



SAFETY DATA SHEET

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SDS Number: 37-M
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 BRAZING AND SOLDERING ALLOYS
100 P/Ns: 69050197, 69050201, 69050300, 69050207, 69050218
101 Cadmium Free P/Ns: 69050352, 69050354, 69050353, 69050400, 69050244, 69050401
101 FC Cadmium Free P/Ns: 69050410, 69050245, 69050411, 69050263
125 P/Ns: 69050161
155 P/Ns: 69050190, 69050191, 69050272, 69050277, 69050307, 69050273
155 FC P/Ns: 69050130, 69050280, 69050131, 69050281
Strongset® 390 Solder P/Ns: 69070064, 69070065
Strongset® 509 Solder P/Ns: 69070028, 69070050, 69070051, 69070053
Bi-Metal P/Ns: 69050220
Tri-Metal P/Ns: 69050222

Application: Brazing and Soldering Wires, Rods and Strip
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

2. HAZARDS IDENTIFICATION

Emergency Overview: Metallic wires, rods, flux coated rods or strip in varying colors. These products are normally not considered hazardous as shipped. Gloves should be worn when handling to prevent cuts and abrasions and contaminating hands with product dust.

Some of these products contain nickel, which is classified as toxic by prolonged inhalation, a skin sensitizer and a suspect carcinogen. In the form that nickel is present in these products it does not contribute to a hazard classification of the products.

Avoid eye contact or inhalation of dust from some of these products. Skin contact is normally no hazard but should be avoided to prevent possible allergic reactions. Skin contact may cause an allergic reaction to individuals sensitized to nickel metals.

Persons with a pacemaker should not go near brazing or soldering 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 soldering process, the most important hazards are heat, radiation, electric shock and brazing and soldering 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 soldering 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 soldering fumes may affect pulmonary function. Prolonged inhalation of nickel, chromium and cadmium 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. Some individuals may develop blue-gray skin pigmentation from exposure to silver (argyria). Cadmium may cause reproductive effects.

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 solid metal rods, flux coated (FC) metal rods, solid metal wires and strip.

Ingredients	REACH Reg. #	CAS#	EINECS#	Hazard classification ⁽¹⁾	IARC ⁽²⁾	NTP ⁽³⁾	OSHA List ⁽⁴⁾
Boric Acid	--	10043-35-3	233-139-2	Repr. Cat. 2; R60-61	--	--	--
Cadmium	--	7440-43-9	231-152-8	Carc. Cat. 2; R45 Muta. Cat. 3; R68 Repr. Cat. 3; R62- 63 T; R48/23/25 T+; R26 N; R50-53	1	K	K
Copper	--	7440-50-8	231-159-6	No	--	--	--
Methacrylate/Aliphatic & Naphthenic Hydrocarbon Compound	--	Proprietary	--	No	--	--	--
Nickel	--	7440-02-0	231-111-4	Carc. Cat. 3; R40 T; R48/23 R43	2B	S	--
Potassium Bifluoride	--	7789-29-2	232-156-2	T; R25 C; R34	--	--	--
Potassium Pentaborate	--	11128-29-3	234-371-7	No	--	--	--
Potassium Tetraborate	--	1332-77-0	215-575-5	No	--	--	--
Silver	--	7440-22-4	213-131-3	No	--	--	--
Sodium Dodecyl Sulfate	--	151-21-3	205-788-1	No	--	--	--
Tin	--	7440-31-5	231-141-8	No	--	--	--
Zinc	--	7440-66-6	231-175-3	F; R15-17 N; R50-53	--	--	--

⁽¹⁾ Hazard Classification according to European Council Directive 67/548/EEC, for R-phrases, see Section 16.⁽²⁾ Evaluation according to the International Agency for Research on Cancer.

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

⁽³⁾ Classification according to the 11th Report on Carcinogens, published by the US National Toxicology Program.
K – Known Carcinogen S – Suspect Carcinogen⁽⁴⁾ Carcinogen listing according to OSHA, Occupational Safety & Health Administration (USA).**APPROXIMATE COMPOSITION (Wt.%)**

All-State Product Trade Name	100	101 Cadmium Free	101 FC Cadmium Free	125	155
Boric Acid	--	--	1-10	--	--
Cadmium	--	--	--	--	--
Copper	30	30	22-27	43	22
Methacrylate/Aliphatic & Naphthenic Hydrocarbon Compound	--	--	Proprietary	--	--
Nickel	2	--	--	--	--
Potassium Bifluoride	--	--	2-8	--	--
Potassium Pentaborate	--	--	0.1-2	--	--
Potassium Tetraborate	--	--	3-13	--	--
Silver	40	45	30-40	25	56
Sodium Dodecyl Sulfate	--	--	<0.2	--	--
Tin	--	--	--	--	7-13
Zinc	28	25	18-23	30	17



All-State Product Trade Name	155 FC	Strongset 390 Solder	Strongset 509 Solder	Bi-Metal	Tri-Metal
Boric Acid	2-15	--	--	--	--
Cadmium	--	--	80-85	--	7-9
Copper	12-17	--	--	20-40	57-58
Methacrylate/Aliphatic & Naphthenic Hydrocarbon Compound	Proprietary	--	--	--	--
Nickel	--	--	--	1-5	1-2
Potassium Bifluoride	5-15	--	--	--	--
Potassium Pentaborate	0.1-2	--	--	--	--
Potassium Tetraborate	8-18	--	--	--	--
Silver	30-40	--	--	40-54	24-26
Sodium Dodecyl Sulfate	<0.2	--	--	--	--
Tin	2-5	85-95	--	--	--
Zinc	8-13	<10	10-20	10-28	6-10

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 soldering consumables. Brazing and soldering 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:

Handle with care to avoid stings and cuts. Wear gloves when handling brazing and soldering consumables. Avoid exposure to dust. Do not ingest.

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

Storage:

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 soldering fumes, radiation, spatter, electric shock, heated materials and dust.

Engineering measures: (Brazing and soldering operations)



Ensure sufficient ventilation, local exhaust, or both, to keep brazing and soldering 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 soldering operations)

Use respirator or air supplied respirator when brazing or soldering 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 and soldering 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 soldering fume analysis refer to Section 10.

Substance		CAS#	ACGIH TLV ⁽¹⁾ mg/m ³	OSHA PEL ⁽²⁾ mg/m ³
Boric Acid	(as borates)	10043-35-3	2 ***, 6 (STEL) ***	None
Cadmium	(as Cd)	7440-43-9	0.01 0.002**	0.005
Copper	(fume, as Cu)	7440-50-8	0.2	0.1
	(dust and mists, as Cu)		1	1
Methacrylate/Aliphatic & Naphthenic Hydrocarbon Compound		Proprietary	None	None
Nickel, elemental		7440-02-0	1.5***	1
Potassium Bifluoride	(as F)	7789-29-9	2.5	2.5
Potassium Pentaborate	(as boron oxide fume)	11128-29-3	10	15*
Potassium Tetraborate	(as boron oxide fume)	1332-77-0	10	15*
Silver (metal)		7440-22-4	0.1 (dust and fume)	0.01
Sodium Dodecyl Sulfate		151-21-3	None	None
Tin (metal)		7440-31-5	2	2
Zinc (metal)		7440-66-6	None	None

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

(2) 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.

NOTE: Some of these products may not contain all of the materials listed. For details of composition, refer to the COMPOSITION TABLES in Section 3.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Metallic rods, wires and strip in various colors.
Specific Gravity:	8-10 estimated.
Boiling Point:	Not determined.
Melting Point:	Not determined.
Vapor Pressure:	Not determined (solid).
Vapor Density:	Not determined (solid).
Evaporation Rate:	Not applicable.
Solubility in Water:	None for uncoated materials. Flux coating is slightly soluble.
Flash Point:	Not flammable.
Upper/Lower Flame Limit:	None.
Auto-ignition Temperature:	None.

10. STABILITY AND REACTIVITY

General:	These products are intended for normal brazing and soldering 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 or soldering process, hazardous decomposition products would include those from the volatilization, reaction or oxidation of the materials listed in Section 3 and those from the base metal and coating.

Fumes from these products may contain compounds of the following chemical elements: Ag, B, Cd, Cu, F, K, Ni, Sn 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. 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 soldering area can be affected by the brazing and soldering process and influence the composition and quantity of fumes and gases produced.

11. TOXICOLOGICAL INFORMATION

Inhalation of brazing and soldering fumes and gases can be dangerous to your health. Classification of brazing and soldering 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 soldering fumes may result in symptoms like metal fume fever, dizziness, nausea, dryness or irritation of the nose, throat or eyes.

Chronic toxicity: Overexposure to brazing and soldering 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. Some individuals may develop blue-grey skin pigmentation from exposure to silver (argyria). Chronic exposure to fluorides above safe exposure levels can cause changes in bone density and the teeth (fluorosis). Overexposure to cadmium may cause cancer.

12. ECOLOGICAL INFORMATION

Brazing and soldering consumables and materials could degrade/weather into components originating from the consumables or from the materials used in the brazing and soldering 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 soldering consumables and processes could degrade and accumulate in soils and groundwater. Brazing and soldering slag from these products typically contain mainly the following components originating from the coating of the electrode: Ag, B, Cd, Cu, F, K, Ni, Sn and Zn.

14. TRANSPORT INFORMATION

No international regulations or restrictions are applicable.

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 soldering and protect yourself and others.

WARNING: Brazing and soldering 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 1, Subdivision A
Class D; Division 2, Subdivision A

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):

Ingredient name	RQ (lb)	TPQ (lb)
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.

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.

Ingredient name	Disclosure threshold
Cadmium	0.1% de minimis concentration
Copper	1.0% de minimis concentration
Nickel	0.1% de minimis concentration
Silver	1.0% de minimis concentraton
Zinc (fume or dust)	1.0% de minimis concentraton

16. OTHER INFORMATION

This Safety Data Sheet has been revised due to modifications to Section 8. This SDS supersedes 37-L.

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 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.

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: R15 – Contact with water liberates extremely flammable gases.

R17 – Spontaneously flammable in air.

R25 – Toxic if swallowed.

R26 – Very toxic by inhalation.

R34 – Causes burns.

R40 – Limited evidence of a carcinogenic effect.

R43 – May cause sensitization by skin contact.

R45 – May cause cancer.

R48/23 – Toxic: danger of serious damage to health by prolonged exposure through inhalation.

R48/23/25 – Toxic: danger of serious damage to health by prolonged exposure through inhalation and if swallowed.



- R50 – Very toxic to aquatic organisms.
- R53 – May cause long-term adverse effects in the aquatic environment.
- R60 – May impair fertility.
- R61 – May cause harm to the unborn child.
- R62 – Possible risk of impaired fertility.
- R63 – Possible risk of harm to the unborn child.
- R68 – Possible risk of irreversible effects.

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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