

**Safety Data Sheet**  
**acc. to OSHA HCS**

Printing date 04/14/2023

Reviewed on 04/14/2023

**1 Identification**· **Product identifier**· **Trade name:** PMGI SF Series Resists· **Product number:**G113101, G113102, G113103, G113104, G113105, G113106, G113107, G113175, G113108, G113109, G113110, G113111, G113112, G113113, G113114, G113115, G113117, G113119, G113123· **Application of the substance / the mixture** Photoresist· **Details of the supplier of the safety data sheet**· **Manufacturer/Supplier:**Kayaku Advanced Materials, Inc.  
200 Flanders Road  
Westborough, MA 01581  
Tel: (617) 965-5511  
Fax: (617) 965-5818· **Information department:**Product SafetyEmail: [productsafety@kayakuam.com](mailto:productsafety@kayakuam.com)· **Emergency telephone number:**Kayaku Advanced Materials : 617-965-5511Chemtrec USA Emergency : 800-424-9300Chemtrec International Emergency : 703-527-3887**2 Hazard(s) identification**· **Classification of the substance or mixture**GHS02 FlameFlammable Liquids 3      H226 Flammable liquid and vapor.GHS08 Health hazardToxic to Reproduction 1B   H360 May damage fertility or the unborn child.GHS07Skin Irritation 2      H315 Causes skin irritation.Eye Irritation 2A      H319 Causes serious eye irritation.· **Label elements**· **GHS label elements** The product is classified and labeled according to the Globally Harmonized System (GHS).· **Hazard pictograms**GHS02GHS07GHS08

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**Trade name: PMGI SF Series Resists**

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· **Signal word** *Danger*

· **Hazard-determining components of labeling:**

*Tetrahydrofurfuryl alcohol*

· **Hazard statements**

*H226 Flammable liquid and vapor.*

*H315 Causes skin irritation.*

*H319 Causes serious eye irritation.*

*H360 May damage fertility or the unborn child.*

· **Precautionary statements**

*P210 Keep away from heat/sparks/open flames/hot surfaces. - No smoking.*

*P261 Avoid breathing dust/fume/gas/mist/vapors/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 person to fresh air and keep 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.*

· **Classification system:**

· **NFPA ratings (scale 0 - 4)**



*Health = 2*

*Fire = 3*

*Reactivity = 0*

· **HMIS-ratings (scale 0 - 4)**



*Health = 2*

*Fire = 3*

*Reactivity = 0*

· **Other hazards**

· **Results of PBT and vPvB assessment**

· **PBT:** Not applicable.

· **vPvB:** Not applicable.

### 3 Composition/information on ingredients

· **Chemical characterization: Mixtures**

· **Description:** Mixture of the substances listed below with nonhazardous additions.

· **Dangerous components:**

120-92-3	Cyclopentanone	65-85%
	Flammable Liquids 3, H226;  Skin Irritation 2, H315; Eye Irritation 2A, H319	

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97-99-4	Tetrahydrofurfuryl alcohol	1-15%
	☠ Toxic to Reproduction 1B, H360; ⚠ Eye Irritation 2A, H319	
102322-80-5	Polyaliphatic imide copolymer	1-25%
	⚠ Skin Irritation 2, H315; Eye Irritation 2A, H319	
<b>Additional Components:</b>		
	Proprietary surfactant	<1%

### 4 First-aid measures

- **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:**  
Do not induce vomiting unless instructed to do so by a physician. Wash out mouth with water and keep person at rest. Seek immediate medical attention.
- **Information for doctor:**
- **Most important symptoms and effects, both acute and delayed** No further relevant information available.
- **Indication of any immediate medical attention and special treatment needed** Treat symptomatically.

### 5 Fire-fighting measures

- **Extinguishing media**
- **Suitable extinguishing agents:**  
Alcohol resistant foam  
Fire-extinguishing powder  
Carbon dioxide
- **For safety reasons unsuitable extinguishing agents:** Water with full jet
- **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.
- **Advice for firefighters**
- **Protective equipment:** Wear SCBA.

### 6 Accidental release measures

- **Personal precautions, protective equipment and emergency procedures**  
Wear protective equipment. Keep unprotected persons away.  
Ensure adequate ventilation  
Keep away from ignition sources

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- **Environmental precautions:** Do not allow to enter sewers/ surface or ground water.
- **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.
- **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.
- **Protective Action Criteria for Chemicals**

**· PAC-1:**

120-92-3	Cyclopentanone	0.87 ppm
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**· PAC-2:**

120-92-3	Cyclopentanone	9.5 ppm
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**· PAC-3:**

120-92-3	Cyclopentanone	57 ppm
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### 7 Handling and storage

- **Handling:**
- **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 protection against explosions and fires:**  
 Keep ignition sources away - Do not smoke.  
 Use explosion-proof apparatus / fittings and spark-proof tools.  
 Protect against electrostatic charges.
- **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 oxidizing and acidic materials.  
 Do not store together with alkalis (caustic solutions).
- **Further information about storage conditions:**  
 Keep container well-sealed in cool, dry location.  
 Store receptacle in a well ventilated area.  
 Protect from heat and direct sunlight.
- **Specific end use(s)** No further relevant information available.

### 8 Exposure controls/personal protection

- **Additional information about design of technical systems:** No further data; see section 7.

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### · Control parameters

#### · Components with limit values that require monitoring at the workplace:

**97-99-4 Tetrahydrofurfuryl alcohol**
**WEEL** 0.5 ppm

 · **Additional information:** The lists that were valid during the creation were used as basis.

### · 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 equipment:

In case of low exposure, use cartridge respirator. In case of intensive or longer exposure, use SCBA.

#### · Protection of hands:



Protective gloves

Contact glove manufacturer for break-through time.

 · **Material of gloves** Nitrile rubber, NBR

 · **Penetration time of glove material** Contact glove manufacture for break-through time.

#### · Eye protection:



Tightly sealed goggles

## 9 Physical and chemical properties

### · Information on basic physical and chemical properties

#### · General Information

#### · Appearance:

<b>Form:</b>	Liquid
<b>Color:</b>	Clear to light yellow
<b>Odor:</b>	Sweet
<b>Odor threshold:</b>	Not determined.

 · **pH-value:** Not determined.

#### · Change in condition

<b>Melting point/Melting range:</b>	Undetermined.
<b>Boiling point/Boiling range:</b>	130-180 °C (266-356 °F)

 · **Flash point:** 30 °C (86 °F)

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

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· <b>Auto igniting:</b>	280 °C (536 °F)																																																																																																				
· <b>Decomposition temperature:</b>	Not determined.																																																																																																				
· <b>Ignition temperature:</b>	Product is not selfigniting.																																																																																																				
· <b>Danger of explosion:</b>	Product is not explosive. However, formation of explosive air/vapor mixtures are possible.																																																																																																				
· <b>Explosion limits:</b>																																																																																																					
<b>Lower:</b>	1.5 Vol %																																																																																																				
<b>Upper:</b>	Not determined.																																																																																																				
· <b>Vapor pressure at 20 °C (68 °F):</b>	0.3 hPa (0.2 mm Hg)																																																																																																				
· <b>Density:</b>	See other information																																																																																																				
· <b>Vapor density</b>	Not determined.																																																																																																				
· <b>Evaporation rate</b>	1.6-2.3 (BuAc=1)																																																																																																				
· <b>Solubility in / Miscibility with Water:</b>	Slightly soluble.																																																																																																				
· <b>Partition coefficient (n-octanol/water):</b>	Not determined.																																																																																																				
· <b>Viscosity:</b>																																																																																																					
<b>Dynamic:</b>	Not determined.																																																																																																				
<b>Kinematic:</b>	Not determined.																																																																																																				
· <b>Other information</b>	<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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### 10 Stability and reactivity

- **Reactivity** No further relevant information available.
- **Chemical stability** Stable
- **Thermal decomposition / conditions to be avoided:** No decomposition if used according to specifications.
- **Possibility of hazardous reactions** No dangerous reactions known.

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

### 11 Toxicological information

- **Information on toxicological effects**
- **Acute toxicity:**

 · **LD/LC50 values that are 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:**
- **on the skin:** Irritant to skin and mucous membranes.
- **on the eye:** Strong irritant with the danger of severe eye injury.
- **Sensitization:** No sensitizing effects known.
- **Additional toxicological information:**  
 The product shows the following dangers according to internally approved calculation methods for preparations:  
 Irritant

 · **Carcinogenic categories**

 · **IARC (International Agency for Research on Cancer)**

None of the ingredients are listed.

 · **NTP (National Toxicology Program)**

None of the ingredients are listed.

 · **OSHA-Ca (Occupational Safety & Health Administration)**

None of the ingredients are listed.

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### 12 Ecological information

· **Toxicity**

· **Aquatic toxicity:**

**120-92-3 Cyclopentanone**

EC50/48 h	100 mg/l (daphnia magna)
EC50/72 h	>100 mg/l (scenedesmus subspicatus)
LC50/96 h	>100 mg/l (fish)

· **Persistence and degradability** Moderately /partly biodegradable

· **Behavior in environmental systems:**

· **Bioaccumulative potential** No further relevant information available.

· **Mobility in soil** No further relevant information available.

· **Additional ecological information:**

· **General notes:**

Water hazard class 1 (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.

· **Results of PBT and vPvB assessment**

· **PBT:** Not applicable.

· **vPvB:** Not applicable.

· **Other adverse effects** No further relevant information available.

### 13 Disposal considerations

· **Waste treatment methods**

· **Recommendation:**

Must not be disposed of as regular garbage/trash. Do not allow product to reach sewage system.

Disposal must be made in accordance with Federal, State, and Local regulations.

· **Uncleaned packagings:**

· **Recommendation:** Disposal must be made in accordance with Federal, State, and Local regulations.

### 14 Transport information

· **UN-Number**

· **DOT, ADR, IMDG, IATA** UN1866

· **UN proper shipping name**

· **DOT, IMDG, IATA** RESIN SOLUTION

· **ADR** 1866 RESIN SOLUTION

· **Transport hazard class(es)**

· **DOT**



· **Class**

3 Flammable liquids

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· <b>Label</b>	3
· <b>ADR, IMDG, IATA</b>	
	
· <b>Class</b>	3 Flammable liquids
· <b>Label</b>	3
· <b>Packing group</b>	
· <b>DOT, ADR, IMDG, IATA</b>	III
· <b>Environmental hazards:</b>	
· <b>Marine pollutant:</b>	No
· <b>Special precautions for user</b>	Warning: Flammable liquids
· <b>Hazard identification number (Kemler code):</b>	33
· <b>EMS Number:</b>	F-E, S-E
· <b>Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code</b>	Not applicable.
· <b>UN "Model Regulation":</b>	UN1866, RESIN SOLUTION, 3, III

### 15 Regulatory information

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

#### · Section 355 (extremely hazardous substances):

None of the ingredients are listed.

#### · Section 313 (Specific toxic chemical listings):

None of the ingredients is listed.

- **TSCA (Toxic Substances Control Act):** All ingredients are listed or comply with TSCA regulations.

#### · **Hazardous Air Pollutants**

None of the ingredients are listed.

#### · **Proposition 65**

#### · **Chemicals known to cause cancer:**

None of the ingredients are listed.

#### · **Chemicals known to cause reproductive toxicity for females:**

None of the ingredients are listed.

#### · **Chemicals known to cause reproductive toxicity for males:**

None of the ingredients are listed.

#### · **Chemicals known to cause developmental toxicity:**

None of the ingredients are listed.

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· **Carcinogenic categories**

· **EPA (Environmental Protection Agency)**

None of the ingredients are listed.

· **TLV (Threshold Limit Value)**

None of the ingredients are listed.

· **NIOSH-Ca (National Institute for Occupational Safety and Health)**

None of the ingredients are listed.

· **Massachusetts State Right To Know List**

120-92-3 Cyclopentanone

97-99-4 Tetrahydrofurfuryl alcohol

· **New Jersey State Right To Know List**

120-92-3 Cyclopentanone

· **Pennsylvania Hazardous Substances List**

120-92-3 Cyclopentanone

97-99-4 Tetrahydrofurfuryl alcohol

· **California SCAQMD Rule 443.1 VOC's: See Table 1 - Section 9**

· **GHS label elements** The product is classified and labeled according to the Globally Harmonized System (GHS).

· **Hazard pictograms**



GHS02   GHS07   GHS08

· **Signal word** Danger

· **Hazard-determining components of labeling:**

Tetrahydrofurfuryl alcohol

· **Hazard statements**

H226 Flammable liquid and vapor.

H315 Causes skin irritation.

H319 Causes serious eye irritation.

H360 May damage fertility or the unborn child.

· **Precautionary statements**

P210 Keep away from heat/sparks/open flames/hot surfaces. - No smoking.

P261 Avoid breathing dust/fume/gas/mist/vapors/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 person to fresh air and keep 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.

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P403+P235 Store in a well-ventilated place. Keep cool.  
P501 Dispose of contents/container in accordance with local/regional/national/international regulations.  
· **Chemical safety assessment:** A Chemical Safety Assessment has not been carried out.

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**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.

- **Department issuing SDS:** Product safety department
- **Contact:** Tom Cole, EHS Manager (tcole@kayakuam.com)

**· Revision History:**

The manufacturer's information in Section 1, the product hazard information in Section 2 and the component hazard information in Section 3 have been updated.

- **Date of preparation / last revision** 04/14/2023

**· 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  
DOT: US Department of Transportation  
IATA: International Air Transport Association  
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)  
NFPA: National Fire Protection Association (USA)  
HMIS: Hazardous Materials Identification System (USA)  
LC50: Lethal concentration, 50 percent  
LD50: Lethal dose, 50 percent  
PBT: Persistent, Bioaccumulative and Toxic  
vPvB: very Persistent and very Bioaccumulative  
NIOSH: National Institute for Occupational Safety  
OSHA: Occupational Safety & Health  
TLV: Threshold Limit Value  
PEL: Permissible Exposure Limit  
REL: Recommended Exposure Limit  
Flammable Liquids 3: Flammable liquids – Category 3  
Skin Irritation 2: Skin corrosion/irritation – Category 2  
Eye Irritation 2A: Serious eye damage/eye irritation – Category 2A  
Toxic to Reproduction 1B: Reproductive toxicity – Category 1B

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