



SAFETY DATA SHEET

MAY BE USED TO COMPLY WITH OSHA'S HAZARD COMMUNICATION STANDARD, 29 CFR 1910.1200 AND SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT (SARA) OF 1986 PUBLIC LAW 99-499. STANDARD SHOULD BE CONSULTED FOR SPECIFIC REQUIREMENTS.

SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

NAME OF PRODUCT: US FORGE – Aluminum Flux
PART NUMBER: 02410

**MANUFACTURER/
SUPPLIER:** US FORGE
N94 W14355 GARWIN MACE DRIVE
MENOMONEE FALLS, WI 53051 USA

TELEPHONE NUMBER (262) 255-5157 or Toll Free (800) 343-3758
FAX NUMBER: (262) 255-2374
US FORGE WEBSITE: www.us-forge.com

PRODUCT CLASSIFICATION: Aluminum Brazing Flux

SECTION 2: HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW:

Target organ statement: DANGER: Causes severe burns to skin, eyes, and respiratory system. May be fatal if swallowed or inhaled.

Does not pose a fire hazard as shipped. **Non-Flammable:** However, heat and flames used during brazing and soldering can ignite combustibles. Refer to American National Standard Z49.1 for fire prevention during welding and brazing.

ROUTES OF ENTRY: Primary route of entry is the respiratory system. Other possible routes are eyes, ingestion, and/or skin contact.

POTENTIAL HEALTH EFFECTS:

Swallowing: May cause burns of mouth and throat.
Inhalation: Irritation to respiratory system. Coughing and sneezing. Existing lung disorders will be aggravated. Severe exposure may cause pulmonary edema. Metal fume fever may result from inhaling zinc oxide, which is a possible decomposition product at high temperatures.
Skin Contact: Dermatitis, possible chemical burns, and corrosive to skin. Existing disorders will be aggravated.
Eye Contact: Irritation to the eyes, tearing, burn of the eye surfaces, corrosive to the eyes, may cause blindness.

WARNING: This product contains or produces a chemical known to the State of California to cause birth defects (or other reproductive harm) and/or cancer. (California Health & Safety Code 25249.5 et seq.).

CARCINOGENICITY

WELDING FUMES (not otherwise specified) are considered to be carcinogenic defined with no further categorization by NIOSH and IARC.

HAZARDS:

Indications of danger : Corrosive, Harmful, Dangerous for the environment

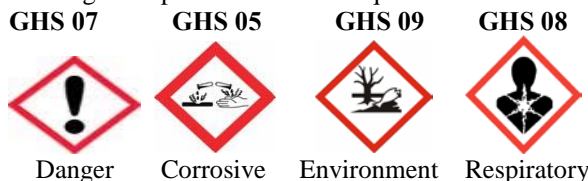
Contact with acids liberates very toxic gas.

Harmful if swallowed.

Causes burns.

Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Although this product does not require a hazard warning label in all countries, we recommend the following GHS pictograms:



Contains zinc chloride.

Hazard statements

- H302 Harmful if swallowed.
- H314 Causes severe skin burns and eye damage.
- H335 May cause respiratory irritation.
- H410 Very toxic to aquatic life with long lasting effects.

Precautionary statements

- P285 In case of inadequate ventilation wear respiratory protection.
- P314 Get medical advice/attention if you feel unwell.
- P280 Wear protective gloves/protective clothing/eye protection/face protection.
- P202 Do not handle until all safety precautions have been read and understood.
- P260 Do not breathe dust/fume/gas/mist/vapors/spray.
- P501 Dispose of contents/container to waste treatment facility in accordance with local and national regulations.

See additional information in Section 3 for ingredients.

Before using this product, contact your doctor to determine if exposure to product or use of this product will aggravate your medical conditions. Spatter and flames from brazing and soldering may cause burns and start fires.

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

IMPORTANT: This section covers the materials from which these products are manufactured. Any of the chemicals or compounds subject to reporting under Title III, in Section 313, of the Superfund Amendments and Reauthorization Act (SARA) are marked by the symbol #.

| INGREDIENTS | CAS NUMBER | Exposure Limit (mg/m ³) | |
|------------------|------------|-------------------------------------|------------|
| | | OSHA PEL | ACGIH -TLV |
| Lithium Chloride | 7447-41-8 | Not listed | Not listed |
| Zinc Chloride # | 7646-85-7 | 1 | 1 |
| Lithium Fluoride | 7789-24-4 | 2.5 (as F) | 2.5 (as F) |

CAS / EINECS NUMBER / HAZARD CLASSIFICATION FOR ABOVE INGREDIENTS

| INGREDIENTS | CAS NUMBER | EINECS NUMBER | Hazard Classification per ECD 67/548/EEC |
|------------------|------------|---------------|--|
| Lithium Chloride | 7447-41-8 | 231-212-3 | No |
| Zinc Chloride # | 7646-85-7 | 231-592-0 | C; R34 - Xn; R22 - N; R50-53 |
| Lithium Fluoride | 7789-24-4 | 232-152-0 | No |

Others, if any, are non-hazardous and are claimed secret. Percentages are proprietary. Exposure limits are subject to change. Contact ACGIH and OSHA for current values. See Section 16 for European Council Directive 67/548/EEC R-phrases



SECTION 4: FIRST AID MEASURES

EMERGENCY & FIRST AID PROCEDURES: Call for medical aid and inform them of the ingredients from Section 3. Employ first aid techniques recommended by The American Red Cross.

- Ingestion:** Immediately call a doctor or your poison control center. Inform them of the ingredients listed in Section 3. Swallowing flux may be fatal. Flux is corrosive to mucous membranes.
- Skin:** Promptly flush with water for 15 minutes to remove all residue. If rash or burn develops, consult a physician. Material is corrosive. Remove contaminated clothing and shoes. Wash contaminated clothing before reuse.
- Inhalation:** Remove to fresh air. If fumes are inhaled, call a physician.
- Eyes:** Flush with water for at least 15 minutes to remove all residue. Hold eyelids apart during irrigation. **Get immediate medical help - blindness may result.**

SECTION 5: FIRE FIGHTING MEASURES

Non-Flammable -These products as shipped are nonflammable, non-explosive, and non-reactive.

Flashpoint: Will not burn. Does not support combustion.

NFPA HAZARD CLASSIFICATION:

Health: 3 Flammability: 0 Reactivity: 0 Special Hazard -----

EXTINGUISHING MEDIA: Water, fog, or foam that is suitable for the material that is burning.

SPECIAL FIRE FIGHTING PROCEDURES: In case of fire, metal halide and toxic fumes may be produced. Use of full protective equipment required. Use Self Contained Breathing Apparatus (SCBA).

UNUSUAL FIRE AND EXPLOSION HAZARDS: Dense smoke may be generated in a fire.

HAZARDOUS DECOMPOSITION PRODUCTS: Thermal decomposition may release zinc oxide and zinc chloride.

Refer to American National Standard Z49.1 for fire prevention during welding and soldering.

SECTION 6: ACCIDENTAL RELEASE MEASURES

ACCIDENTAL RELEASE MEASURES: Do not discharge into the drain or bodies of water. Contain spill, absorb, sweep up and dispose of in accordance with Federal, State, and Local regulations.

PERSONAL PRECAUTIONS: Wear head, hand, and body protection that help to prevent injury; including rubber apron and rubber gloves.

ENVIRONMENTAL PRECAUTIONS: Do not flush residue into waterways.

SECTION 7: HANDLING AND STORAGE

HANDLING: Avoid exposure to product; do not ingest and avoid contact with eyes. Some individuals can develop an allergic reaction to certain materials. Do not eat, drink, or smoke when using this product. Wash thoroughly after using this product.

STORAGE: Keep material tightly sealed and stored at room temperature. After opening keep remaining product sealed and in original labeled packaging. Store at ambient room temperature and away from food, drink and animal goods.

Other precautions: Do NOT breathe fumes. Professionally wash contaminated clothing before reuse. Existing lung disorders will have increased toxic susceptibility.

SECTION 8: EXPOSURE CONTROLS / PERSONAL PROTECTION



Read and understand the manufacturer's instructions and precautionary label on this product.

ENGINEERING CONTROLS: Proper ventilation **must** be maintained.

VENTILATION: Use enough ventilation, local exhaust at the work area, or both, to keep the fumes and gases below the TLV's / PEL's in the workers breathing zone and the general area. Train the worker to keep his head out of the fumes. Monitor fume levels and do not exceed permissible exposure limits or values. Adhere to environmental regulations for exhausts.

RESPIRATORY PROTECTION: Do NOT breathe fumes. If the workstation is not properly ventilated to exhaust all fumes and vapors, use a NIOSH approved respirator. Monitor fume levels and keep exposure below the TLV's.

EYE PROTECTION: Wear appropriate brazing / soldering chemical safety goggles. Do NOT wear contact lenses.

PROTECTIVE CLOTHING: Wear head, hand, and body protection that help to prevent injury; including rubber apron and rubber gloves. See ANSI Z49.1.

SKIN PROTECTION: Individuals having sensitive skin may find it beneficial to use a barrier cream or moisturizer when excessive or prolonged contact with skin is likely, along with rubber gloves.

OTHER PROTECTIVE EQUIPMENT: Full protective equipment normally used in soldering operation so as to prevent any contact. Review operations to avoid contact with hazardous gas, liquid, or solid. See also:

29CFR 1910.132 - 29 CFR 1910.140 Personal Protective Equipment
29 CFR 1910.251 - 29 CFR 1910.257 Welding, Cutting and Brazing

WORK HYGIENIC PRACTICES: Professionally wash contaminated clothing before re-use. Food and drink should not be consumed or neither tobacco products used, nor cosmetics applied in area where flux exposures are possible.

EXPOSURE GUIDELINES Use industrial hygiene monitoring equipment to ensure that exposure does not exceed applicable national exposure limits. See Section 3 for ingredients.

EFFECTS OF OVEREXPOSURE - brazing or soldering may create one or more of the following health hazards:

FUMES AND GASES can be dangerous to your health.

PRIMARY ROUTES OF ENTRY are the respiratory system. Other possible routes are eyes, ingestion, and/or skin contact.

PREEXISTING respiratory or allergic conditions may be aggravated in some individuals (i.e. asthma, emphysema).



Brazing and soldering fumes cannot be classified simply. The composition and quantity of both are dependent upon the metal being brazed or soldered, the process, procedure, and the filler material 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 brazed or soldered (such as paint, plating, etc.), the volume of the work area, the quality and the amount of ventilation, position of the worker'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).

When the material is consumed, fume and gas decomposition products generated are different in percent and form from the ingredients listed in Section 3. Fume and decomposition products, not the ingredients in the rod, are important. Decomposition products include those originating from the volatilization, reaction, or oxidation of materials in Section 3 plus those from the base metal and coating, etc., as noted above. These components are virtually always present as complex oxides and not as metals (Characterization of Arc Welding Fume: American Welding Society). The following limits can be used as guidance. Refer to Section 11 for more information about welding fumes.

| <u>Substance</u> | <u>CAS NUMBER</u> | <u>Exposure Limit (mg/m³)</u> | |
|------------------|-------------------|--|------------------|
| | | <u>OSHA PEL</u> | <u>ACGIH-TLV</u> |
| Lithium Fluoride | 7789-24-4 | 2.5 (as F) | 2.5 (as F) |
| Zinc Chloride # | 7646-85-7 | 1 (fume) | 1 (fume) |

Gaseous reaction products may include carbon monoxide and carbon dioxide. Monitor fume levels.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Appearance: Blue powder. No odor

Vapor density: not applicable

Percent volatiles by volume: not applicable

Solubility in water: slight

Active range for use: 900 °F – 1200 °F (482 °C – 649 °C)

pH-Value: not determined

Boiling point: not applicable

Vapor pressure: not applicable

Specific gravity: 2.15

SECTION 10: STABILITY AND REACTIVITY

GENERAL: This item is only intended for use in brazing applications.

STABILITY: Product is chemically stable and non-reactive.

CONDITIONS TO AVOID: excess heat

MATERIALS TO AVOID: Strong acids, cyanides, and sulfides.

HAZARDOUS POLYMERIZATION: Will not occur.

REACTIVITY: None known.

HAZARDOUS DECOMPOSITION OR BY-PRODUCTS: In the presence of heat and water, HCl and HF will be given off.

SECTION 11: TOXICOLOGICAL INFORMATION

Threshold Limit Value: The ACGIH recommended general limit for welding fume NOS (not otherwise specified) is 5 mg/m³. The ACGIH 1999 preface states: "The TLV-TWA should be used as guides in the control of health hazards and should not be used as firm lines between safe and dangerous concentrations." See Section 8 for specific fume constituents that may modify the TLV. Brazing/soldering vapors and fumes from some brazing/soldering fluxes may cause metal fume fever. Symptoms are similar to influenza type sickness, including chills, fever, head and muscle ache, tightness in chest, dryness of nose, mouth, muscular pain, nausea, and vomiting. Symptoms can appear within several hours of exposure and may last 6 - 24 hours. Consult a doctor immediately if any of these symptoms develop after using the product.



SHORT TERM (ACUTE) OVEREXPOSURE to welding fumes may result in discomfort such as metal fume fever, dizziness, nausea, or dryness or irritation of nose, throat, or eyes. **PRIMARY ROUTE OF ENTRY** is the respiratory system. **CHLORIDE COMPOUNDS:** (zinc chloride): Overexposure may cause severe irritation or burns of the eyes and skin. Chloride compounds will form strong acids in the presence of water and may give off HCL gas in a fire. Ingestion will cause nausea.

FLUORIDES - Fluoride compounds produced may cause eye and skin burns, and pulmonary edema bronchitis. 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. **ZINC CHLORIDE:** Very hazardous in case of skin contact (irritant), of eye contact (irritant), of ingestion, of inhalation. Hazardous in case of skin contact (corrosive, permeator), of eye contact (corrosive). The amount of tissue damage depends on length of contact. Eye contact can result in corneal damage or blindness. Skin contact can produce inflammation and blistering. Inhalation of dust will produce irritation to gastro-intestinal or respiratory tract, characterized by burning, sneezing and coughing. Severe over-exposure can produce lung damage, choking, unconsciousness or death. Inflammation of the eye is characterized by redness, watering, and itching. Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering.

LONG TERM (CHRONIC) OVEREXPOSURE is believed by some investigators to affect pulmonary functions. **PRIMARY ROUTE OF ENTRY** is the respiratory system. May cause coughing, CNS effects, erythema, nausea, and kidney effects.

FLUORIDES - Overexposure to fluorides can cause serious bone erosion, excessive calcification of the bone and calcification of the ribs, pelvis and spinal column. May cause skin rash. **ZINC CHLORIDE:** The substance may be toxic to kidneys, pancreas. Repeated or prolonged exposure to the substance can produce target organs damage. Repeated exposure of the eyes to a low level of dust can produce eye irritation. Repeated skin exposure can produce local skin destruction, or dermatitis. Repeated inhalation of dust can produce varying degree of respiratory irritation or lung damage. Chronic exposure to **LITHIUM** may result in neuromuscular effects, hyperactive reflexes, and weight loss. Contact your industrial hygienists department for more information.

Monitor fume levels when using this product.

SECTION 12: ECOLOGICAL INFORMATION

CONTAMINATED PACKAGING: Empty containers should be taken for local recycling, recovery, or waste disposal. Contaminated flux should be disposed of in accordance with Federal, State, and Local regulations.

SPILLS: Contain spill, absorb, sweep up and dispose of in accordance with Federal, State, and Local regulations. Material contains in excess 10% Zinc Chloride: Classified as a marine pollutant. Do not flush into waterways.

SECTION 13: DISPOSAL CONSIDERATION

WASTE DISPOSAL METHOD: Dispose of any waste residues in accordance with Federal, State, and Local regulations.

WASTE TYPE: Review U.S. Federal Hazardous Waste Regulations §40 CFR261 for more information for the hazardous materials used in this flux. Please be advised that state and local requirements, or other country requirements, for waste disposal may be more restrictive or otherwise different than U.S. Federal regulations. It is not possible to give this product a waste code number according to the European waste catalogue because only the intended use of the user consents the assignment of a specific code number.

SECTION 14: TRANSPORTATION INFORMATION

Shipping Information: Proper shipping name: Corrosive Solids N.O.S. (Zinc chloride, lithium chloride)
Hazard class: Class 8
ID & Packing Group Number: UN 1759, PG II
ERG Guide Number: 154



Toxic Substances Control Act: all components of this compound are listed within the TSCA inventory.

SARA Title II Program: This product contains the following toxic chemicals subject to reporting requirements of EPCRA of 1986 and 40 CFR 372:

| <u>Cemical name</u> | <u>CAS nr.</u> | <u>Concentration</u> |
|---------------------|----------------|----------------------|
| Zinc compounds: | N/E | < 12 % |

This product contains the following marine pollutants listed under 49CFR 172.101 Appendix B: NONE

Other regulations may apply when shipping this material and may be in the process of change or update. Verify all applicable regulations prior to shipment either domestically, internationally via air, ground, or water.

This information must be included in all SDS that are copied and distributed for this material.

Handle with care to avoid damaging the product and keep product dry. Do not remove product identification label or warning label. Do not store next to food, drink, or animal goods.

SECTION 15: REGULATORY INFORMATION

Read and understand the manufacturer's instructions and precautionary label on this product.

See American National Standard Z49.1, Safety in Welding and Cutting, published by the "American Welding Society," 550 N.W. LeJeune Road, Miami, FL 33126 and OSHA Publication 2206 (29CFR 1910), U.S. Government Printing Office, Superintendent of Documents, P.O. Box 371954, Pittsburgh, PA 15250-7954 for more information. Before using this product, understand and your employer's safety practices.

U.S. EPA TSCA (TOXIC SUBSTANCE CONTROL ACT): All constituents of these products are on the TSCA inventory list or are excluded from listing.

Spills or releases resulting in the loss of any ingredient at or above its RQ require immediate notification to the National Response Center and to our Local Emergency Planning Committee.

EPCRA/SARA TITLE III 313 TOXIC CHEMICALS:

The following metallic components are listed as SARA 313 "TOXIC CHEMICALS" and are potentially subject to annual SARA 313 reporting. See Section 3 to determine if the ingredient is present and for the percent.

| <u>INGREDIENT NAME</u> | <u>CAS NUMBER</u> | <u>DISCLOSURE THRESHOLD</u> |
|-------------------------------|-------------------|--------------------------------|
| Chromium & chromium compounds | 7440-47-3 | 1.0 % de minimis concentration |
| Chromium VI | Not listed | 0.1 % de minimis concentration |
| Barium compounds | Not listed | 1.0 % de minimis concentration |
| Cobalt | 7440-48-4 | 0.1 % de minimis concentration |
| Copper | 7440-50-8 | 1.0 % de minimis concentration |
| Manganese | 7439-96-5 | 1.0 % de minimis concentration |
| Nickel | 7440-02-0 | 0.1 % de minimis concentration |
| Aluminum (fume or dust) | 7429-90-5 | 1.0 % de minimis concentration |
| Silver | 7440-22-4 | 1.0 % de minimis concentration |

Other regulations may apply when shipping this material and are in the process of change or update, verify all applicable regulations prior to shipment either domestically, internationally via air, ground, or water.

International rules may vary and the appropriate regulations should be followed as defined by the country where the product is used.

SECTION 16: OTHER INFORMATION

This Safety Data Sheet has been revised due to modifications to several paragraphs and/or new format.

Prepared by: US Forge, USA

R - Phrases

Zinc Chloride #

R22 : Harmful if swallowed.

R34 : Causes burns.

R50/53 : Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

S-phrases

Zinc Chloride #

S1/2 : Keep locked up and out of the reach of children.

S26 : In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S36/37/39 : Wear suitable protective clothing, gloves and eye/face protection.

S45 : In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

S60 : This material and its container must be disposed of as hazardous waste.

S61 : Avoid release to the environment. Refer to special instructions/Safety data sheets.

SUPPLEMENTAL INFORMATION – DEFINITIONS:

IARC: International Agency for the Research on Cancer

NIOSH: National Institute for Occupational Safety and Health

OSHA: U.S. Occupational Safety and Health Administration

ACGIH: American Conference of Governmental Industrial Hygienists

CAS: Chemical Abstracts Service Registry Number

EINECS: European Inventory of Existing Chemical Substances

PEL: Permissible Exposure Limit

NTP: National Toxicology Program

TLV: Threshold Limit Value

ECD: European Council Directive

GHS: Globally Harmonized System

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