

CROWN ALLOYS COMPANY

MATERIAL SAFETY DATA SHEET

Section 1 - COMPANY AND MATERIAL IDENTIFICATION

PRODUCT TYPE: Silver brazing flux (high temperature).

TRADE NAME: #45 SILVER (BLACK FLUX)

SPECIFICATION: N/A
CLASSIFICATION: N/A

VENDOR: Crown Alloys Company

ADDRESS: 30105 Stephenson Hwy.
Madison Heights, MI. 48071

TELEPHONE: (248) 588-3790 Emergency 24 hour telephone #
CHEMTREC (800) 424-9300

WEBSITE: www.crownalloys.com

DATE: December 29, 2004

Section 2 - HAZARDOUS INGREDIENTS

IMPORTANT! This section covers the material from which these products are manufactured. The fumes and gases produced when welding with normal use of these products are covered in Section 5 & 6.

Ingredient	CAS No.	OSHA – TWA PEL,mg/m ³	(ACGIH – TWA) ¹ TLV,mg/m ³	Wt. %
Boric Acid	10043-35-3	N/E	N/E	20.0 – 30.0
Boron	7440-42-8	N/E	N/E	1.0 – 5.0
Potassium Bifluoride	7789-29-9	2.5 (as F)	2.5 (as F)	20.0 – 30.0
Potassium Pentaborate	11128-29-3	N/E	N/E	1.0 – 5.0
Potassium Tetraborate	1332-77-0	N/E	N/E	30.0 – 40.0
Sodium Dodecyl Sulfate	151-21-3	N/E	N/E	0.5 max.
Water	7732-18-5	N/E	N/E	10.0 – 20.0

N/E = Not Established

Single values shown are maximum.

NIOSH classifies welding fumes as carcinogens.

¹The ACGIH has an established exposure limit for Welding Fumes, Not Otherwise Classified. That Threshold Limit Value is 5 mg/m³.

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Section 3 - PHYSICAL and CHEMICAL CHARACTERISTICS

APPEARANCE AND COLOR:

- Black creamy paste that is odorless.

SPECIFIC GRAVITY @ 20°C (water = 1): 1.5 lbs./in.³

SOLUBILITY IN WATER: 100% - complete

VAPOR PRESSURE: (mm Hg): Not Applicable

MELTING POINT: 422.4°C

EVAPORATION RATE: Not Applicable

BOILING POINT: Not Applicable

VAPOR DENSITY (AIR = 1): Not Applicable

pH: 8.0 to 9.0

Section 4 - FIRE and EXPLOSION HAZARD DATA

FLAMMABLE LIMITS (in air by volume, %): Lower (LEL): Not Applicable Upper (UEL): Not Applicable

FLASH POINT: Not Applicable

AUTO-IGNITION: Not Applicable

FIRE EXTINGUISHING MATERIALS: Use water spray, dry chemical, alcohol foam, or carbon dioxide. Use water to keep fire-exposed containers cool.

NFPA HAZARD CLASSIFICATION:	Health – 3 Flammable – 0 Reactivity – 0	HMIS HAZARD CLASSIFICATION:	Health – 3* Flammable – 0 Reactivity – 0
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* Indicates the possibility of chronic health effects. See HEALTH HAZARD DATA in SECTION 6 for more information.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Not a fire or explosion hazard. However, toxic and corrosive fluoride compounds may be released in a fire situation.

SPECIAL FIRE-FIGHTING PROCEDURES: Wear NIOSH/MSHA approved positive-pressure self-contained breathing apparatus and protective clothing as specified in 29 CFR 1910.156. Chemical resistant clothing may be necessary. If possible, prevent run-off water from entering storm drains, bodies of water or other environmentally sensitive areas.

Section 5 - STABILITY AND REACTIVITY DATA

STABILITY: Generally considered stable.

HAZARDOUS POLYMERIZATION: Will not occur.

CONDITIONS TO AVOID: Uncontrolled exposure to extreme temperatures and high pressures.

HAZARDOUS DECOMPOSITION PRODUCTS: Emits toxic and corrosive fluoride compounds. It may also emit oxides of boron and potassium when heated to decomposition.

MATERIALS WITH WHICH THIS PRODUCT IS INCOMPATIBLE: Strong acids, combustibles and alkalis.

Hazardous Decomposition Products

Brazing/soldering fumes and gases can not be classified simply. The composition and quantity of both are dependent upon the type of flux, the metal being soldered/brazed and the rods 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 soldered/brazed (such as paint, plating, or galvanizing), the number of welders, the volume of the work area, the quality and the amount of ventilation, the position of the welder's head with respect to the gas plume, the presence of contaminants in the atmosphere (such as chlorinated hydrocarbon vapors from cleaning and degreasing activities), the process and procedures, as well as the soldering/brazing consumables.

When this flux is consumed, the fume and gas decomposition products generated are different in percent and form from the ingredients listed in Section 2. Decomposition products of normal operation include those originating from the volatilization, reaction, or oxidation of the materials shown in Section 2, plus those from the base metal, coatings, etc., as noted above. Gaseous reaction products may include carbon monoxide and carbon dioxide. Ozone and nitrogen oxides may be formed by the radiation from an arc, in addition to the shielding gases like argon and helium, whenever they are employed.

One recommended way to determine the composition and quantity of fumes and gases to which workers are exposed is to take an air sample inside the welder's helmet if worn or in the worker's breathing zone. See ANSI/AWS F1.1 "Method for Sampling Airborne Particles Generated by Welding and Allied Processes" and "Characterization of Arc Welding Fume" available from the American Welding Society, 550 N.W. LeJeune Road, Miami, FL 33126.

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Section 6 - HEALTH HAZARD DATA

- **Medical conditions aggravated by exposure to this product:** May adversely affect existing medical conditions such as eye, skin, respiratory, liver and/or kidney ailments, and central nervous system disorders.
- **EYES:** Contact with this flux will cause irritation to the eyes, tearing, burning of eye surfaces. This flux will have a corrosive effect. Chronic overexposure will lead to contact burns to the eyes. Thermal decomposition of this flux can generate **fluoride compounds**, which are toxic and can cause burns in extreme cases. Burns from **fluoride compounds** can be delayed.
- **SKIN:** Contact with this flux may cause fluoride burns which may not be immediately painful or evident, especially on prolonged contact. This material may be absorbed through the skin resulting in systemic poisoning. Symptoms of poisoning are similar to those that occur with ingestion.
- **INGESTION:** Contact with this flux may cause abdominal pain, diarrhea, vomiting, excess salivation, thirst, perspiration and painful spasms of the limbs. Large amounts may be fatal. Prolonged or repeated exposure may cause gastrointestinal and neuromuscular effects, as well as injury to the kidneys and reproductive system.
- **INHALATION:** During brazing and soldering operations, the most significant route of overexposure is via inhalation of fumes. Some of the health effects are listed below:
 - **SHORT TERM (ACUTE):** Inhalation of large amounts of particulates generated by this product during metal processing operations (ie. soldering) may be physically irritating and cause severe burns to the respiratory system. Inhalation may cause respiratory tract and mucous membrane irritation. Symptoms include nasal discharge and nosebleeds, coughing, sore throat and labored breathing.
 - **LONG TERM (CHRONIC):** *Chronic overexposure* to this flux may affect the kidneys. *Chronic overexposure* may cause gastrointestinal and neuromuscular effects, as well as injury to the reproductive system. *Chronic overexposure* to this flux will irritate the respiratory system. It will also lead to coughing, chest pains, nausea and headaches. Existing lung disorders will be aggravated. *Chronic overexposure* may cause bronchospasm and pulmonary edema. Absorption may cause systemic poisoning similar to that which occurs with ingestion. *Chronic overexposure* to **fluorides** over years may produce mottling of tooth enamel, embrittlement and calcification of bones, and an increased calcification of ligaments and vertebrae resulting in spinal stiffness (fluorosis). *Chronic overexposure* to **boron compounds** may cause mild gastrointestinal irritation, loss of appetite, nausea and erythematous rash. Dryness of the skin and mucous membranes, loss of hair, conjunctivitis and kidney injury have also been observed. Reproductive effects have been observed in laboratory animals. Over inhalation may cause a life-threatening lung injury.

Section 7 - PRECAUTIONS FOR SAFE HANDLING & USE/APPLICABLE

CONTROL MEASURES

VENTILATION AND ENGINEERING CONTROLS: Maintain exposures below the acceptable exposure levels (see Section 2). Use industrial hygiene air monitoring to ensure that your use of this product does not create exposures that exceed the recommended exposure limits. Always use exhaust ventilation in user operations such as high temperature cutting, grinding, welding, brazing and soldering. Train the welder to keep his head out of the fume plume. Maintain air flow away from the user to remove all fumes and dusts, so that the PEL is never exceeded. Adhere to Environmental regulations for exhausts. Confined spaces require adequate ventilation and/or air supplied respirators. Read and understand the manufacturer's instructions 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, 550 N.W. LeJeune Road, Miami, FL 33126 and OSHA Publication 2206 (29CFR1910), US Government Printing Office, Washington, D.C. 20402 for more details on many of the following.

RESPIRATORY PROTECTION: Use respirable fume respirator or air supplied respirator when welding in confined space or where local exhaust or ventilation does not keep exposure below PEL's (see Section 2). Use only NIOSH approved respirators in accordance with 29 CFR 1910.134 – Respiratory Protection. Oxygen levels below 19.5% are considered IDLH by OSHA. In such atmospheres, use of a full-facepiece pressure/demand SCBA or a full facepiece, supplied air respirator with auxiliary self-contained air supply is required under OSHA's Respiratory Protection Standard (1910.134-1998).

FOR MAXIMUM SAFETY, BE CERTIFIED FOR AND WEAR A RESPIRATOR AT ALL TIMES WHEN WELDING OR BRAZING OR SOLDERING!

EYE PROTECTION: Ensure eyewash/safety shower stations are available near areas where these products are used. Wear safety glasses, goggles or face-shield with filter lens of appropriate shade number (per ANSI Z49.1-1988, "Safety in Welding and Cutting"). Goggles must be chemically tight safety goggles. Do NOT wear contact lenses.

PROTECTIVE CLOTHING: Protective gloves are recommended that are chemical and acid impervious. Since soldering involves high temperatures, be sure the gloves are designed for high temperature applications to prevent burns.

WORK PRACTICES AND HYGIENE PRACTICES: As with all chemicals, avoid getting this product ON YOU or IN YOU. Wash hands after handling this product. Do not eat or drink while handling this product. Do not smoke or apply cosmetics in areas where exposures exist.

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED: If molten, allow spilled material to solidify. Contain the spill and then absorb, sweep-up and dispose of material. Flush the area to a chemical sewer. Notification of the National Response Center (800/424-8802) may be required. Refer to EPA, DOT and applicable state and local regulations for current response information.

WASTE DISPOSAL METHOD: Prevent waste from contaminating surrounding environment. Discard any product, residue, disposable container or liner in an environmentally acceptable manner, in full compliance with federal, state and local regulations.

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE: Store the flux at ambient conditions. Keep under extremely dry and controlled conditions. Wash thoroughly after handling to remove all residue. DO NOT BREATHE FUMES! MAY BE FATAL! Professionally wash contaminated clothing before re-use. Material will naturally absorb moisture and cake solid. Existing lung disorders will have increased toxic susceptibility.

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Section 8 - FIRST AID MEASURES

- **EYE EXPOSURE:** Immediately flush eyes with plenty of water for at least 30 minutes. Hold eyelids open during this flushing with water. Call a physician immediately.
- **SKIN EXPOSURE:** Flush area with water while removing contaminated clothing and shoes. Follow by washing with soap and large amounts of water until no evidence of chemical remains (15 – 20 minutes). Get medical attention if needed.
- **INHALATION EXPOSURE:** Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, oxygen should be administered by qualified personnel. Call a physician immediately; advise of chemical composition (Section 2) and potential health hazards (Section 6). Over inhalation may cause a life-threatening lung injury.
- **INGESTION EXPOSURE:** If swallowed, “**DO NOT INDUCE VOMITING**”. Give 3 – 4 glasses of water. Do not give anything by mouth to an unconscious or convulsing person. Call a physical or poison control center at once. Advise of chemical composition (Section 2) and potential health effects (Section 6).
- **RECOMMENDATIONS TO PHYSICIANS:** Treat symptoms and eliminate overexposure.

Section 9 – TOXICOLOGICAL INFORMATION

Below are human toxicological data available for the components of this flux present in concentrations greater than 1%.

BORIC ACID: (CAS No. 10043-35-3) LD ₅₀ (oral, mouse) = 3,450 mg/kg	BORIC ACID: (CAS No. 10043-35-3) LC ₅₀ (rat) = 9,600 µg/m ³ /4 hr BORON: (CAS No. 7440-42-8) LD ₅₀ (oral, mouse) = 2,000 mg/kg	SODIUM DODECYL SULFATE: (CAS No. 151-21-3) LD ₅₀ (oral, rat) = 1,288 mg/m ³
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Section 10 – REGULATORY INFORMATION

TOXIC SUBSTANCE CONTROL ACT:

All components of this product are listed within the TSCA inventory

SARA 311 AND 312 HAZARD CATEGORIES:

IMMEDIATE (ACUTE) Health Hazard: Yes

DELAYED (CHRONIC) Health Hazard: Yes

FIRE HAZARD: No

REACTIVITY Hazard: No

SUDDEN RELEASE OF PRESSURE: No

This information must be included in all MSDS's that are copied and distributed for this material!

Section 11 – OPTIONAL INFORMATION

DEPARTMENT OF TRANSPORTATION: (Domestic Ground)

DOT Classification: 8 Corrosive material

DOT Proper shipping name: Corrosive liquid, basic, inorganic, n.o.s.
(Contains Potassium Bifluoride)

[Note: Consumer quantity, ORM-D, in inner packagings not over 4 liters (1 gal.) net capacity each for liquids, packed in strong outer packagings.]

ID & Packing Group Number: UN 3266, PG III

Section 12 – DEFINITIONS OF TERMS

CAS No. - Chemical Abstracts Service Number **PEL** - Permissible Exposure Level **TLV** - Threshold Limit Value

TWA - Time Weighted Average **STEL** - Short Term Exposure Limit **IARC** – International Agency for Research on Cancer

NIOSH – National Institute of Occupational Safety and Health **OSHA** – U.S. Occupational Safety and Health Administration

TDLo – the lowest dose to cause a symptom **TCLo** – the lowest concentration to cause a symptom

TDo, LDLo, and LDo, or TC, TCo, LCLo, and LCo – the lowest dose (or concentration) to cause lethal or toxic effects.

SARA – Superfund Amendments and Reauthorization Act **ACGIH** – American Conference of Governmental Industrial Hygienists

LD₅₀ & LC₅₀ – These values are the amount of a substance given to the stated species that causes 50% of that species to die.

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