

Safety data sheet
according to 1907/2006/EC, Article 31

Printing date 14.11.2022

Version number 4

Revision: 14.11.2022

SECTION 1: Identification of the substance/mixture and of the company/undertaking**1.1 Product identifier****Trade name:** PermiNex® 2000 Series Resists**Article number:** Y614022, Y614045, Y614058, Y614064**1.2 Relevant identified uses of the substance or mixture and uses advised against****Sector of Use** SU16 Manufacture of computer, electronic and optical products, electrical equipment**Product category** PC30 Photo-chemicals**Application of the substance / the mixture** Photoresist**1.3 Details of the supplier of the safety data sheet****Manufacturer/Supplier:**

Manufacturer:

Kayaku Advanced Materials

200 Flanders Road

Westborough, MA 01581

Telephone: (617) 965-5511

Fax: (617) 965-5818

Importer:

A-Gas Electronic Materials

Unit 3, IO Centre

Swift Valley

Rugby, Warwickshire

CV21 1TW, UK

Tel: +44-0-1788-537535

Fax: +44-0-1788-535835

Website: www.agasem.comEmail: customerservice.em@agas.com**Further information obtainable from:**

Product Safety

Email: productsafety@kayakuAM.com**1.4 Emergency telephone number:**

Kayaku Advanced Materials : 617-965-5511

Chemtrec USA Emergency : 800-424-9300 (24 hr)

Chemtrec International Emergency : 703-527-3887 (24 hr)

SECTION 2: Hazards identification**2.1 Classification of the substance or mixture****Classification according to Regulation (EC) No 1272/2008**

flame

Flam. Liq. 3 H226 Flammable liquid and vapour.



environment

Aquatic Chronic 2 H411 Toxic to aquatic life with long lasting effects.

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| | |
|----------------------|--|
| <i>Skin Irrit. 2</i> | <i>H315 Causes skin irritation.</i> |
| <i>Eye Irrit. 2</i> | <i>H319 Causes serious eye irritation.</i> |
| <i>Skin Sens. 1</i> | <i>H317 May cause an allergic skin reaction.</i> |

· 2.2 Label elements

· Labelling according to Regulation (EC) No 1272/2008

The product is classified and labelled according to the GB CLP regulation.

· Hazard pictograms



GHS02 GHS07 GHS09

· Signal word *Warning*

· Hazard-determining components of labelling:

Epoxy Resin M2

· Hazard statements

H226 Flammable liquid and vapour.
H315 Causes skin irritation.
H319 Causes serious eye irritation.
H317 May cause an allergic skin reaction.
H411 Toxic to aquatic life with long lasting effects.

· Precautionary statements

P210 *Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.*

P261 *Avoid breathing dust/fume/gas/mist/vapours/spray.*

P273 *Avoid release to the environment.*

P280 *Wear protective gloves/protective clothing/eye protection/face protection.*

P301+P310 *IF SWALLOWED: Immediately call a POISON CENTER/ doctor.*

P302+P352 *IF ON SKIN: Wash with plenty of soap and water.*

P304+P341 *IF INHALED: If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing.*

P305+P351+P338 *IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.*

P333+P313 *If skin irritation or rash occurs: Get medical advice/attention.*

P337+P313 *If eye irritation persists: Get medical advice/attention.*

P370+P378 *In case of fire: Use to extinguish: Alcohol resistant foam, Fire-extinguishing powder, Carbon dioxide.*

P403+P235 *Store in a well-ventilated place. Keep cool.*

P501 *Dispose of contents/container in accordance with local/regional/national/international regulations.*

· Additional information:

41.8 % of the mixture consists of component(s) of unknown toxicity.
Contains 59.2 % of components with unknown hazards to the aquatic environment.

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- **2.3 Other hazards**
- **Results of PBT and vPvB assessment**
- **PBT:** Not applicable.
- **vPvB:** Not applicable.

SECTION 3: Composition/information on ingredients

- **3.2 Chemical characterisation: Mixtures**
- **Description:** Mixture of substances listed below with nonhazardous additions.

· **Dangerous components:**

| | | |
|------------------------------------|--|--------|
| CAS: 120-92-3 EINECS: 204-435-9 | Cyclopentanone ⚠ Flam. Liq. 3, H226; ⚠ Skin Irrit. 2, H315; Eye Irrit. 2, H319 | 15-75% |
| | Epoxy Resin M2 ⚠ Aquatic Chronic 2, H411; ⚠ Skin Irrit. 2, H315; Eye Irrit. 2, H319; Skin Sens. 1, H317 | 5-25% |
| | Epoxy Resin M3 ⚠ Aquatic Chronic 2, H411; ⚠ Skin Irrit. 2, H315; Eye Irrit. 2, H319; Skin Sens. 1, H317 | 1-10% |
| | Epoxy Compound ⚠ Eye Dam. 1, H318 | <1.5% |

· **Additional Components:**

| | |
|----------------------------------|--------|
| Proprietary modified epoxy resin | 15-50% |
| Proprietary Photoacid Generator | <1.5% |

- **Additional information:** For the wording of the listed hazard phrases refer to section 16.

SECTION 4: First aid measures

- **4.1 Description of first aid measures**
- **General information:** Immediately remove any clothing soiled by the product.
- **After inhalation:**
Supply fresh air. If required, provide artificial respiration. Keep patient warm. Consult doctor if symptoms persist.
- **After skin contact:** Immediately wash with water and soap and rinse thoroughly.
- **After eye contact:**
Wash eyes immediately with a large amount of water or normal saline, occasionally lifting upper and lower eye lids until no evidence of chemical remains (about 20 minutes). Remove contact lenses if present and easy to remove. Seek immediate medical attention.
- **After swallowing:** If symptoms persist consult doctor.
- **4.2 Most important symptoms and effects, both acute and delayed** No further relevant information available.
- **4.3 Indication of any immediate medical attention and special treatment needed** Treat symptomatically.

SECTION 5: Firefighting measures

- **5.1 Extinguishing media**
- **Suitable extinguishing agents:**
Alcohol resistant foam
Fire-extinguishing powder

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- ABC powder
- **For safety reasons unsuitable extinguishing agents:**
 Water with full jet
 Water
- **5.2 Special hazards arising from the substance or mixture** No further relevant information available.
- **5.3 Advice for firefighters**
- **Protective equipment:** Wear self-contained respiratory protective device.

SECTION 6: Accidental release measures

- **6.1 Personal precautions, protective equipment and emergency procedures**
 Wear protective equipment. Keep unprotected persons away.
 Ensure adequate ventilation
 Keep away from ignition sources.
- **6.2 Environmental precautions:** Do not allow to enter sewers/ surface or ground water.
- **6.3 Methods and material for containment and cleaning up:**
 Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).
 Ensure adequate ventilation.
 Do not flush with water or aqueous cleansing agents
- **6.4 Reference to other sections**
 See Section 7 for information on safe handling.
 See Section 8 for information on personal protection equipment.
 See Section 13 for disposal information.

SECTION 7: Handling and storage

- **7.1 Precautions for safe handling**
 Ensure good ventilation/exhaust at the workplace.
 Prevent formation of aerosols.
- **Information about fire - and explosion protection:**
 Keep ignition sources away - Do not smoke.
 Protect against electrostatic charges.
 Use explosion-proof apparatus / fittings and spark-proof tools.
- **7.2 Conditions for safe storage, including any incompatibilities**
- **Storage:**
- **Requirements to be met by storerooms and containers:**
 Due to photo-sensitivity, store product in brown-glass or stainless steel receptacles.
- **Information about storage in one common storage facility:**
 Do not store together with oxidising and acidic materials.
 Do not store together with alkalis (caustic solutions).
- **Further information about storage conditions:**
 Store in cool, dry conditions in well sealed containers.
 Protect from heat and direct sunlight.
 Store receptacle in a well ventilated area.
- **7.3 Specific end use(s)** No further relevant information available.

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SECTION 8: Exposure controls/personal protection

- **8.1 Control parameters**
- **Additional information about design of technical facilities:** No further data; see item 7.
- **Ingredients with limit values that require monitoring at the workplace:**
 The product does not contain any relevant quantities of materials with critical values that have to be monitored at the workplace.
- **Additional information:** The lists valid during the making were used as basis.
- **8.2 Exposure controls**
- **Personal protective equipment:**
- **General protective and hygienic measures:**
 Keep away from food and beverages.
 Immediately remove all soiled and contaminated clothing
 Wash hands before breaks and at the end of work.
 Avoid contact with the eyes and skin.
- **Respiratory protection:**
 In case of low exposure use cartridge respirator. In case of intensive or longer exposure use self-contained respiratory protective device.
- **Protection of hands:**



Protective gloves

- The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.
- **Material of gloves** Nitrile rubber, NBR
 - **Penetration time of glove material**
 The exact break through time has to be found out by the manufacturer of the protective gloves and has to be observed.
 - **Eye protection:**



Tightly sealed goggles

SECTION 9: Physical and chemical properties

- **9.1 Information on basic physical and chemical properties**
- **General Information**
- **Appearance:**

| | |
|------------------|-----------------------|
| Form: | Liquid |
| Colour: | Clear to light yellow |
| Odour: | Characteristic |
| Odour threshold: | Not determined. |
- **pH-value:** Not determined.
- **Change in condition**

| | |
|--|---------------|
| Melting point/freezing point: | Undetermined. |
| Initial boiling point and boiling range: | 130 °C |

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| | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|--|-----------|---------------|-----------|---------------|----------|---------|---------|--------|-------|-----|---------|---------|--------|-------|-----|---------|---------|--------|-------|-----|---------|---------|--------|-------|-----|
| · Flash point: | 30 °C (クローズドカップ) | | | | | | | | | | | | | | | | | | | | | | | | | |
| · Flammability (solid, gas): | Not applicable. | | | | | | | | | | | | | | | | | | | | | | | | | |
| · Ignition temperature: | 430 °C | | | | | | | | | | | | | | | | | | | | | | | | | |
| · Decomposition temperature: | Not determined. | | | | | | | | | | | | | | | | | | | | | | | | | |
| · Auto-ignition temperature: | Product is not selfigniting. | | | | | | | | | | | | | | | | | | | | | | | | | |
| · Explosive properties: | Product is not explosive. However, formation of explosive air/vapour mixtures are possible. | | | | | | | | | | | | | | | | | | | | | | | | | |
| · Explosion limits: Lower: Upper: | 1.3 Vol % 0.0 Vol % | | | | | | | | | | | | | | | | | | | | | | | | | |
| · Vapour pressure at 20 °C: | 11 hPa | | | | | | | | | | | | | | | | | | | | | | | | | |
| · Density: · Relative density · Vapour density · Evaporation rate | Not determined. Not determined. Not determined. Not determined. | | | | | | | | | | | | | | | | | | | | | | | | | |
| · Solubility in / Miscibility with water: | Not miscible or difficult to mix. | | | | | | | | | | | | | | | | | | | | | | | | | |
| · Partition coefficient: n-octanol/water: | Not determined. | | | | | | | | | | | | | | | | | | | | | | | | | |
| · Viscosity: Dynamic: Kinematic: | Not determined. Not determined. | | | | | | | | | | | | | | | | | | | | | | | | | |
| · Solvent content: Organic solvents: | 0.0 % | | | | | | | | | | | | | | | | | | | | | | | | | |
| · 9.2 Other information | Table 1. Product specific gravity and VOC data. <table><tr><td>Name</td><td>Number</td><td>Sp. Grav.</td><td>Vol.(%by wt.)</td><td>VOC(g/L)</td></tr><tr><td>PN 2001</td><td>Y614022</td><td>1.0018</td><td>70-75</td><td>710</td></tr><tr><td>PN 2005</td><td>Y614045</td><td>1.0619</td><td>40-45</td><td>445</td></tr><tr><td>PN 2010</td><td>Y614058</td><td>1.1020</td><td>25-30</td><td>290</td></tr><tr><td>PN 2015</td><td>Y614064</td><td>1.1220</td><td>15-20</td><td>190</td></tr></table> | Name | Number | Sp. Grav. | Vol.(%by wt.) | VOC(g/L) | PN 2001 | Y614022 | 1.0018 | 70-75 | 710 | PN 2005 | Y614045 | 1.0619 | 40-45 | 445 | PN 2010 | Y614058 | 1.1020 | 25-30 | 290 | PN 2015 | Y614064 | 1.1220 | 15-20 | 190 |
| Name | Number | Sp. Grav. | Vol.(%by wt.) | VOC(g/L) | | | | | | | | | | | | | | | | | | | | | | |
| PN 2001 | Y614022 | 1.0018 | 70-75 | 710 | | | | | | | | | | | | | | | | | | | | | | |
| PN 2005 | Y614045 | 1.0619 | 40-45 | 445 | | | | | | | | | | | | | | | | | | | | | | |
| PN 2010 | Y614058 | 1.1020 | 25-30 | 290 | | | | | | | | | | | | | | | | | | | | | | |
| PN 2015 | Y614064 | 1.1220 | 15-20 | 190 | | | | | | | | | | | | | | | | | | | | | | |

SECTION 10: Stability and reactivity

- **10.1 Reactivity** No further relevant information available.
- **10.2 Chemical stability** Stable
- **Thermal decomposition / conditions to be avoided:** No decomposition if used according to specifications.
- **10.3 Possibility of hazardous reactions** Exothermic polymerisation.
- **10.4 Conditions to avoid**
Heat, flames and sparks. Extremes of temperature and direct sunlight.
Contact with incompatible materials.
- **10.5 Incompatible materials:** Strong Oxidizing Agents, Strong Acids, Strong Bases
- **10.6 Hazardous decomposition products:**
Carbon monoxide and carbon dioxide

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Corrosive gases/vapours
 Danger of forming toxic pyrolysis products.

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SECTION 11: Toxicological information

- **11.1 Information on toxicological effects**
- **Acute toxicity** Based on available data, the classification criteria are not met.

· **LD/LC50 values relevant for classification:**

| Epoxy Resin M2 | | |
|--------------------------------|----------|----------------------|
| Oral | LD50 | >2000 mg/kg (Rat) |
| Epoxy Compound | | |
| Oral | LD50 | 8030 mg/kg (Rat) |
| Dermal | LD50 | 4248 mg/kg (Rat) |
| Inhalative | LC50/4 h | > 5.3 mg/l (Rat) |
| 120-92-3 Cyclopentanone | | |
| Oral | LD50 | 1820 mg/kg (Rat) |
| Dermal | LD50 | >2000 mg/kg (rabbit) |
| Inhalative | LC50/4 h | 19.5 mg/l (Rat) |

- **Primary irritant effect:**
- **Skin corrosion/irritation**
 Causes skin irritation.
- **Serious eye damage/irritation**
 Causes serious eye irritation.
- **Respiratory or skin sensitisation**
 May cause an allergic skin reaction.
- **Additional toxicological information:**
- **CMR effects (carcinogenicity, mutagenicity and toxicity for reproduction)**
- **Germ cell mutagenicity** Based on available data, the classification criteria are not met.
- **Carcinogenicity** Based on available data, the classification criteria are not met.
- **Reproductive toxicity** Based on available data, the classification criteria are not met.
- **STOT-single exposure** Based on available data, the classification criteria are not met.
- **STOT-repeated exposure** Based on available data, the classification criteria are not met.
- **Aspiration hazard** Based on available data, the classification criteria are not met.

SECTION 12: Ecological information

· **12.1 Toxicity**

· **Aquatic toxicity:**

| Epoxy Compound | |
|--------------------------------|--|
| LC50/96 h | 55 mg/l (Cyprinus carpio (common carp)) |
| EC50/48 h | 30 mg/l (daphnia magna) |
| EC50/72 h | 255 mg/l (Desmodesmus subscipatus (green algae)) |
| 120-92-3 Cyclopentanone | |
| LC50/48 hr | 2950 mg/L (golden orfe) |
| LC50/96 h | >100 mg/l (fish) |

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| | |
|-----------|---|
| EC50/48 h | 3600 mg/l (Ceriodaphnia dubia (water flea)) 100 mg/l (daphnia magna) |
| EC50/72 h | >100 mg/l (scenedesmus subspicatus) |

- **12.2 Persistence and degradability** No further relevant information available.
- **12.3 Bioaccumulative potential** No further relevant information available.
- **12.4 Mobility in soil** No further relevant information available.
- **Additional ecological information:**
- **General notes:**
 Water hazard class 1 (German Regulation) (Self-assessment): slightly hazardous for water
 Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system.
- **12.5 Results of PBT and vPvB assessment**
- **PBT:** Not applicable.
- **vPvB:** Not applicable.
- **12.6 Other adverse effects** No further relevant information available.

SECTION 13: Disposal considerations

- **13.1 Waste treatment methods**
- **Recommendation**
 Must not be disposed together with household garbage. Do not allow product to reach sewage system.
- **Uncleaned packaging:**
- **Recommendation:** Disposal must be made according to official regulations.

SECTION 14: Transport information

| | |
|--|---|
| · 14.1 UN-Number | |
| · ADR, IMDG, IATA | UN1866 |
| · 14.2 UN proper shipping name | |
| · ADR | RESIN SOLUTION |
| · IMDG | RESIN SOLUTION, MARINE POLLUTANT |
| · IATA | Resin solution |
| · 14.3 Transport hazard class(es) | |
| · ADR, IMDG, IATA | |
| |  |
| · Class | 3 Flammable liquids. |
| · Label | 3 |
| · 14.4 Packing group | |
| · ADR, IMDG, IATA | III |
| · 14.5 Environmental hazards: | Not applicable. |
| · 14.6 Special precautions for user | Warning: Flammable liquids. |
| · Hazard identification number (Kemler code): | 30 |

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| | |
|--|---|
| · EMS Number: | <i>F-E, S-E</i> |
| · Stowage Category | <i>A</i> |
| · 14.7 Transport in bulk according to Annex II of Marpol and the IBC Code | <i>Not applicable.</i> |
| · Transport/Additional information: | |
| · ADR | |
| · Limited quantities (LQ) | <i>5L</i> |
| · Excepted quantities (EQ) | <i>Code: E1</i> <i>Maximum net quantity per inner packaging: 30 ml</i> <i>Maximum net quantity per outer packaging: 1000 ml</i> |
| · Transport category | <i>3</i> |
| · Tunnel restriction code | <i>D/E</i> |
| · IMDG | |
| · Limited quantities (LQ) | <i>5L</i> |
| · Excepted quantities (EQ) | <i>Code: E1</i> <i>Maximum net quantity per inner packaging: 30 ml</i> <i>Maximum net quantity per outer packaging: 1000 ml</i> |
| · UN "Model Regulation": | <i>UN 1866 RESIN SOLUTION, 3, III</i> |

SECTION 15: Regulatory information

- **15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture**
- **Directive 2012/18/EU**
- **Named dangerous substances - ANNEX I** *None of the ingredients is listed.*
- **Seveso category**
E2 Hazardous to the Aquatic Environment
P5c FLAMMABLE LIQUIDS
- **Qualifying quantity (tonnes) for the application of lower-tier requirements** *200 t*
- **Qualifying quantity (tonnes) for the application of upper-tier requirements** *500 t*
- **15.2 Chemical safety assessment:** *A Chemical Safety Assessment has not been carried out.*

SECTION 16: Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

- **Relevant phrases**
H226 Flammable liquid and vapour.
H315 Causes skin irritation.
H317 May cause an allergic skin reaction.
H318 Causes serious eye damage.
H319 Causes serious eye irritation.
H411 Toxic to aquatic life with long lasting effects.
- **Department issuing SDS:** *Product safety department*
- **Contact:** *Tom Cole, EHS Manager (tcole@kayakuAM.com)*

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Abbreviations and acronyms:

ADR: Accord relatif au transport international des marchandises dangereuses par route (European Agreement Concerning the International Carriage of Dangerous Goods by Road)

IMDG: International Maritime Code for Dangerous Goods

IATA: International Air Transport Association

GHS: Globally Harmonised System of Classification and Labelling of Chemicals

EINECS: European Inventory of Existing Commercial Chemical Substances

ELINCS: European List of Notified Chemical Substances

CAS: Chemical Abstracts Service (division of the American Chemical Society)

LC50: Lethal concentration, 50 percent

LD50: Lethal dose, 50 percent

PBT: Persistent, Bioaccumulative and Toxic

vPvB: very Persistent and very Bioaccumulative

Flam. Liq. 3: Flammable liquids – Category 3

Skin Irrit. 2: Skin corrosion/irritation – Category 2

Eye Dam. 1: Serious eye damage/eye irritation – Category 1

Eye Irrit. 2: Serious eye damage/eye irritation – Category 2

Skin Sens. 1: Skin sensitisation – Category 1

Aquatic Chronic 2: Hazardous to the aquatic environment - long-term aquatic hazard – Category 2

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