



Hazard Ratings  
 4 = Extreme  
 3 = High  
 2 = Moderate  
 1 = Slight  
 0 = Insignificant

# Material Safety Data Sheet

(Essentially Similar to U.S. Department of Labor Suggested  
 Form For Hazard Communication Compliance)

## I. Product Identification

**Product Type** - ALL-STATE ALUMINUM AND MAGNESIUM WELDING AND BRAZING FLUXES

**Manufacturer** - THE ESAB GROUP, INC.

**Telephone No.** - 1-717-637-8911  
 1-800-933-7070

**Address** - 801 Wilson Avenue  
 Hanover, PA 17331

**Emergency No.** - 1-717-637-8911  
 (CHEMTREC) 1-800-424-9300

### NOMINAL CHEMICAL COMPOSITION

<u>All-State Product Trade Name</u>	<u>All-State No. 31 Flux</u> Ⓣ	<u>All-State No. 31NC Flux</u> Ⓣ	<u>All-State No. 35 Flux</u> Ⓣ	<u>All-State No. 53 Flux</u> Ⓣ	<u>All-State No. 61 Flux</u> Ⓣ
Lithium chloride	X	--	X	X	X
Lithium fluoride	X	--	X	X	--
Sodium fluoride	--	--	--	--	X
Potassium hexafluoroaluminate	--	X	--	--	--
Potassium pentafluoroaluminate	--	X	--	--	--
Potassium tetrafluoroaluminate	--	X	--	--	--
Zinc chloride	<15%	--	--	<15%	--
Proprietary complex Silicon fluoride salt	--	X	--	--	--

**NOTE:** X indicates material is present. Others, if any, are not in the lists of hazardous materials and are classified as trade secrets.

Ⓣ See Note in Section VI

**THE ESAB GROUP** requests the users of these products to study this Material Safety Data Sheet (MSDS) and the product labels and become fully aware of the product hazards and safety information. To promote the safe use of these products a user should (1) notify and train its employees, agents and contractors concerning the information on this MSDS and any product hazards and safety information, (2) furnish this same information to each of its customers for these products, and (3) request that such customers notify and train their employees and customers, for these products, of the same product hazards and safety information.

## II. Hazardous Ingredients

**IMPORTANT:** This section covers the materials from which this product is manufactured. The fumes and gases produced during normal use of these products are covered in Section V. The term **HAZARDOUS** should be interpreted as a term required and defined by Laws, Statutes or Regulations, and does not necessarily imply the existence of any hazard when the products are used as directed by **THE ESAB GROUP**.

Material	(CAS No.)	SARA	ACGIH TLV (1999)		OSHA – PEL (1993)	
			TWA (ppm)	STEL (ppm)	TWA (ppm)	STEL (ppm)
Lithium Chloride	(7447-41-8)		Not Listed		Not Listed	
Lithium Fluoride	(7789-24-4)		2.5 mg(as F)/m <sup>3</sup>		2.5 mg(as F)/m <sup>3</sup>	
Potassium hexafluoroaluminate	(13775-52-5)		2.5 mg(as F)/m <sup>3</sup>		2.5 mg(as F)/m <sup>3</sup>	
Potassium pentafluoroaluminate	(41627-26-3)		2.5 mg(as F)/m <sup>3</sup>		2.5 mg(as F)/m <sup>3</sup>	
Potassium tetrafluoroaluminate	(14484-69-6)		2.5 mg(as F)/m <sup>3</sup>		2.5 mg(as F)/m <sup>3</sup>	
Proprietary complex silicon fluoride salt			2.5 mg(as F)/m <sup>3</sup>		2.5 mg(as F)/m <sup>3</sup>	
Sodium Fluoride	(7681-49-4)		2.5 mg(as F)/m <sup>3</sup>		2.5 mg(as F)/m <sup>3</sup>	
Zinc Chloride	(7646-85-7)	*	1.0 (Fume)	2.0	1.0 (Fume)	2.0

**NOTE:** In the ingredients table, an asterisk (\*) after the CAS number indicates a toxic chemical subject to the reporting requirements of Section 313 of the Emergency Planning and Community Right-To-Know Act of 1986 (SARA) and 40 CFR Part 372.

## III. Physical Data

<b>Physical State:</b>	Gas ( )	Liquid ( )	Solid (X)		
<b>Solubility in Water:</b>	All-State No. 31		Slight	All-State No. 31NC	None
	All-State No. 35		Moderate	All-State No.53	Slight
	All-State No. 61		Moderate		
<b>Specific Gravity: (H<sub>2</sub>O = 1):</b>	All-State No. 31:		2.15	All-State No 31NC	2.8
	All-State No. 35		2.09	All-State No. 53	2.15
	All-State No 61		2.15		
<b>Odor and Appearance:</b>	All-State No. 31		Blue Powder, odorless		
	All-State No. 31NC		White to grey powder, odorless		
	All-State No. 35		White powder, odorless		
	All-State No. 53		White powder, odorless		
	All-State No. 61		White powder, odorless		

## IV. Fire & Explosion Hazard

**Flammable/Explosive:** NO (X) YES ( )

**Under what conditions:** Only the packaging for this product will burn.

**Extinguishing Media:** This product will not burn; however, welding arcs and sparks can ignite combustible and flammable materials. Use the extinguishing media recommended for the burning materials and fire situation. See ANSI Z49.1 "Safety in Welding and Cutting" and "Safe Practices" Code: SP, published by the American Welding Society, P. O. Box 351040, Miami, FL 33135, and NFPA 51B "Cutting and Welding Processes," published by the National Fire Protection Association, Batterymarch Park, Quincy, MA 02269 for additional fire prevention and protection information.

**Special Fire Fighting Procedures:** Metal halide and toxic fumes produced. Wear self-contained respiratory apparatus.

**Unusual Fire and Explosion Hazards:** None.

## V. Reactivity Data

**Stability:** Stable (X) Unstable ( ) Hazardous polymerization will not occur.

**Conditions to Avoid:** None.

**Incompatibility** (Materials to Avoid): Strong acids, cyanides and sulfides

**Hazardous decomposition products:** In the presence of water and heat, HCl and HF will be given off. Welding and brazing fumes and gases cannot be classified simply. The composition and quantity of the fumes and gases are dependent upon the base metal, the flux and filler metal being used. Coatings on the base metal such as paint, galvanizing or plating will produce fumes as well. Other conditions which influence the composition and quality of the fumes and gases to which workers may be exposed are the number of operators relative to the volume of the work area, the quality and amount of ventilation, the position of the welder's head with respect to the fume plume, as well as the presence of contaminants in the atmosphere such as halogenated hydrocarbon vapors from cleaning and degreasing activities. When the materials are consumed, the fume and gas decomposition products generated are different in percent and form from the ingredients listed in Section II. Decomposition products of normal operation include those originating from the volatilization, reaction or oxidation of the ingredients, plus those from the material being worked and the coatings etc. noted above. The only way to determine the true identity of the decomposition products is by sampling and analysis. The composition and quantity of the fumes and gases to which a worker may be exposed can be determined from a sample obtained from 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," available from the American Welding Society.

## VI. Physical and Health Hazard Data

Electric arc working may create one or more of the following health or physical hazards. Fumes and gases can be dangerous to your health. Electric shock can kill you. Arc rays can injure eyes and burn skin. Noise can damage hearing. A detailed description of the Health and Physical Hazards and their consequences may be found in ESAB's free publications F2035 "Precautions and Safe Practices for Gas Welding, Cutting and Heating." You may obtain copies from your local supplier or by writing to the address in Section I.

**Route of overexposure:** The primary route of entry of the decomposition products is by inhalation. Skin contact, eye contact, and ingestion are possible. When these products are used as recommended by **THE ESAB GROUP**, and ventilation maintains exposure to the decomposition products below the limits recommended in this section, overexposure is unlikely.

**Effects of acute (short-term) overexposure** to the gases, fumes and dusts may include irritation of the eyes, lungs, nose and throat. Some toxic gases associated with welding may cause pulmonary edema, asphyxiation, and death. Acute overexposure may include signs and symptoms such as watery eyes, nose and throat irritation, headache, dizziness, difficulty in breathing, frequent coughing, or chest pain. Acute effects of this product are:

**Inhalation:** Irritant to respiratory system. Lithium dust and fumes are absorbed through the lungs. Lung damage. Preexisting lung disorders will be aggravated.

**Eye Contact:** Irritation and possible burn of eye surfaces.

**Skin Contact:** Dermatitis; possibly a chemical burn. Existing skin disorders will be aggravated. Not known as a skin absorbent. No toxicology data available.

**Ingestion:** Nausea, vomiting. Can cause chemical burn to digestive system and toxic effects due to lithium ion.

**Pre-existing Medical Conditions Aggravated by Overexposure:** Individuals with allergies or impaired respiratory function may have symptoms worsened by exposure to welding fumes. However, such reaction cannot be predicted due to the variation in composition and quantity of the decomposition products.

**Effects of chronic (long-term) overexposure:** Coughing, erythema, nausea, and kidney effects. Also possible CNS effects. Chronic fluoride absorption can result in osseous fluorosis, increased radiographic density of the bones and mottling of the teeth.

**Exposure limits** for the ingredients are listed in Section II. The 1989 OSHA TWA for welding fume is 5 mg/m<sup>3</sup>. TLV-TWAs should be used as a guide in the control of health hazards and not as fine lines between safe and excessive concentrations. As noted in Section V, the welding fume is a mixture of many components. Therefore, a statutory computation of the *equivalent exposure* is required. The *equivalent exposure* value for the welding fume mixture shall always be less than one. When these products are used as recommended by **THE ESAB GROUP**, and the preventive measures taught in this MSDS are followed, overexposure to hazardous substances will not occur.

**Emergency First Aid Measures:** ALWAYS CONTACT PHYSICIAN OR POISON CONTROL CENTER IN CASE OF MEDICAL EMERGENCY

**Inhalation:** Remove to fresh air. If fumes, vapors or dusts are inhaled, call a physician.

**Eye Contact:** Flush with water for at least 15 minutes to remove all residue. Get medical attention immediately! **Blindness can result!**

**Skin Contact:** Wash hands with soap and water to remove all residue. If rash develops, consult a physician.

**Ingestion:** Call a physician or your Poison Control Center at once. Advise of Section II. **Corrosive** to mucous membranes.

**Carcinogenic Assessment (NTP Annual Report, IARC Monographs, Other):** NONE.

☉ **WARNING:** 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.)

## VII. Precautions for Safe Handling and Use/Applicable Control Measures

Read and understand the manufacturer's instructions and the precautionary label on this product. See American National Standard Z-49.1, "Safety in Welding and Cutting," published by the American Welding Society, P. O. Box 351040, Miami, FL 33135 and OSHA Publication 2206 (29 C.F.R. 1910), U.S. Government Printing Office, Superintendent of Documents, P.O. Box 371954, Pittsburgh, PA 15250-7954 for more detail on many of the following:

**Ventilation:** Use enough ventilation, local exhaust at the arc, or both, to keep the exposure within legal limits. In the worker's breathing zone and the general area, dust, fumes and gases must be kept below the TLVs and the equivalent exposure must compute to less than one.. Train the welder to keep his head out of the fumes.

**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 the TLVs.

**Eye Protection:** Wear chemical tight safety goggles. Wear helmet or use face shield with filter lens. As a rule of thumb, start with a shade which is too dark to see the weld zone. Then go to the next lighter shade which gives sufficient view of the weld zone. Provide protective screens and flash goggles, if necessary, to shield others.

**Protective Clothing:** Wear head, hand and body protection which help to prevent injury from radiation, sparks and electrical shock. See ANSI Z-49.1. At a minimum, this includes welder's gloves and a protective face shield and may include arm protectors, aprons, hats, shoulder protection, as well as dark substantial clothing. Train the welder not to touch live electrical parts and to insulate himself from work and ground. For No. 31 and No. 53, use chemical and acid impervious gloves. For No. 35 and No. 61, use chemical and oil impervious gloves.

**Steps to be taken if material is spilled or released:** Contain spill, absorb, sweep up. Remove and flush area with water to chemical sewer.

**Waste Disposal Method:** Dispose of in accordance with all local, state and federal regulations.

**Special Handling Considerations:** Do NOT breathe fumes. For all fluxes, remove and professionally clean contaminated clothing before reuse.

**Special Storage Considerations:** Material will naturally absorb moisture and cake solid. Store under extremely dry and controlled conditions.

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The opinions expressed in this MSDS are those of qualified experts within **THE ESAB GROUP**. We believe that the information contained herein is current as of the date of this MSDS. Since the use of this information and these opinions and the conditions of use of these products are not within the control of **THE ESAB GROUP**, it is the user's obligation to determine the conditions of safe use of these products.