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· **Product Identifier**
· **Trade Name: EP1225 Black B**
· **Application of the Substance or Mixture:** Epoxy Hardener

· **Details of the Supplier of the Safety Data Sheet (SDS)**
· **Manufacturer or Supplier:**
Resinlab, LLC
N109 W13300 Ellsworth Drive,
Germantown, WI 53022
1-800-388-8605
www.resinlab.com
· **Information Department:** Product Safety Department: msds@resinlab.com
· **Emergency Telephone Number:**
North America - Chemtrec: 1-800-424-9300 (24 hours)
International - Chemtrec: 01-703-527-3887 (24 hours)

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2 Hazard(s) identification

· **Hazard Classification**


GHS08 Health hazard

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


GHS05 Corrosion

Skin Corr. 1B H314 Causes severe skin burns and eye damage.
Eye Dam. 1 H318 Causes serious eye damage.


GHS09 Environment

Aquatic Chronic 1 H410 Very toxic to aquatic life with long lasting effects.


GHS07

Acute Tox. 4 H302 Harmful if swallowed.
Acute Tox. 4 H312 Harmful in contact with skin.
Skin Sens. 1 H317 May cause an allergic skin reaction.

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


GHS05 GHS07 GHS08 GHS09

· **Signal Word** Danger

· **Hazard-determining Component(s)**
N-(2-Aminoethyl)piperazine
4-Nonylphenol, branched
Diethylenetriamine
· **Hazard statements**
Harmful if swallowed or in contact with skin.

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Causes severe skin burns and eye damage.
May cause an allergic skin reaction.
Suspected of damaging fertility or the unborn child.
Very toxic to aquatic life with long lasting effects.

· **Precautionary statements**
Do not breathe dusts or mists.
Wear protective gloves.
Wear protective gloves / protective clothing.
Wear eye protection / face protection.
Avoid release to the environment.
Wash thoroughly after handling.
Contaminated work clothing must not be allowed out of the workplace.
Obtain special instructions before use.
Do not handle until all safety precautions have been read and understood.
Do not eat, drink or smoke when using this product.
IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.
If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
Immediately call a poison center/doctor.
Specific treatment (see on this label).
If swallowed: Call a poison center/doctor if you feel unwell.
IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
Wash contaminated clothing before reuse.
IF exposed or concerned: Get medical advice/attention.
If skin irritation or rash occurs: Get medical advice/attention.
If swallowed: Rinse mouth. Do NOT induce vomiting.
Collect spillage.
Take off contaminated clothing and wash it before reuse.
Store locked up.
Dispose of contents/container in accordance with local/regional/national/international regulations.

· **Prevention**
Do not breathe dust/fume/gas/mist/vapors/spray.
Wear protective gloves/protective clothing/eye protection/face protection.
Use personal protective equipment as required.
Avoid release to the environment.
Wash thoroughly after handling.
Contaminated work clothing must not be allowed out of the workplace.
Obtain special instructions before use.
Do not handle until all safety precautions have been read and understood.
Avoid breathing dust/fume/gas/mist/vapors/spray

· **Disposal** *Dispose of contents/container in accordance with local/regional/national/international regulations.*

· **Hazard Rating System**
· **NFPA System**
· **NFPA Ratings (scale 0 - 4)**

Health = 3
Fire = 1
Reactivity = 0

NFPA special hazards (water reactivity and oxidizing property): None

· **HMIS System**
· **HMIS Ratings (scale 0 - 4)**

HEALTH	3
FIRE	1
REACTIVITY	0

Health = 3
Fire = 1
Reactivity = 0

· **Other hazards**
· **Results of PBT and vPvB assessment**
· **PBT:** *Not applicable.*

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· **vPvB:** Not applicable.

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3 Composition/information on ingredients

· **Chemical Characterization: Mixtures**

· **Composition/Information on Ingredients**

CAS: 84852-15-3 EINECS: 284-625-5 Index Number: 601-053-00-8	4-Nonylphenol, branched Repr. 2, H361 Skin Corr. 1B, H314; Eye Dam. 1, H318 Aquatic Chronic 1, H410 Acute Tox. 4, H302	50-60%
CAS: 140-31-8 EINECS: 205-411-0 Index Number: 612-105-00-4 RTECS: TK 8050000	N-(2-Aminoethyl)piperazine Acute Tox. 3, H311 Skin Corr. 1B, H314; Eye Dam. 1, H318 Acute Tox. 4, H302; Skin Sens. 1, H317 Aquatic Acute 3, H402; Aquatic Chronic 3, H412	30-40%
CAS: 111-40-0 EINECS: 203-865-4 Index Number: 612-058-00-X RTECS: IE 1225000	Diethylenetriamine Skin Corr. 1B, H314 Acute Tox. 4, H302; Acute Tox. 4, H312; Skin Sens. 1, H317	≤1%

· **Classification System:**
The Classifications were based on the Toxicological and Ecological Data of the substances/mixtures in the Section 11 and 12.

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4 First-aid measures

· **Description of First Aid Measures**

· **General Information**
Ensure medical personnel are aware of exposure and take precautions for their personal protection; see Section 8 for the information of personal protection.

· **After Inhalation**
Remove victim from exposure to fresh air. Keep person at rest. Provide oxygen if person is not breathing.
It may be dangerous to the person administering rescue breaths.
Supply fresh air and to be sure call for a doctor.
In case of unconsciousness place patient stably in side position for transportation.
If breathing is difficult, administer oxygen.
Seek immediate medical advice.

· **After Skin Contact**
Immediately remove all contaminated clothing and put them in a tightly sealed bag.
Immediately wash contaminated skin with water and soap and rinse them thoroughly.
Seek immediate medical advice even if no symptoms develop.

· **After Eye Contact**
Immediately rinse opened eyes for at least 15 minutes under running water.
Immediately remove contact lenses if present. Continue rinsing.
Do not put any ointments, oils or medication in eyes without specific instructions.
IMMEDIATELY transport victim to a hospital even if no symptoms develop.

· **After Swallowing**
If victim is unconscious; never give anything by mouth.
If victim is conscious; rinse out mouth and give victim small amounts of water.
Do NOT induce vomiting.
Drink fluids and provide fresh air, get medical attention immediately.
If vomiting occurs spontaneously, keep victim's head below hips to prevent aspiration of liquid into lungs.
Seek immediate medical advice.

· **After Exposure**
Move to fresh air at once.

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Get medical advice/attention at once.

· **Information for Doctor** Have chemical containers, labels and/or (M)SDS ready when calling or visiting a medical center.

· **Indication of any Immediate Medical Attention and Special Treatment Needed**
After frequent or high intense exposure, the following medical tests are recommended:
eye tests
skin tests
kidney tests
Reproductive system function tests
Check section 11 Toxicological Information for further relevant information.

· **Additional Information**
For additional information, please consult the corresponding first aid measures in the most current version of Emergency Response Guidebook which is produced by the US Department of Transportation.

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5 Fire-fighting measures

· **Extinguishing Media**

· **Suitable Extinguishing Agent(s)**
Use fire fighting measures and extinguishing agents that suit the environment.
In case of fire, suitable extinguishing agents are:
Alcohol resistant foam.
Dry chemical or fire-extinguishing powder.
Carbon dioxide (CO_2).
Water spray or water fog.

· **Unsuitable Extinguishing Agent(s)** Water with full jet

· **Firefighting Procedures**
Isolate fire and deny unnecessary entry.
Eliminate all ignition sources if safe to do so.
Do not extinguish fire unless flow can be stopped.
Fight fire remotely due to the risk of explosion.
Solid stream of water may spread fire; use water spray or water fog.
Cool all affected containers with flooding quantities of water.
Runoff from fire control or dilution water may be corrosive and/or toxic; protect personnel and minimize property damage.
Contain fire water runoff if possible to prevent environmental pollution.
Fight fire from protected location or safe distance.
Contain fire water runoff if possible to prevent environmental pollution.

· **Special Hazards Arising in Fire**
In case of fire, following can be released:
Carbon oxides and Nitrogen oxides

· **Advice for Firefighters**
If employees are expected to fight fires, they must be trained and equipped as stated in the OSHA fire brigades standard (29 CFR 1910.156).
As with any fire, wear positive-pressure self-contained breathing apparatus and full protective gear that are NIOSH approved.

· **Additional Information** Ensure adequate and functional fire fighting facilities equipped in working area at all times.

*
6 Accidental release measures

· **Personal Precautions**
Do not touch damaged containers or spills unless wearing appropriate protective equipment.
Do not breathe gas, vapors, dusts or mists if their inhalable particles occur during use.
Ensure personnel take precautions for their personal protection during clean up; see Section 8 for the specific requirements.

· **Environmental Precautions**
Keep away from sewage system or other water courses; do not penetrate ground/soil.
Inform respective authorities in case of any seepage to the environment.

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· **Cleaning Up Methods**
Ensure adequate ventilation.
Eliminate all ignition sources.
Keep unauthorized personnel away.
For large spills:
Shut off source of leak if safe to do so.
Dike and contain.
Remove with vacuum trucks or pump to storage/salvage vessels.
Absorb residues with liquid-binding materials.
For small spills:
Ventilate and wash area after clean-up is complete.
Collect spills in suitable and properly labeled containers.
Do not use solvents unless following safe handling practices and within the recommended exposure guidelines.
Dispose contaminated chemicals as waste according to Section 13.

· **Additional Information** No further relevant information.

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7 Handling and storage

· **Handling**
· **Precautions for Safe Handling**
Obtain special instruction before use; do not handle until all safety precautions have been read and understood.
Do not breathe gas, vapors, dusts or mists if their inhalable particles occur during handling.
Avoid any body contact of containers or contents unless wearing appropriate personal protective equipment.
Wear respiratory protection when handling.
Ensure good ventilation and/or exhaustion at workplace.
Keep away from incompatible material(s).
Avoid any release into the environment.
Observe all the personal protection requirements in Section 8.
· **Information about Protection Against Explosions and Fires**
Will not burn unless preheated.
Keep away from heat, sparks, open flame and other ignition sources during handling.

· **Storage**
· **Requirements to be Met by Storerooms and Receptacles**
Store in a well-ventilated place; provide ventilation for receptacles.
Keep stored in accordance with local, regional, national, and international regulations.
· **Information about Storage in One Common Storage Facility**
Store away from incompatible material(s).
Store away from foodstuffs.
Avoid release to the environment.

· **Additional Information** No further relevant information.

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8 Exposure controls/personal protection

· **Engineering Measures or Controls**

· **Exposure Limit Values that Require Monitoring at the Workplace**

84852-15-3 4-Nonylphenol, branched	
TEEL-1	Short-term value: 20 mg/m³
TEEL-2	Short-term value: 125 mg/m³
TEEL-3	Short-term value: 500 mg/m³
140-31-8 N-(2-Aminoethyl)piperazine	
TEEL-1	Short-term value: 7.5 mg/m³
TEEL-2	Short-term value: 50.0 mg/m³
TEEL-3	Short-term value: 500 mg/m³

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111-40-0 Diethylenetriamine	
REL	Long-term value: 4 mg/m³, 1 ppm Skin
TLV	Long-term value: 4.2 mg/m³, 1 ppm Skin

· **Other Engineering Measures or Controls**
Ventilation rates should be matched to conditions.
If applicable, use process enclosure(s), local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits.

· **Personal Protective**

· **General Protective and Hygienic Measures**
Avoid any contact with skin or eye.
Do not eat, drink or smoke during work.
Keep food, drink or feed away from working area.
Contaminated work clothing is not allowed out of workplace.
Clean hands and exposed skin thoroughly after work and before breaks.

· **Personal Protective Equipment (PPE)**

· **Breathing Equipment**
Caution! Improper use of respirators is dangerous.
In case of brief exposure or low pollution, use a respiratory filter device.
In case of intensive or longer exposure, use a positive-pressure respiratory protective device that is independent of circulating air.

· **Hand Protection**

Protective gloves

Selection of glove material should take into consideration the penetration times, rates of diffusion, and the degradation.
Suggested glove type(s):
Nitrile Gloves
Butyl Rubber Gloves

· **Eye Protection**

Brief or short term use: Tightly sealed goggles

Intensive or long term use: Tightly sealed goggles and Face Shields

· **Body Protection**

Intensive or long term use: Protective Clothing

· **Additional Information**
All protective clothing (suits, gloves, footwear, headgear) should be clean, available every day, and put on before work.
The Engineering measures or controls, and PPE recommendations are only guidelines and may not apply to every situation. For additional information, please consult the corresponding requirements under OSHA 29 CFR 1910.94-95, and 29 CFR 1910.132-138.

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9 Physical and chemical properties

· **Information on Basic Physical and Chemical Properties**	
· **Appearance:**	
· **Form:**	Liquid
· **Color:**	Light yellow
· **Odor:**	Amine-like
· **Odor Threshold:**	Not determined.
· **PH-Value:**	Not determined.
· **Change in Condition:**	
· **Melting Point:**	Not determined.
· **Boiling Point:**	> 222 °C (> 432 °F)
· **Flash Point:**	>93 °C (>199 °F)
· **Decomposition Temperature:**	Not determined.
· **Auto-ignition Temperature:**	Not determined.
· **Flammability:**	Not determined.
· **Explosion:**	Not determined.
· **Explosion Limits:**	
· **Lower:**	Not determined.
· **Upper:**	Not determined.
· **Vapor Pressure:**	Not determined.
· **Vapor Density:**	not determined
· **Density at 25 °C (77 °F):**	0.97 g/cm³ (8.095 lbs/gal)
· **Solubility in or Miscibility with**	
· **Water:**	Soluble.
· **Segregation coefficient LogPow (n-octanol/ water):**	Not determined.
· **Viscosity:**	
· **Dynamic at 20 °C (68 °F):**	3000 mPas
· **Kinematic:**	Not determined.
· **Additional Information**	No further relevant information.

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10 Stability and reactivity

· **Physical Hazard(s)** Not a regulated reactive or physical hazard under GHS.

· **Hazardous Reactivity and Chemical Stability**
Heating this substance above 300 deg F in the presence of air may cause slow oxidative decomposition; above 500 deg F polymerization may occur.

· **Thermal Decomposition and Conditions to be Avoided**
Keep away from incompatible material(s).
Thermally decomposes during fire or high heat; keep away from heat, sparks, open flame and other ignition sources.

· **Possibility of Other Hazardous Reaction(s)**
May react with strong reducing agents generating flammable hydrogen (H_2).
May slowly corrode alkali metals.

· **Incompatible Material(s)**
Amines.
Oxidizing agents
Strong acids
Nitrocellulose

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Isocyanates
Aldehydes
Chloroformates
Vinyl acetate, Nitrides, Acrylates, Substituted alkyls, Alkylene oxides, Epichlorohydrin, Caprolactam solution, and Carbon monoxide (CO).

· **Hazardous Decomposition Product(s)**
Oxides of Nitrogen
Carbon Monoxide and Carbon Dioxide
Ammonia (NH_3) and/or Amines.
Thermally decomposes during fire or very high heat. See Section 5 for fire hazards evolved during thermal decomposition.

· **Hazardous Polymerization Product(s)** *No relevant information.*

· **Additional Information** *No further relevant information.*

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11 Toxicological information

· **Acute Toxicity**

· Oral		
84852-15-3 4-Nonylphenol, branched		
Oral	LD50	1604 mg/kg (rat) Reference: Royce SDS (2015)
140-31-8 N-(2-Aminoethyl)piperazine		
Oral	LD50	2140 mg/kg (rat) Royce SDS (2015)
111-40-0 Diethylenetriamine		
Oral	LD50	1315 mg/kg (rat) (average of the test results of LD50 (oral, rats)) 600 mg/kg (pig) (test details not available) When considering the weight of evidence, 1315 mg/kg was used for acute oral classification. Reference: GHS-J (2006) and OECD SIDS (1996).

· **Potential Health Effect(s):**
Harmful if swallowed.
If swallowed, may cause:
abnormal pain
diarrhea
nausea
shock or collapse
See acute inhalative effect(s) for further information

· Dermal		
84852-15-3 4-Nonylphenol, branched		
Dermal	LD50	2031 mg/kg (rabbit) Royce SDS (2015)
140-31-8 N-(2-Aminoethyl)piperazine		
Dermal	LD50	866 mg/kg (rabbit) Reference: OECD SIDS (2005).
111-40-0 Diethylenetriamine		
Dermal	LD50	1090 mg/kg (rabbit) (1 out of 6 rabbits died at 10% concentration) 1090 mg/kg (Estimated from 10% concentration where 1 out of 6 rabbits died) 950 - 1240 mg/kg bw (test detail not available) 650 mg/kg (Calculated from 0.707 mL/kg which was estimated from 1.0 mL/kg where 3 out of 4 rabbits died, and 0.5 mL/kg where 1 out of 4 rabbits died) Reference: ECHA (2011) and OECD SIDS (1996).

· **Potential Health Effect(s):**
Harmful in contact with skin.
See acute inhalative effect(s) for further information.

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· Inhalative

84852-15-3 4-Nonylphenol, branched		
Inhalative	LC50/4 h	(mouse) (Non-toxic; LC50 exceeded the satured vapor value) At 267 mg/m³ (230 ppm), there was no significant depression. At the saturated vapor concentration of 3636 mg/m³ (400 ppm) at 70 °C, there was sensory irritation observed which was rapidly gone after removal from exposure. The substance was not classified as an acute inhalative hazard under its regular use. Reference: IUCLID Dataset (2000).
140-31-8 N-(2-Aminoethyl)piperazine		
Inhalative	LC50/4 h	(rat) (No mortality observed at saturated atmosphere) No mortality was observed in rats after a single exposure to the saturated atmosphere for 8 hours. Reference: OECD SIDS (2005).
111-40-0 Diethylenetriamine		
Inhalative	LC50/4 h	0.71 mg/l (rat) (LC50(vapor; 4 hours)) NOEL (lethality; aerosolized air; OECD TG 403) = 0.07 mg/L LC100 (lethality; aerosolized air; OECD TG 403) = 0.30 mg/L LC50 (vapor; 4 hours) = 170 ppm = 0.71 mg/L (1 ppm = 4.22E-3 mg/L) The LC50 value (4 hours) of 170ppm was lower than 90% of the saturated vapor concentration (200ppm) under a saturated vapour pressure of 0.2hPa (20 °C), the substance was therefore considered as vapor containing substantially no mist. Thus, the substance was classified as an Acute-2 inhalative hazard based on the criteria. Reference: ECHA (2011), GHS-J (2006) and NLM HSDB (2011).

· Potential Health Effect(s):
While not a classified inhalative acute toxicity hazard, the product may cause the following symptoms:
sore throat
cough, headache, nausea, shortness of breath, vomiting, and wheezing

· Skin Corrosion or Irritation

84852-15-3 4-Nonylphenol, branched	
Corrosion/Irritation	corrosive (rabbit) (Directive 84/449/EEC B4; Post-exposure: 8 days) All tested animals showed signs of erythema, edema, and eschar which were not fully reversible within 8 days. Reference: IUCLID Dataset (2000).
140-31-8 N-(2-Aminoethyl)piperazine	
Corrosion/Irritation	corrosive (rabbit) (US DOT Corrosivity Assay) 100 % pure substance (4 hours) - corrosive 10 % substance (9 -11 days) - moderate irritation 10 % substance (abraded skin, 2 days) - deep necrosis Thus, the substance was classified as corrosive to rabbit skin (Category 1). Reference: OECD SIDS (2005).
111-40-0 Diethylenetriamine	
Corrosion/Irritation	corrosive (rabbit) A 15 min-contact to a 40% solution of the substance resulted in visible erythema in 1 out of 2 animals. A 15 min-contact to a 100% solution of the substance resulted in necrosis in 2 out of 2 animals with remaining deep scar 21 days after application. Thus, the substance was classified as corrosive to rabbit skin (Category 1B). Reference: ECHA (2011).

· Potential Health Effect(s):
Causes severe skin burns and eye damage.
In contact with skin, may cause:
redness, pain and severe skin burns

· Eye Serious Damage or Irritation

84852-15-3 4-Nonylphenol, branched	
Damage/Irritation	serious irrit. (rabbit) (Draize Test) There was corneal opacity in all animals and iritis in two. Meanwhile, all treated animals showed marked conjunctival involvement with transient discharges. Thus, the substance was classified as a serious eye irritant (Category 1). Reference: IUCLID Dataset (2000).
140-31-8 N-(2-Aminoethyl)piperazine	
Damage/Irritation	serious damage (rabbit) Neat substance applied to rabbit eyes caused extensive irritation in the conjunctiva and cornea, which most likely resulted in permanent blindness. Reference: OECD SIDS (2005).

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111-40-0 Diethylenetriamine	
Damage/Irritation	(rabbit) (seriously damage) Cornea: 4.33/5 (Max. 5; at 1+24+48 hrs; pure substance; mean score of all treated animals; both 30-sec contact and full-time contact). 30 sec-contact (washed after 30 sec) was 50% opaque; and unwashed eye (full-time contact) was completely opaque one hour after application. Conjunctivae: 6/6 (Max. 6; at 1+24+48 hrs; pure substance; mean score of all treated animals; both 30-sec contact and full-time contact). Severely inflamed and swollen conjunctiva with edematous membranes were observed which were not reversible within 8 days after application. Thus, the substance was classified as a serious eye irritant (Category 1). Reference: ECHA (2011).

· **Potential Health Effect(s):**
Causes serious eye damage.
In contact with eye, may cause:
decrease or loss of vision
redness, pain and severe deep burns

· **Respiratory or Skin Sensitization**

84852-15-3 4-Nonylphenol, branched		
Sensitization	Skin	not sensitizing (guinea pig) (Buehler test with OECD TG 406) Guinea pig maximization test - negative There was no significant difference between treated and negative controlled groups; the substance was not classified as a dermal sensitizer. Reference: IUCLID Dataset (2000).
	Respiratory	(No data available)

140-31-8 N-(2-Aminoethyl)piperazine		
Sensitization	Skin	sensitizing (guinea pig) (OECD TG 406) 5 out of 20 guinea pigs showed positive responses in the maximization tests. For safety reason, the substance was classified as a skin sensitizer (Category 1). Reference: OECD SIDS (2005).
	Respiratory	(No data available)

111-40-0 Diethylenetriamine		
Sensitization	Skin	sensitizing (mouse) (OECD TG 429) Stimulation index: 1.0 (0%; the negative controlled group). Stimulation index: 2.6, 3.3, and 3.5 (2.5%, 5%, and 10% respectively). The substance was classified as sensitizing to mouse skin. Reference: ECHA (2011).
	Respiratory	(Test species: n/a) (conclusive but not sufficient for classification) Reference: ECHA (2011).

· **Potential Health Effect(s):**
May cause an allergic skin reaction.
Repeated skin contact may cause dermatitis, skin rash or itchiness.
No relevant information for respiratory sensitization; classification is not possible.

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

None of the ingredients is listed.

· **Germ Cell Mutagenicity**

84852-15-3 4-Nonylphenol, branched	
Mutagenicity	negative (mouse) (In Vivo (Directive 79/831/EEC, B12)) In Vitro (Ames test; salmonella typhimurium) - negative with and without metabolic activation In Vitro (HGPRT assay with OECD TG 476; Chinese Hamster) - negative with and without metabolic activation In Vivo (Directive 79/831/EEC, B12; mouse) - no mutagenic effects in mouse erythrocytes were observed during the test sampling time. Reference: IUCLID Dataset (2000).

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140-31-8 N-(2-Aminoethyl)piperazine	
Mutagenicity	negative (Human) (In Vitro (Cytogenic Assay with OECD TG 473)) In Vitro (Salmonella typhimurium; OECD TG 471) - Negative with and without metabolic activation negative (mouse) (In Vivo (Micronucleus Assay)) In Vitro (Mouse; Lymphoma Assay) - Negative with and without metabolic activation. In Vitro (Mouse; Gene Mutation Assay) - Positive without metabolic activation (due to high pH) In Vitro (Rat; Unscheduled DNA Synthesis with OECD TG 482) - Negative In Vitro (Saccharomyces cerevisiae) - Negative with and without metabolic activation. When considering all of the evidence, the substance is not classified as a mutagen. Reference: OECD SIDS (2005) and IUCLID Dataset (2000).
111-40-0 Diethylenetriamine	
Mutagenicity	negative (salmonella typhimurium) (In Vitro (Bacterial reverse mutation assay)) In Vitro (bacterial reverse mutation assay in Salmonella typhimuriun TA98, TA100, TA1535, and TA1537 strains with OECD TG 471) - negative with and without metabolic activation In Vitro (bacterial reverse mutation assay in E .coli WP2 uvrA with OECD TG 471) - negative with and without metabolic activation In Vitro (mammalian chromosome aberration test in Chinese hamster Ovary (CHO) cells with EPA Method 560/6-82-001) - negative without metabolic activation In Vivo (Drosophila SLRL test; male D. melanogasters; EPA Method 560/6-82-001; oral) - negative; the substance did not induce a significant increase in SLRL mutation frequencies by comparing with the control groups. negative (mouse) (In Vivo (Micronucleus assay)) In Vivo (micronucleus assay; CD-1 strains; OECD TG 474; oral with up to 850 mg/kg bw) - negative; the substance did not significantly increase the frequencies of micronucleated polychromatic erythrocytes, and was therefore considered as negative in the mouse bone marrow micronucleus test. Reference: ECHA (2011).

· **Potential Health Effect(s):** Not a known Germ Cell Mutagen.

· Carcinogenicity

84852-15-3 4-Nonylphenol, branched	
Carcinogenicity	negative (Test species: n/a) (not listed as a Carcinogen by NTP, IARC or OSHA) Reference: Hexion (M)SDS (2004).
140-31-8 N-(2-Aminoethyl)piperazine	
Carcinogenicity	negative (Test species: n/a) (not listed as a Carcinogen by NTP, IARC or OSHA)
111-40-0 Diethylenetriamine	
Carcinogenicity	negative (mouse) (No treatment related tumor observed) NOEL (Carcinogenicity; male mice; 3 feeds/week) = 56.3 mg/kg bw (maximum test dose). There was no treatment related tumor observed. Reference: ECHA (2011).

· **Potential Health Effect(s):** Not a known Carcinogen.

· Reproductive Toxicity

84852-15-3 4-Nonylphenol, branched	
Reproductive Toxi.	positive (rat) (NOAEL (oral) = 15 mg/kg/day) There were adverse effects on pups observed at the non-maternally toxic doses; the substance was therefore classified as a suspected reproductive hazard by EU. Reference: EPA HPVIS (2010) and REACh CLP (2012).
140-31-8 N-(2-Aminoethyl)piperazine	
Reproductive Toxi.	negative (rat) (OECD TG 422; No reproductive performance observed) Route: Oral with up to 416 mg/kg/day (male rats) and 598 mg/kg/day (female rats) No reproductive performance in maternal animals or general physical condition in F1 pups was observed at any dose levels. Thus, the substance was not classified as a reproductive hazard. Reference: ECHA (2011).
111-40-0 Diethylenetriamine	
Reproductive Toxi.	N/A (rat) (conclusive but not sufficient for classification) NOAEL (OECD TG 421; oral; 28 days) = 30 mg/kg/day; loss of post-implantation and greater duration of gestation were both observed at 100 and 300 mg/kg bw/day. However, ECHA concluded it as conclusive but not sufficient for classification. Reference: ECHA (2011) and GHS-J (2006).

· **Potential Health Effect(s):** Suspected of damaging fertility or the unborn child.

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· Specific Target Organ Toxicity - Single Exposure

84852-15-3 4-Nonylphenol, branched	
STOT-Single	(No data available)
140-31-8 N-(2-Aminoethyl)piperazine	
STOT-Single	Target: N/A (rat) (conclusive but not sufficient for classification) NOAEL (oral) < 2097 mg/kg At necropsy, slightly congested lungs, mottled livers, intestine and adrenal hemorrhaged stomach, and congested internally but pale externally kidneys were observed in victims that were killed at the dose level of 2097 mg/kg. NOAEL was not established. Meanwhile, ECHA concluded it as conclusive but not sufficient for classification. Reference: ECHA (2011).
111-40-0 Diethylenetriamine	
STOT-Single	(rat) (Respiratory tract irritation via inhalation) Respiratory tract irritation were observed in treated rats via inhalation. Reference: ECHA (2011).

· **Potential Health Effect(s):** No further relevant information; classification is not possible.

· Specific Target Organ Toxicity - Repeated Exposure

84852-15-3 4-Nonylphenol, branched	
STOT-Repeated	(rat) (Target: Kidney via Oral routes) NOAEL (oral, 90 days) = 50 mg/kg/day; there were renal tubular epithelial degeneration and renal tubular dilatation observed from the test animals. Reference: Huntsman (M)SDS (2009), EPA HPVIS (2010), IUCLID Dataset (2000) and GHS-J (2006).
140-31-8 N-(2-Aminoethyl)piperazine	
STOT-Repeated	Target: None (rat) (After repeated dermal or oral administration) Target organs: None NOAEL (dermal; 4 weeks; OECD TG 410) = 1000 mg/kg/day (the maximum test dose) There was no evidence of systemic toxicity observed. (rat) (Oral; OECD TG 422) Target organs: None A test item-related lower mean final body weight was apparent in females of the 8000 ppm/day group (598 mg/kg/day) at the scheduled necropsy. However, the dose level was outside of the guidance value ranges. Reference: OECD SIDS (2005) and ECHA (2011).
111-40-0 Diethylenetriamine	
STOT-Repeated	Target: None (rat) (No systemic effects after oral or inhalative doses) -Target organs: None Groups of rats which were exposed to an essentially saturated vapor of the substance for 6 hrs/day for 15 days showed no adverse effects. -Target organs: None NOAEL (OECD TG 451; oral with up to 1210 mg/kg bw/day; 4 weeks) = 70 mg/kg bw/day LOAEL (OECD TG 451; oral with up to 1210 mg/kg bw/day; 4 weeks) = 530 mg/kg bw/day which was outside of the guidance value ranges. Reference: ECHA (2011).

· **Potential Health Effect(s):** No further relevant information; classification is not possible.

· Aspiration Hazard

84852-15-3 4-Nonylphenol, branched	
Aspiration Hazard	(No data available)
140-31-8 N-(2-Aminoethyl)piperazine	
Aspiration Hazard	(No data available)
111-40-0 Diethylenetriamine	
Aspiration Hazard	(No data available)

· **Potential Health Effect(s):** No relevant information; classification is not possible.

· **Additional Information** No further relevant information.

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12 Ecological information

· Aquatic Environmental Toxicity

84852-15-3 4-Nonylphenol, branched

Algae Toxicity	0.27 mg/l (Skeletonema costatum) (EC50 (96 hrs)) (Pseudokirchneriella subcapitata) EC50 (96 hrs) = 0.41 mg/L (Scenedesmus subspicatus) EC50 (72 hrs; Algenwachstums-Hemmtest nach UBA) = 1.3 mg/L
Crustacean Toxicity	0.15 mg/l (Hyalella azteca) (EC50 (96 hrs)) (Daphnia magna (water flea)) EC50 (48 hrs) = 0.035 mg/L Royce SDS (2015) NOEC (21 days) = 0.024 mg/L (Mysidopsis bahia) EC50 (96 hrs) = 0.043 mg/L NOEC (28 days) = 3.9 µg/L
Fish Toxicity	0.14 mg/l (Pimephales promelas (fathead minnow)) Royce SDS (2015)

140-31-8 N-(2-Aminoethyl)piperazine

Algae Toxicity	495 mg/l (Green Algae) (EC50 (72 hrs); OECD TG 201) Royce SDS (2015)
Crustacean Toxicity	32 mg/l (Daphnia magna (water flea)) (EC50 (48 hrs); OECD TG 202) Based on the non-rapid degradability and the acute EC50 < 100 mg/L, the substance is classified as a Chronic-3 environmental hazard. Royce SDS (2015)
Fish Toxicity	368 mg/l (Leuciscus idus (Ide or Orfe)) (LC50 (96 hrs)) 560 mg/l (Pimephales promelas (fathead minnow)) (LC50 (96 hrs); OECD TG 203) Reference: OECD SIDS (2005) and ECHA (2011).

111-40-0 Diethylenetriamine

Algae Toxicity	72 mg/l (Selenastrum capricornum) (EC50 (72 hrs; biomass); OECD TG 201) 1164 mg/l (EC50 (72 hrs; growth-rate); OECD TG 201)
Crustacean Toxicity	16 mg/l (Daphnia magna (water flea)) (EC50 (48 hrs); DIN38412 Part 11) 64.6 mg/l (EC50 (48 hrs); EU Method C2) 5.6 mg/L (NOEC (21 days); EU Method C20) Based on the acute EC50 < 100 mg/L, the substance is classified as an Acute-3 environmental hazard.
Fish Toxicity	430 mg/l (Poecilia reticulata) (LC50 (96 hrs); EU Method C1) > 10 mg/L (NOEC (28 days); OECD TG 210) Based on the non-rapid degradability and the chronic NOEC > 1 mg/L, the substance is not classified as a chronic environmental hazard. Reference: ECHA (2011).

· **Aquatic Environmental Toxicity Assessment:** Very toxic to aquatic life with long lasting effects.

· Degradability and Stability

84852-15-3 4-Nonylphenol, branched

Biodegradation	non-biodegrad. (Test species: n/a) (Read-across from 25154-52-3; OECD TG 301C) Biodegradation (Conc. 100 ppm; 2 weeks; Direct analysis from GC, UV-vis, HPLC) = 8.9, 5.3, 2.5% Biodegradation (Conc. 100 ppm; 2 weeks; Indirect analysis from BOD) = 0% The substance is non-biodegradable. Reference: NITE CHRIP (2010).
Persistence	(Test species: n/a) (The substance is not persistent) Reference: Canada DSL (2007).
Photodegradation	9.99E-11 cm³/molecule-sec (OH radical) (Half-life (5.0E5 OH/cm³) = 0.3 day) Reference: IUCLID Dataset (2000).
Stability in water	(No data available)

140-31-8 N-(2-Aminoethyl)piperazine

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Biodegradation	non-biodegrad. (Test species: n/a) (Biodegradation (OECD TG 301C) < 5%) Biodegradation (Conc.: 100 mg/L; 4 weeks; Indirect analysis from BOD) < 1% Biodegradation (Conc.: 100 mg/L; 4 weeks; Direct analysis from TOC and GC) ≤ 5% This substance is non-biodegradable. Reference: NITE CHRIP (2011).
Persistence	(Test species: n/a) (The substance is persistent) Reference: NITE CHRIP (2011).
Photodegradation	2.14E-14 cm³/molecule-sec (OH radical) (Half-life (1.5E6 OH/cm³) = 0.6 hours) However, photolysis effect can be seen as negligible based on the partition of the substance to air is less than 1%. Reference: OECD SIDS (2005).
Stability in water	stable (Test species: n/a) Hydrolysis is not expected under environmental conditions (pH from 5 to 9). Reference: IUCLID Dataset (2000).

111-40-0 Diethylenetriamine

Biodegradation	non-biodegrad. (Activated Sludge) (Biodegradation (OECD TG 301C) < 4.3%) Biodegradation (2 weeks; Chemical conc.100 ppm; Direct from TOC and UV-vis) = "a negative value" and 4.3% Biodegradation (2 weeks; Chemical conc.100 ppm; Indirect from BOD) = 0% The substance is not biodegradable. Reference: CHRIP (2011).
Persistence	(Test species: n/a) (The substance is persistent) Reference: Canada DSL (2007).
Photodegradation	1.48E-10 cm³/molecule-sec (OH radical) (Half-life = 2.6 hours) However, photolysis is negligible in water. Reference: ChemID Full Record (2011) and ECHA (2011).
Stability in water	stable (Test species: n/a) (Half-life(pH=8; Conc. 1,5,&15 mg/L)=2,8,&15 days) Half-life (at PH=8; 20 ℃; Chem conc. 1 mg/L) = 2 - 4 days Half-life (at PH=8; 20 ℃; Chem conc. 5 mg/L) = 8 days Half-life (at PH=8; 20 ℃; Chem conc. 15 mg/L) = 15 days Reference: IUCLID Dataset (2000).

· Bioaccumulation and Distribution

84852-15-3 4-Nonylphenol, branched

BCF	90-330 (Cyprinus carpio) (The substance is not bioaccumulative) BCF = 250 - 330 (8 weeks; Concentration: 0.1 ppm) BCF = 90 - 220 (8 weeks; Concentration: 0.01 ppm) (Pimephales promelas (fathead minnow)) BCF (20 days, chemical concentration = 21 µg/L) = 271 Reference: NITE CHRIP (2010) and IUCLID Dataset (2000).
Koc	2580 - 25200 L/kg (Test species: n/a) Calculated from Log Koc = 0.989 LogPow - 0.346 and LogPow of 3.8 - 4.8. Reference: IUCLID Dataset (2000).
LogPow	3.8 - 4.8 (Test species: n/a) Reference: IUCLID Dataset (2000).

140-31-8 N-(2-Aminoethyl)piperazine

BCF	(Test species: n/a) (The substance is not bioaccumulative) Reference: Canada DSL (2007).
Koc	37000 L/kg (Test species: n/a) (Batch equilibrium method) The substance is expected to have high affinity for adsorption to soil and sediments via a cation exchange mechanism. The substance would partition primarily to water (71.4%) and to a lesser extent soil (28.6%) based on Level 3 Fugacity Modeling. Reference: ECHA (2011).
LogPow	-1.48 (Test species: n/a) (Shake-flask method) Reference: ECHA (2011) and OECD SIDS (2005).

111-40-0 Diethylenetriamine

BCF	< 6.3 (Cyprinus carpio) (The substance is not bioaccumulative) BCF (Chemical concentration: 2ppm; 6 weeks) =< 1.7 BCF (Chemical concentration: 0.2ppm; 6 weeks) < 6.3 Reference: CHRIP (2011).

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Koc	2582-36658 L/kg (soil) (EPA OTS 796.2750) LogKoc = 3.4 - 4.6; mobility of the substance in soil is moderate to high. Reference: ECHA (2011).
LogPow	-1.3 to -1.6 (Test species: n/a) (Calculated) Reference: ECHA (2011).

· **Degradability and Bioaccumulation Assessment:** Non-rapidly degradable, and low bioaccumulative.

· **Additional Information** No further relevant information.

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13 Disposal considerations

· **Hazardous Waste List**

· **Description:**
The product has not been evaluated for its hazards when disposed as a waste by RCRA.
However, it is necessary to contain and dispose of the product as a hazardous waste based on the Hazard Identification in Section 2.

· **RCRA Waste:**

111-40-0	Diethylenetriamine	D002	≤1%

· **Waste Treatment Recommendation:**
Generation of waste should be avoided or minimized wherever possible.
Chemical waste, even small quantities, is neither allowed to be poured down drains, sewage system or waterways; nor disposed with household garbage.
Dispose of contents/containers in accordance with local, regional, national, and international regulations.

· **Unused and Uncontaminated Packagings**

· **Recommendation** Dispose of according to your local waste regulations.

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14 Transport information

· **UN-Number**

· **DOT, ADR, IMDG, IATA** UN3267

· **UN Proper Shipping Name**

· **DOT, ADR, IMDG, IATA** Corrosive liquid, basic, organic, n.o.s. (4-Nonylphenol, branched, N-Aminoethylpiperazine)

· **Transport hazard class(es)**

· **DOT**

· **Class** 8 Corrosive substances

· **Label** 8

· **ADR**

· **Class** 8 (C7) Corrosive substances

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· **Label** 8

· **IMDG**

· **Class** 8 Corrosive substances
· **Label** 8

· **IATA**

· **Class** 8 Corrosive substances
· **Label** 8

· **Packing group**
· **DOT, ADR, IMDG, IATA** III

· **Environmental Hazards:** Product contains environmentally hazardous substances: 4-Nonylphenol, branched
· **Marine Pollutant:** Yes
Symbol (fish and tree)
· **Special Marking (ADR):** Symbol (fish and tree)

· **Special Precautions:** Warning: Corrosive substances
· **Danger Code (Kemler):** 80
· **EMS Number:** F-A,S-B
· **Segregation Groups** Alkalis

· **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: 5 L
On cargo aircraft only: 60 L
· **Remarks:** Special marking with the symbol (fish and tree).

· **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":** UN3267, Corrosive liquid, basic, organic, n.o.s. (4-Nonylphenol, branched, N-Aminoethylpiperazine), 8, III

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15 Regulatory information

· **USA Regulation Lists**

· **SARA (Superfund Amendments and Reauthorization Act of 1986)**

· **Section 302 (Extremely Hazardous Substances)**

None of the ingredients is listed.

· **Section 313 (Toxics Release Inventory (TRI) reporting)**

None of the ingredients is listed.

· **Section 311/312 (Hazardous Chemical Inventory Reporting)**

84852-15-3	4-Nonylphenol, branched	A	50-60%
140-31-8	N-(2-Aminoethyl)piperazine	A, C	30-40%
111-40-0	Diethylenetriamine	A, C	≤1%

· **Hazard Abbreviations for SARA 311/312**

A - Acute Health Hazard
C - Chronic Health Hazard
F - Fire Hazard
R - Reactive Hazard
S - Sudden Release of Pressure Hazard

· **TSCA (Toxic Substances Control Act)**

All ingredients are listed.

· **Proposition 65**

· **Chemicals Known to Cause Cancer**

None of the ingredients is listed.

· **Chemicals Known to Cause Reproductive Toxicity for Females**

None of the ingredients is listed.

· **Chemicals Known to Cause Reproductive Toxicity for Males**

None of the ingredients is listed.

· **Chemicals Known to Cause Developmental Toxicity**

None of the ingredients is listed.

· **Carcinogenic Categories**

· **EPA (Environmental Protection Agency)**

None of the ingredients is listed.

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

None of the ingredients is listed.

· **NTP (National Toxicology Program)**

None of the ingredients is listed.

· **TLV (Threshold Limit Value Established by ACGIH)**

None of the ingredients is listed.

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

None of the ingredients is listed.

· **International Regulation Lists**

· **Canadian Domestic Substance Listings:**

All ingredients are listed.

· **Canadian Ingredient Disclosure list (limit 0.1%)**

111-40-0	Diethylenetriamine

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· **Canadian Ingredient Disclosure list (limit 1%)**

140-31-8	N-(2-Aminoethyl)piperazine

· **Chinese Chemical Inventory of Existing Chemical Substances:**

All ingredients are listed.

· **Japanese Existing and New Chemical Substance List:**

All ingredients are listed.

· **Korean Existing Chemical Inventory:**

All ingredients are listed.

· **European Pre-registered substances:**

All ingredients are listed.

· **REACh - Substances of Very High Concern (SVHC) List:**

84852-15-3	4-Nonylphenol, branched	50-60%

· **Restriction of Hazardous Substances Directive (RoHS) list:**

None of the ingredients is listed.

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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 (M)SDS:** Product Safety Department
· **Contact:** msds@resinlab.com

· **Abbreviations and acronyms:**
ACGIH: American Conference of Governmental Industrial Hygienists
ACToR: US EPA Aggregated Computational Toxicology Resource
ADR: European Agreement Concerning the International Carriage of Dangerous Goods by Road
BCF: Bioconcentration Factor
CAS: Chemical Abstracts Service (division of the American Chemical Society)
CCRIS: US NLM TOXNET Chemical Carcinogenesis Research Information System
CHRIP: Japan NITE Information on Biodegradation and Bioconcentration of the Existing Chemical Substances in the Chemical Risk Information Platform
DOT: US Department of Transportation
DSL: Canada Domestic Substance List
ECHA: European Chemicals Agency's Dissemination portal with information on chemical substances registered under REACH
HMIS: US National Paint & Coatings Association (NPCA) Hazardous Materials Identification System
HPVIS: US EPA High Production Volume Information System
HSDB: US NLM TOXNET Hazardous Substances Databank
HSNO CCID: New Zealand Hazardous Substances and New Organisms Chemical Classification Information Database
IARC: International Agency for Research on Cancer developed by United Nations World Health Organisation (WHO)
IATA-DGR: Dangerous Goods Regulations (DGR) by the International Air Transport Association (IATA)
ICAO-TI: Technical Instructions (TI) by the International Civil Aviation Organization (ICAO)
ICSC: International Chemical Safety Cards
IMDG: International Maritime Dangerous Goods; the principal international rules for International Carriage of Dangerous Goods by SEA under the Recommendations on the Transport of Dangerous Goods by United Nations (RTDG)
IUCLID: EU REACh International Uniform Chemical Information Database
Koc: Partition coefficient, soil Organic Carbon to water
LC50/LD50: Lethal Concentration/Dose, 50 percent
N/a: Not available or Not applicable
NFPA: US National Fire Protection Association
NIOSH: US National Institute of Occupational Safety and Health
NITE: National Institute of Technology and Evaluation, Japan
NLM TOXNET: US National Library of Medicine Toxicology Data Network
OECD: Organisation for Economic Co-operation and Development
OSHA: US Occupational Safety and Health Administration
P: Marine Pollutant
RCRA: Resource Conservation and Recovery Act (USA)

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REACh: EU Registry, Evaluation and Authorisation of Chemicals
RID: the Regulations Concerning the International Carriage of Dangerous Goods by Rail; published by the Central Office for International Carriage by Rail (OTIF)
RTDG: the Recommendations on the Transport of Dangerous Goods by United Nations (UN)
RTECS: US Registry of Toxic Effects of Chemical Substances
SARA: US Superfund Amendments and Reauthorization Act
SIDS: OECD existing chemicals Screening Information Data Sets
SVHC: EU ECHA Substance of Very High Concern
TEEL: Temporary Emergency Exposure Limit developed by US Subcommittee on Consequence Assessment and Protective Actions (SCAPA) of US Department of Energy (DOE)
TOXLINE: US NLM bibliographic database search system
TSCA: US Toxic Substance Control Act
ESIS: European Chemical Substances Information System

· **Date of preparation / last revision** 05/21/2015 / 1