##### **Repeated dose toxicity**

**Product:** No data available.

##### **Skin Corrosion/Irritation**

**Product:** Causes severe skin burns.

##### **Serious Eye Damage/Eye Irritation**

**Product:** Causes serious eye damage.

##### **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

##### **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): 1300 ppm
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

**Specified substance(s):**

Potassium hydrogendifluoride	LC 50 (Various, 96 h): 51 mg/l
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**Aquatic Invertebrates**

**Product:** Not classified

**Specified substance(s):**

Potassium hydrogendifluoride	EC 50 (Daphnia magna; Daphnia sp., 96 h): 10.5 mg/l
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**Chronic hazards to the aquatic environment:**

**Fish**

**Product:** Not classified

**Specified substance(s):**

Potassium hydrogendifluoride	NOAEL (Oncorhynchus mykiss): 4 mg/l
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**Aquatic Invertebrates**

**Product:** Not classified

**Specified substance(s):**

Potassium hydrogendifluoride	NOAEL (Daphnia magna): 3.7 mg/l
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**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

**CNDG**

UN number or ID number:

UN 1759

UN Proper Shipping Name:

CORROSIVE SOLID, N.O.S.(Potassium hydrogendifluoride)

Transport Hazard Class(es)

Class:

8

Label(s):

8

EmS No.:

ERG 154,

Packing Group:

III

Marine Pollutant:

No

Special precautions for user:

May be shipped as "Not restricted" provided the net quantity in any receptacle does not exceed applicable threshold limits. Consult mode-specific regulations for Limited and Excepted Quantity provisions prior to shipping this product in any package configuration.

**IMDG**

UN number or ID number:

UN 1759

UN Proper Shipping Name:

CORROSIVE SOLID, N.O.S.(Potassium hydrogendifluoride)

Transport Hazard Class(es)

Class:

8

Label(s):

8

EmS No.:

ERG 154,

Packing Group:

III

Limited quantity:

5.00KG

Excepted quantity:

E1

Marine Pollutant:

No



Special precautions for user: May be shipped as "Not restricted" provided the net quantity in any receptacle does not exceed applicable threshold limits. Consult mode-specific regulations for Limited and Excepted Quantity provisions prior to shipping this product in any package configuration.

#### IATA

UN number or ID number: UN 1759  
Proper Shipping Name: Corrosive solid, n.o.s.(Potassium hydrogendifluoride)  
Transport Hazard Class(es):  
Class: 8  
Label(s): 8  
Packing Group: III  
Excepted quantity: E1  
Marine Pollutant: No  
Special precautions for user: May be shipped as "Not restricted" provided the net quantity in any receptacle does not exceed applicable threshold limits. Consult mode-specific regulations for Limited and Excepted Quantity provisions prior to shipping this product in any package configuration.  
Cargo aircraft only: Allowed.

## 15. REGULATORY INFORMATION

### China. National Catalogue of Hazardous Wastes

Potassium fluoroborate Listed.  
Potassium hydrogendifluoride Listed.

### China. Highly Toxic Chemicals (Dept. of Health Notice)

Potassium hydrogendifluoride Listed.

### China. Very Toxic Chemicals (Public Notice No. 2)

China. Precursor Chemicals (Decree No. 445 of the PRC on Regulation for Administration of Precursor Chemicals, Appendix: Categories 1-3)  
Not Regulated

China: CWC. Controlled Chemicals List (Regulations on the Administration of Controlled Chemicals, Decree No. 190, Dec. 27, 1995, as amended)  
Not Regulated

China. Explosive Precursor Hazardous Chemicals (Ministry of Public Safety, 2011 version)  
Not Regulated

China. National List of Ozone Depleting Substances (MEP/NDRC/MIIT Joint Notice No. 2010-72)  
Not Regulated

China. Catalog of Hazardous Chemicals  
Not Regulated

### Inventory Status:

Australia Industrial Chem. Act (AIIC):	On or in compliance with the inventory
Canada DSL Inventory List:	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.
Ontario Inventory:	One or more components are not listed or are exempt from listing.
China Inv. Existing Chemical Substances:	On or in compliance with the inventory
Japan (ENCS) List:	One or more components are not listed or are exempt from listing.
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.
Korea Existing Chemicals Inv. (KECI):	One or more components are not listed or are exempt from listing.
Mexico INSQ:	One or more components are not listed or are exempt from listing.





New Zealand Inventory of Chemicals:	On or in compliance with the inventory
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.
Switzerland New Subs	
Notified/Registered:	One or more components are not listed or are exempt from listing.
Thailand Existing Chemical Inv. List:	One or more components are not listed or are exempt from listing.
Vietnam National Chemical Inventory:	One or more components are not listed or are exempt from listing.
Taiwan Chemical Substance Inventory:	On or in compliance with the inventory
EINECS, ELINCS or NLP:	One or more components are not listed or are exempt from listing.

## 16. OTHER INFORMATION

### Definitions:

**Revision Date:** 11.07.2024

**Further Information:** Additional information is available by request.

**References:** Prepared in accordance with GB/T 16483 and GB/T 17519.

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