Safety Data Sheet

M-Flux AR-2

ACCORDING TO OSHA HCS (29 CFR 1910.1200)

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Version 2.0

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
Relevant identified uses of the substance or mixture and uses advised against	
Identified Use(s)	Soldering Flux. Welding and soldering products
Uses advised against	Anything other than the above.
Details of the supplier of the safety data sheet	VISHAY MEASUREMENTS GROUP, INC. Post Office Box 27777 Raleigh, NC 27611 USA
Supplier	919-365-3800
Telephone	919-365-3945
E-mail (competent person)	mm.us@vpgsensors.com
Emergency telephone number	
Emergency Phone No.	+1 800-262-8200 (for spills and releases) CHEMTREC (24 hours)
Languages spoken	English

SECTION 2: HAZARDS IDENTIFICATION

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

Physical hazards	Flammable liquid, Category 2
health hazards	Serious eye damage/irritation, Category 2 Specific target organ toxicity - Single exposure, Category 3 (Narcotic effects)
Environmental hazards	Not classified as hazardous for supply/use.

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. Keep container tightly closed. Keep cool. Ground and bond container and receiving equipment. Use explosion proof electrical equipment. Use non-sparking tools. Take precautionary measures against static discharge. Avoid breathing mist/vapours/spray. Wash hands and exposed skin thoroughly after handling. Wear protective gloves and eye/face protection. IF ON SKIN or hair: Take off immediately all contaminated clothing. Rinse skin with water.

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.
Call a POISON CENTER/doctor if you feel unwell.
If eye irritation persists: Get medical advice/attention.
In case of fire: Use dry powder to extinguish.
Store in a well-ventilated place. Keep container tightly closed.
Store in a well-ventilated place. Keep cool.
Store locked up.
Dispose of contents in accordance with local, state or national legislation.

Other hazards Vapours can form explosive mixtures with air.

Percent of the mixture consists of ingredient(s) of unknown acute toxicity: 0% of the mixture consists of ingredients of unknown acute inhalated toxicity.
0% of the mixture consists of ingredients of unknown acute oral toxicity.
0% of the mixture consists of ingredients of unknown acute dermal toxicity.

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

Substances
Not applicable

Mixtures Substances in preparations / mixtures.
Classification: OSHA HCS (29 CFR 1910.1200)

Chemical identity of the substance	%W/W	CAS No.	EC No.	Hazard classification
Propan-2-ol	70 - 90	67-63-0	200-661-7	Flammable liquid, Category 2 Serious eye damage/irritation, Category 2 Specific target organ toxicity - Single exposure, Category 3 (Narcotic effects)
Benzyl alcohol	1 - 1 0	100-51-6	202-859-9	Acute toxicity (oral), Category 4 Serious eye damage/irritation, Category 2 Acute Toxicity (inhalation), Category 4

SECTION 4: FIRST AID MEASURES

Description of first aid measures

Self-protection of the first aider: Avoid breathing mist/vapours/spray. Ensure adequate ventilation Wear suitable protective clothing. Wear suitable respiratory protective equipment if exposure to high levels of material are likely. Avoid contact with skin. Contaminated clothing should be laundered before reuse. Do not use mouth-to-mouth resuscitation. Eyewash facilities should be stationed close to workplace where possible.

Inhalation: IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/doctor if you feel unwell.

Skin contact: IF ON SKIN: Gently wash with plenty of soap and water. Remove contaminated clothing and wash clothing before reuse. 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 eye irritation persists: Get medical advice/attention.

Ingestion: IF SWALLOWED: Rinse mouth. Do not give anything by mouth to an unconscious person. Do NOT induce vomiting. If symptoms occur obtain medical attention.

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: FIREFIGHTING 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. Vapours can form explosive mixtures with air. Containers may explode when involved in a fire. Keep container(s) exposed to fire cool, by spraying with water. Thermal decomposition will evolve toxic and corrosive vapours: Carbon dioxide, Carbon monoxide lammable liquid and vapour. Vapours are heavier than air and may travel considerable distances to a source of ignition and flashback. Sealed containers may rupture explosively if hot.
Advice for firefighters	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. In case of leakage, eliminate all ignition sources. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Avoid breathing mist/vapours/spray. Avoid contact with skin, eyes or clothing. Use personal protective equipment as required. See Section: 8. The vapour is heavier than air; beware of pits and confined spaces.
Methods and material for containment and cleaning up	Ensure suitable personal protection during removal of spillages. Use non-sparking equipment when picking up flammable spill. Adsorb spillages onto sand, earth or any suitable adsorbent material. Do NOT absorb in saw-dust or other combustible absorbents. Transfer to a lidded container for disposal or recovery. Ventilate the area and wash spill site after material pick-up is complete. Dispose of this material and its container as hazardous waste. Allow small spillages to evaporate provided there is adequate ventilation.

SECTION 7: HANDLING AND STORAGE

Precautions for safe handling	Ensure adequate ventilation Avoid breathing mist/vapours/spray. Avoid contact with skin, eyes or clothing. Use personal protective equipment as required. See Section: 8. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Take action to prevent static discharges. Do not use sparking tools. Do not spray on an open flame or other ignition source. Do not eat, drink or smoke when using this product. Wash hands before breaks and after work. Ground and bond container and receiving equipment.
Conditions for safe storage, including any incompatibilities	Store in a cool/low-temperature, well-ventilated (dry) place away from heat and ignition sources. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Keep away from direct sunlight. Do not reuse empty containers.
storage temperature	Store in a cool/low temperature. Keep at a temperature not exceeding (℃): 17.
Incompatible materials	Keep away from: Strong oxidising agents, Strong acids and alkali., Iron, Aluminium, Air, Halogens, Peroxides.

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	Source
Propan-2-ol	67-63-0	400	980	500	1225	-	NIOSH
		400	980	-	-	-	OSHA
		200	-	400	-	A4	ACGIH

Source:
OSHA: Occupational Safety and Health Standards - Permissible Exposure Limit (PEL), 1910.1000 TABLE Z-1
NIOSH: National Institute for Occupational Safety and Health (NIOSH) Recommended exposure limits (RELs)
ACGIH: American Conference of Governmental Industrial Hygienists - Threshold limit values (TLV) 2021

Notes:
A4 - Not Classifiable as a Human Carcinogen

Biological exposure indicies

SUBSTANCE	CAS No.	Determinant	Biological Exposure Indices	Sampling Time	Note
Propan-2-ol	67-63-0	Acetone in urine	40 mg/l	End of shift at end of workweek	B, Ns

Source: ACGIH: American Conference of Governmental Industrial Hygienists Biological Exposure Indicies (BEIs) 2021

Notes:
B – Background
Ns - Nonspecific

Appropriate engineering controls

Ensure adequate ventilation Or Use appropriate containment. Atmospheric levels should be controlled in compliance with the occupational exposure limit. Local exhaust recommended. Use non-sparking ventilation systems, approved explosion-proof equipment, and intrinsically safe electrical systems. Eyewash facilities should be stationed close to workplace where possible.

Individual protection measures, such as personal protective equipment

Use personal protective equipment as required. Protective clothing should be selected specifically for the working place, depending on concentration and quantity of the hazardous substances handled. The resistance of the protective clothing to chemicals should be ascertained with the respective supplier.Wash contaminated clothing before reuse. Avoid contact with skin and eyes. Do not breathe vapour. Wash hands before breaks and after work. Do not eat, drink or smoke at the work place.

Protective clothing should be selected specifically for the working place, depending on concentration and quantity of the hazardous substances handled. The resistance of the protective clothing to chemicals should be ascertained with the respective supplier.

Eye / face protection

Wear eye protection with side protection. Recommended: EN166. Eyewash bottles should be available.

Skin protection

Hand protection:
Wear impervious gloves (EN374). Nitrile rubber, Butyl rubber. Breakthrough time of the glove material: refer to the information provided by the gloves' producer.
Recommended: Nitrile rubber, Butyl rubber.
Unsuitable gloves materials: Natural rubber / PVC.

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

Respiratory protection

An approved dust mask should be worn if dust is generated during processing or handling. Recommended: Wear a respirator conforming to EN140 with Type A filter or better.

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	Not established
Flammability (solid, gas)	Not applicable
Upper/lower flammability or explosive limits	Upper explosion limit: 12.0 Vol% Lower explosion limit: 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
Other information	None Known
Explosive properties	Not explosive. Vapours can form explosive mixtures with air.

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	Vapour is explosive in air at temperatures higher than the flash point. Vapours are heavier than air and may travel considerable distances to a source of ignition and flashback.
Conditions to avoid	Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Keep from direct sunlight. Do not spray on an open flame or other ignition source. Take precautionary measures against static discharge.
Incompatible materials	Strong oxidising agents, Strong acids and alkali., Iron, Aluminium, Air, Halogens, Peroxides.
Hazardous decomposition products	Highly flammable liquid and vapour. May decompose in a fire giving off toxic fumes. 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. When heated to soldering temperatures, the solvents are evaporated and rosin may be thermally degraded. Decomposition products: Carbon monoxide, Carbon dioxide, aliphatic aldehydes, aromatic aldehydes, acids and terpenes.

SECTION 11: TOXICOLOGICAL INFORMATION

Information on toxicological effects

Acute toxicity - Ingestion		Mixture: Based upon the available data, the classification criteria are not met. Calculated acute toxicity estimate (ATE) >2,000 mg/kg.
Acute toxicity - inhalation		Mixture: Based upon the available data, the classification criteria are not met. Calculated acute toxicity estimate (ATE) >2,000 mg/kg.
Acute toxicity - Skin contact		Mixture: Based upon the available data, the classification criteria are not met. Calculated acute toxicity estimate (ATE) > 5 mg/L (Dusts)
Skin corrosion/irritation		Mixture: Based upon the available data, the classification criteria are not met.
Serious eye damage/irritation		Mixture: Serious eye damage/irritation, Category 2: Causes serious eye irritation.
	Propan-2-ol	Serious eye damage/irritation, Category 2: Causes serious eye irritation. Irritating to eyes. (rabbit) (OECD 405) ECHA registration dossier
	Benzyl alcohol	Serious eye damage/irritation, Category 2: Causes serious eye irritation. Irritating to eyes. (rabbit) (OECD 405) Harmonised Classification/ ECHA registration dossier
Respiratory or skin sensitisation		Mixture: Based upon the available data, the classification criteria are not met.
Germ cell mutagenicity		Mixture: Based upon the available data, the classification criteria are not met.
Carcinogenicity		Mixture: Based upon the available data, the classification criteria are not met.
Reproductive toxicity		Mixture: Based upon the available data, the classification criteria are not met.
STOT - single exposure		Mixture: Specific target organ toxicity - Single exposure, Category 3 (Narcotic effects H336: May cause drowsiness or dizziness.
	Propan-2-ol	Specific target organ toxicity - Single exposure, Category 3: May cause drowsiness or dizziness. Test Result: Higher concentrations can produce central nervous system depression, narcosis, and unconsciousness.(OECD 403) ECHA registration dossier
STOT - repeated exposure		Mixture: Based upon the available data, the classification criteria are not met.

Aspiration hazard	Mixture: Based upon the available data, the classification criteria are not met.

Information on likely routes of exposure

Inhalation	Possible – accidental exposure
Ingestion	Unlikely – accidental exposure
Skin contact	Possible – accidental exposure
Eye contact	Possible – accidental exposure

Early onset symptoms related to exposure	None Known
Delayed health effects from exposure	Causes serious eye irritation. May cause drowsiness or dizziness.
Exposure levels and health effects	See Section: 8
Interactive effects	None Known

Other information

OSHA Designated Carcinogen	All chemicals are not listed
NIOSH Occupational Carcinogen List	All chemicals are not listed
NTP Report on Carcinogens	All chemicals are not listed
IARC Monographs	Propan-2-ol: Group 3

SECTION 12: ECOLOGICAL INFORMATION

Toxicity		Mixture: Based upon the available data, the classification criteria are not met.
Persistence and degradability		No data for the mixture as a whole.
	Propan-2-ol	Readily biodegradable (according to OECD criteria).
	Benzyl alcohol	Readily biodegradable (according to OECD criteria).
Bioaccumulative potential		No data for the mixture as a whole.
	Propan-2-ol	The substance has low potential for bioaccumulation. Log Pow < 3.
	Benzyl alcohol	The substance has low potential for bioaccumulation. Bioconcentration factor (BCF) : 1.37 l/kg ww, Log Pow: 1.1 (Q)SAR (US EPA, 2014)
Mobility in soil		No data for the mixture as a whole.
	Propan-2-ol	The substance is predicted to have high mobility in soil. Log Pow: < 3. Readily biodegradable.
	Benzyl alcohol	The substance is predicted to have high mobility in soil. Koc at 20℃ = 15.7, Log Koc = 1.2 (Q)SAR (US EPA, 2014)
Other adverse effects		None Known

SECTION 13: DISPOSAL CONSIDERATIONS

Waste treatment methods	Dispose of wastes in an approved waste disposal facility. Recover or recycle if possible.
Packaging waste	Disposal should be in accordance with local, state or national legislation.

SECTION 14: TRANSPORT INFORMATION

	Road/rail (ADR/RID)	**Sea transport (IMDG)**	**Air (ICAO/IATA)**
UN number	UN 1219	UN 1219	UN 1219
UN proper shipping name	ISOPROPANOL (ISOPROPYL ALCOHOL) mixture	ISOPROPANOL (ISOPROPYL ALCOHOL) mixture	ISOPROPANOL (ISOPROPYL ALCOHOL) mixture
Transport hazard class(es)	3	3	3
Packing group	II	II	II
Environmental hazards	Not classified	Not classified as a Marine Pollutant.	Not classified

Special precautions for user	See Section: 2
Transport in bulk according to Annex II of Marpol and the IBC Code	Not applicable
Additional information	Not applicable

SECTION 15: REGULATORY INFORMATION

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

US Federal Regulations

TSCA Chemical Data Reporting (CDR) Rule	Propan-2-ol: Subject to 25,000lb reporting threshold Benzyl alcohol: Subject to 25,000lb reporting threshold

NIOSH Occupational Carcinogen List	All chemicals are not listed
EPCRA Section 313	Propan-2-ol: De minimis% Limit: 1%
CWA 307- Toxic	All chemicals are not listed
CERCLA - Hazardous Substances	All chemicals are not listed
CWA Section 311 List of Hazardous Substances	All chemicals are not listed
USDOT - 01. Marine Pollutants List	All chemicals are not listed
NTP Report on Carcinogens	All chemicals are not listed

US State Regulations

California (CA) Biological monitoring	All chemicals are not listed
Proposition 65 (California)	All chemicals are not listed
California (CA) SCPR	Propan-2-ol: listed
Maine State	All chemicals are not listed
Massachusetts, New Jersey, Pennsylvania, Rhode Island- State Right to Know Lists	Propan-2-ol: listed Benzyl alcohol: listed
New York -State Right to Know Lists	Propan-2-ol: listed
Minnesota - State Right to Know Lists	Propan-2-ol: listed Benzyl alcohol: listed
Massachusetts – Toxic Use reduction act	Propan-2-ol: listed
Rhode Island State - Hazardous substances RTK Act	Propan-2-ol: listed

Non-Regional

IARC Monographs	Propan-2-ol: Group 3

SECTION 16: OTHER INFORMATION

The following sections contain revisions or new statements: V2.0 -Updated version and date

Version	2.0
Revision Date	24/05/2024
Date of First Issue	19/09/2016

This Safety Data Sheet was prepared in accordance with US Regulation OSHA HCS (29 CFR 1910.1200)

References:
Harmonised Classification(s) for Propan-2-ol (CAS No. 67-63-0) and Benzyl alcohol (CAS No. 100-51-6).
Existing ECHA registration(s) for Propan-2-ol (CAS No. 67-63-0)and Benzyl alcohol (CAS No. 100-51-6).
Literature References:

1. United States Environmental Protection Agency, 2014. EPI Suite v4.1, http://epa.gov/oppt/exposure/pubs/episuite.htm

Legend

ADR	European Agreement concerning the International Carriage of Dangerous Goods by Road
CAS	CAS: Chemical Abstracts Service
CERCLA	Comprehensive Environmental Response Compensation and Liability Act
CWA	Clean Water Act
IATA	International Air Transport Association
IARC	International Agency for Research on Cancer
ICAO	International Civil Aviation Organization
IMDG	International Maritime Dangerous Goods
LC50	Lethal concentration at which 50% of the population is killed
LD50	Lethal dose at which 50% of the population is killed
MARPOL	The International Convention for the Prevention of Pollution from Ships
NTP	National Toxicology Program
OSHA	The Occupational Safety & Health Administration
RID	Regulations concerning the International Carriage of Dangerous Goods by Rail
TSCA	Toxic Substance Control Act

UN	United Nations
US EPA	United States Environmental Protection Agency

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.

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