

Safety data sheet

according to 1907/2006/EC, Article 31

Printing date 14.04.2023

Version number 7

Revision: 14.04.2023

SECTION 1: Identification of the substance/mixture and of the company/undertaking

· **1.1 Product identifier**

· **Trade name:** PMGI SF Series Resists

· **Article number:**

G113101, G113102, G113103, G113104, G113105, G113106, G113107, G113175, G113108, G113109, G113110, G113111, G113112, G113113, G113114, G113115, G113117, G113119, G113123

· **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.com

Email: 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.



health hazard

Repr. 1B H360 May damage fertility or the unborn child.

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Skin Irrit. 2 H315 Causes skin irritation.

Eye Irrit. 2 H319 Causes serious eye irritation.

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



GHS08

Signal word Danger

Hazard-determining components of labelling:

Tetrahydrofurfuryl alcohol

Hazard statements

H226 Flammable liquid and vapour.

H315 Causes skin irritation.

H319 Causes serious eye irritation.

H360 May damage fertility or the unborn child.

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.

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.

P332+P313 If skin irritation 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:

Restricted to professional users.

2.3 Other hazards

None of the ingredients are included in the list established in accordance with Article 59(1) for having endocrine disrupting properties.

None of the ingredients are substances identified as having endocrine disrupting properties in accordance with the criteria set out in Commission Delegated Regulation (EU) 2017/2100 (or Commission Regulation (EU) 2018/605.

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- **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	Cyclopentanone	65-85%
EINECS: 204-435-9	⚠ Flam. Liq. 3, H226; ⚠ Skin Irrit. 2, H315; Eye Irrit. 2, H319	
CAS: 97-99-4	Tetrahydrofurfuryl alcohol	1-15%
EINECS: 202-625-6	⚠ Repr. 1B, H360; ⚠ Eye Irrit. 2, H319	

· **Additional Components:**

102322-80-5	Polyaliphatic imide copolymer	⚠ Skin Irrit. 2, H315; Eye Irrit. 2, H319	1-25%
	Proprietary surfactant		<1%

- **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.
If skin irritation continues, consult a doctor.
- **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
Carbon dioxide
- **For safety reasons unsuitable extinguishing agents:** Water with full jet
- **5.2 Special hazards arising from the substance or mixture**
Containers may explode due to pressure increase when container is exposed to extreme heat. Vapors may travel a considerable distance to a source of ignition and flash back along vapor trail.

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- **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
Dispose contaminated material as waste according to section 13.
- **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.
Keep receptacles tightly sealed.
Use only under yellow light
Prevent formation of aerosols.
- **Information about fire - and explosion protection:**
Keep ignition sources away - Do not smoke.
Use explosion-proof apparatus / fittings and spark-proof tools.
Protect against electrostatic charges.
- **7.2 Conditions for safe storage, including any incompatibilities**
- **Storage:**
- **Requirements to be met by storerooms and containers:**
Store in a cool location.
Store in inert atmosphere or keep well sealed to prevent the formation of peroxides and other oxidation products.
- **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.
Store receptacle in a well ventilated area.
Protect from heat and direct sunlight.
- **7.3 Specific end use(s)** No further relevant information available.

SECTION 8: Exposure controls/personal protection

- **8.1 Control parameters**
- **Additional information about design of technical facilities:** No further data; see section 7.

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· **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:**

Do not inhale gases / fumes / aerosols.

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

Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation

· **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:	Sweetish
Odour threshold:	Not determined.

· **pH-value:** Not determined.

· **Change in condition**

Melting point/freezing point:	Undetermined.
Initial boiling point and boiling range:	130-180 °C

· **Flash point:** 30 °C

· **Flammability (solid, gas):** Not applicable.

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· Auto-ignition temperature:	280 °C																																																																																																				
· Decomposition temperature:	Not determined.																																																																																																				
· Ignition temperature:	Product is not selfigniting.																																																																																																				
· Explosive properties:	Product is not explosive. However, formation of explosive air/vapour mixtures are possible.																																																																																																				
· Explosion limits:																																																																																																					
Lower:	1.5 Vol %																																																																																																				
Upper:	Not determined.																																																																																																				
· Vapour pressure at 20 °C:	0.3 hPa																																																																																																				
· Density:	Not determined.																																																																																																				
· Vapour density	Not determined.																																																																																																				
· Evaporation rate	Not determined.																																																																																																				
· Solubility in / Miscibility with water:	Slightly soluble.																																																																																																				
· Partition coefficient: n-octanol/water:	Not determined.																																																																																																				
· Viscosity:																																																																																																					
Dynamic:	Not determined.																																																																																																				
Kinematic:	Not determined.																																																																																																				
· 9.2 Other information	<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>SF1</td><td>G113101</td><td>0.963</td><td>84</td><td>810</td></tr><tr><td>SF2</td><td>G113102</td><td>0.966</td><td>83</td><td>805</td></tr><tr><td>SF3</td><td>G113103</td><td>0.968</td><td>83</td><td>800</td></tr><tr><td>SF4</td><td>G113104</td><td>0.971</td><td>82</td><td>790</td></tr><tr><td>SF5</td><td>G113105</td><td>0.973</td><td>81</td><td>785</td></tr><tr><td>SF6</td><td>G113106</td><td>0.977</td><td>80</td><td>780</td></tr><tr><td>SF7</td><td>G113107</td><td>0.979</td><td>79</td><td>775</td></tr><tr><td>SF7.5</td><td>G113175</td><td>0.981</td><td>79</td><td>770</td></tr><tr><td>SF8</td><td>G113108</td><td>0.983</td><td>78</td><td>765</td></tr><tr><td>SF9</td><td>G113109</td><td>0.984</td><td>78</td><td>760</td></tr><tr><td>SF10</td><td>G113110</td><td>0.987</td><td>77</td><td>755</td></tr><tr><td>SF11</td><td>G113111</td><td>0.992</td><td>75</td><td>750</td></tr><tr><td>SF12</td><td>G113112</td><td>0.995</td><td>74</td><td>740</td></tr><tr><td>SF13</td><td>G113113</td><td>0.998</td><td>73</td><td>735</td></tr><tr><td>SF14</td><td>G113114</td><td>1.001</td><td>73</td><td>730</td></tr><tr><td>SF15</td><td>G113115</td><td>1.004</td><td>72</td><td>720</td></tr><tr><td>SF17</td><td>G113117</td><td>1.010</td><td>70</td><td>710</td></tr><tr><td>SF19</td><td>G113119</td><td>1.015</td><td>69</td><td>695</td></tr><tr><td>SF23</td><td>G113123</td><td>1.023</td><td>65</td><td>670</td></tr></table>	Name	Number	Sp. Grav.	Vol.(%by wt.)	VOC(g/L)	SF1	G113101	0.963	84	810	SF2	G113102	0.966	83	805	SF3	G113103	0.968	83	800	SF4	G113104	0.971	82	790	SF5	G113105	0.973	81	785	SF6	G113106	0.977	80	780	SF7	G113107	0.979	79	775	SF7.5	G113175	0.981	79	770	SF8	G113108	0.983	78	765	SF9	G113109	0.984	78	760	SF10	G113110	0.987	77	755	SF11	G113111	0.992	75	750	SF12	G113112	0.995	74	740	SF13	G113113	0.998	73	735	SF14	G113114	1.001	73	730	SF15	G113115	1.004	72	720	SF17	G113117	1.010	70	710	SF19	G113119	1.015	69	695	SF23	G113123	1.023	65	670
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SF23	G113123	1.023	65	670																																																																																																	

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** No dangerous reactions known.

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- **10.4 Conditions to avoid**
 Contact with incompatible materials.
 Heat, flames and sparks. Extremes of temperature and direct sunlight.
- **10.5 Incompatible materials:** Strong Oxidizing Agents, Strong Bases, Strong Acids, Amines
- **10.6 Hazardous decomposition products:** Carbon monoxide and carbon dioxide

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:

120-92-3 Cyclopentanone

Oral	LD50	1180 mg/kg (Rat)
Dermal	LD50	>2000 mg/kg (rabbit)
Inhalative	LC50/4 h	>19.5 mg/l (Rat)

97-99-4 Tetrahydrofurfuryl alcohol

Oral	LD50	800 mg/kg (Guinea pig) 2300 mg/kg (mouse) 1600 mg/kg (Rat)
Dermal	LD50	5000 mg/kg (Guinea pig)

102322-80-5 Polyaliphatic imide copolymer

Oral	LD50	>5000 mg/kg (Rat) (Data for compositionally similar material)
Dermal	LD50	>5000 mg/kg (Rat) (Data for compositionally similar material)

- **Primary irritant effect:**
- **Skin corrosion/irritation**
 Causes skin irritation.
- **Serious eye damage/irritation**
 Causes serious eye irritation.
- **Respiratory or skin sensitisation** Based on available data, the classification criteria are not met.
- **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**
 May damage fertility or the unborn child.
- **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:

120-92-3 Cyclopentanone

EC50/48 h	100 mg/l (daphnia magna)
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 EC50/72 h >100 mg/l (*scenedesmus subspicatus*)

LC50/96 h >100 mg/l (fish)


- **12.2 Persistence and degradability** Moderately /partly biodegradable
- **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, IMDG, IATA | RESIN SOLUTION |
| · 14.3 Transport hazard class(es)
· ADR, IMDG, IATA

<div style="text-align: center;">  </div> | 3 Flammable liquids.
3 |
| · 14.4 Packing group
· ADR, IMDG, IATA | III |
| · 14.5 Environmental hazards:
· Marine pollutant: | No |
| · 14.6 Special precautions for user
· Hazard identification number (Kemler code):
· EMS Number: | Warning: Flammable liquids.
33
F-E, <u>S</u> -E |

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- | | |
|--|--------------------------------|
| · 14.7 Transport in bulk according to Annex II of Marpol and the IBC Code | Not applicable. |
| · Transport/Additional information: | |
| · ADR | |
| · Limited quantities (LQ) | 5L |
| · Transport category | 3 |
| · Tunnel restriction code | D/E |
| · UN "Model Regulation": | UN1866, RESIN SOLUTION, 3, III |

SECTION 15: Regulatory information

- **15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture**
No further relevant information available.
- **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.
 H319 Causes serious eye irritation.
 H360 May damage fertility or the unborn child.
- **Department issuing SDS:** Product safety department
- **Contact:** Tom Cole, EHS Manager (tcole@kayakuam.com)
- **Abbreviations and acronyms:**
 RID: Règlement international concernant le transport des marchandises dangereuses par chemin de fer (Regulations Concerning the International Transport of Dangerous Goods by Rail)
 ICAO: International Civil Aviation Organisation
 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 Irrit. 2: Serious eye damage/eye irritation – Category 2
 Repr. 1B: Reproductive toxicity – Category 1B