

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

Printing date 10.03.2021

Version number 5

Revision: 10.03.2021

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

- **1.1 Product identifier**
- **Trade name:** LOR A Series Resists
- **Article number:**
G516602, G516603, G516604, G516605, G516606, G516607, G516608, G516658, G516609, G516610, G516611, G516612, G516614, G516616, G516619
- **1.2 Relevant identified uses of the substance or mixture and uses advised against**
No further relevant information available.
- **Sector of Use** SU16 Manufacture of computer, electronic and optical products, electrical equipment
- **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
- **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.



GHS07

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.
- **Hazard pictograms**



GHS02



GHS07

- **Signal word** Warning

(Contd. on page 2)

Safety data sheet

according to 1907/2006/EC, Article 31

Printing date 10.03.2021

Version number 5

Revision: 10.03.2021

Trade name: LOR A Series Resists

(Contd. of page 1)

· Hazard statements

H226 Flammable liquid and vapour.

H315 Causes skin irritation.

H319 Causes serious eye irritation.

· Precautionary statements

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

P260 Do not breathe 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.

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	Cyclopentanone ⚠ Flam. Liq. 3, H226; ⚠ Skin Irrit. 2, H315; Eye Irrit. 2, H319	65-90%
CAS: 107-98-2 EINECS: 203-539-1 Index number: 603-064-00-3	1-methoxy-2-propanol ⚠ Flam. Liq. 3, H226; ⚠ STOT SE 3, H336	5-25%
CAS: 102322-80-5	Polyaliphatic imide copolymer ⚠ Skin Irrit. 2, H315; Eye Irrit. 2, H319	1-20%

· Additional Components:

Proprietary Dye A	<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.

(Contd. on page 3)

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

Printing date 10.03.2021

Version number 5

Revision: 10.03.2021

Trade name: LOR A Series Resists

(Contd. of page 2)

- **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
- **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.

EU

(Contd. on page 4)

Safety data sheet

according to 1907/2006/EC, Article 31

Printing date 10.03.2021

Version number 5

Revision: 10.03.2021

Trade name: LOR A Series Resists

(Contd. of page 3)

SECTION 7: Handling and storage

· 7.1 Precautions for safe handling

No release to water in manufacturing, process, use or disposal.
 Ensure good ventilation/exhaust at the workplace.
 Prevent formation of aerosols.
 Keep receptacles tightly sealed.
 Use only under yellow light

· 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.

· Information about storage in one common storage facility:

Do not store together with alkalis (caustic solutions).
 Do not store together with oxidising and acidic materials.

· 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:

107-98-2 1-methoxy-2-propanol

IOELV	Short-term value: 568 mg/m ³ , 150 ppm Long-term value: 375 mg/m ³ , 100 ppm Skin
-------	---------------------------------------------------------------------------------------------------------------

· **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.
 Do not inhale gases / fumes / aerosols.

· Respiratory protection:

In case of low exposure use cartridge respirator. In case of intensive or longer exposure use self-contained respiratory protective device.

(Contd. on page 5)

Safety data sheet

according to 1907/2006/EC, Article 31

Printing date 10.03.2021

Version number 5

Revision: 10.03.2021

Trade name: LOR A Series Resists

(Contd. of page 4)

· 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:	Red
· Odour:	Slightly sweet
· Odour threshold:	Not determined.

· pH-value: Not determined.

· Change in condition

Melting point/freezing point:	Undetermined.
Initial boiling point and boiling range:	120 °C

· Flash point: 30 °C

· Flammability (solid, gas): Not applicable.

· Ignition temperature: 270 °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:	2.3 Vol %
Upper:	Not determined.

· Vapour pressure at 20 °C: 12 hPa

· Density:	Not determined
· Relative density	See Table 1 Other Information
· Vapour density	Not determined.

(Contd. on page 6)

Safety data sheet

according to 1907/2006/EC, Article 31

Printing date 10.03.2021

Version number 5

Revision: 10.03.2021

Trade name: LOR A Series Resists

(Contd. of page 5)

· Evaporation rate	Not determined.																																																																																
· Solubility in / Miscibility with water:	Not miscible or difficult to mix.																																																																																
· 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>LOR 0.5A</td><td>G516602</td><td>0.965</td><td>98</td><td>945</td></tr><tr><td>LOR 0.7A</td><td>G516603</td><td>0.968</td><td>97</td><td>940</td></tr><tr><td>LOR 1A</td><td>G516604</td><td>0.973</td><td>96</td><td>940</td></tr><tr><td>LOR 2A</td><td>G516605</td><td>0.977</td><td>95</td><td>935</td></tr><tr><td>LOR 3A</td><td>G516606</td><td>0.98</td><td>94</td><td>920</td></tr><tr><td>LOR 4A</td><td>G516607</td><td>0.982</td><td>93</td><td>915</td></tr><tr><td>LOR 5A</td><td>G516608</td><td>0.984</td><td>92</td><td>905</td></tr><tr><td>LOR 6A</td><td>G516658</td><td>0.986</td><td>92</td><td>905</td></tr><tr><td>LOR 7A</td><td>G516609</td><td>0.988</td><td>91</td><td>900</td></tr><tr><td>LOR 8A</td><td>G516610</td><td>0.988</td><td>90</td><td>895</td></tr><tr><td>LOR 10A</td><td>G516611</td><td>0.99</td><td>89</td><td>885</td></tr><tr><td>LOR 15A</td><td>G516612</td><td>0.99</td><td>87</td><td>860</td></tr><tr><td>LOR 20A</td><td>G516614</td><td>0.99</td><td>86</td><td>850</td></tr><tr><td>LOR 30A</td><td>G516616</td><td>0.99</td><td>84</td><td>830</td></tr><tr><td>LOR 50A</td><td>G516619</td><td>0.995</td><td>81</td><td>820</td></tr></table>	Name	Number	Sp. Grav.	Vol.(%by wt.)	VOC(g/L)	LOR 0.5A	G516602	0.965	98	945	LOR 0.7A	G516603	0.968	97	940	LOR 1A	G516604	0.973	96	940	LOR 2A	G516605	0.977	95	935	LOR 3A	G516606	0.98	94	920	LOR 4A	G516607	0.982	93	915	LOR 5A	G516608	0.984	92	905	LOR 6A	G516658	0.986	92	905	LOR 7A	G516609	0.988	91	900	LOR 8A	G516610	0.988	90	895	LOR 10A	G516611	0.99	89	885	LOR 15A	G516612	0.99	87	860	LOR 20A	G516614	0.99	86	850	LOR 30A	G516616	0.99	84	830	LOR 50A	G516619	0.995	81	820
Name	Number	Sp. Grav.	Vol.(%by wt.)	VOC(g/L)																																																																													
LOR 0.5A	G516602	0.965	98	945																																																																													
LOR 0.7A	G516603	0.968	97	940																																																																													
LOR 1A	G516604	0.973	96	940																																																																													
LOR 2A	G516605	0.977	95	935																																																																													
LOR 3A	G516606	0.98	94	920																																																																													
LOR 4A	G516607	0.982	93	915																																																																													
LOR 5A	G516608	0.984	92	905																																																																													
LOR 6A	G516658	0.986	92	905																																																																													
LOR 7A	G516609	0.988	91	900																																																																													
LOR 8A	G516610	0.988	90	895																																																																													
LOR 10A	G516611	0.99	89	885																																																																													
LOR 15A	G516612	0.99	87	860																																																																													
LOR 20A	G516614	0.99	86	850																																																																													
LOR 30A	G516616	0.99	84	830																																																																													
LOR 50A	G516619	0.995	81	820																																																																													

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**
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
Nitrogen oxides (NOx)

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)

(Contd. on page 7)

Safety data sheet

according to 1907/2006/EC, Article 31

Printing date 10.03.2021

Version number 5

Revision: 10.03.2021

Trade name: LOR A Series Resists

(Contd. of page 6)

Inhalative	LC50/4 h	>19.5 mg/l (Rat)
107-98-2 1-methoxy-2-propanol		
Oral	LD50	5660 mg/kg (Rat)
Dermal	LD50	13000 mg/kg (rabbit)
Inhalative	LC50/4 h	54.6 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.
- **Experience with humans:** No further relevant information available.
- **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:		
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)
107-98-2 1-methoxy-2-propanol		
EC50/96 hr	23300 mg/l	(daphnia magna)
	>1000 mg/l	(green algae)
LC50/96 h	20800 mg/l	(Pimephales promelas)

- **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.

(Contd. on page 8)

Safety data sheet

according to 1907/2006/EC, Article 31

Printing date 10.03.2021

Version number 5

Revision: 10.03.2021

Trade name: LOR A Series Resists

· 12.6 Other adverse effects No further relevant information available.

(Contd. of page 7)

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

EU

(Contd. on page 9)

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

Printing date 10.03.2021

Version number 5

Revision: 10.03.2021

Trade name: LOR A Series Resists

(Contd. of page 8)

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.
H315 Causes skin irritation.
H319 Causes serious eye irritation.
H336 May cause drowsiness or dizziness.
- **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
Skin Irrit. 2: Skin corrosion/irritation – Category 2
Eye Irrit. 2: Serious eye damage/eye irritation – Category 2
STOT SE 3: Specific target organ toxicity (single exposure) – Category 3

EU