

SAFETY DATA SHEET

Version: 2.0
Date of Issue: 04 May 2017
Date of First Issue: 24 August 2015

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ACCORDING TO OSHA HCS (29 CFR 1910.1200)

SECTION 1: IDENTIFICATION

Product identifier used on the label	1240 FPA Silver Solder	
Other means of identification	Not applicable	
Recommended use of the chemical and restrictions on use		
Recommended use	Welding and soldering products.	
Restrictions on use	None known.	
Details of the supplier of the safety data sheet		
Supplier	VISHAY MEASUREMENTS GROUP, INC.	
Address of Supplier	Post Office Box 27777 Raleigh, NC 27611 USA	
Telephone	+1 919-365-3800	
Fax	+1 919-365-3945	
E-Mail (competent person)	mm.us@vishaypg.com	
Emergency telephone number	1-800-424-9300	CHEMTREC (24 hours)

SECTION 2: HAZARD(S) IDENTIFICATION

Classification of the substance or mixture in accordance with paragraph (d) of 29 CFR 1910.1200

Physical hazards
Health hazards

Acute toxicity, Category 4 – Oral
Skin Sensitisation, Category 1
Carcinogen, Category 2
Reproductive toxicity, Category 2
Specific target organ toxicity — repeated exposure, Category 1
Hazardous to the aquatic environment, Acute, Category 1
Hazardous to the aquatic environment, Chronic, Category 1

Environmental hazards

Hazard Symbol



Signal Word(s)

Warning

Hazard Statement(s)

Harmful if swallowed.
May cause an allergic skin reaction.
Suspected of causing cancer.
Suspected of damaging the unborn child.
Causes damage to organs through prolonged or repeated exposure.
Very toxic to aquatic life with long lasting effects.

Precautionary Statement(s)

Obtain special instructions before use.
Do not handle until all safety precautions have been read and understood.
Do not breathe vapour.
Wash hands and exposed skin thoroughly after handling.
Wear protective gloves/protective clothing/eye protection/face protection.
IF SWALLOWED: Call a POISON CENTER/doctor if you feel unwell.
Rinse mouth.

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IF ON SKIN: Wash with plenty of water.
If skin irritation or rash occurs: Get medical advice/attention.
IF exposed: Call a POISON CENTER or doctor/physician.

Other hazards

Thermal decomposition will evolve toxic and corrosive vapours.
Contact with reducing agents may form explosive gases.

Percent of the mixture consists of ingredient(s) of unknown acute toxicity: 0%

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

Substances Not applicable

Mixtures Substances in preparations / mixtures

Chemical identity of the substance	%W/W	CAS No.	EC No.	Hazard classification
Silver	< 50	7440-22-4	231-131-3	Hazardous to the aquatic environment, Acute, Category 1 Hazardous to the aquatic environment, Chronic, Category 1
Potassium difluorodihydroxyborate(1-)	< 35	85392-66-1	286-925-2	Acute toxicity, Category 4 – Oral Reproductive toxicity, Category 2 (SCL: $\geq 7.1\%$)
Copper	25 - 35	7440-50-8	231-159-6	Hazardous to the aquatic environment, Acute, Category 1 Hazardous to the aquatic environment, Chronic, Category 3
Zinc	25 - 30	7440-66-6	231-175-3	Hazardous to the aquatic environment, Acute, Category 1 Hazardous to the aquatic environment, Chronic, Category 1
Nickel	< 5	7440-02-0	231-111-4	Skin Sensitisation, Category 1 Carcinogen, Category 2 Specific target organ toxicity — repeated exposure, Category 1 Hazardous to the aquatic environment, Chronic, Category 3

SECTION 4: FIRST AID MEASURES



Description of first aid measures

Self-protection of the first aider

Do not breathe vapour. Wear suitable protective clothing. Wear suitable respiratory protective equipment if exposure to high levels of material are likely. Do not use mouth-to-mouth resuscitation.

Inhalation

IF INHALED: Remove person to fresh air and keep comfortable for breathing. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is laboured, oxygen should be administered by qualified personnel. IF exposed or concerned: Call a POISON CENTER/doctor.

Skin Contact

IF ON SKIN: Remove contaminated clothing and wash all affected areas with plenty of water. Contaminated clothing should be thoroughly cleaned. If skin irritation or rash occurs: Get medical advice/attention. IF exposed or concerned: Call a POISON CENTER/doctor.

In the event of burns from the molten liquid, do not attempt to remove adhering material. In case of burns immediately cool affected skin as long as possible with cold water.

Eye Contact

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical attention if eye irritation develops or persists.

Ingestion

IF SWALLOWED: rinse mouth. Do NOT induce vomiting. Do not give anything by mouth to an unconscious person. IF exposed or concerned: Call a POISON CENTER/doctor.

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Most important symptoms and effects, both acute and delayed

Harmful if swallowed. May cause an allergic skin reaction. Repeated and/or prolonged contact may cause dermatitis. Suspected of causing cancer. Suspected of damaging the unborn child. Causes damage to organs through prolonged or repeated exposure. Molten material can cause severe burns. Flux fumes during soldering may cause irritation and damage of mucous membranes and respiratory system.

Indication of any immediate medical attention and special treatment needed

Treat symptomatically.
Molten material can cause severe burns. Do NOT try to peel molten material from the skin. Cool rapidly with water.

Notes to a physician:

Fluorides can reduce serum calcium levels resulting in potentially fatal hypocalcemia. Focus medical efforts on combating shock and reducing systemic toxicity of fluoride ion.

SECTION 5: FIRE-FIGHTING MEASURES

Extinguishing media

Suitable Extinguishing Media
Unsuitable extinguishing Media

As appropriate for surrounding fire.

Do not use water on fires when molten metal is present.

Special hazards arising from the substance or mixture

Thermal decomposition will evolve toxic and corrosive vapours. Acrid smoke, Carbon monoxide, carbon dioxide, halogenated compounds and hydrofluoric acid. High temperatures may produce heavy metal fumes, dust and/or vapor. Contact with reducing agents may form explosive gases.

Special protective equipment and precautions for fire fighters

Fire fighters should wear complete protective clothing including self-contained breathing apparatus. Do not breathe fumes. Keep containers cool by spraying with water if exposed to fire. Avoid run off to waterways and sewers.

SECTION 6: ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Eliminate all ignition sources if safe to do so. Ensure adequate ventilation. Avoid all contact. Do not breathe vapour. Do not breathe fumes/vapour from heated product. Wear suitable respiratory protection. Use personal protective equipment as required. See Section: 8.

Environmental precautions

Avoid release to the environment. Do NOT wash away into sewer. Spillages or uncontrolled discharges into watercourses must be alerted to the Environment Agency or other appropriate regulatory body.

Methods and material for containment and cleaning up

Ensure suitable personal protection (including respiratory protection) during removal of spillages. Transfer to a container for disposal. Ventilate the area and wash spill site after material pick-up is complete. Recover or recycle if possible. Dispose of this material and its container as hazardous waste.

SECTION 7: HANDLING AND STORAGE

Precautions for safe handling

Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Ensure adequate ventilation. Do not breathe vapour. Do not breathe fumes/vapour from heated product. Avoid all contact. Wear suitable respiratory protection. Use personal protective equipment as required. See Section: 8. Do not eat, drink or smoke when using this product. Wash hands before breaks and after work. When molten: Keep from any possible contact with water.

Conditions for safe storage, including any incompatibilities

Keep container tightly closed, in a cool, well ventilated place.

Storage temperature
Storage life
Incompatible materials

5°C - 25°C

Stable under normal conditions.

Keep away from reducing agents. Keep away from: Acids, Alkalis, Strong oxidising agents, ammonia, peroxides, halogens, halogenated compounds and strong bases. Protect from moisture.

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SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

Occupational Exposure Limits

SUBSTANCE	CAS No.	LTEL (8 hr TWA ppm)	LTEL (8 hr TWA mg/m ³)	STEL (ppm)	STEL (mg/m ³)	Note
Silver (metal dust and soluble compounds, as Ag)	7440-22-4	-	0.01	-	-	NIOSH, OSHA
Silver, metal dust and fume	7440-22-4	-	0.1	-	-	ACGIH
Copper (dusut and mists, as Cu)	7440-50-8	-	1	-	-	NIOSH, OSHA, ACGIH
Copper fume (as Cu)	7440-50-8	-	0.1	-	-	NIOSH, OSHA
		-	0.2	-	-	ACGIH
Nickel	7440-02-0	-	0.015	-	-	NIOSH Total dust
		-	1	-	-	OSHA Total dust
Nickel, Elemental Soluble inorganic compounds Insoluble inorganic compounds	7440-02-0	-	1.5	-	-	ACGIH A5
		-	0.1	-	-	A4
		-	0.2	-	-	A1

Note: OSHA PELs 1910.1000 TABLE Z-1/ NIOSH RELs / ACGIH TLVs

A1: Confirmed Human Carcinogen: The agent is carcinogenic to humans based on the weight of evidence from epidemiological studies.

A4: Not Classifiable as a Human Carcinogen: Agents which cause concern that they could be carcinogenic for humans but which cannot be assessed conclusively because of the lack of data. In vitro or animal studies do not provide indications of carcinogenicity which are sufficient to classify the agent into one of the other categories.

A5: Not suspected as a Human Carcinogen: The agent is not suspected to be a human carcinogen on the basis of properly conducted epidemiological studies in humans. These studies have sufficiently long follow up, reliable exposure histories, sufficiently high dose, and adequate statistical power to conclude that exposure to the agent does not convey a significant risk of cancer to humans; OR, the evidence suggesting a lack of carcinogenicity in experimental animals is supported by mechanistic data.

The other components listed in Section 3 do not have occupational exposure limits.

Biological Exposure Indices

Not established

Appropriate engineering controls

Ensure adequate ventilation or use appropriate containment. Atmospheric levels should be controlled in compliance with the occupational exposure limit. Local exhaust ventilation is required. Guarantee that the eye flushing systems and safety showers are located close to the working place.

Individual protection measures, such as personal protective equipment (PPE)

General hygiene measures for the handling of chemicals are applicable. Avoid all contact. Do not breathe vapour. Do not breathe fumes/vapour from heated product. Wash hands before breaks and after work. Keep work clothes separately. Contaminated clothing should be thoroughly cleaned. Do not eat, drink or smoke at the work place.

Eye/face protection



Wear eye protection with side protection (EN166). When molten: Goggles or Full face shield.

Skin protection



Hand protection: Wear impervious gloves (EN374). Gloves should be changed regularly to avoid permeation problems. The gloves type used must be chosen based on the work activity and duration as well as concentration/quantity of material being handled.

When molten: Use gloves with insulation for thermal protection, when needed.

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Body protection: Wear impervious protective clothing, including boots, lab coat, apron or coveralls, as appropriate, to prevent skin contact. Recommended: Wear work clothes with long sleeves.
When molten: Wear flameproof clothing.

Respiratory protection



In case of inadequate ventilation wear respiratory protection. Open system(s): Wear suitable respiratory protective equipment. Recommended: EN149.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Appearance	Tan coloured viscous paste
Odor	Characteristic
Odor Threshold	Not available.
pH	Not available.
Melting Point/Freezing Point	>538°C
Initial boiling point and boiling range	277- 328°C
Flash Point	Not available.
Evaporation rate (Butyl acetate = 1)	Not available.
Flammability (solid, gas)	Not applicable - Liquid
Upper/lower flammability or explosive limits	Not available.
Vapour pressure	0.093 mm Hg @ 20°C
Vapour density	>1 (Air = 1)
Relative density	>2 (Water = 1)
Solubility(ies)	Water: Negligible
Partition coefficient: n-octanol/water	Not available.
Auto-ignition temperature	Not available.
Decomposition Temperature	Not available.
Viscosity	Not available.

SECTION 10: STABILITY AND REACTIVITY

Reactivity	Stable under normal conditions.
Chemical stability	Stable under normal conditions.
Possibility of hazardous reactions	Contact with reducing agents may form explosive gases. In reduced atmospheres nickel can react with carbon monoxide to form Ni(CO) ₄ , which is an extremely toxic gas.
Conditions to avoid	Keep away from heat and sources of ignition. Protect from moisture.
Incompatible materials	Keep away from reducing agents. Keep away from: Acids, Alkalis, Strong oxidising agents, ammonia, peroxides, halogens, halogenated compounds and strong bases.
Hazardous decomposition product(s)	Thermal decomposition will evolve toxic and corrosive vapours. Acrid smoke, Carbon monoxide, carbon dioxide, halogenated compounds and hydrofluoric acid. High temperatures may produce heavy metal fumes, dust and/or vapor.

SECTION 11: TOXICOLOGICAL INFORMATION

Information on toxicological effects (Substances in preparations / mixtures)

Acute toxicity - Ingestion	Acute toxicity, Category 4; Harmful if swallowed. Acute Toxicity Estimate Mixture Calculation: Estimated LC50 1429 mg/kg bw/day.
Acute toxicity - Inhalation	Based upon the available data, the classification criteria are not met. Acute Toxicity Estimate Mixture Calculation: Estimated LC50 > 20.0 mg/l.
Acute toxicity - Skin Contact	Based upon the available data, the classification criteria are not met.

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Skin corrosion/irritation	Acute Toxicity Estimate Mixture Calculation: Estimated LC50 > 2000 mg/kg bw/day.
Serious eye damage/irritation	Based upon the available data, the classification criteria are not met.
Respiratory or skin sensitization	Based upon the available data, the classification criteria are not met.
Germ cell mutagenicity	Skin Sensitisation, Category 1; May cause an allergic skin reaction.
Carcinogenicity	Based upon the available data, the classification criteria are not met.
Reproductive toxicity	Carcinogen, Category 2: Suspected of causing cancer.
STOT - single exposure	Reproductive toxicity, Category 2: Suspected of damaging the unborn child.
STOT - repeated exposure	Based upon the available data, the classification criteria are not met.
Aspiration hazard	Specific target organ toxicity — repeated exposure, Category 1; Causes damage to organs through prolonged or repeated exposure.
Information on likely routes of exposure	Based upon the available data, the classification criteria are not met.
Inhalation	Possible – accidental exposure
Ingestion	Unlikely – accidental exposure
Skin Contact	Possible – accidental exposure
Eye Contact	Unlikely – accidental exposure
Early onset symptoms related to exposure	May cause an allergic skin reaction. Molten material can cause severe burns. Flux fumes during soldering may cause irritation and damage of mucous membranes and respiratory system.
Delayed health effects from exposure	Harmful if swallowed. Repeated and/or prolonged contact may cause dermatitis. Suspected of causing cancer. Suspected of damaging the unborn child. Causes damage to organs through prolonged or repeated exposure.
Other information	
NTP Report on Carcinogens	Nickel: Reasonably anticipated to be a human carcinogen
IARC Monographs	Nickel: Group2B - Possibly carcinogenic to humans
OSHA Designated Carcinogen	All chemicals are not listed

SECTION 12: ECOLOGICAL INFORMATION

Ecotoxicity	Aquatic Acute 1: Very toxic to aquatic life. Aquatic Chronic 1: Very toxic to aquatic life with long lasting effects. Estimated Mixture LC50 < 1 mg/l (Fish)
Persistence and degradability	The methods for determining the biological degradability are not applicable to inorganic substances.
Bioaccumulative potential	No data for the mixture as a whole.
Mobility in soil	The product is predicted to have low mobility in soil.
Other adverse effects	None known.

SECTION 13: DISPOSAL CONSIDERATIONS

Waste treatment methods	Recover or recycle if possible. Dispose of this material and its container as hazardous waste.
Additional Information	Dispose of contents in accordance with local, state or national legislation. Containers of this material may be hazardous when empty since they retain product residue.

SECTION 14: TRANSPORT INFORMATION

UN number	ADR/RID	IMDG	IATA
UN proper shipping name	UN 3082	UN 3082	UN 3082
	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.

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Transport hazard class(es)	(Silver and Copper) 9	(Silver and Copper) 9	(Silver and Copper) 9
Packing group	III	III	III
Environmental hazards	Environmentally hazardous substance	Classified as a Marine Pollutant	Environmentally hazardous substance
Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code	Not applicable.		
Special precautions for user	See Section: 2		

SECTION 15: REGULATORY INFORMATION

Safety, health and environmental regulations/legislation specific for the substance or mixture

US Federal Regulations

TSCA (Toxic Substance Control Act)

Silver: Subject to 25,000 lb reporting threshold
Copper: Subject to 25,000 lb reporting threshold
Zinc: Subject to 25,000 lb reporting threshold
Nickel: Subject to 25,000 lb reporting threshold
All chemicals are not listed

EPCRA/SARA Section 302 Extremely Hazardous Substances

EPCRA Section 313 Toxics Release Inventory (TRI) Program

Silver: De Minimis limit: 1%
Copper: De Minimis limit: 1%
Zinc: De Minimis limit: 1%
Nickel: De Minimis limit: 0.1%

NIOSH Occupational Carcinogen List

OSHA List of highly hazardous chemicals, toxics and reactives

Nickel
All chemicals are not listed

NTP Report on Carcinogens (RoC) List

Poison Prevention Packaging Act

Nickel: Reasonably anticipated to be a human carcinogen
All chemicals are not listed

US State Regulations

California State, Proposition 65 List

California State, Safer Consumer Products Regulations

Nickel
Silver: Candidate Chemicals List
Copper: Candidate Chemicals List
Zinc: Candidate Chemicals List
Nickel: Initial Candidate Chemicals List

Maine State, Toxic Chemicals in Children's Products Act

New Jersey State Worker and Community RTK Act

Nickel: COC list
Silver: RTKHSL. SHHSL
Copper: RTKHSL
Zinc: RTKHSL. SHHSL
Nickel: RTKHSL. SHHSL

Pennsylvania State, Worker and Community RTK Act

Silver: Hazardous Substance List. Environmental Hazard List
Copper: Hazardous Substance List. Environmental Hazard List
Zinc: Hazardous Substance List. Environmental Hazard List
Nickel: Hazardous Substance List. Environmental Hazard List

Rhode Island State, Hazardous Substances RTK Act

Silver: Hazardous Substance List
Copper: Hazardous Substance List
Zinc: Hazardous Substance List
Nickel: Hazardous Substance List

Non-Regional

IARC Monographs, List of Classifications

Nickel: Group2B

SECTION 16: OTHER INFORMATION

The following sections contain revisions or new statements: Updated substance / mixture classification. New SDS Regulation compliant with HazCom 2012 format, all sections have been updated to include new information. Please review SDS with care.

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References:

Existing Safety Data Sheet (SDS), EU Data: Harmonised Classification(s) for Zinc (CAS No. 7440-66-6) and Nickel (7440-02-0). Existing ECHA registration(s) for Silver (CAS No. 7440-22-4), Copper (CAS No. 7440-50-8), Potassium difluorodihydroxyborate(1-) (CAS No. 85392-66-1), Zinc (CAS No. 7440-66-6) and Nickel (CAS No. 7440-02-0).

GHS Classification of the substance or mixture	Classification Procedure
Acute toxicity, Category 4	Acute Toxicity Estimate Mixture Calculation
Skin Sensitisation, Category 1	Threshold Calculation
Carcinogen, Category 2	Threshold Calculation
Reproductive toxicity, Category 2	Threshold Calculation
Specific target organ toxicity — repeated exposure, Category 1	Threshold Calculation
Hazardous to the aquatic environment, Acute, Category 1	Summation Calculation
Hazardous to the aquatic environment, Chronic, Category 1	Summation Calculation

LEGEND

ACGIH: American Conference of Governmental Industrial Hygienists
BEI: Biological Exposure Indices (ACGIH)
IARC: International Agency for Research on Cancer
Irr: Irritation
NIOSH: National Institute of Occupational Safety and Health
NTP: National Toxicology Program
OSHA: The Occupational Safety & Health Administration
PBT: Persistent, Bioaccumulative and Toxic
PEL: Permissible exposure limit

REL: Recommended exposure limit
SCL: Specific Concentration Limit
Skin²: Risk of overexposure via dermal contact
STEL: Short Term Exposure Limit
TLV: Threshold Limit value
TSCA: Toxic Substance Control Act
TWA: Time Weighted Average
URT: Upper respiratory tract
vPvB: very Persistent and very Bioaccumulative

Training advice: Consideration should be given to the work procedures involved and the potential extent of exposure as they may determine whether a higher level of protection is required.

Disclaimers

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