



# SAFETY DATA SHEET

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SDS Number: 31-I  
Date Revised: 05/01/2014

This Safety Data Sheet complies with Regulation (EC) No. 1907/2006, ISO 11014-1 and ANSI Z400.1

## 1. PRODUCT AND COMPANY IDENTIFICATION

**Product Name:** ALL-STATE ALUMINUM AND MAGNESIUM BRAZING AND WELDING FLUXES

ALL-STATE BRAZALOY NO. 31 FLUX	P/N: 69080208, 069080209, 69080210
ALL-STATE NO. 31NC FLUX	P/N: 69080229
ALL-STATE BRAZALOY NO. 35 FLUX	P/N: 69080045, 69080211
ALL-STATE BRAZALOY NO. 53 FLUX	P/N: 69080212
ALL-STATE NO. 61 FLUX	P/N: 69080213

**Application:** Brazing and Welding Flux  
**Classification:** None  
**Supplier:** THE ESAB GROUP, INC., 801 Wilson Avenue, Hanover, PA 17331  
**Telephone No.:** 1-717-637-8911, 1-800-933-7070  
**Emergency No.:** 1-717-637-8911 and 1-800-424-9300 (CHEMTREC)  
**Web site:** [www.esabna.com](http://www.esabna.com)

## 2. HAZARDS IDENTIFICATION

**Emergency Overview:** A white, grey or blue powder with no odor. Can irritate or burn skin, especially in the presence of moisture. Toxic if swallowed.

Powders can cause irritation or burns to skin, eyes, digestive tract and respiratory tract, especially in the presence of moisture.

Contact with moisture may release fluorides in acidic form (HF) for which specialized first aid may be required. Toxic and may be fatal if swallowed.

Gloves should be worn when handling to prevent contact with product.

Persons with a pacemaker should not go near brazing and welding operations until they have consulted their doctor and obtained information from the manufacturer of the device.

When these products are used in a brazing or welding process, the most important hazards are heat, radiation, electric shock and welding fumes.

**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.

**Fumes:** Overexposure to brazing and welding fumes may result in symptoms like metal fume fever, dizziness, nausea, dryness or irritation of the nose, throat or eyes. Chronic overexposure to brazing and welding fumes may affect pulmonary function. Prolonged inhalation of nickel and chromium compounds above safe exposure limits can cause cancer. Overexposure to manganese and manganese compounds above safe exposure limits can cause irreversible damage to the central nervous system, including the brain, symptoms of which may include slurred speech, lethargy, tremor, muscular weakness, psychological disturbances and spastic gait. Chronic exposure to fluorides above safe exposure levels can cause changes in bone density and the teeth (fluorosis).

Zinc chloride vapors produce irritation to the throat and lungs.

**Flame Processing:** When used with combustible gas equipment (e.g., oxy-acetylene torch), read the use and safety information for that equipment.

## 3. COMPOSITION/INFORMATION ON INGREDIENTS

These products are pastes.

Ingredients	REACH Reg. #	CAS#	EINECS#	Hazard classification <sup>(1)</sup>	IARC <sup>(2)</sup>	NTP <sup>(3)</sup>	OSHA List <sup>(4)</sup>
Lithium Chloride	--	7447-41-8	231-212-3	No	--	--	--
Lithium Fluoride	--	7789-24-4	232-152-0	No	--	--	--
Potassium Aluminum Fluoride	--	60304-36-1	262-153-1	No	--	--	--
Potassium Chloride	--	7447-40-7	231-211-8	No	--	--	--



Ingredients	REACH Reg. #	CAS#	EINECS#	Hazard classification <sup>(1)</sup>	IARC <sup>(2)</sup>	NTP <sup>(3)</sup>	OSHA List <sup>(4)</sup>
Sodium Chloride	--	7647-14-5	231-598-3	No	--	--	--
Sodium Fluoride	--	7681-49-4	231-667-8	T; R25 Xi; R36/38, R32	--	--	--
Zinc Chloride	--	7646-85-7	231-592-0	Xn; R22 C; R34 N; R50-53	--	--	--
Proprietary Complex Silicon Fluoride Salt	--	Trade Secret	--	No	--	--	--

<sup>(1)</sup> Hazard Classification according to European Council Directive 67/548/EEC, for R-phrases, see Section 16.

<sup>(2)</sup> Evaluation according to the International Agency for Research on Cancer.

1 –Carcinogenic to humans. 2A – Probably carcinogenic to humans. 2B – Possibly carcinogenic to humans.

<sup>(3)</sup> Classification according to the 11th Report on Carcinogens, published by the US National Toxicology Program.  
K – Known Carcinogen S – Suspect Carcinogen

<sup>(4)</sup> Carcinogen listing according to OSHA, Occupational Safety & Health Administration (USA).

**APPROXIMATE COMPOSITION (Wt. %)**

All-State Product Trade Name	Brazaloy No. 31 Flux	No. 31NC Flux	Brazaloy No. 35 Flux	Brazaloy No. 53 Flux	No. 61 Flux
Lithium Chloride	7-13	--	5-10	7-13	10-30
Lithium Fluoride	3-7	--	5-10	3-7	--
Potassium Aluminum Fluoride	--	95-99	--	--	--
Potassium Chloride	30-60	--	30-60	30-60	30-60
Sodium Chloride	15-40	--	30-60	15-40	10-30
Sodium Fluoride	--	--	--	--	7-13
Zinc Chloride	7-13	--	--	7-13	--
Proprietary Complex Silicon Fluoride Salt	--	1-5	--	--	--

**4. FIRST AID MEASURES**

- Inhalation: If breathing has stopped, perform artificial respiration and obtain medical assistance immediately! If breathing is difficult, provide fresh air and call physician.
- Eye contact: For radiation burns due to arc flash, see physician. To remove dusts or fumes flush with water for at least fifteen minutes. If irritation persists, obtain medical assistance.
- Skin contact: For skin burns from arc radiation, promptly flush with cold water. Get medical attention for burns or irritations that persist. To remove dust or particles wash with mild soap and water.
- Ingestion: Call a physician or poison control center immediately. Do not induce vomiting unless directed to do so by a physician.
- 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, preferably mouth-to-mouth. If no detectable pulse, begin Cardio Pulmonary Resuscitation (CPR). Immediately call a physician.
- General: Move to fresh air and call for medical aid.

**5. FIRE FIGHTING MEASURES**

No specific recommendations for brazing and welding consumables. Brazing and welding arcs and sparks can ignite combustible and flammable materials. Use the extinguishing media recommended for the burning materials and fire situation. Wear self-contained breathing apparatus as fumes or vapors may be harmful.



## 6. ACCIDENTAL RELEASE MEASURES

Solid objects may be picked up and placed into a container. Liquids or pastes should be scooped up and placed into a container. Wear proper protective equipment while handling these materials. Do not discard as refuse.

Personal precautions: refer to Section 8.

Environmental precautions: refer to Section 13.

## 7. HANDLING AND STORAGE

Handling:

Avoid contact with skin, eyes and clothing. Wear gloves when handling these products. Wash hands after using. Do not swallow or breathe product dusts or vapors produced by use of these products.

Some individuals can develop an allergic reaction to certain materials. Retain all warning and identity labels.

Storage:

Store in cool, dry, well-ventilated place.

Keep separate from chemical substances like acids and strong bases, which could cause chemical reactions.

## 8. EXPOSURE CONTROL/PERSONAL PROTECTION

Avoid exposure to brazing and welding fumes, radiation, spatter, electric shock, heated materials and dust.

Engineering measures: (Brazing and welding operations)

Ensure sufficient ventilation, local exhaust, or both, to keep brazing and welding fumes and gases from breathing zone and general area. Keep working place and protective clothing clean and dry. Train welders to avoid contact with live electrical parts and insulate conductive parts. Check condition of protective clothing and equipment on a regular basis.

Personal protective equipment: (Brazing and welding operations)

Use respirator or air supplied respirator when brazing or welding in a confined space, or where local exhaust or ventilation is not sufficient to keep exposure values within safe limits. Use special care when brazing or welding painted or coated steels since hazardous substances from the coating may be emitted. Wear hand, head, eyes, ear and body protection like welders gloves, helmet or face shield with filter lens, safety boots, apron, arm and shoulder protection. Keep protective clothing clean and dry.

Use industrial hygiene monitoring equipment to ensure that exposure does not exceed applicable national exposure limits. The following limits can be used as guidance. For information about brazing and welding flux fume analysis refer to Section 10. When used with brazing and welding products, refer to the brazing and welding product SDS, Section 10, for information on brazing and welding fumes.

Substance	CAS#	ACGIH TLV <sup>(1)</sup> mg/m <sup>3</sup>	OSHA PEL <sup>(2)</sup> mg/m <sup>3</sup>
Lithium Chloride	7447-41-8	None	None
Lithium Fluoride (as F)	7789-24-4	2.5	2.5
Potassium Aluminum Fluoride (as F)	60304-36-1	2.5	2.5
(as Al)		1**	15*, 5**
Potassium Chloride	7447-40-7	None	None
Sodium Chloride	7647-14-5	None	None
Sodium Fluoride (as F)	7681-49-4	2.5	2.5
Zinc Chloride (fume)	7646-85-7	1, 2 (STEL)	1
Proprietary Complex Silicon Fluoride Salt (as F)	Trade Secret	2.5	2.5

<sup>(1)</sup> Threshold Limit Values according to American Conference of Governmental Industrial Hygienists, 2014

<sup>(2)</sup> Permissible Exposure Limits according to the Occupational Safety & Health Administration (USA)

Unless noted, all values are for 8 hour time weighted averages (TWA).

\* Total dust, \*\* Respirable fraction, \*\*\* Inhalable fraction.



## 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Powder with no odor. Color: White – Nos. 35, 53, 61 Blue – No. 31 White to grey – No. 31NC
Specific Gravity:	No. 31 – 2.15 No. 31NC – 2.8 No. 35 – 2.09 No. 53 – 2.15 No. 61 – 2.01
Boiling Point:	Not determined.
Freezing Point:	Not determined.
Vapor Pressure:	Negligible.
Vapor Density:	Not applicable.
Evaporation Rate:	Solid. Does not evaporate.
Solubility in Water:	Slight to moderate.
Flash Point:	None.
Upper/Lower Flame Limit:	None.
Auto-ignition Temperature:	Not determined.

## 10. STABILITY AND REACTIVITY

**General:** These products are only intended for normal brazing and welding purposes.

**Stability:** These products are stable under normal conditions.

**Reactivity:** Contact with chemical substances like acids or strong bases could cause generation of gas.

When these products are used in a brazing and welding process, hazardous decomposition products would include those from the volatilization, reaction or oxidation of the materials listed in Section 3 and those from the brazing and welding consumable, the base metal and coating.

Fumes from these products may contain compounds of the following chemical elements: Cl, F, Al, Li, K, Na and Zn. The rest is not analyzed, according to available standards.

Refer to applicable national exposure limits for fume compounds, including those exposure limits for fume compounds found in Section 8 of this SDS and the brazing and welding consumable SDS. A significant amount of the chromium in the fumes can be hexavalent chromium, which has a very low exposure limit in some countries. Manganese and nickel also have low exposure limits, in some countries, that may be easily exceeded.

Reasonably expected gaseous products would include carbon oxides, nitrogen oxides and ozone. Air contaminants around the brazing and welding area can be affected by the brazing and welding processes and influence the composition and quantity of fumes and gases produced.

## 11. TOXICOLOGICAL INFORMATION

Inhalation of brazing and welding fumes and gases can be dangerous to your health. Classification of brazing and welding fumes is difficult because of varying base materials, coatings, air contamination and processes. The International Agency for Research on Cancer has classified welding fumes as possibly carcinogenic to humans (Group 2B).

**Acute toxicity:** Overexposure to brazing and welding fumes may result in symptoms like metal fume fever, dizziness, nausea, dryness or irritation of the nose, throat or eyes.

May cause irritation and/or burns. Contact with moisture may release fluorides in acidic form (HF) for which specialized first aid may be required.

Lithium Chloride: LD<sub>50</sub> (oral, rat) – 526 mg/kg

Lithium Fluoride LD<sub>50</sub> (oral, rat) – 143 mg/kg

Potassium Chloride: LD<sub>50</sub> (oral, rat) – 2600 mg/kg

Potassium Aluminum Fluoride: LD<sub>50</sub> (oral, rat) – 2150 mg/kg

Sodium Chloride: LD<sub>50</sub> (oral, rat) – 3000 mg/kg

Zinc Chloride: LD<sub>50</sub> (oral, rat) – 350 mg/kg

**Chronic toxicity:** Overexposure to brazing and welding fumes may affect pulmonary function. Prolonged inhalation of nickel and chromium compounds above safe exposure limits can cause cancer. Overexposure to manganese and manganese compounds above safe exposure limits can cause irreversible damage to the central nervous system, including the brain, symptoms of which may include slurred speech, lethargy, tremor, muscular weakness, psychological disturbances and spastic gait. Chronic exposure to fluorides above safe exposure levels can cause changes in bone density and the teeth (fluorosis).



12. ECOLOGICAL INFORMATION

Brazaloy No. 31 and Brazaloy No. 35: Contain zinc which may be toxic to aquatic species and is regulated as an environmental hazard in the European Union. This hazard is not anticipated from the handling of brazing and welding consumables, but is relevant if consumables enter natural waterways.

Brazing and welding consumables and materials could degrade/weather into components originating from the consumables or from the materials used in the brazing and welding process. Avoid exposure to conditions that could lead to accumulation in soils or groundwater.

13. DISPOSAL CONSIDERATIONS

Discard any product, residue, disposable container or liner in an environmentally acceptable manner, in full compliance with federal and local regulations. Use recycling procedures if available.

USA RCRA: These products are not considered hazardous waste if discarded.

Residues from brazing and welding consumables and processes could degrade and accumulate in soils and groundwater.

14. TRANSPORT INFORMATION

DOT: UN1759, Corrosive solid n.o.s. (Zinc chloride, lithium chloride), 8, PG II. Can be shipped as Consumer Commodity, ORM-D.

TDG: UN1759, Corrosive solid n.o.s. (Zinc chloride, lithium chloride), 8, PG II. Can be shipped as Consumer Commodity.

IMTG UN1759, Corrosive solid n.o.s. (Zinc chloride, lithium chloride), 8, PG II. Can be shipped as Limited Quantity.

IATA: UN1759, Corrosive solid n.o.s. (Zinc chloride, lithium chloride), 8, PG II. Can be shipped as Limited Quantity.

15. REGULATORY INFORMATION

Read and understand the manufacturer's instructions, your employer's safety practices and the health and safety instructions on the label. Observe any federal and local regulations. Take precautions when brazing and welding and protect yourself and others.

WARNING: Brazing and 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.

Canada: WHMIS classification: Class D; Division 2, Subdivision B

Canadian Environmental Protection Act (CEPA): All constituents of these products are on the Domestic Substance List (DSL).

USA: Under the OSHA Hazard Communication Standard, these products are considered hazardous.

These products contain or produce 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 these products are on the TSCA inventory list or are excluded from listing.

CERCLA/SARA Title III

Reportable Quantities (RQs) and/or Threshold Planning Quantities (TPQs):

Table with 3 columns: Ingredient name, RQ (lb), TPQ (lb). Rows include Sodium Fluoride, Zinc Chloride.

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.

Section 311 Hazard Class

As shipped: Immediate In use: Immediate delayed

EPCRA/SARA Title III 313 Toxic Chemicals

The following metallic components are listed as SARA 313 "Toxic Chemicals" and potential subject to annual SARA 313 reporting. See Section 3 for weight percent.

Table with 2 columns: Ingredient name, Disclosure threshold. Row includes Zinc Chloride (as zinc, fume or dust) with 1.0% de minimis concentration.



## 16. OTHER INFORMATION

This Safety Data Sheet has been revised due to modifications to Section 8. This SDS supersedes 31-H.

Refer to ESAB "Welding and Cutting - Risks and Measures", F52-529 "Precautions and Safe Practices for Electric Welding and Cutting" and F2035 "Precautions and Safe Practices for Gas Welding, Cutting and Heating" available from ESAB, and to:

USA: Contact ESAB at [www.esabna.com](http://www.esabna.com) or 1-800-ESAB-123 if you have questions about this SDS.

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](http://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.

UK: WMA Publication 236 and 237, "Hazards from Welding Fume", "The arc welder at work, some general aspects of health and safety".

Germany: Unfallverhütungsvorschrift BGV D1, "Schweißen, Schneiden und verwandte Verfahren".

Canada: CSA Standard CAN/CSA-W117.2-01 "Safety in Welding, Cutting and Allied Processes".

These products have been classified according to the hazard criteria of the CPR and the SDS contains all the information required by the CPR.

Explanation of risk phrases mentioned in this SDS:

- R-phrases:
- R22 – Harmful if swallowed.
  - R25 – Toxic if swallowed.
  - R32 – Contact with acids liberates very toxic gas.
  - R34 – Causes burns.
  - R36/38 – Irritating to eyes and skin.
  - R50 – Very toxic to aquatic organisms.
  - R53 – May cause long-term adverse effects in the aquatic environment.

ESAB requests the users of these products to study this Safety Data Sheet (SDS) and become aware of product hazards and safety information. To promote safe use of these products a user should:

- notify its employees, agents and contractors of the information on this SDS and any product hazards/safety information.
- furnish this same information to each of its customers for these products.
- request such customers to notify employees and customers for the same product hazards and safety information.

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