MICRO CHEM

Safety Data Sheet
acc. to ISO/DIS 11014

Printing date 08/22/2013 Reviewed on 08/22/2013

1 Identification of the substance/mixture and of the company

· **Product identifier**

· **Trade name: LOR A Series Resists**

· **Product number:**
G516602, G516603, G516604, G516605, G516606, G516607, G516608, G516658, G516609, G516610, G516611, G516612, G516614, G516616, G516619

· **Application of the substance / the preparation** Photoresist

· **Details of the supplier of the safety data sheet**

· **Manufacturer/Supplier:**
MicroChem Corp.
90 Oak Street
P.O. Box 426
Newton, MA 02464-0002 USA

· **Information department:**
Product Safety
Email: productsafety@microchem.com

· **Emergency telephone number:**
MicroChem Corp : 617-965-5511
Chemtrec USA Emergency : 800-424-9300
Chemtrec International Emergency : 703-527-3887

2 Hazards identification

· **Classification of the substance or mixture**

GHS02 Flame

Flam. Liq. 3 H226 Flammable liquid and vapor.

GHS08 Health hazard

STOT RE 2 H373 May cause damage to the central nervous system, the kidneys and the liver through prolonged or repeated exposure. Route of exposure: Oral, Inhalative and Dermal.

GHS07

Skin Irrit. 2 H315 Causes skin irritation.

Eye Irrit. 2A H319 Causes serious eye irritation.

STOT SE 3 H335-H336 May cause respiratory irritation. May cause drowsiness or dizziness.

· **Label elements**

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

· **Hazard pictograms**

GHS02 GHS07 GHS08

· **Signal word** Warning

(Contd. on page 2)

MICRO CHEM

Safety Data Sheet
acc. to ISO/DIS 11014

Printing date 08/22/2013 Reviewed on 08/22/2013

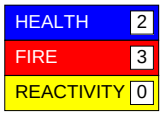
Trade name: LOR A Series Resists

(Contd. of page 1)

· **Hazard-determining components of labelling:**
1-methoxy-2-propanol
Cyclopentanone
· **Hazard statements**
H226 Flammable liquid and vapor.
H315 Causes skin irritation.
H319 Causes serious eye irritation.
H335-H336 May cause respiratory irritation. May cause drowsiness or dizziness.
H373 May cause damage to the central nervous system, the kidneys and the liver through prolonged or repeated exposure. Route of exposure: Oral, Inhalative and Dermal.
· **Precautionary statements**
P210 Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
P260 Do not breathe dust/fume/gas/mist/vapours/spray.
P280 Wear protective gloves/protective clothing/eye protection/face protection.
P233 Keep container tightly closed.
P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P312 Call a POISON CENTER or doctor/physician if you feel unwell.
P337+P313 If eye irritation persists: Get medical advice/attention.
P370+P378 In case of fire: Use for extinction: Alcohol resistant foam.
P370+P378 In case of fire: Use for extinction: Fire-extinguishing powder.
P370+P378 In case of fire: Use for extinction: 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:** No release to water in manufacturing, process, use or disposal.
· **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 Flam. Liq. 3, H226; Acute Tox. 4, H312; Acute Tox. 4, H332; Skin Irrit. 2, H315; Eye Irrit. 2, H319; STOT SE 3, H335-H336	60-80%

(Contd. on page 3)

MICRO CHEM

Safety Data Sheet
acc. to ISO/DIS 11014

Printing date 08/22/2013 Reviewed on 08/22/2013

Trade name: LOR A Series Resists

(Contd. of page 2)

107-98-2	1-methoxy-2-propanol Flam. Liq. 3, H226; STOT RE 2, H373; STOT SE 3, H335	10-25%
102322-80-5	Polyaliphatic imide copolymer Skin Irrit. 2, H315; Eye Irrit. 2A, H319; STOT SE 3, H335	5-15%

· **Additional Components:**		
Proprietary Dye A	Skin Irrit. 2, H315	<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:**
Rinse opened eye for several minutes under running water. If symptoms persist, consult a doctor.
· **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**
No further relevant information available.

5 Firefighting measures

· **Extinguishing media**
· **Suitable extinguishing agents:**
Alcohol resistant foam
Fire-extinguishing powder
Carbon dioxide
· **For safety reasons unsuitable extinguishing agents:**
Water with full jet
Water
· **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.
· **Environmental precautions:**
Do not allow to enter sewers/ surface or ground water.
No release to water in manufacturing, processing, use, or disposal.

(Contd. on page 4)

MICRO CHEM

Safety Data Sheet
acc. to ISO/DIS 11014

Printing date 08/22/2013 Reviewed on 08/22/2013

Trade name: LOR A Series Resists

(Contd. of page 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.
· **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.

7 Handling and storage

· **Handling:**
· **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 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.
· **Information about storage in one common storage facility:**
Do not store together with alkalis (caustic solutions).
Do not store together with oxidizing and acidic materials.
· **Further information about storage conditions:**
Keep container well-sealed in cool, dry location.
Protect from heat and direct sunlight.
Avoid contact with air / oxygen.(formation of peroxide).
Store under lock and key and with access restricted to technical experts or their assistants only.
· **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 item 7.

· **Control parameters**

· **Components with limit values that require monitoring at the workplace:**	
107-98-2 1-methoxy-2-propanol	
REL	Short-term value: 540 mg/m³, 150 ppm Long-term value: 360 mg/m³, 100 ppm
TLV	Short-term value: (553) NIC-369 mg/m³, (150) NIC-100 ppm Long-term value: (369) NIC-184 mg/m³, (100) NIC-50 ppm NIC-A4

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

(Contd. on page 5)

MICRO CHEM

Safety Data Sheet
acc. to ISO/DIS 11014

Printing date 08/22/2013 *Reviewed on 08/22/2013*

Trade name: LOR A Series Resists

(Contd. of page 4)

· **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 equipment:**
In case of low exposure, use cartridge respirator. In case of intensive or longer exposure, use SCBA.
· **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** 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:**	
Form:	Liquid
Color:	Red
· **Odor:**	Slightly sweet
· **Odour threshold:**	Not determined.
· **pH-value:**	Not determined.
· **Change in condition**	
Melting point/Melting range:	Undetermined.
Boiling point/Boiling range:	120 °C (248 °F)
· **Flash point:**	30 °C (86 °F)
· **Flammability (solid, gaseous):**	Not applicable.
· **Ignition temperature:**	270 °C (518 °F)
· **Decomposition temperature:**	Not determined.
· **Auto igniting:**	Product is not selfigniting.
· **Danger of explosion:**	Product is not explosive. However, formation of explosive air/vapor mixtures are possible.
· **Explosion limits:**	
Lower:	2.3 Vol %

(Contd. on page 6)

MICRO CHEM

Safety Data Sheet
acc. to ISO/DIS 11014

Printing date 08/22/2013 Reviewed on 08/22/2013

Trade name: LOR A Series Resists

(Contd. of page 5)

Upper:	Not determined.
· **Vapor pressure at 20 °C (68 °F):**	12 hPa (9 mm Hg)
· **Density:**	Not determined.
· **Relative density**	See Table 1 Other Information
· **Vapour density**	Not determined.
· **Evaporation rate**	Not determined.
· **Solubility in / Miscibility with Water:**	Water miscible No
· **Partition coefficient (n-octanol/water):**	Not determined.
· **Viscosity:**	
Dynamic:	Not determined.
Kinematic:	Not determined.
· **Other information**	Table 1. Product specific gravity and VOC data.

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

10 Stability and reactivity

· **Reactivity**
· **Chemical stability** Stable under normal use conditions
· **Thermal decomposition / conditions to be avoided:** No decomposition if used according to specifications.
· **Possibility of hazardous reactions** No dangerous reactions known.
· **Conditions to avoid** Heat, flames and sparks. Extremes of temperature and direct sunlight.
· **Incompatible materials:** Strong Oxidizing Agents, Strong Acids, Strong Bases
· **Hazardous decomposition products:**
Carbon monoxide and carbon dioxide
Nitrogen oxides (NOx)

(Contd. on page 7)

MICRO CHEM

Safety Data Sheet
acc. to ISO/DIS 11014

Printing date 08/22/2013 Reviewed on 08/22/2013

Trade name: LOR A Series Resists

(Contd. of page 6)

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)
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:**
· **on the skin:** Irritant to skin and mucous membranes.
· **on the eye:** Irritating effect.
· **Sensitization:** No sensitizing effects known.
· **Experience with humans:** No further relevant information available.
· **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.

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)
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)

· **Persistence and degradability** Moderately /partly biodegradable
· **Behavior in environmental systems:**
· **Bioaccumulative potential** No further relevant information available.

(Contd. on page 8)

MICRO CHEM

Safety Data Sheet
acc. to ISO/DIS 11014

Printing date 08/22/2013 Reviewed on 08/22/2013

Trade name: LOR A Series Resists

(Contd. of page 7)

· **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.
No release to water in manufacturing, process, use or disposal.

· **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.
· **Label**	3
· **ADR, IMDG, IATA**	
· **Class**	3 Flammable liquids
· **Label**	3
· **Packing group**	
· **DOT, ADR, IMDG, IATA**	III
· **Environmental hazards:**	
· **Marine pollutant:**	No

(Contd. on page 9)

MICRO CHEM

Safety Data Sheet
acc. to ISO/DIS 11014

Printing date 08/22/2013 *Reviewed on 08/22/2013*

Trade name: LOR A Series Resists

(Contd. of page 8)

· **Special precautions for user**	Warning: Flammable liquids
· **Danger code (Kemler):**	33
· **EMS Number:**	F-E,S-E
· **Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code**	Not applicable.
· **UN "Model Regulation":**	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.

· **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.

· **Carcinogenic categories**

· **EPA (Environmental Protection Agency)**
None of the ingredients are listed.

· **TLV (Threshold Limit Value established by ACGIH)**
None of the ingredients are listed.

· **NIOSH-Ca (National Institute for Occupational Safety and Health)**
None of the ingredients are listed.

· **OSHA-Ca (Occupational Safety & Health Administration)**
None of the ingredients are listed.

· **Massachusetts State Right To Know List**

120-92-3	Cyclopentanone
107-98-2	1-methoxy-2-propanol

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

120-92-3	Cyclopentanone
107-98-2	1-methoxy-2-propanol

(Contd. on page 10)

MICRO CHEM

Safety Data Sheet
acc. to ISO/DIS 11014

Printing date 08/22/2013 Reviewed on 08/22/2013

Trade name: LOR A Series Resists

(Contd. of page 9)

· **Pennsylvania Hazardous Substances List**	
120-92-3	Cyclopentanone
107-98-2	1-methoxy-2-propanol

· **California SCAQMD Rule 443.1 VOC's:** See Table 1 - Section 9
· **GHS label elements** The product is classified and labelled according to the Globally Harmonized System (GHS).
· **Hazard pictograms**

GHS02 GHS07 GHS08

· **Signal word** Warning

· **Hazard-determining components of labelling:**
1-methoxy-2-propanol
Cyclopentanone
· **Hazard statements**
H226 Flammable liquid and vapor.
H315 Causes skin irritation.
H319 Causes serious eye irritation.
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· **Precautionary statements**
P210 Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
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P280 Wear protective gloves/protective clothing/eye protection/face protection.
P233 Keep container tightly closed.
P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P312 Call a POISON CENTER or doctor/physician if you feel unwell.
P337+P313 If eye irritation persists: Get medical advice/attention.
P370+P378 In case of fire: Use for extinction: Alcohol resistant foam.
P370+P378 In case of fire: Use for extinction: Fire-extinguishing powder.
P370+P378 In case of fire: Use for extinction: 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.
· **Chemical safety assessment:** A Chemical Safety Assessment has not been carried out.

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 MSDS:** Product safety department
· **Contact:** Mr. Weber

· **Last Revision Date:**
8/22/2013 Revised hazard classification and precautionary statements. Updated component toxicology data and US State Right To Know Listings.

(Contd. on page 11)

MICRO CHEM

Safety Data Sheet
acc. to ISO/DIS 11014

Printing date 08/22/2013 *Reviewed on 08/22/2013*

Trade name: LOR A Series Resists

(Contd. of page 10)

· **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 Organization
ADR: Accord européen sur le transport 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
ACGIH: American Conference of Governmental Industrial Hygienists
NFPA: National Fire Protection Association (USA)
HMIS: Hazardous Materials Identification System (USA)
LC50: Lethal concentration, 50 percent
LD50: Lethal dose, 50 percent