

## Safety data sheet

according to 1907/2006/EC, Article 31

Printing date 12.10.2021

Version number 4

Revision: 12.10.2021

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

- **1.1 Product identifier**
- **Trade name:** PMGI SF Slow Series Resists
- **Article number:**  
G213102, G213103, G213104, G213105, G213106, G213107, G213108, G213109, G213111, G213113, G213115, G213119
- **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:**  
Kayaku Advanced Materials, Inc.  
200 Flanders Road  
Westborough, MA 01581  
Tel: (617) 965-5511  
Fax: (617) 965-5818
- **Further information obtainable from:**  
Product Safety  
Email: [productsafety@kayakuAM.com](mailto: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**



GHS02 flame

Flam. Liq. 3 H226 Flammable liquid and vapour.



GHS08 health hazard

Repr. 2 H361 Suspected of damaging fertility or the unborn child.



GHS07

Acute Tox. 4 H302 Harmful if swallowed.

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 CLP regulation.

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### · Hazard pictograms



### · Signal word Warning

### · Hazard-determining components of labelling:

Tetrahydrofurfuryl alcohol

### · Hazard statements

H226 Flammable liquid and vapour.

H302 Harmful if swallowed.

H315 Causes skin irritation.

H319 Causes serious eye irritation.

H361 Suspected of damaging 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/hearing 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.

### · 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 Index number: 606-025-00-9 Reg.nr.: 01-2119495595-21-0000	Cyclopentanone  Flam. Liq. 3, H226;  Skin Irrit. 2, H315; Eye Irrit. 2, H319	65-85%
CAS: 97-99-4 EINECS: 202-625-6 Index number: 603-061-00-7	Tetrahydrofurfuryl alcohol  Repr. 2, H361;  Acute Tox. 4, H302; Eye Irrit. 2, H319	1-15%

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CAS: 102322-80-5	Polyaliphatic imide copolymer  Skin Irrit. 2, H315; Eye Irrit. 2, H319	(Contd. of page 2) 1-25%
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 · **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  
Water
- **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.
- **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

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**· 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.**Protect from heat and direct sunlight.**Store receptacle in a well ventilated area.***· 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 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.**Do not inhale gases / fumes / aerosols.**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.*

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**· 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:**

<b>Form:</b>	Liquid
<b>Colour:</b>	Clear to light yellow
<b>· Odour:</b>	Slightly sweet
<b>· Odour threshold:</b>	Not determined.

<b>· pH-value:</b>	Not determined.
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**· Change in condition**

<b>Melting point/freezing point:</b>	Undetermined.
<b>Initial boiling point and boiling range:</b>	130 °C

<b>· Flash point:</b>	30 °C
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<b>· Flammability (solid, gas):</b>	Not applicable.
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<b>· Ignition temperature:</b>	280 °C
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<b>· Decomposition temperature:</b>	Not determined.
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<b>· Auto-ignition temperature:</b>	Product is not selfigniting.
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<b>· Explosive properties:</b>	Product is not explosive. However, formation of explosive air/vapour mixtures are possible.
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**· Explosion limits:**

<b>Lower:</b>	1.5 Vol %
<b>Upper:</b>	9.7 Vol %

<b>· Vapour pressure at 20 °C:</b>	0.3 hPa
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<b>· Density:</b>	Not determined
<b>· Relative density</b>	See Table 1 Other Information
<b>· Vapour density</b>	Not determined.

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 · **Evaporation rate** Not determined.

 · **Solubility in / Miscibility with water:** Partly miscible.

 · **Partition coefficient: n-octanol/water:** Not determined.

 · **Viscosity:**  
   **Dynamic:** Not determined.  
   **Kinematic:** Not determined.

· <b>9.2 Other information</b>	Name	Number	Sp. Grav.	Vol. (%by wt.)	VOC (g/L)
	SF2S	G213102	0.968	98	950
	SF3S	G213103	0.970	97	945
	SF4S	G213104	0.973	96	935
	SF5S	G213105	0.975	95	930
	SF6S	G213106	0.980	94	920
	SF7S	G213107	0.981	93	915
	SF8S	G213108	0.984	92	905
	SF9S	G213109	0.985	91	900
	SF11S	G213111	0.992	89	880
	SF13S	G213113	0.998	87	860
	SF15S	G213115	1.003	85	850
	SF 19S	G213119	1.010	81	800

### 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.
- **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**  
 Harmful if swallowed.

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

#### 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)

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**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)

**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**  
Suspected of damaging 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)
EC50/72 h	>100 mg/l (scenedesmus subspicatus)
LC50/96 h	>100 mg/l (fish)

- **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.

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### 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.  
 Disposal must be made in accordance with International, National, and regional regulations.

##### · 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 1866 RESIN SOLUTION  
 · IMDG, 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:

· Marine pollutant: No

#### · 14.6 Special precautions for user

Warning: Flammable liquids.  
 · Hazard identification number (Kemler code): 33  
 · EMS Number: F-E, S-E

#### · 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

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**SECTION 15: Regulatory information**

- **15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture**  
No further relevant information available.
- **Directive 2012/18/EU**
- **REGULATION (EC) No 1907/2006 ANNEX XVII** Conditions of restriction: 3
- **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.  
H302 Harmful if swallowed.  
H315 Causes skin irritation.  
H319 Causes serious eye irritation.  
H361 Suspected of damaging fertility or the unborn child.
- **Classification according to Regulation (EC) No 1272/2008**  
Art. 9(1) of Regulation (EC) No. 1272/2008 was used for classification purposes.
- **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.
- **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  
Acute Tox. 4: Acute toxicity – Category 4  
Skin Irrit. 2: Skin corrosion/irritation – Category 2  
Eye Irrit. 2: Serious eye damage/eye irritation – Category 2  
Repr. 2: Reproductive toxicity – Category 2