SAFETY DATA SHEET

PRODUCT NAME **KEM AQUA Solvent FAT**

Data of issue 6/11/2018
Date of revision (Confirmation) 2/4/2024

1. Identification of the substance or mixture and the supplier

Product name	KEM AQUA Solvent FAT
SDS No.	GHS-0067E
Name of supplier	Kyoto Electronics Manufacturing Co., Ltd.
Address	68 Ninodan-cho, Shinden, Kisshoin, Minami-ku, Kyoto, Japan
Division	Quality Assurance Department
Phone	+81-75-691-4121
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Recommended uses and restrictions on use

Recommended use	For analysis
Restrictions on use	When using for purposes other than those recommended, consult a specialist.

2. Hazard identification

GHS classification

Physical hazards	
Flammable liquids	Category 3
Health hazards	
Acute toxicity / Oral	Category 4
Acute toxicity / Inhalation	Category 4
Skin corrosion / Irritation	Category 2
Serious eye damage / Eye irritation	Category 1
Germ cell mutagenicity	Category 2
Carcinogenicity	Category 2
Reproductive toxicity	Category 1B
Specific target organ toxicity (single exposure)	Category 1(Liver, Respiratory organs, Kidney, Systemic toxicity, Central nervous system, Cardio-vascular system, Visual organs) Category 3(Narcotic effects)
Specific target organ toxicity (repeated exposure	Category 1(Liver, Respiratory organs, Kidney, Central nervous system, Visual organs)
Environmental hazards	

Short-term (acute) aquatic hazard	Category 3
Long-term (chronic) aquatic hazard	Category 1

GHS label elements

Hazard pictograms

Signal words	Danger
Hazard statements	H226 Flammable liquid and vapor. H302 + H332 Harmful if swallowed or if inhaled. H315 Causes skin irritation. H318 Causes serious eye damage. H336 May cause drowsiness or dizziness. H341 Suspected of causing genetic defects. H351 Suspected of causing cancer. H360 May damage fertility or the unborn child. H370 Causes damage to organs (Liver, Respiratory organs, Kidney, Systemic toxicity, Central nervous system, Cardio-vascular system). H372 Causes damage to organs (Liver, Respiratory organs, Kidney, Central nervous system) through prolonged or repeated exposure. H402 Harmful to aquatic life. H410 Very toxic to aquatic life with long lasting effects.
Precautionary statement	
Prevention	P201 Obtain special instructions before use. P202 Do not handle until all safety precautions have been read and understood. P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. P233 Keep container tightly closed. P240 Ground and bond container and receiving equipment. P241 Use explosion-proof electrical/ ventilating/ lighting/ equipment. P242 Use non-sparking tools. P243 Take action to prevent static discharges.

	P260 Do not breathe mist or vapors. P264 Wash skin thoroughly after handling. P270 Do not eat, drink or smoke when using this product. P271 Use only outdoors or in a well-ventilated area. P273 Avoid release to the environment. P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.
Response	P301 + P312 + P330 IF SWALLOWED: Call a POISON CENTER/ doctor if you feel unwell. Rinse mouth. P303 + P361 + P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water. P304 + P340 + P312 IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/ doctor if you feel unwell. P305 + P351 + P338 + P310 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. P308 + P311 IF exposed or concerned: Call a POISON CENTER/ doctor. P332 + P313 If skin irritation occurs: Get medical advice/ attention. P362 + P364 Take off contaminated clothing and wash it before reuse. P370 + P378 In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish. P391 Collect spillage.
Storage	P403 + P233 Store in a well-ventilated place. Keep container tightly closed. P403 + P235 Store in a well-ventilated place. Keep cool. P405 Store locked up.
Disposal	P501 Dispose of contents/ container to an approved waste disposal plant.
Other hazards which do not result in classification	None known.

3. Composition/Information on ingredients

substance / mixture mixture

Components

No.	Chemical name	CAS No.	Concentration (% w/w)	ENCS / ISHL number
1	chloroform	67-66-3	>=80-<90	2-37
2	methanol	67-56-1	10-20	2-201
3	2-(methylamino)pyridine	4597-87-9	1-5	8-(1)-3318
4	sulfur dioxide	7446-09-5	<1	1-536
5	ethanol	64-17-5	<1	2-202

4. First-aid measures

General advice	Move out of dangerous area.
	Consult a physician.
	Show this material safety data sheet to the doctor in attendance.
	Do not leave the victim unattended.
If inhaled	Remove victim to fresh air and keep at rest in a position comfortable for breathing.
	Call a POISON CENTER or doctor/physician if you feel unwell.
In case of skin contact	Wash off with soap and plenty of water.
	Wash contaminated clothing before re-use.
	Remove contaminated clothing and shoes.
	If skin irritation or rash occurs: Get medical advice/ attention.
In case of eye contact	Immediately flush eye(s) with plenty of water.
	Protect unharmed eye.
	Keep eye wide open while rinsing.
	If eye irritation persists, consult a specialist.
	Remove contact lenses, if present and easy to do. Continue rinsing.
If swallowed	Rinse mouth with water.
	Do NOT induce vomiting.
	If large quantities of this material are swallowed, call a physician immediately.
Most important symptoms and effects, both acute and delayed	Harmful if swallowed or if inhaled.
	Causes skin irritation.
	Causes serious eye damage.
	May cause drowsiness or dizziness.
	Suspected of causing genetic defects.
	Suspected of causing cancer.

	May damage fertility or the unborn child.
	Causes damage to organs.
	Causes damage to organs through prolonged or repeated exposure.
Notes to physician	Treat symptomatically.

5. Fire-fighting measures

Suitable extinguishing media	Carbon dioxide (CO2)
	Dry sand
	Regular foam
	Vermiculite
Unsuitable extinguishing media	High volume water jet
Specific hazards during fire fighting	Do not allow run-off from fire fighting to enter drains or water courses.
Specific extinguishing methods	Collect contaminated fire extinguishing water separately. This must not be discharged into drains.
	Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.
Special protective equipment for fire-fighters	Use personal protective equipment.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures	Use personal protective equipment.
	Remove all sources of ignition.
Environmental precautions	Prevent product from entering drains.
	Prevent further leakage or spillage if safe to do so.
	If the product contaminates rivers and lakes or drains inform respective authorities.
Methods and materials for containment and cleaning up	Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust).
	Keep in suitable, closed containers for disposal.

7. Handling and storage

Handling

Advice on protection against fire and explosion	Do not spray on a naked flame or any incandescent material. Take necessary action to avoid static electricity discharge (which might cause ignition of organic vapors). Keep away from open flames, hot surfaces and sources of ignition.
Advice on safe handling	Take precautionary measures against static discharges. Keep away from fire, sparks and heated surfaces. Wash skin thoroughly after handling. Do not eat, drink or smoke when using this product. Use only in area provided with appropriate exhaust ventilation.
Avoidance of contact	No data available
Hygiene measures	When using do not eat or drink. When using do not smoke. Wash hands before breaks and at the end of workday.

Storage

Conditions for safe storage	Keep in a well-ventilated place. Store at room temperature. To maintain product quality, do not store in heat or direct sunlight. Keep container tightly closed.
Further information on storage stability	No decomposition if stored and applied as directed.

8. Exposure controls/Personal protection

Threshold limit value and permissible exposure limits for each component in the work environment

Components	CAS-No.	Value type (Form of exposure)	Control parameters / Reference concentration / Permissible concentration	Basis
chloroform	67-66-3	ACL OEL-M	3ppm 3ppm 14.7mg/m^3	JP OEL ISHL JP OEL JSOH
	Further information: Skin absorption, Group 2B: possibly carcinogenic to humans			
		TWA	10ppm	ACGIH
methanol	67-56-1	ACL OEL-M	200ppm 200ppm 260mg/m^3	JP OEL ISHL JP OEL JSOH
	Further information: Group 2: Substances presumed to cause reproductive toxicity in humans, Skin absorption			
		TWA	200ppm	ACGIH

		STEL	250ppm	ACGIH
sulphur dioxide	7446-09-5	STEL	0.25pm	ACGIH
ethanol	64-17-5	STEL	1,000pm	ACGIH

Biological occupational exposure limits

Components	CAS-No.	Target substance	Biological specimen	Sampling time	Permissible concentration	Basis
methanol	67-56-1	Methanol	Urine	End of shift	20mg/L	JSOH
		Methanol	Urine	End of shift (As soon as possible after exposure ceases)	15mg/L	ACGIH BEI

Personal protective equipment

Respiratory protection	Suitable respiratory equipment
Hand protection material	Protective gloves
Eye protection	Safety glasses
Skin and body protection	Protective suit

9. Physical and chemical properties

Physical state	Liquid.
Color	Light yellow, transparent
Odor	pungent
Melting point / Freezing point	No data available
Initial boiling point and boiling range	No data available
Flammability (liquids)	No data available
Lower explosion limit and upper explosion limit / flammability limit	
Upper explosion limit / Upper flammability limit	No data available
Lower explosion limit / Lower flammability limit	No data available
Flash point	51.8℃
Decomposition temperature	No data available
pH	No data available
Autoignition temperature	No data available
Self-Accelerating decomposition temperature (SADT)	No data available
Viscosity	
Viscosity, kinematic	0.51mm^2/s
Solubility(ies)	

Water solubility	No data available
Partition coefficient: n-octanol/water	No data available
Vapor pressure	No data available
Density and / or relative density Relative density	1.277 (20℃)
Density	No data available
Relative vapor density	No data available
Particle characteristics Particle size	No data available

10. Stability and reactivity

Reactivity	No decomposition if stored and applied as directed.
Chemical stability	Stable under normal conditions.
Possibility of hazardous reactions	May cause fire, explosion, and/or generation of a hazardous gas
Conditions to avoid	No data available
Incompatible materials	No data available

11. Toxicological information

Acute toxicity	Harmful if swallowed or if inhaled.
Product	
Acute oral toxicity	The component/mixture is moderately toxic after single ingestion.
Acute inhalation toxicity	Test atmosphere vapor
	The component/mixture is moderately toxic after short term inhalation.
chloroform	
Acute oral toxicity	LD50 (Rat) 440mg/kg
	The component/mixture is moderately toxic after single ingestion.
Acute inhalation toxicity	LC50 (Rat) 9,770ppm，Exposure time 4 h, Test atmosphere vapor
	Test atmosphere vapor
	The component/mixture is moderately toxic after short term inhalation.
Acute dermal toxicity	LD0 (Rabbit) 3,980mg/kg
methanol	
Acute oral toxicity	LD50 1,400mg/kg
Acute inhalation toxicity	LC50 (Rat) 64,000ppm，Exposure time 4 h, Test atmosphere vapor
	LC50 (Rat) 145,000ppm，Exposure time 1 h, Test atmosphere dust / mist
Acute dermal toxicity	LDLo 393mg/kg
sulphur dioxide	
Acute inhalation toxicity	LC50 (Rat) 593 - 1319ppm，Exposure time 4 h, Test atmosphere gas
ethanol	

Acute oral toxicity	LD50 (Rat) 15,010mg/kg
Acute inhalation toxicity	LC50 (Rat) 124.7mg/L，Exposure time 4 h, Test atmosphere vapor
Acute dermal toxicity	LDLo (Rabbit) 20,000mg/kg
Skin corrosion/irritation	Causes skin irritation.
Product	Skin irritation
	Extremely corrosive and destructive to tissue.
chloroform	Skin irritation
2-(methylamino)pyridine	Skin irritation
Serious eye damage/eye irritation	Causes serious eye irritation.
Product	Irreversible effects on the eye
	May cause irreversible eye damage.
chloroform	Causes serious eye damage.
methanol	Causes eye irritation.
2-(methylamino)pyridine	Eye irritation.
sulphur dioxide	Causes serious eye irritation.
ethanol	Causes serious eye irritation.
Respiratory or skin sensitization	
Skin sensitization	Not classified based on available information.
Respiratory sensitization	Not classified based on available information.
Germ cell mutagenicity	Suspected of causing genetic defects.
Product	Suspected of inducing heritable mutations in the germ cells of humans.
chloroform	Suspected of inducing heritable mutations in the germ cells of humans.
Carcinogenicity	Suspected of causing cancer.
Product	Suspected human carcinogens
chloroform	Suspected human carcinogens
Reproductive toxicity	May damage fertility or the unborn child.
Product	Presumed human reproductive toxicant
chloroform	Presumed human reproductive toxicant
methanol	Presumed human reproductive toxicant
STOT-single exposure	May cause drowsiness or dizziness.
	Causes damage to organs (Liver, Respiratory organs, Kidney, Systemic toxicity, Central nervous system, Cardio-vascular system).
Product	Target Organs Liver, Respiratory organs, Kidney, Systemic toxicity, Central nervous system, Cardio-vascular system, Visual organs
	The substance or mixture is classified as specific target organ toxicant, single exposure, category 1.
	The substance or mixture is classified as specific target organ toxicant, single exposure, category 3 with narcotic effects.

chloroform	Target Organs Liver, Respiratory organs, Kidney, Cardio-vascular system The substance or mixture is classified as specific target organ toxicant, single exposure, category 1. The substance or mixture is classified as specific target organ toxicant, single exposure, category 3 with narcotic effects.
methanol	Target Organs Systemic toxicity, Central nervous system, Visual organs The substance or mixture is classified as specific target organ toxicant, single exposure, category 1. The substance or mixture is classified as specific target organ toxicant, single exposure, category 3 with narcotic effects.
sulphur dioxide	Target Organs Respiratory organs The substance or mixture is classified as specific target organ toxicant, single exposure, category 1.
ethanol	The substance or mixture is classified as specific target organ toxicant, single exposure, category 3 with respiratory tract irritation. The substance or mixture is classified as specific target organ toxicant, single exposure, category 3 with narcotic effects.
STOT-repeated exposure	Causes damage to organs (Liver, Respiratory organs, Kidney, Central nervous system) through prolonged or repeated exposure.
chloroform	Target Organs Liver, Respiratory organs, Kidney, Central nervous system The substance or mixture is classified as specific target organ toxicant, repeated exposure, category 1.
methanol	Target Organs Central nervous system, Visual organs The substance or mixture is classified as specific target organ toxicant, repeated exposure, category 1.
sulphur dioxide	Target Organs Respiratory organs The substance or mixture is classified as specific target organ toxicant, repeated exposure, category 1.
Aspiration toxicity	Not classified based on available information.
Remarks	Symptoms of overexposure may be headache, dizziness, tiredness, nausea and vomiting. Concentrations substantially above the TLV value may cause narcotic effects. Solvents may degrease the skin.

12. Ecological information

Ecotoxicity

Product	
Acute aquatic toxicity	Harmful to aquatic life.
Chronic aquatic toxicity	Very toxic to aquatic life with long lasting effects.
chloroform	
Toxicity to algae/aquatic plants	EC50 (Chlamydomonas reinhardtii (green algae)) 13.3 mg/L, Exposure time 72 h
Toxicity to fish (Chronic toxicity)	NOEC (Oncorhynchus mykiss (rainbow trout)) 0.059 mg/L, Exposure time 28 Days
M-Factor (Chronic aquatic toxicity)	1
methanol	
Toxicity to fish	LC50 (Lepomis macrochirus (Bluegill sunfish)) 15,400 mg/L, Exposure time 96 h
Toxicity to daphnia and other aquatic invertebrates	EC50 (Daphnia magna (Water flea)) > 10,000 mg/L, Exposure time 48 h
Toxicity to algae/aquatic plants	EC50 (Chaetoceros calcitrans) > 10,000 - < 20,000 mg/L, Exposure time 96 h NOEC (Skeletonema costatum (marine diatom)) 1,400 mg/L, End point Growth inhibition Exposure time 96 h
Toxicity to fish (Chronic toxicity)	NOEC (Oreochromis mossambicus) 23.75 mg/L, End point Growth inhibition Exposure time 90 Days
ethanol	
Toxicity to fish	LC50 (Oncorhynchus mykiss (rainbow trout)) 13,000 mg/L, Exposure time 96 h
Toxicity to daphnia and other aquatic invertebrates	EC50 (Daphnia magna (Water flea)) 12,340 mg/L, End point mortality, Exposure time 48 h
Toxicity to algae/aquatic plants	EC50 (Lemna minor (duckweed)) 3,690 mg/L, End point Growth inhibition, Exposure time 7 Days NOEC (Lemna gibba (gibbous duckweed)) 280 mg/L, End point Growth inhibition Exposure time 7 Days
Toxicity to fish (Chronic toxicity)	NOEC (Ceriodaphnia dubia (Water flea)) 9.6 mg/L, End point Reproductive inhibition, Exposure time 10 Days
Persistence and degradability	
Biodegradability	
chloroform	Biochemical oxygen demand Not rapidly biodegradable, Biodegradation 0 %, Exposure time 14 d
methanol	Biochemical oxygen demand rapidly biodegradable, Biodegradation 92 %, Exposure time 14 d
ethanol	Biochemical oxygen demand rapidly biodegradable, Biodegradation 89 %
Bioaccumulative potential	
Bioaccumulation	

chloroform	Partition coefficient: n-octanol/water log Pow = 1.97
methanol	Species Cyprinus carpio (Carp), Bioconcentration factor (BCF) < 10, Exposure time: 72 h
	Partition coefficient: n-octanol/water log Pow = - 0.77
ethanol	Partition coefficient: n-octanol/water log Pow = - 0.31 (25℃)
Mobility in soil	No data available
Hazardous to the ozone layer	Not applicable
Other adverse effects	An environmental hazard cannot be excluded in the event of unprofessional handling or disposal. Harmful to aquatic life. Very toxic to aquatic life with long lasting effects.

13. Disposal considerations

Waste from residues	Can be incinerated, when in compliance with local regulations. Send to a licensed waste management company.
Contaminated packaging	Empty remaining contents. Empty containers should be taken to an approved waste handling site for recycling or disposal. Dispose of contents/ container to an approved waste disposal plant.

14. Transport information

International Regulations

IATA-DGR

UN / ID No.	UN1993
Proper shipping name	Flammable liquid, n.o.s.（Methanol, solution）
Class	3
Packing group	Ⅲ
Labels	Flammable Liquids
Packing instruction (cargo aircraft)	366

IMDG-Code

UN No.	UN1993
Proper shipping name	FLAMMABLE LIQUID, N.O.S. (METHANOL solution）
Class	3
Packing group	Ⅲ
Labels	3
EmS Code	F-E，S-E
Marine pollutant	no

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

	Not applicable for product as supplied.
Domestic regulation	Please refer to the law and local regulations, etc. in each country
Special precautions for user	The transport classification(s) provided herein are for informational purposes only, and solely based upon the properties of the unpackaged material as it is described within this Safety Data Sheet. Transportation classifications may vary by mode of transportation, package sizes, and variations in regional or country regulations.

15. Regulatory information

16. Other information

Full text of other abbreviations

ACGIH	USA. ACGIH Threshold Limit Values (TLV)
ACGIH BEI	ACGIH - Biological Exposure Indices (BEI)
JP OEL ISHL	Japan. Administrative Control Levels
JP OEL JSOH	Japan. The Japan Society for Occupational Health. Recommendation of Occupational Exposure Limits
ACGIH／TWA	8-hour, time-weighted average
ACGIH／STEL	Short-term exposure limit
JP OEL ISHL / ACL	Administrative Control level
JP OEL JSOH / OEL-M	Occupational Exposure Limit-Mean

AIIC - Australian Inventory of Industrial Chemicals; ANTT - National Agency for Transport by Land of Brazil; ASTM - American Society for the Testing of Materials; bw - Body weight; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; ERG - Emergency Response Guide; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; n.o.s. - Not Otherwise Specified; Nch - Chilean Norm;

NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NOM - Official Mexican Norm; NTP - National Toxicology Program; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; SADT - Self-Accelerating Decomposition Temperature; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TDG - Transportation of Dangerous Goods; TECI - Thailand Existing Chemicals Inventory; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative; WHMIS - Workplace Hazardous Materials Information System.

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.