





SAFETY DATA SHEET (SDS)

Fluxes

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| 1 | Identification |
| 1.1 | GHS product identifier Trade names: 2 Flux, 3 Flux, 71 Flux, 73 Flux, 96 Flux, 98 Flux |
| 1.2 | Other means of identification: N. App. |
| 1.3 | Recommended use of the chemical and restriction on use: Used for flux for aluminum, silver brazing, soft and common soldering, as applicable. Do not work near flammable or combustible materials. |
| 1.4 | Supplier: Arctec Alloys Limited 4304 - 10 St. N.E., Calgary, Alberta, T2E 6K3 Phone: (403) 250-9355 |
| 1.5 | Emergency phone number: HealthLink 24/7 (Alberta Health Services): 800-624-2356 Out-of-province or internet phone users: 866-408-5465 |
| 2 | Hazard(s) Identification |
| 2.1 | Classification of the substance or mixture: Class: Reproductive Toxicity Category: 2 Class: Germ Cell Mutagenicity Category: 1B Class: Specific Target Organ Toxicity – (repeated exposure) Category: 1 Target Organs: Lungs, Kidneys, Liver, Respiratory System, Nerves, Blood, Eyes, Skin   |
| 2.2 | GHS label elements: Signal Word: Danger Hazard Statements: H315 Causes skin irritation. H319 Causes serious eye irritation. H331 Toxic if inhaled. H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled. H361 Suspected of damaging fertility or the unborn child. H372 Causes damage to organs through prolonged or repeated exposure. Precautionary Statements: P201 Obtain special instructions before use. P202 Do not handle until all safety precautions have been read and understood. P260 Do not breathe dust/fume/gas/mist/vapours/spray. P264 Wash hands thoroughly after handling. P270 Do not eat, drink or smoke when using this product. P272 Contaminated work clothing should not be allowed out of the workplace. P280 Wear protective gloves/protective clothing/eye protection/face protection. P283 Wear fire resistant or flame retardant clothing. P284 In case of inadequate ventilation wear respiratory protection. Response Statements: P308 + P313 If exposed or concerned, get medical advice/attention. P314 Get medical attention if you feel unwell. P332 + P352 IF SKIN irritation occurs: Wash with plenty of water. |

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| | P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do. Continue rinsing. P337 + P313 If eye irritation persists: Get medical attention. | | | | | | | |
| 2.3 | Other hazards which do not result in classification: Persons with pacemakers should not go near welding or cutting operations until they have consulted their doctor and obtained information from the manufacturer of the device. Heat: Spatter and melting metal can cause burn injuries and start fires. Radiation: Arc rays can severely damage eyes or skin. Electricity: Electric shock can kill. | | | | | | | |
| 3 | Composition/Information on Ingredients | | | | | | | |
| | Chemical Name | SDS# and Weight % | | | | | CAS Number | EINECS Number |
| | | 2 Flux | 3 Flux | 71 Flux | 73 Flux | 96 Flux | 98 Flux | |
| | Ammonium chloride | 7-13 | 7-13 | <0.1 | <0.1 | <0.1 | <0.1 | 12125-02-9 235-186-4 |
| | Boric Acid | <0.1 | <0.1 | <0.1 | <0.1 | 40-70 | 40-70 | 10043-35-3 233-139-2 |
| | Hydrochloric acid | 5-10 | 10-30 | <0.1 | <0.1 | <0.1 | <0.1 | 7647-01-0 231-595-7 |
| | Lithium chloride | <0.1 | <0.1 | 10-30 | 7-13 | <0.1 | <0.1 | 7447-41-8 231-212-3 |
| | Lithium fluoride | <0.1 | <0.1 | 5-10 | 7-13 | <0.1 | <0.1 | 7789-24-4 232-152-0 |
| | Potassium bifluoride | <0.1 | <0.1 | <0.1 | <0.1 | 15-40 | 15-40 | 7789-29-9 232-156-2 |
| | Potassium chloride | <0.1 | <0.1 | 15-40 | 40-70 | <0.1 | <0.1 | 7447-40-7 231-211-8 |
| | Potassium pentaborate | <0.1 | <0.1 | <0.1 | <0.1 | 7-13 | 7-13 | 11128-29-3 234-371-7 |
| | Potassium tetraborate | <0.1 | <0.1 | <0.1 | <0.1 | 7-13 | 7-13 | 12228-88-5 682-302-8 |
| | Sodium chloride | <0.1 | <0.1 | 10-30 | 40-70 | <0.1 | <0.1 | 7647-14-5 231-598-3 |
| | Water | 60-100 | 40-70 | <0.1 | <0.1 | 15-40 | 15-40 | 7732-18-5 231-791-2 |
| | Zinc chloride | 7-13 | 15-40 | 10-30 | <0.1 | <0.1 | <0.1 | 7646-85-7 231-592-0 |
| 4 | First Aid Measures | | | | | | | |
| 4.1 | Description of necessary first-aid measures: | | | | | | | |
| | Inhalation: | If breathing has stopped, perform artificial respiration. If no detectable pulse, begin Cardio Pulmonary Resuscitation (CPR). Obtain emergency medical assistance immediately! If breathing is difficult, provide fresh air and call Poison Center/doctor. | | | | | | |
| | Eye: | For radiation burns due to arc flash, see doctor. To remove dusts or fumes, flush cautiously with water for at least fifteen minutes. Remove contact lenses if present and easy to do. If irritation persists, see a doctor. | | | | | | |
| | Skin: | For skin burns from arc radiation, promptly flush with cool water. Get medical attention for burns or irritations that persist. To remove dust or particles wash with water. | | | | | | |
| | Ingestion: | Not applicable | | | | | | |
| | Electric Shock: | Disconnect and turn off the power. Use a nonconductive material to pull victim away from contact with live parts or wires. If not breathing, begin artificial respiration. If no detectable pulse, begin Cardio Pulmonary Resuscitation (CPR). Obtain emergency medical assistance immediately! | | | | | | |
| 4.2 | Most important symptoms/effects, acute and delayed: Asthma, chest pain, cough, wheezing, chest tightness. | | | | | | | |
| 4.3 | Indication of immediate medical attention and special treatment needed: Asthma, chest pain, cough, wheezing, chest tightness. For severe inhalation exposure, watch person for at least 48 hours in case pulmonary oedema develops. | | | | | | | |
| 4.4 | General: Move to fresh air and get medical assistance. | | | | | | | |
| 5 | Fire Fighting Measures | | | | | | | |
| 5.1 | Suitable extinguishing media: No specific recommendations for welding consumables. Arcs and sparks can ignite combustible and flammable materials. Use the extinguishing media recommended for the burning materials and fire situation. | | | | | | | |
| 5.2 | Specific hazards arising from the substance or mixture: Depends on burning materials. Smoke may contain toxic substances such as hydrogen chloride, ammonia, boron and zinc from fluxes. | | | | | | | |
| 5.3 | Special protective equipment or actions for fire-fighters: Wear self-contained breathing apparatus. | | | | | | | |
| 6 | Accidental Release Measures | | | | | | | |
| 6.1 | Personal precautions, protective equipment and emergency procedures: Refer to Section 8 | | | | | | | |

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| 6.2 | Environmental precautions: Refer to Section 13 | | | | |
| 6.3 | Methods and materials for containment and cleaning up: Place in suitable container for appropriate disposal. | | | | |
| 7 | Handling and Storage | | | | |
| 7.1 | Precautions for safe handling: Wear gloves when handling welding consumables. Avoid exposure to fume and dust. Retain all warning and identity labels. | | | | |
| 7.2 | Conditions for safe storage, including any incompatibilities: Store in a dry place. Keep separate from chemical substances such as acids and strong bases, which could cause chemical reactions. | | | | |
| 7.3 | Specific end use(s): Welding. | | | | |
| 8 | Exposure Controls/Personal Protection | | | | |
| 8.1 | Control parameters: | | | | |
| Exposure limits: Use industrial hygiene monitoring equipment to ensure that exposures do not exceed applicable regulatory exposure limits (see below). ACGIH TLVs are recommended limits – not regulatory limits. Unless noted, all values apply to 8-hour time weighted average exposures (TWA). | | | | | |
| | Substance | CAS# | ACGIH TLV mg/m³ | Alberta OEL mg/m³ | BC EL mg/m³ |
| | Ammonia | 7664-41-7 | 17 (25 ppm) | 17 (25 ppm) | 17 (25 ppm) |
| | Ammonium chloride, fume | 12125-02-9 | 10 | 10 | 10 |
| | Borate compounds, Inorganic, Inhalable | 1303-96-4 1330-43-4 10043-35-3 12179-04-3 | 2 | N.Av. | 2 |
| | Boron oxide | 1303-86-2 | 10 | 10 | 10 |
| | Chlorine | 7782-50-5 | 0.1 ppm | 1.5 (0.5 ppm) | 1.5 (0.5 ppm) |
| | Fluoride | 7789-75-5 | 2.5 | 2.5 | 2.5 |
| | Hydrogen chloride | 7647-01-0 | 3 (2 ppm) (C) | 3 (2 ppm) (C) | 3 (2 ppm) (C) |
| | Hydrogen fluoride, as F | 7664-39-3 | 0.4 (0.5 ppm) | 0.4 (0.5 ppm) | 1.6 (2 ppm) (C) |
| | Potassium hydroxide | 1310-58-3 | 2 (C) | 2 (C) | 2 (C) |
| | Zinc chloride fume | 7646-85-7 | 1 | 1 | 1 |
| | Zinc oxide (fume) | 1314-13-2 | 2 (R) | 2 (R) | 2 (R) |
| ACGIH TLVs: Threshold Limit Values according to American Conference of Governmental Industrial Hygienists. Alberta OELs: Alberta Occupational Exposure Limits BC ELs: British Columbia Exposure Limits (R) Respirable fraction, (I) Inhalable fraction. If no (R) or (I) designation is shown, values refer to total particulate. | | | | | |
| 8.2 | Appropriate engineering controls: Ensure sufficient local exhaust and general ventilation to keep exposures to welding fumes and gases below regulatory exposure limits. Use special care when welding painted or coated steels since hazardous substances from the coating may be emitted. If coating contains lead or mercury, remove before welding. | | | | |
| 8.3 | Individual protection measures: Wear hand, head, eye, hearing and body protection such as welder's gloves, helmet or face shield with filter lens, ear muffs/plugs, safety boots, apron, arm and shoulder protection. Keep protective clothing clean and dry. Check condition of protective clothing and equipment on a regular basis. Use respiratory protection (P100/acid gas/ammonia air purifying or supplied air respirator as appropriate) where ventilation is not sufficient to keep exposures below regulatory limits. Never use air purifying respirators in oxygen deficient atmospheres. | | | | |
| 9 | Physical and Chemical Properties | | | | |
| 9.1 | Information on basic physical and chemical properties: | | | | |
| | Appearance, colour: | Varies | | | |
| | Physical state: | Liquid or powder | | | |
| | Auto-ignition temperature: | Not available | | | |
| | Decomposition temperature: | Not available | | | |
| | Evaporation rate: | Not applicable | | | |
| | Explosive properties: | Not applicable | | | |
| | Flammability (solid, gas): | Not applicable | | | |

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| | Flash point: | Not applicable | | |
| | Initial boiling point and boiling range: | Not available | | |
| | Melting point: | Varies | | |
| | Freezing Point: | Varies | | |
| | Odour: | None | | |
| | Odour threshold: | Not applicable | | |
| | Oxidising Properties: | Not applicable | | |
| | Partition coefficient (n-octanol/water): | Not available | | |
| | pH: | Not available | | |
| | Relative density: | Not available | | |
| | Solubility: | Varies | | |
| | Upper / Lower flammability or explosive limits: | Not applicable | | |
| | Vapour density: | Not applicable | | |
| | Vapour pressure: | Not applicable | | |
| | Viscosity: | Not applicable | | |
| 10 | Stability and Reactivity | | | |
| 10.1 | Reactivity: May react with water, acids and strong bases producing gas. | | | |
| 10.2 | Chemical stability: This product is stable under normal conditions. | | | |
| 10.3 | Possibility of hazardous reactions: May react with water, acids and strong bases producing gas. | | | |
| 10.4 | Conditions to avoid: Wet, acids, bases | | | |
| 10.5 | Incompatible materials: Water, acids, bases | | | |
| 10.6 | Hazardous decomposition products: When this product is used in a brazing or soldering process, hazardous decomposition products include those from the volatilization, reaction or oxidation of the materials listed in Section 2 and those from the base metal coating. Carbon oxides, nitrogen oxides and ozone may also be produced. Allow cleaning solvents to dry off work before brazing or soldering. Thermal decomposition products of halogenated cleaning solvents may be highly poisonous. | | | |
| 11 | Toxicological Information | | | |
| 11.1 | Likely Routes of Exposure: <input checked="" type="checkbox"/> Inhalation <input checked="" type="checkbox"/> Skin contact <input checked="" type="checkbox"/> Eye contact <input type="checkbox"/> Ingestion | | | |
| | Acute Toxicity: Overexposure to fumes and gases can cause irritation of eyes, nose, throat and lungs. It may result in metal fume fever (chills, fever, upset stomach, vomiting, throat irritation, muscle aches), dizziness, nausea, dryness or irritation of the nose, throat, lungs and eyes. Airway restriction with tightening of chest and cough may occur. Excessive exposure may cause delayed pulmonary oedema (after 24-48 hours), which may be fatal. | | | |
| | Skin corrosion/irritation: Irritation | | | |
| | Serious eye damage/ irritation: Irritation | | | |
| | Respiratory and/or skin sensitization: Yes | | | |
| | Germ cell mutagenicity: Not available | | | |
| | Genotoxicity: Yes | | | |
| | Carcinogenicity: Yes | | | |
| | Reproductive toxicity: Yes | | | |
| | STOT – Single Exposure: Not available | | | |
| | STOT – Repeated Exposure: Yes – lungs and skin | | | |
| | Harmful if inhaled: Yes | | | |
| | Single exposure: Yes | | | |
| | Aspiration hazard: No | | | |
| | Repeated exposure: Yes | | | |
| | Interactive effects: Not available | | | |
| | Chemical Name | CAS Number | EINECS Number | LC50, inhalation, 4 Hours |
| | Ammonia | 7664-41-7 | 231-635-3 | 2000 ppm, rat |
| | Ammonium chloride | 12125-02-9 | 235-186-4 | N.Av. |
| | Boric Acid | 10043-35-3 | 233-139-2 | N.Av. |
| | | | | LD50, oral |
| | | | | N.Av. |
| | | | | 1650 mg/kg |
| | | | | 2660 mg/kg, rat |

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| | Hydrochloric acid | 7647-01-0 | 231-595-7 | 1662 ppm, rat, 4H (based on conversion from 30 minute data) | N.Av. |
| | Lithium chloride | 7447-41-8 | 231-212-3 | N.Av. | 526 mg/kg, rat |
| | Lithium fluoride | 7789-24-4 | 232-152-0 | N.Av. | 143 mg/kg, rat |
| | Potassium bifluoride | 7789-29-9 | 232-156-2 | N.Av. | 160 mg/kg, rat |
| | Potassium chloride | 7447-40-7 | 231-211-8 | N.Av. | 2600 mg/kg, rat |
| | Potassium pentaborate | 12229-13-9 | 602-489-1 | N.Av. | N.Av. |
| | Potassium tetraborate | 12228-88-5 | 682-302-8 | N.Av. | >2000 mg/kg, rat |
| | Sodium chloride | 7647-14-5 | 231-598-3 | >21000 mg/m ³ , rat, 4 H (based on conversion from 1 hour data) | 3000 mg/kg, rat |
| | Zinc chloride | 7646-85-7 | 231-592-0 | N.Av. | 350 mg/kg, rat |
| | Chronic Toxicity: Long term exposure to ammonia may cause chronic eye, nose and throat irritation, and increase the risk of bronchitis and asthma. Boron compounds can cause irritation of the eyes, nose, throat and lungs. No significant long term effects were found for humans, but some evidence was found of reproductive toxicity in test animals. Exposure to fluorides can cause eye, nose and throat irritation and fluorosis, a potentially crippling bone disease. Hydrogen chloride is a powerful irritant of the eyes, nose, throat and lungs. It can worsen asthma and bronchitis, and in severe cases may cause temporary constriction severe enough to obstruct breathing. It may also cause erosion of the teeth. Zinc fume exposure may cause metal fume fever with cough, chills, fever, shortness of breath, chest pain, nausea and vomiting. | | | | |
| 12 | Ecological Information | | | | |
| 12.1 | Toxicity: Not available | | | | |
| 12.2 | Persistence and degradability: Not available | | | | |
| 12.3 | Bioaccumulative potential: Not available | | | | |
| 12.4 | Mobility in soil: Not available | | | | |
| 12.5 | Results of PBT and vPvB assessment: Not available | | | | |
| 12.6 | Other adverse effects: Not available | | | | |
| 12.7 | Other: Brazing and soldering consumables and materials could degrade / weather into components originating from the consumables or from other materials used in the process. Avoid exposure to conditions that could lead to accumulation in soils or groundwater. | | | | |
| 13 | Disposal Considerations | | | | |
| 13.1 | Disposal and waste treatment methods: Reuse or recycle where possible. Discard any product, residue, disposable container or liner in an environmentally acceptable manner, in full compliance with federal, provincial and local regulations. Use recycling procedures if available. USA RCRA: Residues from consumables could degrade and accumulate in soils and groundwater. | | | | |
| 14 | Transportation Information | | | | |
| 14.1 | UN number: Not applicable | | | | |
| 14.2 | UN proper shipping name: Not applicable | | | | |
| 14.3 | Transport hazard class(es): Not applicable | | | | |
| 14.4 | Packing group: Not applicable | | | | |
| 14.5 | Environmental hazards: Not applicable | | | | |
| 14.6 | Special precautions for user: Not applicable | | | | |
| 14.7 | Transport in bulk according to Annex II of MARPOL and the IBC Code: Not applicable | | | | |
| 15 | Regulatory Information | | | | |
| 15.1 | Safety health and environmental regulations /legislation specific for the substance or mixture (applies to the airborne emissions during use). | | | | |
| | Canada: | | | | |
| | Class: Reproductive Toxicity | | | | Category: 2 |
| | Class: Germ Cell Mutagenicity | | | | Category: 1B |
| | Class: Specific Target Organ Toxicity – (repeated exposure) | | | | Category: 1 |
| | Target Organs: Lungs, Kidneys, Liver, Respiratory System, Nerves, Blood, Eyes, Skin | | | | |

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| | <p>Canadian Environmental Protection Act (CEPA): All constituents of this product are on the Domestic Substances List (DSL).</p> <p>USA: Under the OSHA Hazard Communication Standard, this product is considered hazardous. This product contains or produces a chemical known to the state of California to cause cancer and birth defects (or other reproductive harm). (California Health & Safety Code § 25249.5 et seq.) United States EPA Toxic Substance Control Act: All constituents of this product are on the TSCA inventory list or are excluded from listing.</p> <p>CERCLA/SARA Title III Reportable Quantities (RQs) and/or Threshold Planning Quantities (TPQs): Product is a solid solution in the form of a solid article: 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 your Local Emergency Planning Committee. The following metallic components are listed as SARA 313 “Toxic Chemicals” and potentially subject to annual SARA 313 reporting: boron compounds, zinc. See Section 3 for weight percent.</p> |
| 15.2 | <p>Other: Read and understand the manufacturer's instructions, your employer's safety practices and the health and safety instructions on the label. Observe all applicable regulations. Take precautions when welding and protect yourself and others. WARNING: Welding fumes and gases are hazardous to your health and may damage lungs and other organs. Use adequate ventilation. ELECTRIC SHOCK can kill. ARC RAYS and SPARKS can injure eyes and burn skin. Wear correct hand, head, eye and body protection.</p> |
| 16 | <p>Other Information</p> |
| 16.1 | <p>USA: American National Standard Z49.1. “Safety in Welding and Cutting”, ANSI/AWS F1.5. Methods for Sampling and analyzing Gases from Welding and Allied Processes., ANSI/AWS F1.1 “Method for Sampling Airborne Particles Generated by Welding and Allied Processes”, AWSF3.2M/F3.2 “Ventilation Guide for Weld Fume”, American Welding Society, 550 North Le Jeune Road, Miami Florida, 33135. Safety and Health Fact Sheets available from AWS at www.aws.org OSHA Publication 2206 (29 C.F.R. 1910), U.S. Government Printing Office, Superintendent of Documents, P.O. Box 371954, Pittsburgh, PA 15250-7954. American Conference of Governmental Hygienists (ACGIH), Threshold Limit Values and Biological Exposure Indices, 6500 Glenway Ave., Cincinnati, Ohio 45211, USA. NFPA 51B “Standard for Fire Prevention During Welding, Cutting and Other Hot Work” published by the National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02169 Canada: CSA Standard CAN/CSA-W117.2-01 “Safety in Welding, Cutting and Allied Processes”</p> |
| 16.2 | <p>This SDS has been prepared by Arctec Alloys Limited based on information obtained from sources believed to be accurate and reliable. However, this information is provided without any representation or warranty, expressed or implied, regarding accuracy or completeness thereof. The conditions or methods of handling, storage, use and disposal of the product are beyond the control and knowledge of Arctec Alloys Limited. For this and other reasons Arctec Alloys Limited does not assume responsibility, and expressly disclaims liability for loss, damage or expense arising from it or in any way connected with the handling, storage, use or disposal of the product.</p> |