SAFETY DATA SHEET

Version: 06
Date of Issue: 06/09/2017
Date of First Issue: 11/29/2016

www.vishaypg.com

ACCORDING TO OSHA HCS (29 CFR 1910.1200)

SECTION 1: IDENTIFICATION

Product identifier used on the label M-Flux SS

Other means of identification None

Recommended use of the chemical and restrictions on use

Recommended use: PC38 Welding and soldering products (with flux coatings or flux cores.), flux products

Restrictions on use: Anything other than the above.

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 1-800-4249300 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: Flammable Liquid, Category 4
Metal Corrosive, Category 1

Health hazards: Acute toxicity, Category 4
Skin Corrosion/Irritation, Category 1A
Eye Damage, Category 1
Specific target organ toxicity — single exposure, Category 3
Specific target organ toxicity — single exposure, Category 2

Environmental hazards: Hazardous to the aquatic environment, Acute, Category 1
Hazardous to the aquatic environment, Chronic, Category 1

Hazard Symbol

Signal Word(s): DANGER

Hazard Statement(s):

Combustible liquid
May be corrosive to metals.
Harmful if swallowed.
Causes severe skin burns and eye damage.
May cause respiratory irritation.
May cause damage to organs.
Very toxic to aquatic life with long lasting effects.

Precautionary Statement(s):

Keep away from fire, sparks and heated surfaces - no smoking.
Keep only in original container.

Absorb spillage to prevent material damage.
Store in corrosive resistant container with a resistant inner liner.
Do not breathe vapour.
Wash hands and exposed skin thoroughly after handling.
Wear protective gloves/protective clothing/eye protection/face protection.
IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.
Rinse mouth.
IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
Wash contaminated clothing before reuse.
IF INHALED: Remove person to fresh air and keep comfortable for breathing.
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
Immediately call a POISON CENTER/doctor.
Store locked up. Store in a well-ventilated place. Keep cool.
Dispose of contents in accordance with local, state or national legislation.

Other hazards None known

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

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

Mixtures Substances in preparations / mixtures

Chemical identity of the substance	%W/W	CAS No.	EC No.	Hazard classification
Hydrochloric Acid	20 – 32	7647-01-0	231-595-7	Metal Corrosive, Category 1 Skin Corrosion/Irritation, Category 1A Specific target organ toxicity — single exposure, Category 3
Zinc Chloride	20 – 32	7646-85-7	231-592-0	Acute toxicity, Category 4 Skin Corrosion/Irritation, Category 1B Hazardous to the aquatic environment, Acute, Category 1 Hazardous to the aquatic environment, Chronic, Category 1
Methanol	1 – 5	67-56-1	200-659-6	Flammable Liquid, Category 2 Acute toxicity, Category 3 – Oral Acute toxicity, Category 3 – Inhalation Acute toxicity, Category 3 – Dermal Specific target organ toxicity — single exposure, Category 1
Ammonium Chloride	1 – 5	12125-02-9	235-186-4	Acute toxicity, Category 4 Eye Irritation, Category 2

In accordance with paragraph i of 29 CFR 1910.1200, the chemical identity and/or exact percentage concentration of remaining composition has been withheld as a trade secret

SECTION 4: FIRST AID MEASURES

Description of first aid measures

Self-protection of the first aider

Use personal protective equipment as required. Wear appropriate personal protective equipment, avoid direct contact. Ensure adequate ventilation. Do not breathe vapour. Do not ingest. If swallowed then seek immediate medical assistance. Avoid all contact. Contaminated clothing should be laundered before reuse.

Inhalation	IF INHALED: If breathing is difficult, remove to fresh air and keep at rest in a position comfortable for breathing. Call a POISON CENTER/doctor.
Skin Contact	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower. Continue irrigation until medical attention can be obtained. Immediately call a POISON CENTER/doctor.
Eye Contact	IF IN EYES: Flush eyes with water for at least 15 minutes while holding eyelids open. Immediately call a POISON CENTER/doctor. Continue irrigation until medical attention can be obtained. Treatment by an ophthalmologist due to possible caustic burn of the eyes may be required.
Ingestion	IF SWALLOWED: rinse mouth. Do NOT induce vomiting. Immediately call a POISON CENTER/doctor. Continue irrigation until medical attention can be obtained. Do NOT induce vomiting. Immediately call a POISON CENTER/doctor.
Most important symptoms and effects, both acute and delayed	Harmful if swallowed. Causes severe burns to skin, eyes, respiratory system and gastrointestinal tract. May cause respiratory irritation. May cause damage to organs. (Optic nerve, Central nervous system)
Indication of any immediate medical attention and special treatment needed	Treat symptomatically
Notes to a physician:	IF IN EYES: Obtain prompt consultation, preferably from an ophthalmologist. IF INHALED: Initiate inhalative cortisone therapy (e.g. Auxiloson, Thomae).

SECTION 5: FIRE-FIGHTING MEASURES

Extinguishing media

Suitable Extinguishing Media	As appropriate for surrounding fire. Extinguish with carbon dioxide, dry chemical, foam or waterspray.
Unsuitable extinguishing Media	Do not use water jet. Direct water jet may spread the fire.
Special hazards arising from the substance or mixture	Combustible liquid. May release toxic metal halide and corrosive hydrochloric acid fumes. May be corrosive to metals. Decomposes in a fire giving off toxic fumes: Carbon monoxide, Carbon dioxide, Nitrogen oxides, halogenated compounds. The vapour is heavier than air; beware of pits and confined spaces.
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	Ensure adequate ventilation. Stop leak if safe to do so. Use personal protective equipment as required. Wear appropriate personal protective equipment, avoid direct contact. Do not breathe vapour. Avoid all contact. Do not ingest. If swallowed then seek immediate medical assistance. Isolate the area and allow vapours to disperse.
Environmental precautions	Avoid release to the environment. Do not allow to enter drains, sewers or watercourses. 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	Absorb spillage to prevent material damage. Adsorb spillages onto sand, earth or any suitable adsorbent material. Transfer to a container for disposal. Dispose of this material and its container as hazardous waste.

SECTION 7: HANDLING AND STORAGE

Precautions for safe handling	Avoid all contact. Do not breathe vapour. Ensure adequate ventilation. Wear appropriate personal protective equipment, avoid direct contact. 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. Contaminated clothing should be laundered before reuse. The vapour is heavier than air; beware of pits and confined spaces. Isolate the area and allow vapours to disperse. In confined spaces, sewers, etc., the vapours may collect to form

explosive mixtures with air.

Conditions for safe storage, including any incompatibilities	Store in a well-ventilated place. Keep container tightly closed. Keep away from heat and direct sunlight.
Storage temperature	Ambient.
Storage life	Stable under normal conditions.
Incompatible materials	Forms flammable and explosive hydrogen through corrosion of metals. Alkaline materials and materials containing chlorine. Nitrates. Strong oxidising agents

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

Occupational Exposure Limits

SUBSTANCE	CAS No.	LTEL (8 hr TWA ppm)	LTEL (8 hr TWA mg/m³)	STEL (ppm)	STEL (mg/m³)	Note
Zinc chloride	7646-85-7	-	1	-	2	NIOSH, ACGIH
		-	1	-	-	OSHA
Hydrochloric Acid	7647-01-0	-	-	5	7	NIOSH, OSHA
		-	-	2	-	ACGIH, A4
Methanol	67-56-1	200	260	250	325	NIOSH
		200	260	-	-	OSHA
		200	-	250	-	ACGIH, Sk, BEI
Ammonium Chloride	12125-02-9	-	10	-	20	NIOSH, ACGIH

Note: OSHA PELs 1910.1000 TABLE Z-1/ NIOSH RELs / ACGIH TLVs
Sk - Can be absorbed through skin.
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.

Biological exposure indicies — Not established

SUBSTANCE	CAS No.	Determinant	Biological Exposure Indices	Sampling Time	Note
Methanol	67-56-1	Methanol in Urine	15 mg/l	End of shift	B, Ns

Source: 2015 ACGIH Biological Exposure Indicies (BEIs)

The other components listed in Section 3 do not have biological exposure indicies.

Appropriate engineering controls — Ensure adequate ventilation. or Use appropriate containment. Atmospheric levels should be controlled in compliance with the occupational exposure limit. A washing facility/water for eye and skin cleaning purposes should be present.

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. Wash hands before breaks and after work. Keep work clothes separately. Contaminated clothing should be laundered before reuse. Do not eat, drink or smoke at the work place.

Eye/face protection

Wear goggles giving complete protection to eyes to protect against liquid splashes (EN166). Do not wear contact lenses when working with this material.

Skin protection

Hand protection:
Wear impervious gloves (EN374). Gloves should be changed regularly to avoid permeation problems. Breakthrough time of the glove material: refer to the

information provided by the gloves' producer. Protective index 6, corresponding > 480 minutes of permeation time according to EN 374

Suitable materials:
Nitrile rubber (Minimum thickness: 0.11 mm; breakthrough time: > 480 min)
Polyvinyl chloride - PVC (Minimum thickness: 1.2 mm; breakthrough time: > 480 min)
Butyl rubber (Minimum thickness: 0.7 mm; breakthrough time: > 480 min)

Body protection:
Wear impervious protective clothing, including boots, lab coat, apron or coveralls, as appropriate, to prevent skin contact.

Respiratory protection

Normally no personal respiratory protection is necessary. In case of inadequate ventilation wear respiratory protection. A suitable mask with filter type A (EN141 or EN405) may be appropriate.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Appearance	Clear, Milky white Liquid
Odor	No odour.
Odor Threshold	Not available.
pH	Not established.
Melting Point/Freezing Point	Not established.
Initial boiling point and boiling range	108°C (Mixture)
Flash Point	Non-flammable.
Evaporation Rate	<1 (BuAc = 1)
Flammability (solid, gas)	Non-flammable
Upper/lower flammability or explosive limits	Not available.
Vapour pressure	Not established.
Vapour density	0.48 (Air = 1)
Relative density	1.35 g/cm^3 (H_2O = 1)
Solubility(ies)	100% (Water)
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	Reacts with metals.
Possibility of hazardous reactions	May release toxic metal halide and corrosive hydrochloric acid fumes. May be corrosive to metals.
Conditions to avoid	In contact with hot metals like iron, explosive hydrogen gas may evolve.
Incompatible materials	May be corrosive to metals.
Hazardous decomposition product(s)	Hydrogen chloride, Zinc oxide, Ammonia. Carbon oxides may be formed. Formaldehyde Combustion products: Alkaline materials and materials containing chlorine. Nitrates. Strong oxidising agents

SECTION 11: TOXICOLOGICAL INFORMATION

Information on toxicological effects (Substances in preparations / mixtures)

Acute toxicity - Ingestion	Acute Tox. 4; Harmful if swallowed. Acute Toxicity Estimate Mixture Calculation: LD50 >1200 mg/kg bw/day.

Zinc Chloride:	Acute Tox. 4; H302 Harmonised Classification LD50 (oral,rat) mg/kg: 1100 (OECD 401)
Hydrochloric Acid:	Not classified. Substance is either gas or corrosive aqueous solution. Testing for acute systemic toxicity of the corrosive substance by oral or dermal route is not appropriate.
Ammonium Chloride:	Acute Tox. 4; H302 Harmonised Classification LD50 (oral,rat) mg/kg: 1410 (Unamed, 1983)
Methanol:	Acute Tox. 3; H301 Harmonised Classification No data
Acute toxicity - Inhalation	Based upon the available data, the classification criteria are not met. Acute Toxicity Estimate Mixture Calculation: LC50 > 20.0 mg/l.
Zinc Chloride:	Not classified LC50 (Inhalation, (rat)) mg/m³ 2000 (Karlsson N et al, 1986)
Hydrochloric Acid:	Not classified LC50 (inhalation,rat) mg/l/4h: 45.6 (Unnamed, 1974)
Ammonium Chloride:	Not classified No data
Methanol:	Acute Tox. 3; H331 Harmonised Classification. No data
Acute toxicity - Skin Contact	Based upon the available data, the classification criteria are not met. Acute Toxicity Estimate Mixture Calculation: LD50 > 2000 mg/kg bw/day.
Zinc Chloride:	Not classified LD50 (skin,rat) mg/kg: >2000 (OECD 402)
Hydrochloric Acid:	Not classified Substance is either gas or corrosive aqueous solution. Testing for acute systemic toxicity of the corrosive substance by oral or dermal route is not appropriate.
Ammonium Chloride:	Not classified LD50 (skin,rat) mg/kg: >2000 (EU Method B.3)
Methanol:	Acute Tox. 3; H311 Harmonised Classification. No data
Skin corrosion/irritation	Skin Corr. 1A; Causes severe skin burns and eye damage.
Zinc Chloride:	Skin Corr. 1B; H314 Harmonised Classification. Corrosive (mouse) (Unnamed, 1991)
Hydrochloric Acid:	Skin Corr. 1A; H314 Harmonised Classification. Corrosive (In vitro) (OECD 431)
Ammonium Chloride:	Not classified. No data
Methanol:	Not classified. Not irritating to skin (rabbit) (Unnamed, 1975)
Serious eye damage/irritation	Eye Dam. 1; Causes serious eye damage.
Zinc Chloride:	Not classified. No data
Hydrochloric Acid:	Not classified. No data
Ammonium Chloride:	Eye Irrit. 2; H319 No data
Methanol:	Not classified. Not irritating to eyes (rabbit) (Unnamed, 1975)
Respiratory or skin sensitization	Based upon the available data, the classification criteria are not met.
Zinc Chloride:	Not classified Skin sensitization: Sensitisation (guinea pig) - Negative (OECD 406)

	Respiratory sensitization: No data.
Hydrochloric Acid:	Not classified
	Skin sensitization: Sensitisation (guinea pig) - Negative (OECD 406)
	Respiratory sensitization: No data.
Ammonium Chloride:	Not classified
	Skin sensitization: Sensitisation (guinea pig) - Negative (EPA 540/9-82-025)
	Respiratory sensitization: No data.
Methanol:	Not classified
	Skin sensitization: Sensitisation (guinea pig) - Negative (OECD 406)
	Respiratory sensitization: No data.
Germ cell mutagenicity	Based upon the available data, the classification criteria are not met.
Zinc Chloride:	Not classified
	In vitro: Negative (Bacteria) (OECD 471)
	In vivo: Negative (mouse) (Gocke E et al, 1981)
Hydrochloric Acid:	Not classified
	In vitro: Negative (Bacteria) (Unnamed, 1988)
	In vivo: No data
Ammonium Chloride:	Not classified
	In vitro: Negative (Bacteria) (OECD 471)
	In vivo: Negative (mouse) (OECD 478)
Methanol:	Not classified
	In vitro: Negative (Bacteria) (OECD 471)
	In vivo: Negative (mouse) (Hayashi M et al., 1988)
Carcinogenicity	Based upon the available data, the classification criteria are not met.
Zinc Chloride:	Not classified.
	Negative (mouse) (Walters M & Roe FJC, 1965)
Hydrochloric Acid:	Not classified.
	Hydrochloric acid did not evoke a carcinogenic response in treated rats. (Unnamed, 1985)
Ammonium Chloride:	Not classified.
	No data
Methanol:	Not classified.
	Negative NOAEL $\geq$ 1.3 mg/L air (mouse) > 3000 mg/kg (OECD 453)
Reproductive toxicity	Based upon the available data, the classification criteria are not met.
Zinc Chloride:	Not classified.
	Reproductive toxicity: Although effects were seen at 7.5 mg/kg/d, these were considered to be toxicologically non significant. (OECD 416)
	Developmental toxicity: NOAEL 88 mg/kg bw/day. No clearly discernible effects on maternal survival, body weight gains, number of corpora lutea, implantations and resorptions were observed. (Unnamed, 1973)
Hydrochloric Acid:	Not classified.

	Weight of evidence approach. The available data give no indication that HCl is toxic for reproduction. In contact with water it dissociates completely to give eventually hydronium and chloride ions which being physiologically abundantly present in organisms, are unlikely to lead to a hazard towards reproduction or development. (ECHA Registration Endpoint summary)
Ammonium Chloride:	Not classified. NOAEL 1500 mg/kg bw/day for Reproductive / Developmental Toxicity (OECD 422)
Methanol:	Not classified. Reproductive toxicity: Negative NOAEL < 1000 mg/kg (mouse) (Ward, J. B. et al, 1984) Developmental toxicity: Negative NOAEL 945 mg/kg bw/day (rat) (OECD 414)
STOT - single exposure	STOT SE 3; May cause respiratory irritation.
Zinc Chloride:	Not classified Weight of evidence approach. Based upon the available data, the classification criteria are not met.
Hydrochloric Acid:	STOT SE 3; H335 Exposure by inhalation to aerosol from aqueous solutions will be limited. Effects are localaised in nature and depend on the aqueous concentration of HCl in the aerosol. Being a corrosive substance classification the current harmonised classification to STOT SE 3, H335 (May cause respiratory irritation), is appropriate. (ECHA Registration Endpoint summary)
Ammonium Chloride:	Not classified Weight of evidence approach. Based upon the available data, the classification criteria are not met.
Methanol:	STOT SE. 1; H370 Harmonised Classification. STOT SE 2; H371: 3 % ≤ C < 10 % Harmonised Classification
STOT - repeated exposure	Based upon the available data, the classification criteria are not met.
Zinc Chloride:	Not classified. Oral: NOEL 3000 ppm. No effects observed (rat) (OECD 408) Inhalation: No data Dermal: No data
Hydrochloric Acid:	Not classified. Oral: No data Inhalation: NOAEL 20ppm (rat). Based on the lack of effects on body weight and the lack of pathological findings except for effects of site-of-contact local irritation. (OECD 413) Dermal: No data
Ammonium Chloride:	Not classified. Oral: NOAEL 206 mg/kg bw/day (Crookshank, H.R., 1973) Inhalation: No data Dermal: No data
Methanol:	Not classified. Oral: LOAEL > 2300 mg/kg bw/day (Rhesus Monkey) (Rao, K.R. et al., 1977) Inhalation: NOAEC 2.65 mg/L Air (Cameron, A.M. et al., 1984) Dermal: No data.

Aspiration hazard	Not applicable
Information on likely routes of exposure	
Inhalation	Possible – accidental exposure
Ingestion	Unlikely – accidental exposure
Skin Contact	Possible – accidental exposure
Eye Contact	Unlikely – accidental exposure
Early onset symptoms related to exposure	Harmful if swallowed. Causes severe burns to skin, eyes, respiratory system and gastrointestinal tract. May cause respiratory irritation. May cause damage to organs. (Optic nerve, Central nervous system)
Delayed health effects from exposure	Harmful if swallowed. May cause damage to organs. (Optic nerve, Central nervous system)
Other information	
NTP Report on Carcinogens	All chemicals are not listed
IARC Monographs	Hydrochloric Acid: Group 3
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 LC50 (Fish) $\leq$ 1 mg/l (96 hour)
Zinc Chloride:	Aquatic Acute 1; H400 Acute toxicity: LC50 (fish) mg/l 0.315 (Buhl K. and Hamilton S., 1990) Aquatic Chronic 1; H410 Chronic Toxicity: NOEC (Fish) mg/l 0.199 (OECD 215)
Hydrochloric Acid:	Not classified Acute toxicity: LC50 (fish) mg/l 3.5 – 3.6 (Unnamed, 1959) Aquatic Chronic 1; H410 Chronic Toxicity: For hydrochloric acid, it is not relevant to determine chronic toxicity in terms of mg/L due to the varying buffering capacity of different test systems and different aquatic ecosystems.
Ammonium Chloride:	Not classified Acute toxicity: LC50 (fish) mg/l 209 (E03-05:APHA, AWWA & WPCF) Aquatic Chronic 1; H410 Chronic Toxicity: NOEC (Fish) mg/l 11.8 (Mayes M.A. et al, 1986)
Methanol:	Not classified Acute toxicity: LC50 (fish) mg/l 15400 (EPA-660/3-75-009, 1975) Chronic Toxicity: EC50 (Fish) mg/l 14536 (Gonzáles-Doncel, M. et al., 2008)
Persistence and degradability	No data for the mixture as a whole.
Zinc Chloride:	Not applicable for inorganic substances
Hydrochloric Acid:	Not applicable for inorganic substances
Ammonium Chloride:	Not applicable for inorganic substances
Methanol:	Degradation of methanol was higher under aerobic than anaerobic conditions..
Bioaccumulative potential	No data for the mixture as a whole.
Zinc Chloride:	Bioconcentration is not a relevant parameter for this substance.
Hydrochloric Acid:	Bioconcentration is not a relevant parameter for this substance.
Ammonium Chloride:	Bioconcentration is not a relevant parameter for this substance.
Methanol:	The substance has low potential for bioaccumulation. Bioconcentration factor (BCF) : 1
Mobility in soil	The product is predicted to have high mobility in soil. Soluble in water.
Zinc Chloride:	The substance is predicted to have high mobility in soil. Soluble in water.
Hydrochloric Acid:	The substance is predicted to have high mobility in soil. Soluble in water.
Ammonium Chloride:	The substance is predicted to have high mobility in soil. Soluble in water.
Methanol:	The substance has high mobility in soil. Miscible with water.
Other adverse effects	None known.

SECTION 13: DISPOSAL CONSIDERATIONS

Waste treatment methods — Dispose of this material and its container as hazardous waste. Do not empty into drains, dispose of this material and its container at hazardous or special waste collection point. Disposal should be in accordance with local, state or national legislation.

SECTION 14: TRANSPORT INFORMATION

	ADR/RID	IMDG	IATA/ICAO
UN number	UN 1760	UN 1760	UN 1760
UN proper shipping name	CORROSIVE LIQUID, N.O.S (Zinc Chloride, Hydrochloric Acid)	CORROSIVE LIQUID, N.O.S (Zinc Chloride, Hydrochloric Acid)	CORROSIVE LIQUID, N.O.S (Zinc Chloride, Hydrochloric Acid)
Transport hazard class(es)	8	8	8
Packing group	II	II	II
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	EmS; F-A, SB		

SECTION 15: REGULATORY INFORMATION

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

US Federal Regulations

TSCA (Toxic Substance Control Act)	**Subject to 25,000 lb reporting threshold:** Hydrochloric Acid Zinc Chloride Methanol Ammonium Chloride
EPCRA/SARA Section 302 Extremely Hazardous Substances	Hydrochloric Acid: RQ = 5,000 lbs; TPQ = 500 lbs
EPCRA Section 313 Toxics Release Inventory (TRI) Program	**De Minimis limit: 1%:** Hydrochloric Acid Zinc Chloride Methanol
NIOSH Occupational Carcinogen List	All chemicals are not listed
OSHA List of highly hazardous chemicals, toxics and reactives	Hydrochloric Acid: TQ = 5000 lbs
NTP Report on Carcinogens (RoC) List	All chemicals are not listed
Poison Prevention Packaging Act	**Substance requiring special packaging:** Methanol

US State Regulations

California State, Proposition 65 List	Methanol: Safe harbor level - MADL: 47000 (inhalation) µg/day, 23000 (oral) µg/day
California State, Safer Consumer Products Regulations	**Candidate Chemicals List** Hydrochloric Acid Methanol
Maine State, Toxic Chemicals in Children's Products Act	**COC list** Methanol
New Jersey State Worker and Community RTK Act	**RTKHSL.** Hydrochloric Acid Zinc Chloride Methanol Ammonium Chloride **SHHSL** Hydrochloric Acid

	Zinc Chloride
	Methanol
Pennsylvania State, Worker and Community RTK Act	**Hazardous Substance List.**
	Hydrochloric Acid
	Zinc Chloride
	Methanol
	Ammonium Chloride
	Environmental Hazard List
	Hydrochloric Acid
	Zinc Chloride
	Methanol
	Ammonium Chloride
Rhode Island State, Hazardous Substances RTK Act	**Hazardous Substance List**
	Hydrochloric Acid
	Zinc Chloride
	Methanol
	Ammonium Chloride
Non-Regional	
IARC Monographs, List of Classifications	Hydrochloric Acid: Group 3

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.

Version	V 5.0
Revision Date	06/09/2017
Date of First Issue	11/29/2016

References: Existing Safety Data Sheet (SDS) Existing ECHA registration(s) for and Harmonised Classification(s) for Zinc Chloride (CAS No. 7646-85-7), Ammonium Chloride (CAS No. 12125-02-9), Hydrochloric Acid (CAS No. 7647-01-0), Methanol (CAS No. 67-56-1)

Literature References:

1. Karlsson N, Cassel G, Fangmark I & Bergman F, 1986, A comparative study of the acute inhalation toxicity of smoke from TiO2-hexachloroethane and Zn-hexachloroethane pyrotechnic mixtures, Arch. Toxicol. 59(3): 160-166.
2. Gocke E, King M-T, Eckhardt K & Wild D, 1981, Mutagenicity of Cosmetics Ingredients Licensed by the European Communities, Mutat. Res. 90: 91-109
3. Hayashi M et al., 1988, Micronucleus test in mice on 39 food additives and eight miscellaneous chemicals., Fd. Chem. Toxic., 26, 487-500, (1988)
4. Walters M & Roe FJC, 1965, A Study of the Effects of Zinc and Tin Administered Orally to Mice Over a Prolonged Period, Fd. Cosmet. Toxicol. 3: 271-276
5. Ward, J. B. et al, 1984, Sperm count, morphology, and fluorescent body frequency in autopsy service workers exposed to formaldehyde., Mutat Res 130: 417-424
6. Crookshank, H.R., 1973, Ammonium Chloride and Ammonium Sulfate in Cattle Feedlot Finishing Rations, J. of Animal Sci., 36(6), 1007-1009 (1973)
7. Rao, K.R. et al., 1977, Biochemical changes in brain in methanol poisoning--an experimental study., Indian J Med Res 65(2): 285-292.
8. Cameron, A.M. et al., 1984, Circulating concentrations of testosterone, luteinizing hormone and follicle stimulating hormone in male rats after inhalation of methanol., Arch Toxicol Suppl 7: 441-443
9. Buhl K. and Hamilton S., 1990, Comparative toxicity of inorganic contaminants released by placer mining to early life stage salmonids, Ecotoxicology and environmental safety 20, 325-342
10. Mayes M.A. et al, 1986, Acute and chronic toxicity of ammonia to freshwater fish: A site-specific study., Env.Tox. Chem. 5, 437-442 (1986)
11. Gonzáles-Doncel, M. et al., 2008, An artificial fertilization method with the Japanese medaka: Implications in early life stage bioassays and solvent toxicity, Ecotoxicology and Environmental Safety 69: 95-103

GHS Classification of the substance or mixture	Classification Procedure
Flammable Liquid, Category 4	Flash Point Range
Metal Corrosive, Category 1	Self classification: / Expert judgement
Acute toxicity, Category 4	Acute Toxicity Estimate Mixture Calculation

Skin Corrosion/Irritation, Category 1A	Threshold Calculation
Eye Damage, Category 1	Threshold Calculation
Specific target organ toxicity — single exposure, Category 3	Threshold Calculation
Specific target organ toxicity — single exposure, Category 2	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
IARC: International Agency for Research on Cancer
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
STEL: Short Term Exposure Limit
TLV: Threshold Limit value
TWA: Time Weighted Average
TSCA: Toxic Substance Control Act
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

Information contained in this publication or as otherwise supplied to Users is believed to be accurate and is given in good faith, but it is for the Users to satisfy themselves of the suitability of the product for their own particular purpose. Vishay Precision Group gives no warranty as to the fitness of the product for any particular purpose and any implied warranty or condition (statutory or otherwise) is excluded except to the extent that exclusion is prevented by law. Vishay Precision Group accepts no liability for loss or damage (other than that arising from death or personal injury caused by defective product, if proved), resulting from reliance on this information. Freedom under Patents, Copyright and Designs cannot be assumed.