URALANE® 5774-1 A US

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SECTION 1. IDENTIFICATION

Product name : URALANE® 5774-1 A US

Manufacturer or supplier's details

Company name of supplier : Huntsman Advanced Materials Americas LLC
Address : P.O. Box 4980
The Woodlands,
TX 77387
United States of America (USA)
Telephone : Non-Emergency: (800) 257-5547

E-mail address : Global_Product_EHS_AdMat@huntsman.com

Emergency telephone number : Chemtrec: (800) 424-9300 or (703) 527-3887

Recommended use of the chemical and restrictions on use

Recommended use : Component of a Polyurethane System.

SECTION 2. HAZARDS IDENTIFICATION

GHS classification in accordance with the OSHA Hazard Communication Standard (29 CFR 1910.1200)

Acute toxicity (Inhalation) : Category 4

Skin irritation : Category 2

Eye irritation : Category 2A

Respiratory sensitisation : Category 1

Skin sensitisation : Category 1

Specific target organ toxicity - single exposure : Category 3 (Respiratory system)

Specific target organ toxicity - repeated exposure (Inhalation) : Category 2

GHS label elements

Hazard pictograms :

Signal word : Danger

Hazard statements : H315 Causes skin irritation.

H317 May cause an allergic skin reaction.
H319 Causes serious eye irritation.
H332 Harmful if inhaled.
H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled.
H335 May cause respiratory irritation.
H373 May cause damage to organs through prolonged or repeated exposure if inhaled.

Precautionary statements : **Prevention:**
P260 Do not breathe dust.
P264 Wash skin thoroughly after handling.
P271 Use only outdoors or in a well-ventilated area.
P272 Contaminated work clothing must not be allowed out of the workplace.
P280 Wear protective gloves/ eye protection/ face protection.
P285 In case of inadequate ventilation wear respiratory protection.
Response:
P302 + P352 IF ON SKIN: Wash with plenty of soap and water.
P304 + P340 + P312 IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/ doctor if you feel unwell.
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.
P342 + P311 If experiencing respiratory symptoms: Call a POISON CENTER/ doctor.
P362 Take off contaminated clothing and wash before reuse.
Storage:
P403 + P233 Store in a well-ventilated place. Keep container tightly closed.
P405 Store locked up.
Disposal:
P501 Dispose of contents/ container to an approved waste disposal plant.

Other hazards

None known.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Hazardous components

Chemical name	CAS-No.	Concentration (% w/w)
Oxirane, methyl-, polymer with oxirane, ether with 1,2,3-propanetriol (3:1), polymer with 1,1'-methylenebis[4-isocyanatocyclohexane]	67837-35-8	50 - 70
2-Oxepanone, polymer with 1,1'-methylenebis[4-isocyanatocyclohexane]	54954-83-5	10 - 20

and 2,2'-oxybis[ethanol]		
4,4'-methylenedicyclohexyl diisocyanate	5124-30-1	1 - 5

The specific chemical identity and/or exact percentage (concentration) of composition may be withheld as a trade secret.

SECTION 4. FIRST AID MEASURES

General advice : Move out of dangerous area.
Do not leave the victim unattended.
Get medical attention immediately if symptoms occur.
Show this safety data sheet to the doctor in attendance.

If inhaled : If breathed in, move person into fresh air.
Call a physician or poison control centre immediately.
Keep patient warm and at rest.
Keep respiratory tract clear.
If breathing is difficult, give oxygen.
If breathing is irregular or stopped, administer artificial respiration.
If unconscious, place in recovery position and seek medical advice.
Consult a physician immediately if symptoms such as shortness of breath or asthma are observed.
A hyper-reactive response to even minimal concentrations of diisocyanates may develop in sensitised persons.
The exposed person may need to be kept under medical surveillance for 48 hours.
LC50 (rat) : ca. 490 mg/m³ (4 hours) : using experimentally produced respirable aerosol having aerodynamic diameter <5microns.
Methods used to generate the exposure concentrations in the animal studies use extreme laboratory conditions and does not represent actual exposure conditions of the material in the workplace, storage, transportation or expected use on the market due to the very low vapor pressure. Therefore, these test results cannot be used to for hazard classification of the material. Rather, an acute toxicity estimate is calculated based on weight of evidence and expert judgement and is used to justify a modified classification for acute inhalation toxicity.

In case of skin contact : In case of contact, immediately flush skin with soap and plenty of water.
Take off contaminated clothing and shoes immediately.
Wash contaminated clothing before reuse.
Thoroughly clean shoes before reuse.
Call a physician if irritation develops or persists.
An MDI study has demonstrated that a polyglycol-based skin cleanser (such as D-Tam™, PEG-400) or corn oil may be more effective than soap and water.

In case of eye contact	:	Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. If easy to do, remove contact lens, if worn. Protect unharmed eye. Keep eye wide open while rinsing. Seek medical advice.
If swallowed	:	Gently wipe or rinse the inside of the mouth with water. DO NOT induce vomiting unless directed to do so by a physician or poison control center. Keep respiratory tract clear. Keep at rest. If a person vomits when lying on his back, place him in the recovery position. Never give anything by mouth to an unconscious person. Take victim immediately to hospital. If symptoms persist, call a physician.
Most important symptoms and effects, both acute and delayed	:	Severe allergic skin reactions, bronchiospasm and anaphylactic shock This product is a respiratory irritant and potential respiratory sensitiser: repeated inhalation of vapour or aerosol at levels above the occupational exposure limit could cause respiratory sensitisation. Symptoms may include irritation to the eyes, nose, throat and lungs, possibly combined with dryness of the throat, tightness of chest and difficulty in breathing. The onset of the respiratory symptoms may be delayed for several hours after exposure. A hyper-reactive response to even minimal concentrations of MDI may develop in sensitised persons.
Protection of first-aiders	:	No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. If potential for exposure exists refer to Section 8 for specific personal protective equipment. First Aid responders should pay attention to self-protection and use the recommended protective clothing
Notes to physician	:	Symptomatic and supportive therapy as needed. Following severe exposure medical follow-up should be monitored for at least 48 hours. The first aid procedure should be established in consultation with the doctor responsible for industrial medicine.

SECTION 5. FIREFIGHTING MEASURES

Suitable extinguishing media	:	Use extinguishing measures that are appropriate to local circumstances and the surrounding environment. Foam

Carbon dioxide (CO2)
Dry powder

Unsuitable extinguishing media	:	Water may be used if no other available and then in copious quantities. Reaction between water and hot isocyanate may be vigorous.
Specific hazards during firefighting	:	Do not allow run-off from fire fighting to enter drains or water courses. The pressure in sealed containers can increase under the influence of heat. Exposure to decomposition products may be a hazard to health.
Hazardous combustion products	:	Combustion products may include: carbon monoxide, carbon dioxide, nitrogen oxides, hydrocarbons and HCN. In the event of extreme heat (>500 degrees C), aniline is suspected of being formed.
Specific extinguishing methods	:	Cool containers/tanks with water spray.
Further information	:	Standard procedure for chemical fires. Due to reaction with water producing CO2-gas, a hazardous build-up of pressure could result if contaminated containers are re-sealed. Collect contaminated fire extinguishing water separately. This must not be discharged into drains. Prevent fire extinguishing water from contaminating surface water or the ground water system. Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.
Special protective equipment for firefighters	:	Wear an approved positive pressure self-contained breathing apparatus in addition to standard fire fighting gear.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures	:	Immediately evacuate personnel to safe areas. Use personal protective equipment. If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. Ensure adequate ventilation. Keep people away from and upwind of spill/leak. Only qualified personnel equipped with suitable protective equipment may intervene. For additional precautions and advice on safe handling, see section 7. Never return spills in original containers for re-use. Make sure that there is a sufficient amount of neutralizing/ absorbent material near the storage area. The danger areas must be delimited and identified using relevant warning and safety signs. Treat recovered material as described in the section "Disposal

considerations".
For disposal considerations see section 13.

Environmental precautions	:	Do not allow uncontrolled discharge of product into the environment. Do not allow material to contaminate ground water system. Prevent product from entering drains. Prevent further leakage or spillage if safe to do so. Local authorities should be advised if significant spillages cannot be contained. If the product contaminates rivers and lakes or drains inform respective authorities.
Methods and materials for containment and cleaning up	:	Clean-up methods - small spillage Contain spillage, soak up with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and transfer to a container for disposal according to local / national regulations (see section 13). Clean contaminated surface thoroughly. Sweep up or vacuum up spillage and collect in suitable container for disposal. Neutralize small spillages with decontaminant. The compositions of liquid decontaminants are given in Section 16. Remove and dispose of residues. Clean-up methods - large spillage If the product is in its solid form: Spilled MDI flakes should be picked up carefully. The area should be vacuum cleaned to remove remaining dust particles completely. If the product is in its liquid form: Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust). Leave to react for at least 30 minutes. Shovel into open-top drums for further decontamination. Wash the spillage area with water. Test atmosphere for MDI vapour. Keep in suitable, closed containers for disposal.

SECTION 7. HANDLING AND STORAGE

Technical measures	:	Ensure that eyewash stations and safety showers are close to the workstation location.
Local/Total ventilation	:	Use only with adequate ventilation.
Advice on protection against fire and explosion	:	Normal measures for preventive fire protection.
Advice on safe handling	:	For personal protection see section 8. Avoid formation of aerosol. Do not breathe vapours or spray mist. Do not breathe vapours/dust.

Do not swallow.
Do not get in eyes or mouth or on skin.
Do not get on skin or clothing.
Avoid exposure - obtain special instructions before use.
Smoking, eating and drinking should be prohibited in the application area.
Provide sufficient air exchange and/or exhaust in work rooms.
Keep container closed when not in use.
Open drum carefully as content may be under pressure.
Dispose of rinse water in accordance with local and national regulations.
Persons susceptible to skin sensitisation problems or asthma, allergies, chronic or recurrent respiratory disease should not be employed in any process in which this mixture is being used.
Industrial use of aprotic polar solvents for cleaning can release hazardous primary aromatic amines (>0.1%)

Conditions for safe storage : Keep containers tightly closed in a dry, cool and well-ventilated place.
Keep in properly labelled containers.
Observe label precautions.
Protect from moisture.
Electrical installations / working materials must comply with the technological safety standards.
Containers which are opened must be carefully resealed and kept upright to prevent leakage.

Materials to avoid : For incompatible materials please refer to Section 10 of this SDS.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Components with workplace control parameters

Components	CAS-No.	Value type (Form of exposure)	Control parameters / Permissible concentration	Basis
4,4'-methylenedicyclohexyl diisocyanate	5124-30-1	TWA	0.005 ppm	ACGIH
		C	0.01 ppm 0.11 mg/m3	NIOSH REL
		C	0.01 ppm 0.11 mg/m3	OSHA P0

Personal protective equipment

Respiratory protection : Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary.
Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.
In emergency, non-routine and unknown exposure situations, including confined space entries, a NIOSH-certified full facepiece pressure demand self-contained breathing

apparatus (SCBA)or a full facepiece pressure demand supplied air respirator (SAR) with auxiliary self-contained air supply, should be used.

Hand protection

Remarks : The suitability for a specific workplace should be discussed with the producers of the protective gloves.
Protective gloves should be worn when handling freshly made polyurethane products to avoid contact with trace residual materials which may be hazardous in contact with skin.

Use chemical resistant gloves classified under Standard EN374: protective gloves against chemicals and microorganisms. Examples of glove materials that might provide suitable protection include: Butyl rubber, Chlorinated polyethylene, Polyethylene, Ethyl vinyl alcohol copolymers laminated (“EVAL”), Polychloroprene (Neoprene*), Nitrile/butadiene rubber (“nitrile” or “NBR”), Polyvinyl chloride (“PVC” or “vinyl”), Fluoroelastomer (Viton*).

When prolonged or frequently repeated contact may occur, a glove with protection class of 5 or higher (breakthrough time greater than 240 minutes according to EN374) is recommended.

When only brief contact is expected, a glove with protection class of 3 or higher (breakthrough time greater than 60 minutes according to EN374) is recommended.
Notice: The selection of a specific glove for a particular application and duration of use in a workplace should also take into account all requisite workplace factors such as, but not limited to : other chemicals that may be handled, physical requirements (cut/puncture protection, dexterity, thermal protection), as well as instructions/specifications provided by the glove supplier
By industrial use of aprotic polar solvents for cleaning : Butyl rubber (0.7mm), Nitrile rubber (0.4mm), Chloroprene (0.5mm)

Eye protection : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists or dusts.
Chemical splash goggles.
Always wear eye protection when the potential for inadvertent eye contact with the product cannot be excluded.
Please follow all applicable local/national requirements when selecting protective measures for a specific workplace.
Ensure that eyewash stations and safety showers are close to the workstation location.

Skin and body protection : Impervious clothing
Choose body protection according to the amount and concentration of the dangerous substance at the work place.
Recommended:
Overall (preferably heavy cotton) or Tyvek-Pro Tech 'C' ,

Tyvek Pro 'F' disposable coverall.

Protective measures	:	Personal protective equipment comprising: suitable protective gloves, safety goggles and protective clothing The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace. Ensure that eye flushing systems and safety showers are located close to the working place.
Hygiene measures	:	Handle in accordance with good industrial hygiene and safety practice. Wash face, hands and any exposed skin thoroughly after handling. Remove contaminated clothing and protective equipment before entering eating areas. When using do not eat, drink or smoke. Contaminated work clothing should not be allowed out of the workplace. Wash hands before breaks and immediately after handling the product. Wash hands before breaks and at the end of workday.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	:	paste
Colour	:	off-white
Odour	:	slight
Odour Threshold	:	No data is available on the product itself.
pH	:	substance/mixture reacts with water
Melting point/freezing point	:	No data is available on the product itself.
Boiling point	:	No data is available on the product itself.
Flash point	:	> 392 °F / > 200 °C Method: Pensky-Martens closed cup
Evaporation rate	:	No data is available on the product itself.
Flammability (solid, gas)	:	No data is available on the product itself.
Flammability (liquids)	:	No data is available on the product itself.
Upper explosion limit / Upper flammability limit	:	No data is available on the product itself.
Lower explosion limit / Lower flammability limit	:	No data is available on the product itself.

Vapour pressure	:	< 1 hPa (68 °F / 20 °C)
Relative vapour density	:	No data is available on the product itself.
Relative density	:	No data is available on the product itself.
Density	:	1.1 - 1.25 g/cm3 (68 °F / 20 °C)
Solubility(ies)		
Water solubility	:	Water reactive (68 °F / 20 °C)
Solubility in other solvents	:	No data is available on the product itself.
Partition coefficient: n-octanol/water	:	No data is available on the product itself.
Auto-ignition temperature	:	No data is available on the product itself.
Decomposition temperature	:	No data is available on the product itself.
Self-Accelerating decomposition temperature (SADT)	:	No data is available on the product itself.
Viscosity	:	No data is available on the product itself.
Explosive properties	:	No data is available on the product itself.
Oxidizing properties	:	No data is available on the product itself.
Particle size	:	No data is available on the product itself.

SECTION 10. STABILITY AND REACTIVITY

Reactivity	:	No dangerous reaction known under conditions of normal use.
Chemical stability	:	Stable under normal conditions.
Possibility of hazardous reactions	:	Reaction with water (moisture) produces CO2-gas. Exothermic reaction with materials containing active hydrogen groups. The reaction becomes progressively more vigorous and can be violent at higher temperatures if the miscibility of the reaction partners is good or is supported by stirring or by the presence of solvents. MDI is insoluble with, and heavier than water and sinks to the bottom but reacts slowly at the interface. A solid water-insoluble layer of polyurea is formed at the interface by liberating carbon dioxide gas.
Conditions to avoid	:	Extremes of temperature and direct sunlight. Exposure to air or moisture over prolonged periods.
Incompatible materials	:	Acids

Amines
Bases
Metals
water

Hazardous decomposition products : Combustion products may include: carbon monoxide, carbon dioxide, nitrogen oxides, hydrocarbons and HCN. In the event of extreme heat (>500 degrees C), aniline is suspected of being formed.

SECTION 11. TOXICOLOGICAL INFORMATION

Acute toxicity

Product:

Acute inhalation toxicity : Assessment: The substance/mixture is not toxic on inhalation as defined by dangerous goods regulations.
Remarks: Methods used to generate the exposure concentrations in the animal studies use extreme laboratory conditions and does not represent actual exposure conditions of the material in the workplace, storage, transportation or expected use on the market due to the very low vapor pressure. Therefore, these test results cannot be used to for hazard classification of the material. Rather, an acute toxicity estimate is calculated based on weight of evidence and expert judgement and is used to justify a modified classification for acute inhalation toxicity.

Acute toxicity estimate: 1.86 mg/l
Exposure time: 4 h
Test atmosphere: dust/mist
Method: Calculation method

Acute dermal toxicity : Acute toxicity estimate: > 5,000 mg/kg
Method: Calculation method

Components:

Oxirane, methyl-, polymer with oxirane, ether with 1,2,3-propanetriol (3:1), polymer with 1,1'-methylenebis[4-isocyanatocyclohexane]:

Acute oral toxicity : LD50 (Rat, male and female): > 2,000 mg/kg
Assessment: The substance or mixture has no acute oral toxicity
Remarks: Information given is based on data obtained from similar substances.

Acute inhalation toxicity : LC50 (Rat, male and female): 431.18 mg/m3
Exposure time: 4 h
Test atmosphere: dust/mist
Method: OECD Test Guideline 403
Assessment: The component/mixture is moderately toxic after short term inhalation.

Acute dermal toxicity : LD50 (Rabbit): > 9,400 mg/kg
Remarks: Information given is based on data obtained from

similar substances.

2-Oxepanone, polymer with 1,1'-methylenebis[4-isocyanatocyclohexane] and 2,2'-oxybis[ethanol]:

Acute oral toxicity : LD50 (Rat, male): > 10,000 mg/kg
Method: OECD Test Guideline 401
Remarks: Information given is based on data obtained from similar substances.

Acute inhalation toxicity : LC50 (Rat, male and female): Exposure time: 4 h
Test atmosphere: dust/mist
Method: OECD Test Guideline 403
Assessment: The component/mixture is moderately toxic after short term inhalation.
Remarks: Information given is based on data obtained from similar substances.

Acute dermal toxicity : LD50 (Rabbit, male and female): > 9,400 mg/kg
Method: OECD Test Guideline 402
Remarks: Information given is based on data obtained from similar substances.

4,4'-methylenedicyclohexyl diisocyanate:

Acute oral toxicity : LD50 (Rat, male and female): 18,200 mg/kg
Method: OECD Test Guideline 401
GLP: no
Assessment: The substance or mixture has no acute oral toxicity

Acute inhalation toxicity : LC50 (Rat, male and female): 0.434 mg/l
Exposure time: 4 h
Test atmosphere: dust/mist
Method: OECD Test Guideline 403
GLP: yes

Acute dermal toxicity : LD50 (Rat, male and female): > 7,000 mg/kg
Method: OECD Test Guideline 402
GLP: no
Assessment: The substance or mixture has no acute dermal toxicity

Skin corrosion/irritation

Components:

Oxirane, methyl-, polymer with oxirane, ether with 1,2,3-propanetriol (3:1), polymer with 1,1'-methylenebis[4-isocyanatocyclohexane]:

Species : Rabbit
Assessment : Irritating to skin.
Method : OECD Test Guideline 404
Result : Irritating to skin.

2-Oxepanone, polymer with 1,1'-methylenebis[4-isocyanatocyclohexane] and 2,2'-oxybis[ethanol]:

Species	:	Rabbit
Method	:	OECD Test Guideline 404
Result	:	Irritating to skin.
Remarks	:	Information given is based on data obtained from similar substances.

4,4'-methylenedicyclohexyl diisocyanate:

Species	:	Rabbit
Assessment	:	Irritating to skin.
Method	:	OECD Test Guideline 404
Result	:	Irritating to skin.
GLP	:	yes

Serious eye damage/eye irritation

Components:

Oxirane, methyl-, polymer with oxirane, ether with 1,2,3-propanetriol (3:1), polymer with 1,1'-methylenebis[4-isocyanatocyclohexane]:

Species	:	Rabbit
Result	:	Irritating to eyes.
Assessment	:	Irritating to eyes.
Method	:	OECD Test Guideline 405

2-Oxepanone, polymer with 1,1'-methylenebis[4-isocyanatocyclohexane] and 2,2'-oxybis[ethanol]:

Species	:	Rabbit
Result	:	Mild eye irritation
Remarks	:	Information given is based on data obtained from similar substances.

4,4'-methylenedicyclohexyl diisocyanate:

Species	:	Rabbit
Result	:	Irritating to eyes.
Assessment	:	Irritating to eyes.
Method	:	OECD Test Guideline 405
GLP	:	no

Respiratory or skin sensitisation

Components:

Oxirane, methyl-, polymer with oxirane, ether with 1,2,3-propanetriol (3:1), polymer with 1,1'-methylenebis[4-isocyanatocyclohexane]:

Exposure routes	:	Skin
Species	:	Guinea pig
Assessment	:	May cause sensitisation by skin contact.
Method	:	OECD Test Guideline 406
Result	:	May cause sensitisation by skin contact.

Test Type	:	Local lymph node assay (LLNA)
Exposure routes	:	Respiratory Tract
Species	:	Guinea pig
Assessment	:	May cause sensitisation by inhalation.

Result	:	May cause sensitisation by inhalation.
Assessment	:	May cause allergy or asthma symptoms or breathing difficulties if inhaled., May cause an allergic skin reaction.

2-Oxepanone, polymer with 1,1'-methylenebis[4-isocyanatocyclohexane] and 2,2'-oxybis[ethanol]:

Exposure routes	:	Skin
Species	:	Mouse
Method	:	OECD Test Guideline 429
Result	:	May cause sensitisation by skin contact.
Remarks	:	Information given is based on data obtained from similar substances.
Exposure routes	:	Respiratory Tract
Species	:	Guinea pig
Result	:	May cause sensitisation by inhalation.
Remarks	:	Information given is based on data obtained from similar substances.
Assessment	:	May cause sensitisation by inhalation and skin contact.

4,4'-methylenedicyclohexyl diisocyanate:

Test Type	:	Maximisation Test
Exposure routes	:	Skin
Species	:	Guinea pig
Assessment	:	May cause sensitisation by skin contact.
Method	:	OECD Test Guideline 406
Result	:	May cause sensitisation by skin contact.
Test Type	:	Local lymph node assay (LLNA)
Exposure routes	:	inhalation (dust/mist/fume)
Species	:	Guinea pig
Method	:	OECD Test Guideline 403
Result	:	May cause sensitisation by inhalation.
GLP	:	yes
Assessment	:	May cause allergy or asthma symptoms or breathing difficulties if inhaled.

Germ cell mutagenicity

Components:

Oxirane, methyl-, polymer with oxirane, ether with 1,2,3-propanetriol (3:1), polymer with 1,1'-methylenebis[4-isocyanatocyclohexane]:

Genotoxicity in vitro	:	Test Type: reverse mutation assay Test system: Salmonella typhimurium Metabolic activation: with and without metabolic activation Method: Directive 67/548/EEC, Annex, B.13/14 Result: negative
Genotoxicity in vivo	:	Test Type: Micronucleus test

Species: Rat (male)
Cell type: Somatic
Application Route: Inhalation
Exposure time: 3 Weeks
Method: OECD Test Guideline 474
Result: negative

Test Type: comet assay
Species: Rat (male)
Cell type: Liver cells
Application Route: inhalation (dust/mist/fume)
Dose: 2.5/4.9/12 mg/m3
Method: OECD Test Guideline 489
Result: negative

2-Oxepanone, polymer with 1,1'-methylenebis[4-isocyanatocyclohexane] and 2,2'-oxybis[ethanol]:

Genotoxicity in vitro : Concentration: 200 ug/plate
Metabolic activation: with and without metabolic activation
Method: Directive 67/548/EEC, Annex, B.13/14
Result: negative
Remarks: Information given is based on data obtained from similar substances.

Genotoxicity in vivo : Application Route: Inhalation
Exposure time: 3 Weeks
Dose: 118 mg/m3
Method: OECD Test Guideline 474
Result: negative
Remarks: Information given is based on data obtained from similar substances.

4,4'-methylenedicyclohexyl diisocyanate:

Genotoxicity in vitro : Test Type: reverse mutation assay
Test system: Salmonella typhimurium
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 471
Result: negative
GLP: yes

Test Type: Chromosome aberration test in vitro
Test system: Chinese hamster lung cells
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 473
Result: negative
GLP: yes

Test Type: gene mutation test
Test system: Chinese hamster lung cells
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 476
Result: negative
GLP: yes

Carcinogenicity

Product:

Remarks : Rats have been exposed for two years to a respirable aerosol of polymeric MDI which resulted in a chronic pulmonary irritation at high concentrations. Only at the top level (6 mg/m3), there was a significant incidence of a benign tumour of the lung (adenoma) and one malignant tumour (adenocarcinoma). There were no lung tumours at 1 mg/m3 and no effects at 0.2 mg/m3. Overall, the tumour incidence, both benign and malignant, and the number of animals with the tumours were not different from controls. The increased incidence of lung tumours is associated with prolonged respiratory irritation and the concurrent accumulation of yellow material in the lung, which occurred throughout the study. In the absence of prolonged exposure to high concentrations leading to chronic irritation and lung damage, it is highly unlikely that tumour formation will occur.

Remarks : Industrial use of aprotic polar solvents for cleaning can release hazardous primary aromatic amines (>0.1%)
Based on animal studies, primary aromatic amines are considered as potential carcinogen to humans. Some of those chemicals are proven carcinogens to humans
Provided the recommended personal protective equipment and hygiene measures are applied, no adverse effects to human health are to be expected

Components:

Oxirane, methyl-, polymer with oxirane, ether with 1,2,3-propanetriol (3:1), polymer with 1,1'-methylenebis[4-isocyanatocyclohexane]:

Species	:	Rat, female
Application Route	:	Inhalation
Exposure time	:	24 month(s)
Activity duration	:	17 h
Dose	:	0, 0.2, 0.7, 2.1 mg/m3 mg/m³
Frequency of Treatment	:	5 days/week
NOEL	:	0.7 mg/m³
LOAEL	:	0.23 mg/m³
Result	:	positive
Target Organs	:	Lungs

2-Oxepanone, polymer with 1,1'-methylenebis[4-isocyanatocyclohexane] and 2,2'-oxybis[ethanol]:

Species	:	Rat, male and female
Application Route	:	Inhalation
Exposure time	:	24 month(s)
Dose	:	1 mg/m³
Frequency of Treatment	:	5 daily
Method	:	OECD Test Guideline 453
Result	:	positive
Target Organs	:	Lungs
Remarks	:	Information given is based on data obtained from similar substances.

IARC No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

OSHA No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

NTP No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

Reproductive toxicity

Components:

2-Oxepanone, polymer with 1,1'-methylenebis[4-isocyanatocyclohexane] and 2,2'-oxybis[ethanol]:

Effects on foetal development : Species: Rat, female
Application Route: Inhalation
General Toxicity Maternal: NOAEL: 4 mg/m³
Method: OECD Test Guideline 414
Result: No teratogenic effects
Remarks: Information given is based on data obtained from similar substances.

4,4'-methylenedicyclohexyl diisocyanate:

Effects on fertility : Test Type: Reproduction / Developmental Toxicity Screening Test
Species: Rat, male and female
Application Route: inhalation (dust/mist/fume)
Dose: 1/6/36 mg/m³
Frequency of Treatment: 7 days/week
General Toxicity - Parent: NOAEL: 1 mg/m³
General Toxicity F1: NOAEL: 36 mg/m³
Target Organs: Respiratory Tract
Method: OECD Test Guideline 421
Result: negative
GLP: yes

Effects on foetal development : Test Type: Pre-natal
Species: Rat, female
Application Route: Inhalation
Dose: 1/6/36 mg/m³
Duration of Single Treatment: 14 d
Frequency of Treatment: 7 days/week
General Toxicity Maternal: NOAEL: 1 mg/m³
Developmental Toxicity: NOAEL: 6 mg/m³
Method: OECD Test Guideline 414
Result: No teratogenic effects
GLP: yes

STOT - single exposure

Components:

Oxirane, methyl-, polymer with oxirane, ether with 1,2,3-propanetriol (3:1), polymer with 1,1'-methylenebis[4-isocyanatocyclohexane]:

Exposure routes	:	Inhalation
Target Organs	:	Respiratory system
Assessment	:	May cause respiratory irritation., The substance or mixture is classified as specific target organ toxicant, single exposure, category 3 with respiratory tract irritation.

2-Oxepanone, polymer with 1,1'-methylenebis[4-isocyanatocyclohexane] and 2,2'-oxybis[ethanol]:

Exposure routes	:	Inhalation
Target Organs	:	Respiratory Tract
Assessment	:	May cause respiratory irritation.
Remarks	:	Information given is based on data obtained from similar substances.

4,4'-methylenedicyclohexyl diisocyanate:

Exposure routes	:	Inhalation
Target Organs	:	Respiratory Tract
Assessment	:	May cause respiratory irritation.

STOT - repeated exposure

Components:

Oxirane, methyl-, polymer with oxirane, ether with 1,2,3-propanetriol (3:1), polymer with 1,1'-methylenebis[4-isocyanatocyclohexane]:

Exposure routes	:	inhalation (dust/mist/fume)
Target Organs	:	Respiratory system
Assessment	:	May cause damage to organs through prolonged or repeated exposure., The substance or mixture is classified as specific target organ toxicant, repeated exposure, category 2.

Repeated dose toxicity

Components:

Oxirane, methyl-, polymer with oxirane, ether with 1,2,3-propanetriol (3:1), polymer with 1,1'-methylenebis[4-isocyanatocyclohexane]:

Species	:	Rat, female
LOEC	:	1 mg/m3
Application Route	:	Inhalation
Test atmosphere	:	dust/mist
Exposure time	:	2 years 17 h
Number of exposures	:	5 days/week
Dose	:	0, 0.2, 0.7, 2.1 mg/m3
Method	:	Chronic toxicity
Assessment	:	The substance or mixture is classified as specific target organ toxicant, repeated exposure, category 2.

2-Oxepanone, polymer with 1,1'-methylenebis[4-isocyanatocyclohexane] and 2,2'-oxybis[ethanol]:

Species	:	Rat, male and female
NOEC	:	0.2 mg/m3
Exposure time	:	2 yr
Number of exposures	:	5 d
Method	:	OECD Test Guideline 453
Remarks	:	Information given is based on data obtained from similar substances.

4,4'-methylenedicyclohexyl diisocyanate:

Species	:	Rat, male and female
NOAEL	:	3 mg/m3
Application Route	:	inhalation (dust/mist/fume)
Test atmosphere	:	dust/mist
Exposure time	:	13 weeks 6 h
Number of exposures	:	5 days/week
Dose	:	0.5/3/18 mg/m3
Method	:	OECD Test Guideline 413
GLP	:	yes

Aspiration toxicity

No data available

Experience with human exposure

No data available

Toxicology, Metabolism, Distribution

No data available

Neurological effects

No data available

Further information

No data available

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity

Components:

Oxirane, methyl-, polymer with oxirane, ether with 1,2,3-propanetriol (3:1), polymer with 1,1'-methylenebis[4-isocyanatocyclohexane]:

Toxicity to fish	:	LC50 (Brachydanio rerio (zebrafish)): > 100 mg/l End point: mortality Exposure time: 96 h Test substance: Fresh water Method: OECD Test Guideline 203
Toxicity to daphnia and other aquatic invertebrates	:	EL50 (Daphnia magna (Water flea)): 9 mg/l End point: Immobilization Exposure time: 48 h Test Type: semi-static test Test substance: Fresh water Method: OECD Test Guideline 202

Toxicity to algae/aquatic plants	:	EC50 (Desmodesmus subspicatus (green algae)): > 100 mg/l Exposure time: 72 h Test Type: static test Test substance: Fresh water Method: OECD Test Guideline 201 GLP: yes
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	:	NOEC (Daphnia magna (Water flea)): >= 10 mg/l Exposure time: 21 d Test Type: semi-static test Test substance: Fresh water Method: OECD Test Guideline 211 Remarks: Information given is based on data obtained from similar substances.
Toxicity to microorganisms	:	EC50 (activated sludge): > 1,000 mg/l Exposure time: 3 h Test Type: static test Method: OECD Test Guideline 209
Toxicity to soil dwelling organisms	:	NOEC (Eisenia fetida (earthworms)): >= 1,000 mg/kg Exposure time: 336 h
Plant toxicity	:	EC50: >1000 milligram per kilogram Exposure time: 14 d Species: Avena sativa (oats) EC50: >1000 milligram per kilogram Exposure time: 14 d Species: Lactuca sativa (lettuce)

Ecotoxicology Assessment

Acute aquatic toxicity	:	Toxic to aquatic life.

2-Oxepanone, polymer with 1,1'-methylenebis[4-isocyanatocyclohexane] and 2,2'-oxybis[ethanol]:

Toxicity to fish	:	LC50 (Brachydanio rerio (zebrafish)): > 1,000 mg/l Exposure time: 96 h Test Type: static test Method: OECD Test Guideline 203 Remarks: Information given is based on data obtained from similar substances.
Toxicity to daphnia and other aquatic invertebrates	:	EC50 (Daphnia magna (Water flea)): > 1,000 mg/l Exposure time: 24 h Test Type: static test Test substance: Fresh water Method: OECD Test Guideline 202 Remarks: Information given is based on data obtained from similar substances.
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	:	NOEC (Daphnia magna (Water flea)): >= 10 mg/l Exposure time: 21 d Test Type: semi-static test

Test substance: Fresh water
Method: OECD Test Guideline 211
Remarks: Information given is based on data obtained from similar substances.

4,4'-methylenedicyclohexyl diisocyanate:

Toxicity to fish : LC50 (Brachydanio rerio (zebrafish)): > 8.1 mg/l
End point: mortality
Exposure time: 96 h
Test Type: static test
Analytical monitoring: yes
Test substance: Fresh water
Method: Directive 67/548/EEC, Annex V, C.1.
GLP: yes

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna Straus): > 8.3 mg/l
End point: Immobilization
Exposure time: 48 h
Test Type: static test
Analytical monitoring: yes
Test substance: Fresh water
Method: Directive 67/548/EEC, Annex V, C.2.
GLP: yes

Toxicity to algae/aquatic plants : ErC50 (Desmodesmus subspicatus (green algae)): > 5 mg/l
Exposure time: 72 h
Test Type: static test
Analytical monitoring: yes
Test substance: Fresh water
Method: Directive 67/548/EEC, Annex V, C.3.
GLP: yes

Toxicity to microorganisms : EC50 (activated sludge): 191 mg/l
Exposure time: 3 h
Test Type: static test
Analytical monitoring: no
Test substance: Fresh water
Method: OECD Test Guideline 209
GLP: yes

Ecotoxicology Assessment

Acute aquatic toxicity : This product has no known ecotoxicological effects.

Chronic aquatic toxicity : This product has no known ecotoxicological effects.

Persistence and degradability

Components:

Oxirane, methyl-, polymer with oxirane, ether with 1,2,3-propanetriol (3:1), polymer with 1,1'-methylenebis[4-isocyanatocyclohexane]:

Biodegradability : aerobic
Inoculum: activated sludge, non-adapted
Result: Not readily biodegradable.
Biodegradation: 0 %

Exposure time: 28 d
Method: OECD Test Guideline 301F
Test substance: Fresh water

Stability in water : Degradation half life (DT50): 20 hrs (25 °C)
Remarks: Fresh water

2-Oxepanone, polymer with 1,1'-methylenebis[4-isocyanatocyclohexane] and 2,2'-oxybis[ethanol]:

Biodegradability : Inoculum: Domestic sewage
Concentration: 30 mg/l
Result: Not biodegradable
Biodegradation: 0 %
Exposure time: 28 d
Method: Inherent Biodegradability: Modified MITI Test (II)

4,4'-methylenedicyclohexyl diisocyanate:

Biodegradability : aerobic
Inoculum: activated sludge, non-adapted
Concentration: 100 mg/l
Result: Not readily biodegradable.
Biodegradation: 0 %
Exposure time: 28 d
Method: Directive 67/548/EEC Annex V, C.4.D.
Test substance: Fresh water
GLP: yes

aerobic
Inoculum: activated sludge
Concentration: 12 mg/l
Result: Not readily biodegradable.
Biodegradation: 0 %
Exposure time: 28 d
Method: OECD Test Guideline 301F
Test substance: Fresh water
GLP: yes

Bioaccumulative potential

Components:

Oxirane, methyl-, polymer with oxirane, ether with 1,2,3-propanetriol (3:1), polymer with 1,1'-methylenebis[4-isocyanatocyclohexane]:

Bioaccumulation : Species: Cyprinus carpio (Carp)
Bioconcentration factor (BCF): 200
Exposure time: 28 d
Concentration: 0.08 µg/l
Method: OECD Test Guideline 305
Remarks: Bioaccumulation is unlikely.

2-Oxepanone, polymer with 1,1'-methylenebis[4-isocyanatocyclohexane] and 2,2'-oxybis[ethanol]:

Bioaccumulation : Species: Cyprinus carpio (Carp)
Bioconcentration factor (BCF): 200

Remarks: Bioaccumulation is unlikely.

4,4'-methylenedicyclohexyl diisocyanate:

Bioaccumulation	:	Species: Fish Bioconcentration factor (BCF): 10,186 GLP: no Remarks: The value is given based on a SAR/AAR approach using OECD Toolbox, DEREK, VEGA QSAR models (CAESAR models), etc.
Partition coefficient: n-octanol/water	:	log Pow: 6.11 (68 °F / 20 °C) Method: Calculation method

Mobility in soil

Components:

Oxirane, methyl-, polymer with oxirane, ether with 1,2,3-propanetriol (3:1), polymer with 1,1'-methylenebis[4-isocyanatocyclohexane]:

Distribution among environmental compartments	:	log Koc: 4.5 Method: QSAR
Stability in soil	:	Soil temperature: 72 °F / 22 °C Dissipation time: 24 h Method: OECD Test Guideline 307

4,4'-methylenedicyclohexyl diisocyanate:

Distribution among environmental compartments	:	Koc: 43471 - 375837 Method: QSAR

Other adverse effects

Product:

Ozone-Depletion Potential	:	Regulation: 40 CFR Protection of Environment; Part 82 Protection of Stratospheric Ozone - CAA Section 602 Class I Substances Remarks: This product neither contains, nor was manufactured with a Class I or Class II ODS as defined by the U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App.A + B).

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal methods

Waste from residues	:	Do not dispose of waste into sewer. Do not contaminate ponds, waterways or ditches with chemical or used container. Send to a licensed waste management company.
Contaminated packaging	:	Empty remaining contents. Dispose of as unused product. Do not re-use empty containers.

SECTION 14. TRANSPORT INFORMATION

International Regulations

UNRTDG
Not regulated as dangerous goods

IATA-DGR
Not regulated as dangerous goods

IMDG-Code
Not regulated as dangerous goods

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code
Not applicable for product as supplied.

National Regulations

49 CFR
Not regulated as dangerous goods

Special precautions for user

Remarks : Not classified as dangerous in the meaning of transport regulations.

SECTION 15. REGULATORY INFORMATION

CERCLA Reportable Quantity
Listed substances in the product are at low enough levels to not be expected to exceed the RQ

SARA 311/312 Hazards : Acute toxicity (any route of exposure)
Respiratory or skin sensitisation
Specific target organ toxicity (single or repeated exposure)
Skin corrosion or irritation
Serious eye damage or eye irritation

SARA 313 : The following components are subject to reporting levels established by SARA Title III, Section 313:

4,4'-methylenedicyclohexyl diisocyanate	5124-30-1	>= 1 - < 5 %

This product does not contain any hazardous air pollutants (HAP) >=0.1%, as defined by the U.S. Clean Air Act Section 112 (40 CFR 61

California Prop. 65
WARNING: This product can expose you to chemicals including formaldehyde, which is/are known to the State of California to cause cancer, and
methanol, which is/are known to the State of California to cause birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

The components of this product are reported in the following inventories:

DSL : This product contains one or several components that are not on the Canadian DSL nor NDSL.

AIIC	:	Not in compliance with the inventory
ENCS	:	On the inventory, or in compliance with the inventory
KECI	:	Not in compliance with the inventory
PICCS	:	Not in compliance with the inventory
IECSC	:	On the inventory, or in compliance with the inventory
TCSI	:	On the inventory, or in compliance with the inventory
TSCA	:	All substances listed as active on the TSCA inventory

Inventories

AIIC (Australia), DSL (Canada), IECSC (China), REACH (European Union), ENCS (Japan), ISHL (Japan), KECI (Korea), NZIoC (New Zealand), PICCS (Philippines), TCSI (Taiwan), TECI (Thailand), TSCA (USA)

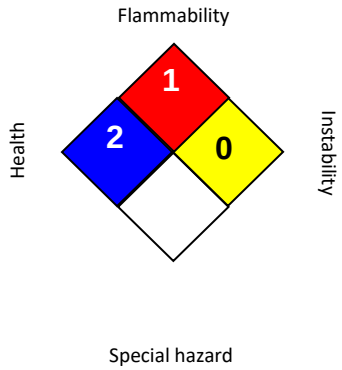
TSCA - 5(a) Significant New Use Rule List of Chemicals
No substances are subject to a Significant New Use Rule.

US. Toxic Substances Control Act (TSCA) Section 12(b) Export Notification (40 CFR 707, Subpt D)
No substances are subject to TSCA 12(b) export notification requirements.

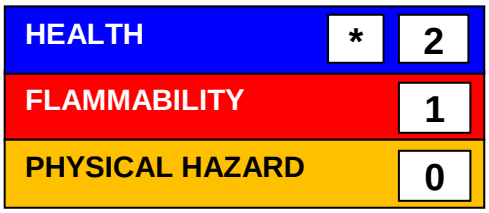
SECTION 16. OTHER INFORMATION

Further information

NFPA 704:



HMIS® IV:



HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. The "*" represents a chronic hazard, while the "/" represents the absence of a chronic hazard

Liquid decontaminants (percentages by weight or volume) :
Decontaminant 1 : *- sodium carbonate : 5 - 10 % *- liquid detergent : 0.2 - 2 % *- water : to make up to 100 %
Decontaminant 2 : *- concentrated ammonia solution : 3 - 8 % *- liquid detergent : 0.2 - 2 % *- water : to make up to 100 %

Decontaminant 1 reacts slower with diisocyanates but is more environmentally friendly than decontaminant 2.
Decontaminant 2 contains ammonia. Ammonia presents health hazards. (See supplier safety information.)

Revision Date	:	09/07/2023
ACGIH	:	USA. ACGIH Threshold Limit Values (TLV)
NIOSH REL	:	USA. NIOSH Recommended Exposure Limits
OSHA P0	:	USA. Table Z-1-A Limits for Air Contaminants (1989 vacated values)
ACGIH / TWA	:	8-hour, time-weighted average
NIOSH REL / C	:	Ceiling value not be exceeded at any time.
OSHA P0 / C	:	Ceiling limit

The information and recommendations in this publication are to the best of our knowledge, information and belief accurate at the date of publication, NOTHING HEREIN IS TO BE CONSTRUED AS A WARRANTY, EXPRESS OR OTHERWISE.

IN ALL CASES, IT IS THE RESPONSIBILITY OF THE USER TO DETERMINE THE APPLICABILITY OF SUCH INFORMATION AND RECOMMENDATIONS AND THE SUITABILITY OF ANY PRODUCT FOR ITS OWN PARTICULAR PURPOSE.

THE PRODUCT MAY PRESENT HAZARDS AND SHOULD BE USED WITH CAUTION. WHILE CERTAIN HAZARDS ARE DESCRIBED IN THIS PUBLICATION, NO GUARANTEE IS MADE THAT THESE ARE THE ONLY HAZARDS THAT EXIST.

Hazards, toxicity and behaviour of the products may differ when used with other materials and are dependent upon the manufacturing circumstances or other processes. Such hazards, toxicity and behaviour should be determined by the user and made known to handlers, processors and end users.

NO PERSON OR ORGANIZATION EXCEPT A DULY AUTHORIZED HUNTSMAN EMPLOYEE IS AUTHORIZED TO PROVIDE OR MAKE AVAILABLE DATA SHEETS FOR HUNTSMAN PRODUCTS. DATA SHEETS FROM UNAUTHORIZED SOURCES MAY CONTAIN INFORMATION THAT IS NO LONGER CURRENT OR ACCURATE.

URALANE® 5774-1 C US

Version	Revision Date:	SDS Number:	Date of last issue: 09/19/2022
2.1	09/20/2022	400001010057	Date of first issue: 09/22/2015

Print Date 02/20/2025

SECTION 1. IDENTIFICATION

Product name : URALANE® 5774-1 C US

Manufacturer or supplier's details

Company name of supplier : Huntsman Advanced Materials Americas LLC

Address : P.O. Box 4980
The Woodlands,
TX 77387
United States of America (USA)

Telephone : Non-Emergency: (800) 257-5547

E-mail address : Global_Product_EHS_AdMat@huntsman.com

Emergency telephone number : Chemtrec: (800) 424-9300 or (703) 527-3887

Recommended use of the chemical and restrictions on use

Recommended use : Hardener

Restrictions on use : For industrial use only.

SECTION 2. HAZARDS IDENTIFICATION

GHS classification in accordance with the OSHA Hazard Communication Standard (29 CFR 1910.1200)

Acute toxicity (Oral) : Category 4

Skin sensitisation : Category 1

Germ cell mutagenicity : Category 2

Carcinogenicity : Category 2

Reproductive toxicity : Category 2

Specific target organ toxicity - single exposure (Oral) : Category 2 (Liver)

Specific target organ toxicity - repeated exposure (Oral) : Category 1 (Liver)

Specific target organ toxicity - repeated exposure (Oral) : Category 2 (Kidney)

Short-term (acute) aquatic hazard : Category 1

Long-term (chronic) aquatic hazard : Category 1

GHS label elements

Hazard pictograms :

Signal word : Danger

Hazard statements : H302 Harmful if swallowed.
H317 May cause an allergic skin reaction.
H341 Suspected of causing genetic defects.
H351 Suspected of causing cancer.
H361 Suspected of damaging fertility or the unborn child.
H371 May cause damage to organs (Liver) if swallowed.
H372 Causes damage to organs (Liver) through prolonged or repeated exposure if swallowed.
H373 May cause damage to organs (Kidney) through prolonged or repeated exposure if swallowed.
H410 Very toxic to aquatic life with long lasting effects.

Precautionary statements : **Prevention:**
P201 Obtain special instructions before use.
P202 Do not handle until all safety precautions have been read and understood.
P260 Do not breathe mist or vapours.
P264 Wash skin thoroughly after handling.
P270 Do not eat, drink or smoke when using this product.
P272 Contaminated work clothing must not be allowed out of the workplace.
P273 Avoid release to the environment.
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.
Response:
P301 + P312 + P330 IF SWALLOWED: Call a POISON CENTER/ doctor if you feel unwell. Rinse mouth.
P302 + P352 IF ON SKIN: Wash with plenty of soap and water.
P308 + P311 IF exposed or concerned: Call a POISON CENTER/ doctor.
P308 + P313 IF exposed or concerned: Get medical advice/ attention.
P333 + P313 If skin irritation or rash occurs: Get medical advice/ attention.
P363 Wash contaminated clothing before reuse.
P391 Collect spillage.
Storage:
P405 Store locked up.
Disposal:
P501 Dispose of contents/container to an approved facility in accordance with local, regional, national and international regulations.

Other hazards

None known.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Mixture

Hazardous components

Chemical name	CAS-No.	Concentration (% w/w)
4,4'-methylenebis(2-ethylaniline)	19900-65-3	10 - 20
tris(methylphenyl) phosphate	1330-78-5	10 - 20
Formaldehyde, polymer with 2-ethylbenzenamine	69178-41-2	5 - 10
4,4'-methylenebis[N-sec-butylaniline]	5285-60-9	5 - 10
1,1',1'',1'''-ethylenedinitrilotetrapropan-2-ol	102-60-3	1 - 5
2-ethylaniline	578-54-1	1 - 5
melamine	108-78-1	0.1 - 1
ethylbenzene	100-41-4	0.1 - 1

The specific chemical identity and/or exact percentage (concentration) of composition may be withheld as a trade secret.

SECTION 4. FIRST AID MEASURES

General advice : Move out of dangerous area.
Consult a physician.
Show this safety data sheet to the doctor in attendance.
Treat symptomatically.
Get medical attention if symptoms occur.

If inhaled : If inhaled, remove to fresh air.
Get medical attention if symptoms occur.

In case of skin contact : If on skin, rinse well with water.

In case of eye contact : Flush eyes with water as a precaution.
Remove contact lenses.
Keep eye wide open while rinsing.
If eye irritation persists, consult a specialist.

If swallowed : Induce vomiting immediately and call a physician.
Keep respiratory tract clear.
Never give anything by mouth to an unconscious person.
If symptoms persist, call a physician.
Take victim immediately to hospital.

Most important symptoms and effects, both acute and : None known.

delayed

Protection of first-aiders	:	First Aid responders should pay attention to self-protection and use the recommended protective clothing If potential for exposure exists refer to Section 8 for specific personal protective equipment. Avoid inhalation, ingestion and contact with skin and eyes. No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.
Notes to physician	:	Treat symptomatically.

SECTION 5. FIREFIGHTING MEASURES

Suitable extinguishing media	:	Water spray Alcohol-resistant foam Carbon dioxide (CO2) Dry chemical
Unsuitable extinguishing media	:	Exercise caution when using a high volume water jet as it may scatter and spread fire
Specific hazards during firefighting	:	Do not allow run-off from fire fighting to enter drains or water courses.
Hazardous combustion products	:	Carbon oxides Nitrogen oxides (NOx)
Specific extinguishing methods	:	Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
Further information	:	Collect contaminated fire extinguishing water separately. This must not be discharged into drains. Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.
Special protective equipment for firefighters	:	Wear self-contained breathing apparatus for firefighting if necessary.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures	:	Use personal protective equipment. Refer to protective measures listed in sections 7 and 8.
Environmental precautions	:	Prevent product from entering drains. Prevent further leakage or spillage if safe to do so. If the product contaminates rivers and lakes or drains inform respective authorities.

Methods and materials for containment and cleaning up	:	Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust). Keep in suitable, closed containers for disposal.

SECTION 7. HANDLING AND STORAGE

Advice on protection against fire and explosion	:	Normal measures for preventive fire protection.
Advice on safe handling	:	Repeated or prolonged skin contact may cause skin irritation and/or dermatitis and sensitisation of susceptible persons. Persons suffering from asthma, eczema or skin problems should avoid contact, including dermal contact, with this product. Do not breathe vapours/dust. Avoid exposure - obtain special instructions before use. Avoid contact with skin and eyes. For personal protection see section 8. Smoking, eating and drinking should be prohibited in the application area. Dispose of rinse water in accordance with local and national regulations.
Conditions for safe storage	:	Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage. Observe label precautions. Keep in properly labelled containers.
Materials to avoid	:	For incompatible materials please refer to Section 10 of this SDS.
Recommended storage temperature	:	36 - 104 °F / 2 - 40 °C
Further information on storage stability	:	Stable under normal conditions.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Components with workplace control parameters

Components	CAS-No.	Value type (Form of exposure)	Control parameters / Permissible concentration	Basis
2-ethylaniline	578-54-1	TWA	5 ppm 19 mg/m3	OSHA Z-1
		TWA	2 ppm 8 mg/m3	OSHA P0

ethylbenzene	100-41-4	TWA	20 ppm	ACGIH
		TWA	100 ppm 435 mg/m3	NIOSH REL
		ST	125 ppm 545 mg/m3	NIOSH REL
		TWA	100 ppm 435 mg/m3	OSHA Z-1
		STEL	125 ppm 545 mg/m3	OSHA P0
		TWA	100 ppm 435 mg/m3	OSHA P0

Biological occupational exposure limits

Components	CAS-No.	Control parameters	Biological specimen	Sampling time	Permissible concentration	Basis
ethylbenzene	100-41-4	Sum of mandelic acid and phenyl glyoxylic acid	Urine	End of shift (As soon as possible after exposure ceases)	0.15 g/g creatinine	ACGIH BEI

Personal protective equipment

Respiratory protection : General and local exhaust ventilation is recommended to maintain vapor exposures below recommended limits. Where concentrations are above recommended limits or are unknown, appropriate respiratory protection should be worn. Follow OSHA respirator regulations (29 CFR 1910.134) and use NIOSH/MSHA approved respirators. Protection provided by air purifying respirators against exposure to any hazardous chemical is limited. Use a positive pressure air supplied respirator if there is any potential for uncontrolled release, exposure levels are unknown, or any other circumstance where air purifying respirators may not provide adequate protection.

Hand protection

Material : butyl-rubber
Break through time : > 8 h

Material : Nitrile rubber
Break through time : 10 - 480 min

Material : Ethyl Vinyl Alcohol Laminate (EVAL)
Break through time : > 8 h

Remarks : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.
The suitability for a specific workplace should be discussed with the producers of the protective gloves.

Eye protection	:	Eye wash bottle with pure water Tightly fitting safety goggles
Skin and body protection	:	Impervious clothing Choose body protection according to the amount and concentration of the dangerous substance at the work place.
Hygiene measures	:	When using do not eat or drink. When using do not smoke. Wash hands before breaks and at the end of workday.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	:	liquid
Colour	:	beige
Odour	:	amine-like
Odour Threshold	:	No data is available on the product itself.
pH	:	substance/mixture is non-soluble (in water)
Melting point/freezing point	:	No data available
Boiling point/boiling range	:	No data available
Flash point	:	212 °F / 100 °C Method: estimated, closed cup
Evaporation rate	:	No data is available on the product itself.
Flammability (solid, gas)	:	No data is available on the product itself.
Flammability (liquids)	:	No data is available on the product itself.
Upper explosion limit / Upper flammability limit	:	No data is available on the product itself.
Lower explosion limit / Lower flammability limit	:	No data is available on the product itself.
Vapour pressure	:	< 1 hPa (68 °F / 20 °C)
Relative vapour density	:	No data is available on the product itself.
Relative density	:	1.15 - 1.4 (77 °F / 25 °C)
Density	:	1.15 - 1.4 g/cm3 (77 °F / 25 °C)
Solubility(ies)		
Water solubility	:	insoluble (68 °F / 20 °C)

Solubility in other solvents	:	No data is available on the product itself.
Partition coefficient: n-octanol/water	:	No data is available on the product itself.
Auto-ignition temperature	:	No data is available on the product itself.
Decomposition temperature	:	> 392 °F / > 200 °C
Self-Accelerating decomposition temperature (SADT)	:	No data is available on the product itself.
Viscosity		
Viscosity, dynamic	:	60,000 mPa.s (77 °F / 25 °C)
Explosive properties	:	No data is available on the product itself.
Oxidizing properties	:	No data is available on the product itself.
Molecular weight	:	No data available
Particle size	:	No data is available on the product itself.

SECTION 10. STABILITY AND REACTIVITY

Reactivity	:	No dangerous reaction known under conditions of normal use.
Chemical stability	:	Stable under normal conditions.
Possibility of hazardous reactions	:	No hazards to be specially mentioned.
Conditions to avoid	:	None known.
Incompatible materials	:	Strong acids Strong bases Strong oxidizing agents
Hazardous decomposition products	:	carbon dioxide carbon monoxide Nitrogen oxides (NOx)

SECTION 11. TOXICOLOGICAL INFORMATION

Acute toxicity

Product:

Acute oral toxicity	:	Acute toxicity estimate: 1,774 mg/kg Method: Calculation method
Acute inhalation toxicity	:	Assessment: The substance/mixture is not toxic on inhalation as defined by dangerous goods regulations.

Acute toxicity estimate: 57.56 mg/l
Exposure time: 4 h
Test atmosphere: vapour
Method: Calculation method

Acute dermal toxicity : Acute toxicity estimate: > 5,000 mg/kg
Method: Calculation method

Components:

4,4'-methylenebis(2-ethylaniline):

Acute oral toxicity : LD50 (Rat): 444 mg/kg
Method: OECD Test Guideline 401

Acute inhalation toxicity : LC50 (Rat, male and female): > 0.85 mg/l
Exposure time: 4 h
Test atmosphere: dust/mist
Assessment: The component/mixture is moderately toxic after short term inhalation.

Acute dermal toxicity : LD50 (Rat, male and female): 2,080 mg/kg
Method: OECD Test Guideline 402
Assessment: The component/mixture is low toxic after single contact with skin.

tris(methylphenyl) phosphate:

Acute oral toxicity : LD50 (Rat): > 20,000 mg/kg

Acute inhalation toxicity : LC50 (Rat): > 11.1 mg/l
Exposure time: 1 h
Test atmosphere: dust/mist
Assessment: The substance or mixture has no acute inhalation toxicity

Acute dermal toxicity : LD50 (Rabbit): 3,700 mg/kg
Assessment: The component/mixture is low toxic after single contact with skin.

Formaldehyde, polymer with 2-ethylbenzenamine:

Acute oral toxicity : LD50 (Rat): 1,000 mg/kg

4,4'-methylenebis[N-sec-butylaniline]:

Acute oral toxicity : LD50 (Rat): 1,380 mg/kg

Acute dermal toxicity : LD50 (Rabbit): > 3,000 mg/kg
Assessment: The substance or mixture has no acute dermal toxicity

1,1',1'',1'''-ethylenedinitrilotetrapropan-2-ol:

Acute oral toxicity : LD50 (Rat, male and female): 2,890 mg/kg
Method: OECD Test Guideline 401

Acute dermal toxicity : LD50 (Rat, male and female): > 2,000 mg/kg

2-ethylaniline:

Acute oral toxicity : LD50: 1,260 mg/kg
Assessment: The component/mixture is moderately toxic after single ingestion.

Acute dermal toxicity : LD50 (Rabbit): 840 mg/kg
Assessment: The component/mixture is toxic after single contact with skin.

melamine:

Acute oral toxicity : LD50 (Rat, male and female): 3,161 - 3,828 mg/kg

Acute inhalation toxicity : LC50 (Rat, male and female): > 5190 mg/m3
Exposure time: 4 h
Test atmosphere: dust/mist
Method: OECD Test Guideline 403
GLP: yes
Assessment: The substance or mixture has no acute inhalation toxicity

ethylbenzene:

Acute oral toxicity : LD50 (Rat): 3,500 - 5,460 mg/kg
Assessment: The substance or mixture has no acute oral toxicity

Acute inhalation toxicity : LC50 (Rat): 17.3 mg/l
Exposure time: 4 h
Test atmosphere: vapour
Assessment: The component/mixture is moderately toxic after short term inhalation.

Acute dermal toxicity : LD50 (Rabbit): 15,400 mg/kg
Assessment: The substance or mixture has no acute dermal toxicity

Skin corrosion/irritation

Components:

4,4'-methylenebis(2-ethylaniline):

Species : Rabbit
Assessment : No skin irritation
Method : OPPTS 870.2500
Result : No skin irritation

tris(methylphenyl) phosphate:

Species : Rabbit
Result : No skin irritation

4,4'-methylenebis[N-sec-butylaniline]:

Species : Rabbit
Result : No skin irritation

melamine:

Species	:	Rabbit
Assessment	:	No skin irritation
Method	:	OECD Test Guideline 404
Result	:	No skin irritation
GLP	:	yes

Serious eye damage/eye irritation

Components:

4,4'-methylenebis(2-ethylaniline):

Species	:	Rabbit
Result	:	No eye irritation
Assessment	:	No eye irritation
Method	:	Acute Eye Irritation

tris(methylphenyl) phosphate:

Species	:	Rabbit
Result	:	No eye irritation

4,4'-methylenebis[N-sec-butylaniline]:

Species	:	Rabbit
Result	:	No eye irritation

1,1',1'',1'''-ethylenedinitrilotetrapropan-2-ol:

Species	:	Rabbit
Result	:	Irritating to eyes.
Assessment	:	Irritant

2-ethylaniline:

Result	:	Eye irritation

melamine:

Species	:	Rabbit
Remarks	:	slight irritation

Respiratory or skin sensitisation

Components:

4,4'-methylenebis(2-ethylaniline):

Exposure routes	:	Skin
Species	:	Humans
Result	:	The product is a skin sensitiser, sub-category 1A.

tris(methylphenyl) phosphate:

Exposure routes	:	Skin
Species	:	Mouse
Method	:	OECD Test Guideline 429

Result : Does not cause skin sensitisation.

4,4'-methylenebis[N-sec-butylaniline]:

Exposure routes : Skin
Result : Does not cause skin sensitisation.

melamine:

Test Type : Maximisation Test
Exposure routes : Skin
Species : Guinea pig
Assessment : Did not cause sensitisation on laboratory animals.
Method : OECD Test Guideline 406
Result : Did not cause sensitisation on laboratory animals.
GLP : yes

Germ cell mutagenicity

Components:

4,4'-methylenebis(2-ethylaniline):

Genotoxicity in vitro : Test Type: Ames test
Test system: Salmonella typhimurium
Metabolic activation: with and without metabolic activation
Method: Mutagenicity (Salmonella typhimurium - reverse mutation assay)
Result: positive

Genotoxicity in vivo : Test Type: In vivo micronucleus test
Species: Mouse
Cell type: Somatic
Application Route: Intraperitoneal injection
Exposure time: 72 h
Dose: 56 - 140 mg/kg
Method: OECD Test Guideline 474
Result: Not classified due to inconclusive data.

Test Type: In vivo micronucleus test
Species: Mouse
Cell type: Somatic
Application Route: Intraperitoneal injection
Dose: 9.3 - 37 mg/kg
Method: OECD Test Guideline 474
Result: positive

Germ cell mutagenicity - Assessment : Positive result(s) from in vivo somatic cell mutagenicity tests supported by positive results from in vitro mutagenicity assays or chemical structure activity relationship to known germ cell mutagens

tris(methylphenyl) phosphate:

Genotoxicity in vitro : Metabolic activation: with and without metabolic activation
Result: negative

Germ cell mutagenicity - : In vitro tests did not show mutagenic effects

Assessment

4,4'-methylenebis[N-sec-butylaniline]:

Genotoxicity in vitro : Method: OECD Test Guideline 471
Result: negative

melamine:

Genotoxicity in vitro : Test Type: reverse mutation assay
Test system: Salmonella typhimurium
Metabolic activation: with and without metabolic activation
Result: negative

Test Type: gene mutation test
Test system: Chinese hamster ovary cells
Metabolic activation: with and without metabolic activation
Result: negative

Test Type: Chromosome aberration test in vitro
Test system: Chinese hamster ovary cells
Metabolic activation: with and without metabolic activation
Result: negative

Genotoxicity in vivo : Test Type: Chromosome aberration test in vitro
Species: Mouse (male)
Cell type: Bone marrow
Application Route: Intraperitoneal injection
Dose: 0 - 150 - 300 - 600 mg/kg
Result: negative

ethylbenzene:

Genotoxicity in vitro : Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 473
Result: negative

Genotoxicity in vivo : Method: OECD Test Guideline 474
Result: negative

Method: OECD Test Guideline 486
Result: negative

Carcinogenicity

Components:

4,4'-methylenebis(2-ethylaniline):

Species : Rat, male and female
Application Route : Oral
Exposure time : 103 weeks
Dose : 9 - 10 mg/kg
Frequency of Treatment : 24 hour
Method : OECD Test Guideline 451
Result : positive

Carcinogenicity - : Limited evidence of carcinogenicity in animal studies

Assessment

tris(methylphenyl) phosphate:

Carcinogenicity - Assessment	:	Animal testing did not show any carcinogenic effects.

melamine:

Species	:	Rat, male and female
Application Route	:	Oral
Exposure time	:	103 weeks
NOAEL	:	126 mg/kg bw/day
Result	:	negative
Target Organs	:	Urinary bladder

Species	:	Mouse, male and female
Application Route	:	Oral
Exposure time	:	103 weeks
NOAEL	:	2,250 mg/kg bw/day
Result	:	negative

IARC	Group 2B: Possibly carcinogenic to humans melamine	108-78-1
	Group 2B: Possibly carcinogenic to humans ethylbenzene	100-41-4

OSHA No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

NTP No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

Reproductive toxicity

Components:

tris(methylphenyl) phosphate:

Effects on fertility	:	Species: Rat, male and female Application Route: Oral General Toxicity - Parent: LOAEL: 62.5 mg/kg body weight Target Organs: Testes, Ovary Method: OECD Test Guideline 415 Result: positive
Effects on foetal development	:	Species: Rat, female Application Route: Oral Dose: 20, 100, 400, 750 milligram per kilogram General Toxicity Maternal: NOEL: 20 mg/kg body weight Method: OPPTS 870.3700 Result: Teratogenic effects
Reproductive toxicity - Assessment	:	Some evidence of adverse effects on sexual function and fertility, and/or on development, based on animal experiments.

1,1',1'',1'''-ethylenedinitrilotetrapropan-2-ol:

Effects on fertility : Species: Rat, male and female
Application Route: Oral
Method: OECD Test Guideline 422
Result: negative

Effects on foetal development : Species: Rat, female
Application Route: Oral
General Toxicity Maternal: NOAEL: 400 mg/kg body weight
Result: No teratogenic effects

melamine:

Effects on fertility : Species: Rat, male and female
Application Route: Oral
Dose: 1000/4000/12500 pm
General Toxicity - Parent: NOAEL: 1,000 ppm
General Toxicity F1: NOAEL: >= 12,500 ppm
General Toxicity F2: NOAEL: >= 12,500 parts per million
Target Organs: Testes
Method: OECD Test Guideline 443
GLP: yes

Effects on foetal development : Species: Rat, female
Application Route: Oral
General Toxicity Maternal: NOAEL: 600 mg/kg body weight
Method: OECD Test Guideline 414
Result: No teratogenic effects

Test Type: Pre-natal
Species: Rat, female
Application Route: Oral
Dose: 136; 400; 1060 mg/kg bw/day
Duration of Single Treatment: 11 d
General Toxicity Maternal: NOAEL: ca. 400 mg/kg body weight
Developmental Toxicity: NOAEL: ca. 1,060 mg/kg body weight
Method: OECD Test Guideline 414
GLP: yes

Test Type: Pre-natal
Species: Rabbit, female
Application Route: Oral
Dose: 15/50/150 mg/kg bw/d
Duration of Single Treatment: 23 d
Frequency of Treatment: 7 days/week
General Toxicity Maternal: NOAEL: 150 mg/kg body weight
Developmental Toxicity: NOAEL: 150 mg/kg body weight
Method: OECD Test Guideline 414
GLP: yes

Reproductive toxicity - Assessment : Suspected of damaging fertility or the unborn child., Some evidence of adverse effects on sexual function and fertility, and/or on development, based on animal experiments.

ethylbenzene:

Effects on fertility : General Toxicity - Parent: NOAEL: 500 ppm

Method: OECD Test Guideline 416

Effects on foetal development	:	General Toxicity Maternal: NOAEL: 500 ppm Teratogenicity: NOAEL: 2,000 ppm Developmental Toxicity: NOAEL: 500 ppm

STOT - single exposure

Components:

4,4'-methylenebis(2-ethylaniline):

Exposure routes	:	Ingestion
Target Organs	:	Liver
Assessment	:	May cause damage to organs.

STOT - repeated exposure

Components:

4,4'-methylenebis(2-ethylaniline):

Exposure routes	:	Ingestion
Target Organs	:	Liver
Assessment	:	Causes damage to organs through prolonged or repeated exposure.

Exposure routes	:	Ingestion
Target Organs	:	Kidney
Assessment	:	May cause damage to organs through prolonged or repeated exposure.

ethylbenzene:

Exposure routes	:	Inhalation
Target Organs	:	Lungs, Liver, Kidney, Central nervous system
Assessment	:	May cause damage to organs through prolonged or repeated exposure.

Repeated dose toxicity

Components:

4,4'-methylenebis(2-ethylaniline):

Species	:	Rat, male and female
LOAEL	:	7.5 - 8 mg/kg/d
Application Route	:	Ingestion
Exposure time	:	2,160 h
Number of exposures	:	7 d
Method	:	Subchronic toxicity

Species	:	Rat, male and female
NOAEL	:	90 mg/kg/d
Application Route	:	Skin contact
Exposure time	:	2,160 h
Number of exposures	:	5 d
Method	:	Subchronic toxicity

tris(methylphenyl) phosphate:

Species	:	Rat, male and female
NOEL	:	1000 mg/kg
Application Route	:	Ingestion
Exposure time	:	2,160 h
Method	:	Subchronic toxicity

1,1',1'',1'''-ethylenedinitrilotetrapropan-2-ol:

Species	:	Rat, male and female
NOAEL	:	1000 mg/kg/d
Application Route	:	Ingestion
Exposure time	:	1,176 h
Number of exposures	:	7 d
Method	:	Subacute toxicity

Species	:	Rat, male and female
NOAEL	:	300 mg/kg/d
Application Route	:	Ingestion
Exposure time	:	1,176 h
Number of exposures	:	7 d
Method	:	Subacute toxicity

melamine:

Species	:	Rat, male
NOAEL	:	72 mg/kg
Application Route	:	oral (feed)
Exposure time	:	13 Weeks
Method	:	Subchronic toxicity

ethylbenzene:

Species	:	Rat, male and female
NOAEL	:	75 mg/kg bw
Application Route	:	oral (gavage)
Exposure time	:	28 d
Dose	:	75/250/750 mg/kg bw
Control Group	:	yes
Method	:	OECD Test Guideline 407
Target Organs	:	Liver
Remarks	:	Subacute toxicity

Species	:	Rat, male and female
NOAEL	:	75 mg/kg bw
Application Route	:	oral (gavage)
Exposure time	:	90 d
Dose	:	75/250/750 mg/kg bw
Control Group	:	yes
Method	:	OECD Test Guideline 408

Species	:	Mouse, male and female
NOAEL	:	3.4 mg/l
Application Route	:	Inhalation
Exposure time	:	28 d
Dose	:	0,4/1,7/3,4 mg/L
Control Group	:	yes

Method	:	OECD Test Guideline 412
Species	:	Rat, male and female
NOAEL	:	1084
NOAEL	:	mg/m3
Application Route	:	inhalation (vapour)
Exposure time	:	104 week
Dose	:	325/1084/3251 mg/m3
Control Group	:	yes
Method	:	OECD Test Guideline 453
Species	:	Rat, male and female
NOAEL	:	4.74 mg/l
Application Route	:	Inhalation
Exposure time	:	13 week
Dose	:	0,47/1,18/2,37/3,55/4,74 mg/L
Control Group	:	yes
Method	:	OECD Test Guideline 413
Target Organs	:	Liver
Species	:	Mouse, male and female
NOAEL	:	3251
NOAEL	:	mg/m3
Application Route	:	Inhalation
Exposure time	:	104 week
Dose	:	325/1084/3251 mg/m3
Control Group	:	yes
Method	:	OECD Test Guideline 453
Species	:	Rabbit, male and female
NOAEL	:	6.8 mg/l
Application Route	:	Inhalation
Exposure time	:	28 d
Dose	:	1,7/3,4/6,8 mg/L
Control Group	:	yes
Method	:	OECD Test Guideline 412

Aspiration toxicity

Components:

ethylbenzene:

May be fatal if swallowed and enters airways.

Experience with human exposure

No data available

Toxicology, Metabolism, Distribution

No data available

Neurological effects

No data available

Further information

No data available

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity

Components:

4,4'-methylenebis(2-ethylaniline):

Toxicity to fish	:	LC50 (Oryzias latipes (Orange-red killifish)): 20.6 mg/l Exposure time: 96 h Test Type: semi-static test Test substance: Fresh water Method: OECD Test Guideline 203
Toxicity to daphnia and other aquatic invertebrates	:	EC50 (Daphnia magna (Water flea)): 0.35 mg/l Exposure time: 48 h Test Type: static test Method: OECD Test Guideline 202
M-Factor (Acute aquatic toxicity)	:	1
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	:	NOEC (Daphnia magna (Water flea)): 0.00525 mg/l Exposure time: 21 d Test Type: semi-static test Test substance: Fresh water Method: OECD Test Guideline 211
M-Factor (Chronic aquatic toxicity)	:	10

tris(methylphenyl) phosphate:

Toxicity to fish	:	LC50 (Oncorhynchus mykiss (rainbow trout)): 0.6 mg/l Exposure time: 96 h Test Type: static test
Toxicity to daphnia and other aquatic invertebrates	:	EC50 (Daphnia magna (Water flea)): 0.146 mg/l Exposure time: 48 h Test Type: static test Method: OECD Test Guideline 202
Toxicity to algae/aquatic plants	:	ErC50: 0.4042 mg/l Exposure time: 72 h Test Type: static test Method: OECD Test Guideline 201
M-Factor (Acute aquatic toxicity)	:	1
Toxicity to fish (Chronic toxicity)	:	NOEC (Other): 0.01 mg/l Exposure time: 28 d
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	:	NOEC (Daphnia magna (Water flea)): 0.1 mg/l Exposure time: 21 d Test Type: semi-static test

M-Factor (Chronic aquatic toxicity) : 1

Toxicity to microorganisms : EC50 (activated sludge): > 1,000 mg/l
Exposure time: 3 h

4,4'-methylenebis[N-sec-butylaniline]:

Ecotoxicology Assessment

Chronic aquatic toxicity : This product has no known ecotoxicological effects.

1,1',1'',1'''-ethylenedinitrilotetrapropan-2-ol:

Toxicity to fish : LC50 (Leuciscus idus (Golden orfe)): 4,600 mg/l
Exposure time: 96 h
Test Type: flow-through test
Test substance: Fresh water
Method: DIN 38412

LC50 (Leuciscus idus (Golden orfe)): 2,700 mg/l
Exposure time: 48 h
Test Type: static test
Method: DIN 38412

Toxicity to daphnia and other aquatic invertebrates : IC0 (Daphnia magna (Water flea)): > 100 mg/l
Exposure time: 48 h
Test Type: static test
Method: Directive 67/548/EEC, Annex V, C.2.

Toxicity to algae/aquatic plants : EC50 (Other): 150.67 mg/l
Exposure time: 72 h
Test substance: Fresh water
Method: Directive 67/548/EEC, Annex V, C.3.

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOEC (Daphnia magna (Water flea)): 10 mg/l
Exposure time: 21 d
Test Type: semi-static test
Test substance: Fresh water
Method: OECD Test Guideline 211

melamine:

Toxicity to fish : LC50 (Oncorhynchus mykiss (rainbow trout)): > 3,000 mg/l
End point: mortality
Exposure time: 96 h
Test Type: semi-static test
Test substance: Fresh water
GLP: no

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 200 mg/l
End point: Immobilization
Exposure time: 48 h
Test Type: static test
Analytical monitoring: no
Test substance: Fresh water
GLP: yes

Toxicity to algae/aquatic plants	:	EC50 (Selenastrum capricornutum (green algae)): 325 mg/l Exposure time: 96 h Test Type: static test Test substance: Fresh water GLP: yes NOEC (Selenastrum capricornutum (green algae)): 98 mg/l Exposure time: 96 h Test Type: static test Test substance: Fresh water GLP: yes
Toxicity to fish (Chronic toxicity)	:	NOEC (Pimephales promelas (fathead minnow)): >= 5 mg/l Exposure time: 36 d Test Type: flow-through test Analytical monitoring: yes Test substance: Fresh water Method: OECD Test Guideline 210 GLP: yes
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	:	NOEC (Daphnia magna (Water flea)): >= 11 mg/l Exposure time: 21 d Test Type: semi-static test Analytical monitoring: yes Test substance: Fresh water Method: OECD Test Guideline 211 GLP: yes

ethylbenzene:

Toxicity to fish	:	LC50: 4.2 mg/l Exposure time: 96 h LC50: 9.2 mg/l Exposure time: 96 h LC50: 12.1 mg/l Exposure time: 96 h LC50: 5.1 mg/l Exposure time: 96 h
Toxicity to daphnia and other aquatic invertebrates	:	EC50: 1.81 - 2.38 mg/l Exposure time: 48 h
Toxicity to algae/aquatic plants	:	IC50: 4.6 mg/l Exposure time: 72 h EC50: 3.6 mg/l Exposure time: 96 h NOEC: 3.4 mg/l Exposure time: 96 h EC50: 7.7 mg/l Exposure time: 96 h

Toxicity to fish (Chronic toxicity) : NOEL: 0.96 mg/l
Exposure time: 7 d

Ecotoxicology Assessment

Acute aquatic toxicity : This product has no known ecotoxicological effects.

Chronic aquatic toxicity : Harmful to aquatic life with long lasting effects.

Persistence and degradability

Components:

tris(methylphenyl) phosphate:

Biodegradability : aerobic
Inoculum: Sewage (STP effluent)
Concentration: 100 mg/l
Result: Readily biodegradable.
Biodegradation: 80 %
Exposure time: 28 d
Method: OECD Test Guideline 301C

1,1',1'',1'''-ethylenedinitrilotetrapropan-2-ol:

Biodegradability : Inoculum: activated sludge
Concentration: 107 mg/l
Result: Inherently biodegradable.
Biodegradation: 36 %
Exposure time: 28 d
Method: OECD Test Guideline 302B

Inoculum: Domestic sewage
Concentration: 30 mg/l
Result: Not readily biodegradable.
Biodegradation: 9 %
Exposure time: 28 d
Method: Directive 67/548/EEC Annex V, C.4.D.

melamine:

Biodegradability : Inoculum: activated sludge
Concentration: 100 mg/l
Dissolved organic carbon (DOC)
Result: Not readily biodegradable.
Biodegradation: < 10 %
Exposure time: 28 d
Method: OECD Test Guideline 302B
Test substance: Fresh water

Inoculum: activated sludge
Concentration: 100 parts per million
Result: Not biodegradable
Method: OECD Test Guideline 301C
Test substance: Fresh water

ethylbenzene:

Biodegradability : Result: Readily biodegradable.
Biodegradation: > 60 %
Exposure time: 28 d

Bioaccumulative potential

Components:

tris(methylphenyl) phosphate:

Partition coefficient: n-octanol/water : log Pow: 5.93

4,4'-methylenebis[N-sec-butylaniline]:

Bioaccumulation : Bioconcentration factor (BCF): 4,700

Partition coefficient: n-octanol/water : log Pow: 6.08
Method: QSAR

1,1',1'',1'''-ethylenedinitrilotetrapropan-2-ol:

Partition coefficient: n-octanol/water : log Pow: -2.08 (77 °F / 25 °C)

melamine:

Partition coefficient: n-octanol/water : log Pow: -1.22 (68 °F / 20 °C)
pH: 8
Method: Partition coefficient
GLP: no

ethylbenzene:

Bioaccumulation : Bioconcentration factor (BCF): 1.9

Partition coefficient: n-octanol/water : log Pow: 3.15

Mobility in soil

Components:

tris(methylphenyl) phosphate:

Distribution among environmental compartments : Koc: 4.31
Method: OECD Test Guideline 121

4,4'-methylenebis[N-sec-butylaniline]:

Distribution among environmental compartments : Koc: 4.91
Method: QSAR

melamine:

Distribution among environmental compartments : Koc: 1.7

ethylbenzene:

Distribution among environmental compartments	:	Koc: 520

Other adverse effects

Product:

Ozone-Depletion Potential	:	Regulation: 40 CFR Protection of Environment; Part 82 Protection of Stratospheric Ozone - CAA Section 602 Class I Substances Remarks: This product neither contains, nor was manufactured with a Class I or Class II ODS as defined by the U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App.A + B).
Additional ecological information	:	An environmental hazard cannot be excluded in the event of unprofessional handling or disposal. Very toxic to aquatic life with long lasting effects.

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal methods

Waste from residues	:	Dispose of contents and container in accordance with all local, regional, national and international regulations. Do not dispose of waste into sewer. Do not contaminate ponds, waterways or ditches with chemical or used container.
Contaminated packaging	:	Empty remaining contents. Dispose of as unused product. Do not re-use empty containers.

SECTION 14. TRANSPORT INFORMATION

International Regulations

IATA-DGR

UN/ID No.	:	UN 3082
Proper shipping name	:	Environmentally hazardous substance, liquid, n.o.s. (4,4'-METHYLENEBIS(2-ETHYLANILINE), TRICRESYL PHOSPHATE)
Class	:	9
Packing group	:	III
Labels	:	Miscellaneous
Packing instruction (cargo aircraft)	:	964
Packing instruction (passenger aircraft)	:	964
Environmentally hazardous	:	yes

IMDG-Code

UN number	:	UN 3082
Proper shipping name	:	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (4,4'-METHYLENEBIS(2-ETHYLANILINE), TRICRESYL

PHOSPHATE)

Class	:	9
Packing group	:	III
Labels	:	9
EmS Code	:	F-A, S-F
Marine pollutant	:	yes

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Not applicable for product as supplied.

National Regulations

49 CFR

UN/ID/NA number	:	UN 3082
Proper shipping name	:	Environmentally hazardous substance, liquid, n.o.s. (4,4'-METHYLENEBIS(2-ETHYLANILINE), TRICRESYL PHOSPHATE)
Class	:	9
Packing group	:	III
Labels	:	CLASS 9
ERG Code	:	171
Marine pollutant	:	yes
Remarks	:	Above applies only to containers over 119 gallons or 450 liters. Not regulated if shipped in packages less than or equal to 119 gallons (450 liters).

Special precautions for user

Remarks	:	49CFR: no dangerous good in non-bulk packaging

The transport classification(s) provided herein are for informational purposes only, and solely based upon the properties of the unpackaged material as it is described within this Safety Data Sheet. Transportation classifications may vary by mode of transportation, package sizes, and variations in regional or country regulations.

SECTION 15. REGULATORY INFORMATION

CERCLA Reportable Quantity

Components	CAS-No.	Component RQ (lbs)	Calculated product RQ (lbs)
xylenes	1330-20-7	100	30959

SARA 311/312 Hazards : Acute toxicity (any route of exposure)
Respiratory or skin sensitisation
Germ cell mutagenicity
Carcinogenicity
Reproductive toxicity
Specific target organ toxicity (single or repeated exposure)

SARA 313 : The following components are subject to reporting levels established by SARA Title III, Section 313:

ethylbenzene	100-41-4	>= 0.1 - < 1 %

The following chemical(s), >= 0.1%, are listed as HAP under the U.S. Clean Air Act, Section 112

(40 CFR 61):

xylenes	1330-20-7
ethylbenzene	100-41-4

California Prop. 65

WARNING: This product can expose you to chemicals including ethylbenzene, which is/are known to the State of California to cause cancer, and
methanol, toluene, which is/are known to the State of California to cause birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

The components of this product are reported in the following inventories:

DSL	:	This product contains one or several components listed in the Canadian NDSL.
AIIC	:	On the inventory, or in compliance with the inventory
NZIoC	:	Not in compliance with the inventory
ENCS	:	On the inventory, or in compliance with the inventory
KECI	:	Not in compliance with the inventory
PICCS	:	On the inventory, or in compliance with the inventory
IECSC	:	On the inventory, or in compliance with the inventory
TCSI	:	On the inventory, or in compliance with the inventory
TSCA	:	All substances listed as active on the TSCA inventory

Inventories

AIIC (Australia), DSL (Canada), IECSC (China), REACH (European Union), ENCS (Japan), ISHL (Japan), KECI (Korea), NZIoC (New Zealand), PICCS (Philippines), TCSI (Taiwan), TECI (Thailand), TSCA (USA)

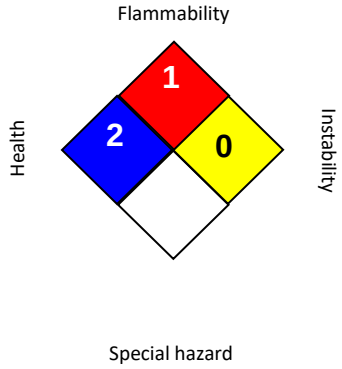
TSCA - 5(a) Significant New Use Rule List of Chemicals
No substances are subject to a Significant New Use Rule.

US. Toxic Substances Control Act (TSCA) Section 12(b) Export Notification (40 CFR 707, Subpt D)
No substances are subject to TSCA 12(b) export notification requirements.

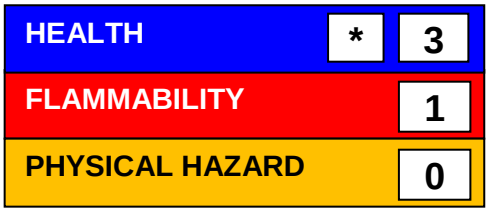
SECTION 16. OTHER INFORMATION

Further information

NFPA 704:



HMIS® IV:



HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. The "*" represents a chronic hazard, while the "/" represents the absence of a chronic hazard

Revision Date	:	09/20/2022
ACGIH	:	USA. ACGIH Threshold Limit Values (TLV)
ACGIH BEI	:	ACGIH - Biological Exposure Indices (BEI)
NIOSH REL	:	USA. NIOSH Recommended Exposure Limits
OSHA P0	:	USA. Table Z-1-A Limits for Air Contaminants (1989 vacated values)
OSHA Z-1	:	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
ACGIH / TWA	:	8-hour, time-weighted average
NIOSH REL / TWA	:	Time-weighted average concentration for up to a 10-hour workday during a 40-hour workweek
NIOSH REL / ST	:	STEL - 15-minute TWA exposure that should not be exceeded at any time during a workday
OSHA P0 / TWA	:	8-hour time weighted average
OSHA P0 / STEL	:	Short-term exposure limit
OSHA Z-1 / TWA	:	8-hour time weighted average

The information and recommendations in this publication are to the best of our knowledge, information and belief accurate at the date of publication, NOTHING HEREIN IS TO BE CONSTRUED AS A WARRANTY, EXPRESS OR OTHERWISE.

IN ALL CASES, IT IS THE RESPONSIBILITY OF THE USER TO DETERMINE THE APPLICABILITY OF SUCH INFORMATION AND RECOMMENDATIONS AND THE SUITABILITY OF ANY PRODUCT FOR ITS OWN PARTICULAR PURPOSE.

THE PRODUCT MAY PRESENT HAZARDS AND SHOULD BE USED WITH CAUTION. WHILE CERTAIN HAZARDS ARE DESCRIBED IN THIS PUBLICATION, NO GUARANTEE IS MADE THAT THESE ARE THE ONLY HAZARDS THAT EXIST.

Hazards, toxicity and behaviour of the products may differ when used with other materials and are dependent upon the manufacturing circumstances or other processes. Such hazards, toxicity and behaviour should be determined by the user and made known to handlers, processors and end users.