SAFETY DATA SHEET

Version: 1.0
Date of Issue: 26 April 2018
Date of First Issue: 26 April 2018

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In accordance with Schedule 1 of Hazardous Products Regulations (HPR) (WHMIS 2015)

SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

Product identifier

Product Name	M-Flux AR-2
Other Means of Identification	None

Recommended use and restrictions

Recommended use	Soldering Flux. Welding and soldering products
Restrictions on use	Anything other than the above.

Initial Supplier Identifier

Company Identification	VISHAY MEASUREMENTS GROUP, INC.
Telephone	Post Office Box 27777 Raleigh, NC 27611 USA
E-Mail (competent person)	mm.us@vishaypg.com

Emergency telephone number

Emergency Phone No.	1-800-424-9300	CHEMTREC (24 hours)
Languages spoken	English	

SECTION 2: HAZARDS IDENTIFICATION

Classification of the substance or mixture

In accordance with Schedule 1 of Hazardous Products Regulations (HPR) (WHMIS 2015)

Flammable Liquid - Category 2
Eye Irritation - Category 2
Specific target organ toxicity — single exposure, Category 3

Label elements

Hazard Pictogram(s)

Signal Word(s): DANGER

Hazard Statement(s):
Highly flammable liquid and vapour.
Causes serious eye irritation.
May cause drowsiness or dizziness.

Precautionary Statement(s):
Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
Ground and bond container and receiving equipment.
Use explosion proof electrical equipment.
Wear protective gloves/protective clothing/eye protection/face protection.
Avoid breathing mist/vapours/spray.
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
If eye irritation persists, get medical advice/attention.
IF INHALED: Remove person to fresh air and keep comfortable for breathing.
Store in a well-ventilated place. Keep cool.

Other hazards

Can form explosive mixture with air.

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

Substances Not applicable

Mixtures

GHS Classification

Chemical Name	CAS No.	Concentration (%W/W)	Common name(s), synonym(s) of the substance	Hazard classification
Isopropanol	67-63-0	60 - 80	Propan-2-ol; IPA; Isopropyl alcohol	Flammable Liquid - Category 2 Eye Irritation - Category 2 Specific target organ toxicity — single exposure - Category 3 (Narcosis)
Benzyl alcohol	100-51-6	3 - 7	Benzenemethanol	Acute toxicity (Oral) - Category 3 Acute toxicity (Inhalation) - Category 3 Eye Irritation - Category 2

Prescribed Concentration Ranges used for trade secret purposes (Canada Gazette, Part II, Vol. 152, No. 8)

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. Avoid breathing vapours. Avoid contact with skin, eyes or clothing.
Inhalation	IF INHALED: If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing. Apply artificial respiration if breathing has ceased or shows signs of failing. Get medical advice/attention if you feel unwell.
Skin Contact	IF ON SKIN (or hair): After contact with skin, take off immediately all contaminated clothing, and wash immediately with plenty of soap and water. If irritation (redness, rash, blistering) develops, get medical attention.
Eye Contact	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If irritation develops and persists, get medical attention.
Ingestion	IF SWALLOWED: Do NOT induce vomiting. If vomiting occurs turn patient on side. Do not give milk or alcoholic beverages. Rinse mouth with water but do not swallow. Never give anything by mouth to an unconscious person. Get medical advice/attention if you feel unwell.
Most important symptoms and effects, both acute and delayed	Causes serious eye irritation. May cause drowsiness or dizziness.
Indication of any immediate medical attention and special treatment needed	Treat symptomatically.

SECTION 5: FIRE-FIGHTING MEASURES

Extinguishing media

Suitable Extinguishing Media	As appropriate for surrounding fire. Extinguish preferably with foam, carbon dioxide or dry chemical.
Unsuitable extinguishing Media	Do not use water jet. Direct water jet may spread the fire.
Special hazards arising from the substance or mixture	Highly flammable liquid and vapour. May decompose in a fire giving off toxic fumes. Combustion products: Carbon monoxide, Carbon dioxide Vapours are heavier than air and may travel considerable distances to a source of ignition and flashback. In confined spaces, sewers, etc., the vapours may collect to form explosive mixtures with air.

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	Use personal protective equipment as required. Wear appropriate personal protective equipment, avoid direct contact. See Section: 8 Contaminated clothing should be laundered before reuse. Ensure adequate ventilation. Avoid breathing vapours. Avoid contact with skin, eyes or clothing. Remove all ignition sources. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Isolate the area and allow vapours to disperse. In confined spaces, sewers, etc., the vapours may collect to form explosive mixtures with air.
Environmental precautions	Avoid release to the environment. Do not allow to enter drains, sewers or watercourses.
Methods and material for containment and cleaning up	**Small spillages:** Allow small spillages to evaporate provided there is adequate ventilation. Contain spillages with sand, earth or any suitable adsorbent material. Transfer to a container for disposal or recovery. **Large spillages:** Evacuate the area and keep personnel upwind. Notify police and fire brigade as soon as possible.
Reference to other sections	See Section: 8, 13

SECTION 7: HANDLING AND STORAGE

Precautions for safe handling	Ground/bond container and receiving equipment. Ensure operatives are trained to minimise exposures. Ensure adequate ventilation. Avoid breathing vapours. Wear appropriate personal protective equipment, avoid direct contact. Keep away from: Elevated temperature. Keep good industrial hygiene. Wash hands thoroughly after handling. Contaminated clothing should be thoroughly cleaned. Do not eat, drink or smoke at the work place. Keep from direct sunlight. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
Conditions for safe storage, including any incompatibilities	Keep only in original container. Store in a cool/low-temperature, well-ventilated (dry) place away from heat and ignition sources. Ground/bond container and receiving equipment.
Storage temperature	Store at ambient temperature.
Incompatible materials	Strong oxidising agents, Strong acids and alkali., Iron, Aluminium, Air, Halogens, Peroxides.
Specific end use(s)	See Section: 1.2

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

Occupational Exposure Limits

SUBSTANCE	CAS No.	ACGIH® TLV® (ppm)		OSHA PEL (ppm)		Note
		TWA	STEL	TWA	STEL	
Isopropanol	67-63-0	200	400	400	980 **mg/m³**	A4

Source: ACGIH: American Conference of Governmental Industrial Hygiene. TLV: Threshold Limit Value (ACGIH) PEL (OSHA)
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.

Alberta: Occupational Health And Safety Code, 2009; Quebec: Health and Safety Work Act, 2016

SUBSTANCE	CAS No.	8-hour Occupational Exposure Limits	15-minute or ceiling (c)	Note

					Occupational Exposure Limits		
		ppm	mg/m³	f/cc	STEL (ppm)	STEL (mg/m³)	
Isopropanol	67-63-0	200	492	-	400	984	Alberta
		400	983	-	500	1230	OEL

Source: Alberta: Occupational Health And Safety Code, 2009
OEL: Quebec Work Health and Safety Regulations, Health and Safety Work Act, (Chapter S – 2.1, a. 223)

British Columbia: Occupational Health and Safety Guidelines, 2015; Northwest Territories: Occupational Health and Safety Regulations, 2012

SUBSTANCE	CAS No.	LTEL (8 hr TWA ppm)	LTEL (8 hr TWA mg/m³)	STEL (ppm)	STEL (mg/m³)	Note
Isopropanol	67-63-0	200	-	400	-	WEL
		200	-	400	-	NW

Source: WEL: Occupational Health and Safety Guidelines Part 5: Chemical Agents and Biological Agents (British Columbia)
NW: WSCC, Occupational Health and Safety Regulations, Northwest Territories Volume 3

Ontario: Occupational Health and Safety Act, 1990; Saskatchewan: Occupational Health and Safety Regulations, 1996.

SUBSTANCE	CAS No.	Time Weighted Average (TWA)	STEL (ppm)	Note
Isopropanol	67-63-0	200	400	WEL
		200	400	SK

Source: WEL: Occupational Health and Safety Act, R.R.O. 1990, Regulation 833, CONTROL OF EXPOSURE TO BIOLOGICAL OR CHEMICAL AGENTS (Ontario)
Saskatchewan (SK): Occupational Health and Safety Act, 1993. O-1.1 REG 1 Occupational Health and Safety Regulations, 1996.

Biological limit value

SUBSTANCE	CAS No.	Biological exposure determinant factors	Biological Exposure Indices	Sampling Time	Note
Isopropanol	67-63-0	Acetone: Urine	40 mg/L	End of Shift: end of workweek	Ns, 1

Source: 2015 ACGIH Biological Exposure Indicies (BEIs)
Ns: Nonspecific
1: Background level

Exposure controls

Appropriate engineering controls

Ensure adequate ventilation. Store in a cool/low-temperature, well-ventilated (dry) place away from heat and ignition sources. Atmospheric levels should be controlled in compliance with the occupational exposure limit. In confined spaces, sewers, etc., the vapours may collect to form explosive mixtures with air.

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

Keep good industrial hygiene. Wear appropriate personal protective equipment, avoid direct contact. Avoid breathing vapours. Avoid contact with skin, eyes or clothing. IF exposed: Wash immediately with water. Wash contaminated clothing before reuse. Do not eat, drink or smoke at the work place.

Eye/face protection

Wear protective eye glasses for protection against liquid splashes. Eye protection with side protection.
Refilling: Full face shield, Goggles giving complete protection to eyes

Skin protection

Hand protection:
Wear impervious gloves. Gloves should be changed regularly to avoid permeation problems. Breakthrough time of the glove material: refer to the information provided by the gloves' producer.
Suitable materials: Nitrile rubber (Minimum thickness: 0.33 mm)

Body protection:

	Wear impervious protective clothing, including boots, lab coat, apron or coveralls, as appropriate, to prevent skin contact.
Respiratory protection 	In case of inadequate ventilation wear respiratory protection. Open system(s): Wear suitable respiratory protective equipment. A suitable mask with filter type A may be appropriate.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Appearance	Amber Liquid
Odour	Alcohol-like.
Odour threshold	Not established.
pH	Not established.
Melting point/freezing point	Not established.
Initial boiling point and boiling range	82 ℃
Flash point	18 ℃
Evaporation rate (Water = 1)	Not established.
Flammability (solid, gas)	Not applicable
Upper/lower flammability or explosive limits	UEL: 12.0 Vol% LEL: 2.0 Vol%
Vapour pressure	43 hPa
Vapour density	Not established.
Relative density	0.88 g/cm³
Solubility(ies)	Partly soluble in water.
Partition coefficient: n-octanol/water	Not established.
Auto-ignition temperature	425 ℃
Decomposition Temperature	Not established.
Viscosity	Not established.
Explosive properties	Not explosive. Can form explosive mixture with air.
Oxidising properties	Not established.
Other information	None known.

SECTION 10: STABILITY AND REACTIVITY

Reactivity	Stable under normal conditions.
Chemical stability	Stable under normal conditions. Hazardous polymerisation will not occur.
Possibility of hazardous reactions	No data for the mixture as a whole.
Conditions to avoid	Heat and ignition sources.
Incompatible materials	Strong oxidising agents, Strong acids and alkali., Iron, Aluminium, Air, Halogens, Peroxides.
Hazardous decomposition product(s)	Air: Benzaldehyde (Benzyl alcohol) Combustion products: Carbon monoxide, Carbon dioxide

SECTION 11: TOXICOLOGICAL INFORMATION

Information on toxicological effects

Acute toxicity - Ingestion	Based upon the available data, the classification criteria are not met. Acute Toxicity Estimate Mixture Calculation: Estimated LC50 > 2000 mg/kg bw/day.
Benzyl alcohol:	Acute toxicity (Oral) - Category 3 LD50 (oral,rat) mg/kg: 1620 (Unnamed, 1978)
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.
Benzyl alcohol:	Acute toxicity (Inhalation) - Category 3 LC50 (rat) (4h) > 4178 mg/m³ (OECD 403)
Acute toxicity - Skin Contact	Based upon the available data, the classification criteria are not met.

	Acute Toxicity Estimate Mixture Calculation: Estimated LC50 > 2000 mg/kg bw/day.
Skin corrosion/irritation	Based upon the available data, the classification criteria are not met.
Serious eye damage/irritation	Eye Irritation - Category 2: Causes serious eye irritation.
Isopropanol:	Eye Irritation - Category 2 Irritating to eyes. (rabbit) (OECD 405)
Benzyl alcohol:	Eye Irritation - Category 2 Irritating to eyes. (rabbit) (OECD 405)
Respiratory or skin sensitization	Based upon the available data, the classification criteria are not met.
Germ cell mutagenicity	Based upon the available data, the classification criteria are not met.
Carcinogenicity	Based upon the available data, the classification criteria are not met.
Reproductive toxicity	Based upon the available data, the classification criteria are not met.
STOT - single exposure	Specific target organ toxicity — single exposure, Category 3: May cause drowsiness or dizziness.
Isopropanol:	Specific target organ toxicity — single exposure, Category 3 LD50 (rat) > 10000 ppm. Effects and Symptoms: Ataxia (impaired locomotor coordination), Narcosis. (OECD 403)
STOT - repeated exposure	Based upon the available data, the classification criteria are not met.
Aspiration hazard	Based upon the available data, the classification criteria are not met.
Other information	None known.

SECTION 12: ECOLOGICAL INFORMATION

Toxicity	Based upon the available data, the classification criteria are not met. Estimated Mixture LC50 > 100 mg/l. (Fish)
Persistence and degradability	Not expected to be readily biodegradable. Some of the components are poorly biodegradable.
Bioaccumulative potential	The product has no potential for bioaccumulation.
Mobility in soil	The product has moderate mobility in soil. Partly soluble in water.
Other adverse effects	None known.

SECTION 13: DISPOSAL CONSIDERATIONS

Waste treatment methods	Dispose of this material and its container as hazardous waste. Send after pre-treatment to a appropriate hazardous waste incinerator facility according to legislation.

SECTION 14: TRANSPORT INFORMATION

		ADR/RID	**IMDG**	**IATA/ICAO**
14.1	**UN number**	UN 1219	UN 1219	UN 1219
14.2	**UN proper shipping name**	ISOPROPANOL (ISOPROPYL ALCOHOL) mixture	ISOPROPANOL (ISOPROPYL ALCOHOL) mixture	ISOPROPANOL (ISOPROPYL ALCOHOL) mixture
14.3	**Transport hazard class(es)**	3	3	3
14.4	**Packing group**	II	II	II
14.5	**Environmental hazards**	Not classified	Not classified / Not classified as a Marine Pollutant.	Not classified
14.6	**Special precautions for user**	See Section: 2		
14.7	**Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code**	Not applicable		

SECTION 15: REGULATORY INFORMATION

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

National regulations	
CEPA, Domestic Substances List	Isopropanol: Yes Benzyl alcohol: Yes
CEPA, Priority Substances List	All chemicals are not listed
CEPA, List of Toxic Substances (Schedule 1)	Isopropanol: VOC - Item 65
CEPA, National Pollutant Release Inventory	Isopropanol: Threshold Category: 1A, Mass Threshold: 10 tonnes MPO, Concentration threshold: 1%; Threshold Category: 5, Mass Threshold: 1 tonnes of 10 tonnes Total VOC air release, Concentration threshold: N/A
CEPA, Environmental Emergency Regulations	All chemicals are not listed
Non-Regional	
IARC Monographs**,** List of Classifications	Isopropanol: Group 3

SECTION 16: OTHER INFORMATION

The following sections contain revisions or new statements: Not applicable – V1.0

Date of First Issue: **26 April 2018**
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References:
Existing Safety Data Sheet (SDS).
EU: Harmonised Classification(s) for Isopropanol (CAS No. 67-63-0), Benzyl alcohol (CAS No. 100-51-6). Existing ECHA registration(s) for Isopropanol (CAS No. 67-63-0).

LEGEND

LTEL: Long Term Exposure Limit
DNEL: Derived No Effect Level
PBT: PBT: Persistent, Bioaccumulative and Toxic
IARC: International Agency for Research on Cancer
OSHA = Occupational Safety and Health Administration

ACGIH: American conference of Governmental Industrial Hygiene
TLV: Threshold Limit Value (ACGIH)
VOC: Volatile Organic Compound
CEPA (Canadian Environmental Protection Act)

STEL: Short Term Exposure Limit
PNEC: Predicted No Effect Concentration
vPvB: very Persistent and very Bioaccumulative
NTP: National Toxicology Program
NIOSHTIC: National Institute for Occupational Safety and Health Technical Information Center
BEI: Biological Exposure Indices (ACGIH)
TWA: Time Weighted Average
EU: European Union

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