



I – Identification of the Substance and of the Company	
<p>SUPPLIER: RMO, Inc. 650 W. Colfax Ave. Denver, CO 80204 303-592-8200</p> <p>Emergency Information: Chemtrec 800-424-9300 Chemtrec International 202-483-7616</p>	<p>Trade Name and Synonyms – Tru-Chrome® Flux - Liquid</p> <p>Description: Fluid flux for electro-soldering</p>
<p>Product Grade / Name: Potassium Hydrogendifluoride</p>	

II – Composition / Information on Ingredients				
Component	CAS Number	Percent	OSHA/PEL (1)	
ACGIH/TLV (1)				
Potassium Hydrogendifluoride	7789-29-9	35 - 45%	2.5 mg/m3 (2)	2.5
Borax Decahydrate	1303-96-4	15 - 25%	10 mg/m3 total dust	5
Pine oil	8002-09-3	<1%	none listed	none
Water	7732-18-5	35 - 45%	none listed	none
<p>PEL=Permissible Exposure Limit TVL=Threshold Limit Value (1) Level of pure product (2) Fluorides, as F</p>				

III – Hazards Identification
<p>NOTE: May cause eye irritation May cause skin irritation May cause irritation of the digestive tract May cause respiratory tract irritation ROUTES OF ENTRY: Skin, eye, ingestion, respiratory SYMPTOMS & EFFECT OF OVEREXPOSURE DERMAL: Potassium Hydrogendifluoride is Corrosive. Delayed effects of skin redness and peeling. Causes severe burns especially when wet. Effects may be delayed from 12 to 24 hours after initial exposure. The fluoride ion is capable of penetrating the skin where it will attack underlying tissues and bone. Large burns (over 25 square inches) may also cause depletion of calcium in the body (hypocalcemia) and other toxic effects which can persist for several weeks and may be fatal.</p>

EYE CONTACT: Potassium Hydrogendifluoride is Corrosive. Causes severe burns to eye and surrounding areas. Permanent eye damage may occur. Borax is non-irritating to eyes in normal industrial use.

INHALATION: Potassium Hydrogendifluoride causes severe irritation and burns to upper respiratory tract including nose, throat, larynx, and lungs. Can cause burning sensation, chest pains, wheezing, cough, difficulty breathing, shortness of breath and choking. Inhalation of strong concentrations or aspiration of liquid product can cause fluids to accumulate in the lungs and larynx (adema) which can progress to airway obstruction, respiratory acidosis, shock, coma, and possible death. Symptoms may be delayed 12 to 36 hours after exposure. Some individuals may suffer from residual chronic lung disease. Pulmonary effects can result even from splashed on the skin.

INGESTION: Potassium Hydrogendifluoride is Toxic. Corrosive. Harmful if swallowed. Causes burns to the mouth, throat, esophagus, and stomach. Can cause perforation of the esophagus and stomach. Can cause nausea, vomiting (may contain blood), bleeding, diarrhea, abdominal pain, and shock. Damage to stomach and esophagus may progress for several weeks. Permanent changes in the form of constriction of the esophagus may occur.

BORAX: Animal ingesting studies in several species, at high doses, indicate that borates cause reproductive and development effects. A human study of occupational exposure to borate dust showed no adverse effect on reproduction. No target organ has been identified in humans. High dose animal ingestion studies indicate the tests are the target organs in male animals. Symptoms of accidental over-exposure to borax might include nausea, vomiting, and diarrhea, with delayed effects of skin redness and peeling. These symptoms have been associated with the accidental over-exposure to the chemically related substance boric acid.

MEDICAL CONDITIONS POSSIBLE AGGRAVATED BY EXPOSURE: Not known for this product

CARCINOGENICITY: Not known for this product

ADDITIONAL INFORMATION: Chronic exposure to inorganic fluorides has been known to produce dembrittlement and decalcification of bones, and increases calcification of ligaments and vertebrae resulting in spinal stiffness (fluorosis). Repeated inhalation may cause chronic lung inflammation, pulmonary resistance, and airway obstruction based on tests with laboratory animals. May cause kidney and liver damage.

One of the components (Potassium Hydrogendifluoride) is extremely hazardous by all routes of exposure, especially when product is dissolved in water. Any contact with this product should be considered serious and persons given prompt medical treatment.

IV – First Aid Measures

EMERGENCY & FIRST AID PROCEDURES:

SKIN: Remove victim from contaminated area. Remove contaminated clothes and shoes. Immediately wash the exposed area, paying particular attention to the underside of fingernails, with plenty of water and a non-abrasive soap. If irritation persists, seek medical attention. For Potassium Hydrogendifluoride burns, after washing for 5 minutes. The burned area should be immersed in a solution of 0.15% iced aqueous benzalkonium chloride until pain is relieved. As an alternate first aid treatment, 2.5% calcium gluconate gel may be continuously massaged into burn area (hands should be protected by latex gloves to prevent secondary contamination) until the pain is relieved. For large burns or burns treated with calcium gluconate gel (in which pain is present for longer than 30 minutes), a physician should inject 5% aqueous calcium gluconate beneath, around, and in the burned area(s).

EYES: Immediately flush eyes with flowing water for at least 15 minutes while holding eyelids away from eyes. If irritation persists, seek medical attention.

ACUTE INHALATION: Remove exposed individual from source of exposure. Allow the victim to rest in a well ventilated area. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, oxygen may be administered by certified persons only. Artificial respiration may be performed only if exposed individual is not breathing. Keep the victim lying down, quiet and warm. See immediate medical attention. If symptoms such as nose or throat irritation are observed, remove person to fresh air.

Seek immediate medical attention. Serious: Evacuate the victim to a safe area as soon as possible. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek medical attention.

INGESTION: Never give anything by mouth to an unconscious person. Get medical aid. DO NOT induce vomiting. If victim is alert, able to swallow, and not convulsing, give large quantities of water to dilute stomach contents. One or two glasses of milk, or a magnesium-containing (milk of magnesia) or calcium-containing antacid may be given for their soothing effect. Seek immediate medical attention.

NOTE TO PHYSICIANS: Borax – Observation only is required for adult ingestion in the range of 4-8 grams of Borax. For ingestion of larger amounts. Maintain adequate kidney function and force liquids. Gastric lavage is recommended for symptomatic patients only. Hemodialysis should be reserved for massive acute ingestion or patients with renal failure. Boron analyses of urine or blood are only useful for documenting exposure and should not to be used to evaluate severity of poisoning or the guide treatment.

V – Fire Fighting Measures

FLASH POINT: Not available

FLAMMABLE LIMITS: Upper – Not available

Lower – Not available

AUTO IGNITION TEMPERATURE: Not available

EXTINGUISHING MEDIUM: use extinguishing medium appropriate to surrounding fire conditions.

SPECIAL FIRE FIGHTING PROCEDURES: Do not get material on skin or clothing. Avoid inhalation of dust, fumes, or mists. Stay upwind, out of low areas, and ventilate closed spaces before entering. Cool containers from the side with water until fire is out. Use water spray to reduce vapor, do not put water directly on leak or spill area. Keep combustibles away from spilled material. Self-contained breathing apparatus (SCBA) and chemical-protective clothing can be worn but may not provide adequate thermal protection for chemical fire unless stated by the manufacturer. Structural fire fighter's protective clothing may not be effective. Move containers from fire area, if possible to do so without risk.

UNUSUAL FIRE & EXPLOSIVE CONDITIONS: One of the components (Potassium Hydrogendifluoride) may evolve toxic and corrosive fumes during fire conditions.

VI – Accidental Release Measures

SPILL OR LEAK PROCEDURES: Wear NIOSH/MSHA-approved respiratory protection and protective clothing to prevent skin and eye contact when cleaning spill. Do not get spilled material on skin or clothing; stop leak if you can do so without risk. Vacuum, spilled solid or dilute with water and neutralize with slaked lime. Scoop up absorbed material and transfer to a suitable plastic-lined container for evaluation and disposal. Wash spill area and collect this wash water for evaluation and disposal.

Avoid runoff into storm sewers and ditches which lead to waterways. Cleanup spills immediately.

NOTE: Absorb with an inert material and put the spilled material in an appropriate waste disposal.

Spillage into water: Where possible, remove any intact containers from the water. Advise local water authority that none of the affected water should be used for irrigation or for the abstraction of portable water until natural dilution returns to the boron value to its normal environmental background level.

OTHER PROCEDURES: For large users or involving large product quantities, we recommend that the purchaser establish a spill prevention, control and counter-measure plan. This plan should include procedures for proper storage as well as clean-up of spills or leaks. The procedure should conform to safe practices and provide for proper recovery and/or disposal. Depending on the quantity spilled, notification to the U.S. National response center (800-424-8802) may be required in case of hazardous substances. (See USEPA and USDOT regulations, also various state and local regulations).

VII – Handling and Storage

PRECAUTIONS TO BE TAKEN IN HANDLING & STORING: Practice good housekeeping procedures. Do not get in eyes, on skin, or on clothing. Do not breathe dusts. Do not take internally. Use only adequate ventilation. Wash thoroughly after handling. Emptied container may contain vapors and product residue. Handle accordingly.

Store in cool, dry place away from incompatible materials. Store away from acids. Maintain package integrity. Keep in well ventilated area. Keep product away from children and their environment.

VIII – Exposure Controls / Personal Protection

PROTECTION:

EYES: Chemical dust resistance goggles. A face shield must also be worn when working with solutions of this product. **DO NOT WEAR CONTACT LENSES!**

SKIN: Boots, apron, sleeves. An impervious coverall may be substituted for the apron and sleeves when additional protection is needed. Launder contaminated clothing before reuse.

VENTILATION: Local exhaust (will reduce airborne concentrations) or an enclosed handling system is highly recommended. Mechanical (general) ventilation is required. Use of NIOSH/MSHA-approved protection if ventilation is inadequate.

PROTECTIVE GLOVES: Butyl rubber or neoprene gloves.

OTHER PROTECTIVE EQUIPMENT: Safety equipment should be worn as appropriate for the work environment includes apron, safety goggle and gloves.

WORK/HYGIENIC PRACTICES: Do not permit eating, drinking or the use of cosmetics or tobacco products while handling or processing material or in product work area. Practice good personal hygiene procedures. Wash hands and face thoroughly before eating, drinking, applying cosmetics or using tobacco products. Avoid inhalation and ingestion of product and activities which generate dust or fume.

IX – Physical and Chemical Properties

Appearance: Form: Opaque Liquid

Odor: Pine

SOLUBILITY IN H₂O: Not available

VAPOR DENSITY: Not available

pH: 5.5

MELTING POINT: Not available

BOILING POINT: Not available

VAPOR PRESSURE: Not available

PERCENT VOLATILE SOLIDS: 16%

MOLECULAR WEIGHT: Not available

TOTAL SOLIDS: 69.1%

X – Stability and Reactivity

Stability: Stable

CONDITIONS TO AVOID: Incompatible materials

INCOMPATIBILITIES (Materials to avoid): glass, enamel, steel, acids, alkalis, strong reducing agents such as metal hydrides or alkali metals (will generate hydrogen gas, which could create an explosive hazard) oxidizing agents, water reactive substances (e.g. sulfuric acid, sodium metal, potassium metal, calcium carbide).

HAZARDOUS DECOMPOSITION PRODUCTS: Hydrofluoric acid and hydrogen fluoride, oxides of nitrogen, oxides of sulfur, oxides of carbon.

HAZARDOUS POLYMERIZATION; Will not occur.

XI – Toxicological Information.

POTASSIUM HYDROGENDIFLUORIDE: Not available

BORAX:

ACCUTE TOXICITY INGESTION: Low acute oral toxicity; LD₅₀ in rate is 4.500 to 15,000 mg/kg of body weight.

SKIN/DERMAL: Low acute inhalation toxicity; LD₅₀ in rabbits is greater than 10,000 mg/kg of body weight. Borax is poorly absorbed through intact skin.

INHALATION: Low acute inhalation toxicity; LC₅₀ in rats is greater than 2.0 mg/l (or g/m³)

SKIN IRRITATION: Non-irritant

EYE IRRITATION: Draize test in rabbits produced eye irritation effects. Fifty years of occupational exposure to Borax indicates no adverse effect on human eye. Therefore, Borax is not considered to be a human eye irritant in normal industrial use.

SENSITIZATION: Borax is not a skin sensitizer.

OTHER: Not Available

REPRODUCTIVE/DEVELOPMENTAL TOXICITY: Animal feeding studies in rat, mouse, and dog, at high doses, have demonstrated effects on fertility and testes. Studies with the chemical related to Boric Acid in the rat, mouse and rabbit at high doses, demonstrate developmental effects on the fetus, including fetal weight loss and minor skeletal variations. The doses administered were many times in excess of those to which humans would normally be exposed.

CARCINOGENICITY/MUTAGENICITY: No evidence of carcinogenicity in mice. No mutagenic activity was observed for Boric acid in a battery of short-term mutagenicity assays.

HUMAN DATA: Human epidemiological studies show no increase in pulmonary disease in occupational populations with chronic exposures to Boric acid and Sodium Borate dust. A recent epidemiology study under the conditions of normal occupational exposure to Borate dusts indicated no effect on fertility.

XII – Ecological Information

POTASSIUM HYDROGENDIFLUORIDE: Not available

BORAX: Large amounts of Borax can be harmful to plants and other species. Therefore, release to the environment should be minimized. General: Boron (6) is the element in Sodium Tetraborate Decahydrate (Borax) which is used by convention to report Borate product ecological effects. It occurs naturally in seawater at an average concentration of 5 mg B/L and generally occurs in fresh water at concentrations up to 1 mg B/L. In dilute aqueous solutions the predominant boron species present is undissociated boric acid. To convert sodium tetraborate Decahydrate into the equivalent boron (B) content, multiply by 0.1134.

PHYTOTOXICITY: Boron is an essential micronutrient for healthy growth in plants; however, it can be harmful to boron sensitive plants in high quantities. Care should be taken to minimize the amount of Borax released to the environment.

ALGA TOXICITY: Green algae, *Scenedesmus subspicatus*
96-hr EC10 = 24 mg B/L *

INVERTEBRATE TOXICITY: Daphnids, *Daphnia magna* straus
24-hr EC50 = 242 mg B/L *

FISH TOXICITY: Sea-water: Dab, *Limanda limanda*
96-hr LC50=74 mg B/L *
Fresh water: Rainbow trout, *S. gairdneri* (embryo-larval stager)
24-day LC50=88 mg B/L *
32-day LC50=54 mg B/L *
Goldfish, *Carassius auratus* (embryo-larval stage)
7-day LC50= 65 mg B/L *
3-day LC50=70 mg B/L *

ENVIRONMENTAL FATE DATA: Persistence/degradation: Boron is naturally occurring and ubiquitous in the environment. Borax decomposes in the environment to natural borate.

Octanol/water partition coefficient: no value. In aqueous solution Sodium tetraborate decahydrate is converted substantially into undissociated boric acid.

Soil mobility: Borax is soluble in water and is leachable through normal soil.

Test substance: *Sodium tetraborate

XIII – Disposal Considerations

Disposal Consideration: Dispose of in accordance with Federal, State, and local regulations.

XIV – Transportation Information

DOT Shipping name: Potassium Hydrogendifluoride

HAZARD CLASS 8

UN NO: 1811

PG: II

DOT LABEL(S): Toxic Liquid, Inorganic, NOS (Potassium Hydrogendifluoride)

XV – Regulatory Information

Classification According to EEC Guidelines: Unknown.

National Prescriptions: Unknown.

Classification According to VbF: Unknown.

XVI – Other Information

The information and recommendations set forth herein (hereafter “information”) are presented in good faith and believed to be correct as of the date hereof. RMO, Inc., however, makes no representations as to the completeness or accuracy of this information and supplies it on the condition that the persons receiving same will make their own determination as to its suitability for their purpose prior to use. In no event will RMO, Inc. be responsible for damages of any nature whatsoever resulting from the use of or reliance upon information.

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