

Safety Data Sheet

acc. to OSHA HCS

Printing date 04/28/2023

Reviewed on 04/28/2023

1 Identification

- **Product identifier**
- **Trade name:** SU-8 Series Resists
- **Product number:** Y131240, Y131252, Y131259, Y131263, Y131269, Y131273
- **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 Safety
 Email: productsafety@kayakuam.com
- **Emergency telephone number:**
 Kayaku Advanced Materials : 617-965-5511
 Chemtrec USA Emergency : 800-424-9300
 Chemtrec International Emergency : 703-527-3887

2 Hazard(s) identification

- **Classification of the substance or mixture**



GHS05 Corrosion

Eye Damage 1

H318 Causes serious eye damage.



GHS09 Environment

Aquatic Chronic 2

H411 Toxic to aquatic life with long lasting effects.



GHS07

Acute Toxicity - Oral 4

H302 Harmful if swallowed.

Skin Irritation 2

H315 Causes skin irritation.

Sensitization - Skin 1

H317 May cause an allergic skin reaction.

Specific Target Organ Toxicity - Single Exposure 3 H336 May cause drowsiness or dizziness.

Aquatic Acute 2

H401 Toxic to aquatic life.

- **Label elements**

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

(Contd. on page 2)

Safety Data Sheet acc. to OSHA HCS

Printing date 04/28/2023

Reviewed on 04/28/2023

Trade name: SU-8 Series Resists

(Contd. of page 1)

· Hazard pictograms



· Signal word Danger

· Hazard-determining components of labeling:

gamma-Butyrolactone

Epoxy resin

Sulfonium, diphenyl[4-(phenylthio)phenyl]-, (OC-6-11)-hexafluoroantimonate(1-) (1:1)

Sulfonium, (thiodi-4,1-phenylene) bis[diphenyl-, (OC-6-11)-hexafluoroantimonate (1-) (1:2)

· Hazard statements

H302 Harmful if swallowed.

H315 Causes skin irritation.

H318 Causes serious eye damage.

H317 May cause an allergic skin reaction.

H336 May cause drowsiness or dizziness.

H411 Toxic to aquatic life with long lasting effects.

· Precautionary statements

P261 Avoid breathing dust/fume/gas/mist/vapors/spray

P273 Avoid release to the environment.

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.

P333+P313 If skin irritation or rash occurs: Get medical advice/attention.

P337+P313 If eye irritation persists: Get medical advice/attention.

P403+P233 Store in a well-ventilated place. Keep container tightly closed.

P501 Dispose of contents/container in accordance with local/regional/national/international regulations.

· Classification system:

· NFPA ratings (scale 0 - 4)



· HMIS-ratings (scale 0 - 4)



· Other hazards

· Results of PBT and vPvB assessment

· PBT: Not applicable.

(Contd. on page 3)

Safety Data Sheet

acc. to OSHA HCS

Printing date 04/28/2023

Reviewed on 04/28/2023

Trade name: SU-8 Series Resists

 · **vPvB:** Not applicable.

(Contd. of page 2)

3 Composition/information on ingredients

 · **Chemical characterization:** Mixtures

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

 · **Dangerous components:**

	Epoxy resin ⚠ Skin Irritation 2, H315; Eye Irritation 2A, H319; Sensitization - Skin 1, H317	35-75%
96-48-0	gamma-Butyrolactone ⚠ Eye Damage 1, H318; ⚠ Acute Toxicity - Oral 4, H302; Specific Target Organ Toxicity - Single Exposure 3, H336	20-60%
108-32-7	Propylene carbonate ⚠ Skin Irritation 2, H315; Eye Irritation 2A, H319	1-5%
89452-37-9	Sulfonium, (thiodi-4,1-phenylene) bis[diphenyl-, (OC-6-11)-hexafluoroantimonate (1-) (1:2)	0.5-5.0%
71449-78-0	Sulfonium, diphenyl[4-(phenylthio)phenyl]-, (OC-6-11)-hexafluoroantimonate(1-) (1:1) ⚠ Aquatic Acute 1, H400; Aquatic Chronic 1, H410; ⚠ Sensitization - Skin 1, H317	0.5-5.0%

4 First-aid measures

 · **Description of first aid measures**

 · **General information:**

Symptoms of poisoning may even occur after several hours; therefore medical observation for at least 48 hours after the accident.

 · **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.

 · **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; immediately call for medical help.

Wash out mouth.

 · **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:**

Fire-extinguishing powder

Alcohol resistant foam

ABC powder

(Contd. on page 4)

Safety Data Sheet

acc. to OSHA HCS

Printing date 04/28/2023

Reviewed on 04/28/2023

Trade name: SU-8 Series Resists

(Contd. of page 3)

- **For safety reasons unsuitable extinguishing agents:** Water with full jet
- **Special hazards arising from the substance or mixture**
In case of fire, the following can be released:
 Carbon monoxide (CO)
 Hydrogen fluoride (HF)
 Formation of toxic gases is possible during heating or in case of fire.
- **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
- **Environmental precautions:**
Do not allow product to reach sewage system or any drains.
Inform respective authorities in case of seepage into water course or sewage system.
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.
- **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:

96-48-0	gamma-Butyrolactone	3.6 mg/m ³
108-32-7	Propylene carbonate	34 mg/m ³

· PAC-2:

96-48-0	gamma-Butyrolactone	39 mg/m ³
108-32-7	Propylene carbonate	370 mg/m ³

· PAC-3:

96-48-0	gamma-Butyrolactone	310 mg/m ³
108-32-7	Propylene carbonate	2,200 mg/m ³

7 Handling and storage

- **Handling:**
- **Precautions for safe handling**
Ensure good ventilation/exhaust at the workplace.
Store in cool, dry place in tightly closed containers.
Prevent formation of aerosols.
- **Information about protection against explosions and fires:**
Use explosion-proof apparatus / fittings and spark-proof tools.
Protect against electrostatic charges.
Keep ignition sources away - Do not smoke.

(Contd. on page 5)

Safety Data Sheet

acc. to OSHA HCS

Printing date 04/28/2023

Reviewed on 04/28/2023

Trade name: SU-8 Series Resists

(Contd. of page 4)

- **Conditions for safe storage, including any incompatibilities**
- **Storage:**
- **Requirements to be met by storerooms and containers:**
 Due to photo-sensitivity, store product in brown-glass or stainless steel receptacles.
 Store in a cool location.
- **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:**
 Protect from exposure to the light.
 Keep container well-sealed in cool, dry location.
 This product is hygroscopic.
- **Specific end use(s)** No further relevant information available.

8 Exposure controls/personal protection

- **Control parameters**
- **Components with limit values that require monitoring at the workplace:**
 The following constituents are the only constituents of the product which have a PEL, TLV or other recommended exposure limit.
 At this time, the other constituents have no known exposure limits.

89452-37-9 Sulfonium, (thiodi-4,1-phenylene) bis[diphenyl-, (OC-6-11)-hexafluoroantimonate (1-) (1:2)	
ACGIH TLV TWA	0.5 mg/m ³
NIOSH IDLH	50 mg/m ³
OSHA PEL	0.5 mg/m ³
71449-78-0 Sulfonium, diphenyl[4-(phenylthio)phenyl]-, (OC-6-11)-hexafluoroantimonate(1-) (1:1)	
ACGIH TLV TWA	0.5 mg/m ³
NIOSH IDLH	50 mg/m ³
OSHA PEL	0.5 mg/m ³

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

The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.

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

(Contd. on page 6)

Safety Data Sheet

acc. to OSHA HCS

Printing date 04/28/2023

Reviewed on 04/28/2023

Trade name: SU-8 Series Resists

(Contd. of page 5)

- **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:	Fluid
Color:	Clear to light yellow
Odor:	Mild
Odor threshold:	Not determined.

· **pH-value:** Not determined.

· Change in condition

Melting point/Melting range:	Undetermined.
Boiling point/Boiling range:	205 °C (401 °F)

· **Flash point:** 100 °C (212 °F)

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

· **Auto igniting:** 445 °C (833 °F)

· **Decomposition temperature:** Not determined.

· **Ignition temperature:** Product is not selfigniting.

· **Danger of explosion:** Product does not present an explosion hazard.

· Explosion limits:

Lower:	2.7 Vol %
Upper:	15.6 Vol %

· **Vapor pressure at 20 °C (68 °F):** 1 hPa (0.8 mm Hg)

Density:	See other information
Relative density	See Other information
Vapor density	Not determined.
Evaporation rate	1.6-2.3 (BuAc=1)

· Solubility in / Miscibility with

Water: Partly miscible.

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

· Viscosity:

Dynamic: Not determined.

(Contd. on page 7)

Safety Data Sheet

acc. to OSHA HCS

Printing date 04/28/2023

Reviewed on 04/28/2023

Trade name: SU-8 Series Resists

(Contd. of page 6)

Kinematic:	Not determined.				
Other information	Name	Number	Sp. Grav.	VOC(%by wt.)	VOC(g/L)
	SU-8 2	Y131240	1.169	<5.0	25
	SU-8 5	Y131252	1.182	<5.0	30
	SU-8 10	Y131259	1.190	<5.0	35
	SU-8 25	Y131263	1.195	<5.0	35
	SU-8 50	Y131269	1.201	<5.0	40
	SU-8 100	Y131273	1.206	<5.0	45

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** Exothermic polymerization.
- **Conditions to avoid**
Heat, flames and sparks. Extremes of temperature and direct sunlight.
Contact with incompatible materials.
- **Incompatible materials:** Strong Oxidizing Agents, Strong Acids, Strong Bases
- **Hazardous decomposition products:**
Carbon monoxide and carbon dioxide
Antimony oxide
Corrosive gases/vapors
Danger of toxic pyrolysis products.

11 Toxicological information

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

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

Epoxy resin		
Oral	LD50	>2000 mg/kg (Rat)
Dermal	LD50	>2000 mg/kg (rabbit)
Inhalative	LC50	5 mg/L (Rat)
96-48-0 gamma-Butyrolactone		
Oral	LD50	1540 mg/kg (Rat)
Dermal	LD50	5000 mg/kg (gui)
Inhalative	LC50/4 h	>5.1 mg/l (Rat)
108-32-7 Propylene carbonate		
Oral	LD50	29000 mg/kg (Rat)
Dermal	LD50	>20,000 mg/kg (rabbit)

- **Primary irritant effect:**
- **on the skin:** Irritant to skin and mucous membranes.
- **on the eye:** Irritating effect.
- **Sensitization:** Sensitization possible through skin contact.

(Contd. on page 8)

Safety Data Sheet

acc. to OSHA HCS

Printing date 04/28/2023

Reviewed on 04/28/2023

Trade name: SU-8 Series Resists

(Contd. of page 7)

· **Additional toxicological information:**

The product shows the following dangers according to internally approved calculation methods for preparations:

Harmful

Irritant

· **Carcinogenic categories**

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

96-48-0	gamma-Butyrolactone	3
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· **NTP (National Toxicology Program)**

None of the ingredients are listed.

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

None of the ingredients are listed.

12 Ecological information

· **Toxicity**

· **Aquatic toxicity:**

Epoxy resin

100<LC/EC/IC 50	≤1000 mg/l (algae)
	≤1000 mg/l (fish)
	≤1000 mg/l (invertebrates)

96-48-0 gamma-Butyrolactone

EC50/17 h	>10000 mg/l (bacterium)
EC50/48 h	>500 mg/l (daphnia magna)
EC50/72 h	360 mg/l (green algae)
LC50/96 h	>220 - <460 mg/l (golden orfe)

89452-37-9 Sulfonium, (thiodi-4,1-phenylene) bis[diphenyl-, (OC-6-11)-hexafluoroantimonate (1-) (1:2)

LC50/24 h	4.4 mg/l (daphnia)
LC50/48 hr	0.68 mg/L (daphnia)

71449-78-0 Sulfonium, diphenyl[4-(phenylthio)phenyl]-, (OC-6-11)-hexafluoroantimonate(1-) (1:1)

LC50/24 h	4.4 mg/l (daphnia)
LC50/48 hr	0.68 mg/L (daphnia)

· **Persistence and degradability** A part of the components is biodegradable.

· **Behavior in environmental systems:**

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

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

· **Ecotoxicological effects:**

· **Remark:** Toxic for fish

· **Additional ecological information:**

· **General notes:**

Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system.

Also poisonous for fish and plankton in water bodies.

Toxic for aquatic organisms

· **Results of PBT and vPvB assessment**

· **PBT:** Not applicable.

· **vPvB:** Not applicable.

(Contd. on page 9)

Safety Data Sheet

acc. to OSHA HCS

Printing date 04/28/2023

Reviewed on 04/28/2023

Trade name: SU-8 Series Resists


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

(Contd. of page 8)

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	UN3082
· DOT, ADR, IMDG, IATA	
· UN proper shipping name	Environmentally hazardous substance, liquid, n.o.s. (Sulfonium, diphenyl[4-(phenylthio)phenyl]-, (OC-6-11)-hexafluoroantimonate(1-) (1:1), Sulfonium, (thiodi-4,1-phenylene) bis[diphenyl-, (OC-6-11)-hexafluoroantimonate (1-) (1:2))
· DOT	
· ADR, IATA	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (Sulfonium, diphenyl[4-(phenylthio)phenyl]-, (OC-6-11)-hexafluoroantimonate(1-) (1:1), Sulfonium, (thiodi-4,1-phenylene) bis[diphenyl-, (OC-6-11)-hexafluoroantimonate (1-) (1:2))
· IMDG	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (Sulfonium, diphenyl[4-(phenylthio)phenyl]-, (OC-6-11)-hexafluoroantimonate(1-) (1:1), Sulfonium, (thiodi-4,1-phenylene) bis[diphenyl-, (OC-6-11)-hexafluoroantimonate (1-) (1:2)), MARINE POLLUTANT
· Transport hazard class(es)	
· DOT, ADR, IMDG, IATA	
	
· Class	9 Miscellaneous dangerous substances and articles
· Label	9
· Packing group	
· DOT, ADR, IMDG, IATA	III
· Environmental hazards:	Product contains environmentally hazardous substances: Sulfonium, (thiodi-4,1-phenylene) bis[diphenyl-, (OC-6-11)-hexafluoroantimonate (1-) (1:2)
· Marine pollutant:	Yes
· Special precautions for user	Warning: Miscellaneous dangerous substances and articles
· Hazard identification number (Kemler code):	90

(Contd. on page 10)

Safety Data Sheet

acc. to OSHA HCS

Printing date 04/28/2023

Reviewed on 04/28/2023

Trade name: SU-8 Series Resists

(Contd. of page 9)

· EMS Number:	F-A,S-F
· Stowage Category	A
· Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code	Not applicable.
· Transport/Additional information:	
· DOT	
· Quantity limitations	On passenger aircraft/rail: No limit On cargo aircraft only: No limit
· ADR	
· Excepted quantities (EQ)	Code: E1 Maximum net quantity per inner packaging: 30 ml Maximum net quantity per outer packaging: 1000 ml
· IMDG	
· Limited quantities (LQ)	5L
· Excepted quantities (EQ)	Code: E1 Maximum net quantity per inner packaging: 30 ml Maximum net quantity per outer packaging: 1000 ml
· UN "Model Regulation":	UN 3082 ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (SULFONIUM, DIPHENYL[4-(PHENYLTHIO)PHENYL]-, (OC-6-11)-HEXAFLUOROANTIMONATE(1-) (1:1), SULFONIUM, (THIODI-4,1-PHENYLENE) BIS[DIPHENYL-, (OC-6-11)-HEXAFLUOROANTIMONATE (1-) (1:2)), 9, 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):
71449-78-0 Sulfonium, diphenyl[4-(phenylthio)phenyl]-, (OC-6-11)-hexafluoroantimonate(1-) (1:1)
89452-37-9 Sulfonium, (thiodi-4,1-phenylene) bis[diphenyl-, (OC-6-11)-hexafluoroantimonate (1-) (1:2)
· 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.

(Contd. on page 11)

Safety Data Sheet

acc. to OSHA HCS

Printing date 04/28/2023

Reviewed on 04/28/2023

Trade name: SU-8 Series Resists

(Contd. of page 10)

· 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)

None of the ingredients are listed.

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

None of the ingredients are listed.

· New Jersey State Right To Know List

96-48-0 | gamma-Butyrolactone

· Pennsylvania Hazardous Substances List

96-48-0 | gamma-Butyrolactone

· 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


GHS05 GHS07 GHS09

· Signal word Danger

· Hazard-determining components of labeling:

gamma-Butyrolactone

Epoxy resin

Sulfonium, diphenyl[4-(phenylthio)phenyl]-, (OC-6-11)-hexafluoroantimonate(1-) (1:1)

Sulfonium, (thiodi-4,1-phenylene) bis[diphenyl-, (OC-6-11)-hexafluoroantimonate (1-) (1:2)

· Hazard statements

H302 Harmful if swallowed.

H315 Causes skin irritation.

H318 Causes serious eye damage.

H317 May cause an allergic skin reaction.

H336 May cause drowsiness or dizziness.

H411 Toxic to aquatic life with long lasting effects.

· Precautionary statements

P261 Avoid breathing dust/fume/gas/mist/vapors/spray

P273 Avoid release to the environment.

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.

P333+P313 If skin irritation or rash occurs: Get medical advice/attention.

P337+P313 If eye irritation persists: Get medical advice/attention.

(Contd. on page 12)

Safety Data Sheet

acc. to OSHA HCS

Printing date 04/28/2023

Reviewed on 04/28/2023

Trade name: SU-8 Series Resists

(Contd. of page 11)

- P403+P233 Store in a well-ventilated place. Keep container tightly closed.
- 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 SDS:** Product safety department
- **Contact:** Tom Cole, EHS Manager (tcole@kayakuam.com)

- **Revision History:**

The business address of the manufacturer in Section 1 was updated. The hazard classification and precautionary statements for the mixture in Section 2 were revised. The toxicology data in Sections 11 and 12 were revised.

Updated hazards for gamma-Butyrolactone (CAS 96-48-0)

- **Date of preparation / last revision** 04/28/2023

- **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

Acute Toxicity - Oral 4: Acute toxicity – Category 4

Skin Irritation 2: Skin corrosion/irritation – Category 2

Eye Damage 1: Serious eye damage/eye irritation – Category 1

Eye Irritation 2A: Serious eye damage/eye irritation – Category 2A

Sensitization - Skin 1: Skin sensitisation – Category 1

Specific Target Organ Toxicity - Single Exposure 3: Specific target organ toxicity (single exposure) – Category 3

Aquatic Acute 1: Hazardous to the aquatic environment - acute aquatic hazard – Category 1

Aquatic Acute 2: Hazardous to the aquatic environment - acute aquatic hazard – Category 2

Aquatic Chronic 1: Hazardous to the aquatic environment - long-term aquatic hazard – Category 1

Aquatic Chronic 2: Hazardous to the aquatic environment - long-term aquatic hazard – Category 2

- *** Data compared to the previous version altered.**