

SAFETY DATA SHEET TOLUENE LRG

According to Regulation (EC) No 1907/2006, Annex II, as amended by Regulation (EU) No 453/2010

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

1.1. Product identifier

Product name	TOLUENE LRG
Product number	1278
REACH registration number	01-2119471310-51-XXXX
REACH registration notes	Provided by supplier.
CAS number	108-88-3
EU index number	601-021-00-3
EC number	203-625-9
CLI number	Not available

1.2. Relevant identified uses of the substance or mixture and uses advised against

Identified uses	Organic solvent Used in organic synthesis Laboratory chemicals
Uses advised against	Mixing with nitric acid can produce explosive mixture. Addition to engine fuel can cause damage to mechanical parts. Processes involving incompatible materials. Processes that would lead to over-exposure of the operators. Processes involving sources of ignition.

1.3. Details of the supplier of the safety data sheet

Supplier	Reagent Chemical Services 18 Aston Fields Road Whitehouse Industrial Estate Runcorn Cheshire WA7 3DL
	T: 01928 716903 (08.30 - 17.00) F: 01928 716425 E: info@reagent.co.uk

1.4. Emergency telephone number

Emergency telephone	OHES Environmental Ltd 24-7 Tel. 0333 333 9939 (24 hour)
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SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification

Physical hazards	Flam. Liq. 2 - H225
Health hazards	Skin Irrit. 2 - H315 Repr. 2 - H361d Asp. Tox. 1 - H304 STOT SE 3 - H336 STOT RE 2 - H373
Environmental hazards	Not Classified

TOLUENE LRG

Classification (67/548/EEC or 1999/45/EC) F;R11 Repr. Cat. 3;R63 Xn;R48/20,R65 Xi;R38 R67

Human health

Irritating to skin. Possible damage to fertility or the unborn child. Possible routes of exposure are via inhalation, ingestion and skin absorption. Acute effects are excitement, euphoria, hallucinations, confusion, headache, dizziness, possible at 200ppm. Higher concentrations produce depression, drowsiness, stupor, death in humans can occur from 10,000ppm inhalation. Chronic exposure can result in accumulation in fatty tissues. Target organs are the central nervous system, liver, kidneys and skin.

Environmental

Toluene is immiscible with water and will remain on the water surface. It will evaporate readily from the surface of water and soil and contribute to the formation of harmful ground level ozone and smogs which are capable of damaging crops. It will travel into soil and groundwater but is readily broken down by micro-organisms. Toluene can be taken up by aquatic organisms but high levels do not persist. Discharges into foul drains can present a health hazard to workers operating on the drainage system due to the volatile nature of the product. If significant amounts have been discharged then the local water treatment company should be informed. The Environment Agency or other regulatory body must be informed of large or uncontrolled discharges to land or water.

Physicochemical

Highly flammable, forms explosive vapour / air mixtures. Reacts with strong oxidising agents, sulphuric and nitric acids, nitrogen tetroxide and chlorine. When heated and reacted with a nitro group the compounds dinitrotoluene and trinitrotoluene can be produced. Trinitrotoluene is volatile and explosive. Reaction with oxidising agents can produce heat and potentially ignite or explode.

2.2. Label elements

EC number

203-625-9

Pictogram



Signal word

Danger

Hazard statements

H225 Highly flammable liquid and vapour.
 H304 May be fatal if swallowed and enters airways.
 H315 Causes skin irritation.
 H336 May cause drowsiness or dizziness.
 H361d Suspected of damaging the unborn child.
 H373 May cause damage to organs through prolonged or repeated exposure.

Precautionary statements

P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
 P280 Wear protective gloves/protective clothing/eye protection/face protection.
 P301+P310 IF SWALLOWED: Immediately call a POISON CENTER/doctor.
 P501 Dispose of contents / container to hazardous waste depot.
 P261 Avoid breathing mist/vapours/spray

TOLUENE LRG

Supplementary precautionary statements	<p>P201 Obtain special instructions before use.</p> <p>P202 Do not handle until all safety precautions have been read and understood.</p> <p>P233 Keep container tightly closed.</p> <p>P240 Ground/bond container and receiving equipment.</p> <p>P241 Use explosion-proof electrical/ventilating/lighting/.../equipment.</p> <p>P242 Use only non-sparking tools.</p> <p>P243 Take precautionary measures against static discharge.</p> <p>P260 Do not breathe dust/fume/gas/mist/vapours/spray.</p> <p>P264 Wash ... thoroughly after handling.</p> <p>P271 Use only outdoors or in a well-ventilated area.</p> <p>P281 Use personal protective equipment as required.</p> <p>P302+P352 IF ON SKIN: Wash with plenty of water.</p> <p>P303+P361+P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.</p> <p>P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.</p> <p>P308+P313 IF exposed or concerned: Get medical advice/attention.</p> <p>P312 Call a POISON CENTER/doctor if you feel unwell.</p> <p>P314 Get medical advice/attention if you feel unwell.</p> <p>P321 Specific treatment (see ... on this label).</p> <p>P331 Do NOT induce vomiting.</p> <p>P332+P313 If skin irritation occurs: Get medical advice/attention.</p> <p>P362 Take off contaminated clothing.</p> <p>P370+P378 In case of fire: Use ... for extinction.</p> <p>P403+P233 Store in a well-ventilated place. Keep container tightly closed.</p> <p>P403+P235 Store in a well-ventilated place. Keep cool.</p> <p>P405 Store locked up.</p>
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2.3. Other hazards

This substance is not classified as PBT or vPvB according to current EU criteria.

SECTION 3: Composition/information on ingredients

3.1. Substances

Product name	TOLUENE LRG
REACH registration number	01-2119471310-51-XXXX
REACH registration notes	Provided by supplier.
EU index number	601-021-00-3
CAS number	108-88-3
EC number	203-625-9
CLI number	Not available
Composition comments	The product contains toluene above 99.9%, impurities are benzene <200ppm and water.

SECTION 4: First aid measures

4.1. Description of first aid measures

TOLUENE LRG

General information	CAUTION! First aid personnel must be aware of own risk during rescue! Always consider any dangers in the vicinity before approaching to treat the casualty. First aid personnel must protect themselves with all necessary personal protective equipment during the assistance of casualties. Isolate all sources of ignition when treating casualties - DO NOT SMOKE. When breathing is difficult, properly trained personnel may assist the casualty by administering oxygen. Check airway for any blockages. Place unconscious person on the side in the recovery position and ensure breathing can take place. Never give anything by mouth to an unconscious person. If breathing has stopped perform CPR. If medical assistance is needed take as much detail as possible about the incident and hazardous materials involved with the casualty.
Inhalation	Remove affected person from source of contamination. Move affected person to fresh air and keep warm and at rest in a position comfortable for breathing. In case of severe exposure or if any discomfort continues get medical attention.
Ingestion	Do not induce vomiting. Rinse mouth thoroughly with water Get medical attention.
Skin contact	Immediately remove contaminated clothing and wash before re-use. Wash skin thoroughly with soap and water. In serious cases or if discomfort continues obtain medical attention.
Eye contact	Promptly wash eyes with plenty of water or eye wash solution while lifting the eyelids. If possible remove any contact lenses and continue to wash. Get medical attention if any discomfort continues.

4.2. Most important symptoms and effects, both acute and delayed

General information	The severity of the symptoms described will vary dependent on the concentration and the length of exposure. Long term high exposure can cause serious brain damage including neurological abnormalities and brain atrophy. There is an increased risk of high frequency hearing loss. Neurological effects can occur at lower levels. Toluene exposure in pregnant women through abuse or the workplace has been associated with spontaneous abortions and physical abnormalities in their children.
Inhalation	Acute: Irritation of nose, throat and airway. Vapours may cause headache, fatigue, dizziness and nausea. Central nervous system depression or excitation. Delayed: Can cause pulmonary edemas. Unconsciousness, coma and possibly death.
Ingestion	Similar effects as inhalation. Acute: Gastric irritation. Nausea, vomiting. Delayed: Liver damage. Coma and death can occur following severe exposure. Possible aspiration hazard upon vomiting.
Skin contact	Acute: Skin irritation. Burns can occur. Delayed: Can cause degreasing of the skin and contact dermatitis may develop after repeated exposure.
Eye contact	Acute: Causes irritation of the eyes. Delayed: Corneal damage.

4.3. Indication of any immediate medical attention and special treatment needed

Notes for the doctor	Cases of ingestion and severe inhalation will require prompt action due to the relatively fast rate of absorption in the body.
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SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media	Small fires: Foam, carbon dioxide or dry powder. Larger fires: Dry powder, foam or water spray/mist.
Unsuitable extinguishing media	Do not use water jet as this can spread the fire. Do not use carbon dioxide in enclosed spaces with insufficient ventilation.

5.2. Special hazards arising from the substance or mixture

TOLUENE LRG

Specific hazards	In case of fire, toxic gases or vapours may be formed. Toluene forms explosive mixtures with air at low concentrations, if vapours are produced during a fire there is a high potential for explosions to occur. Vapours are heavier than air and may spread near ground and travel a considerable distance to a source of ignition and flash back. Sealed containers of the product or other flammable liquids in the near vicinity of the fire can explode due to pressure build up.
Hazardous combustion products	Protection against nuisance dust must be used when the airborne concentration exceeds 10 mg/m ³ . Oxides of carbon.
5.3. Advice for firefighters	
Protective actions during firefighting	Containers close to the fire area should be cooled with water if safe to do so. Be aware that any flammable substance containers are liable to explode when heated. Be aware of dangers from other hazardous substances in the immediate area. Prevent run-off from entering drains and watercourses.
Special protective equipment for firefighters	Wear positive-pressure self-contained breathing apparatus (SCBA) and appropriate protective clothing.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Personal precautions	Spill control personnel should wear personal protective clothing and equipment as described in section 8 of this datasheet. Non-emergency personnel should be kept away from the area of spillage. Isolate all sources of ignition. Provide adequate ventilation. Avoid ingestion, inhalation of vapours and contact with skin and eyes. Have emergency procedures in place for treating spillages, evacuating the area and informing the emergency services if necessary. Restrict access to the area until the spillage is treated, if large amounts of vapours are produced that will be hazardous to others, evacuate the area. When any other effects of spillages will affect the safety of others the area should be evacuated. Use suitable respiratory equipment if spillages occur in enclosed spaces and vapours are produced.
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6.2. Environmental precautions

Environmental precautions	Avoid unauthorised discharge to the environment. Do not discharge into drains or watercourses or onto the ground. Clean up any spillages immediately, prevent material from spreading and entering drains or sewage systems. If spillages to land cannot be treated safely or if contamination will occur the Environment Agency must be alerted immediately. Large spillages or uncontrolled discharge to water systems must be alerted to the Environmental Agency or other regulatory body. If the substance has entered a foul drain or sewage system in significant quantity to cause a hazard the local Water Treatment Company must be informed.
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6.3. Methods and material for containment and cleaning up

Methods for cleaning up	Isolate all ignition sources. Avoid heat, flames, sparks and static discharge. NO SMOKING. Small Spillages: Absorb with inert, non-combustible material. Large Spillages: Dam and absorb spillages with sand, earth or other inert, non-combustible material. Fit drain covers where they are available if the spillage is likely to enter the drainage system. Provide adequate ventilation. Any extraction systems used to ventilate the area must be flameproof. Collect and place in suitable waste disposal containers and seal securely. For waste disposal, see Section 13. Containers with collected spillage must be properly labelled with correct contents and hazard symbol. Ensure there are no ignition or heat sources in the waste storage area. Wash spillage site well with water and detergent, be aware of the potential for surfaces to become slippery. Wash thoroughly after dealing with a spillage. After spillages in enclosed areas test atmosphere before using any potential ignition sources. Ventilate area and allow to dry before allowing access.
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6.4. Reference to other sections

TOLUENE LRG

Reference to other sections Refer to sections 8 and 13 for additional information.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Usage precautions

Static electricity and formation of sparks must be prevented. Eliminate all sources of ignition. Avoid spilling. Avoid contact with skin and eyes. Avoid inhalation of vapours and spray/mists. Do not mix with incompatible substances or mixtures. Do not eat, drink or smoke when handling. Do not dispose of the substance to the environment through unauthorised means. Do not discharge to land or water including the drainage system. Do not use in areas close to drainage systems unless measures are in place to prevent access of product. Do not use in confined spaces without adequate ventilation and/or respirator. Use flame proof fume extraction systems to remove vapours away from the work area. Wash at the end of each work shift and before using the toilet. Remove contaminated clothing/footwear/equipment before entering eating areas or other places that would expose others to the substance. Ensure emergency procedures are in place to treat spillages and cope with other situations such as evacuation.

7.2. Conditions for safe storage, including any incompatibilities

Storage precautions

Keep away from oxidising materials, heat and flames. Avoid all ignition sources. Store in area with adequate ventilation and sufficient air movement to prevent any build up of vapours. Store in closed original container at temperatures between 15°C and 25°C. Store away from heat, direct sunlight and moisture. Store away from oxidising agents. Store away from incompatible materials. Keep above the chemical's freezing point. Store in a stable situation to avoid spillages. It is advisable to store in a bunded area or use other protective measures such as a sump pallet or storage tray. If the substance is transferred to other containers ensure the packaging material is compatible. Consult with the packaging manufacturer or supplier. Do not leave storage containers exposed to the atmosphere as this will result in evaporation of contents.

Storage class

Flammable liquid storage.

7.3. Specific end use(s)

Specific end use(s)

The identified uses for this product are detailed in Section 1.2.

SECTION 8: Exposure Controls/personal protection

8.1. Control parameters

Occupational exposure limits

Long-term exposure limit (8-hour TWA): WEL 50 ppm(Sk) 191 mg/m³(Sk)

Short-term exposure limit (15-minute): WEL 150 ppm(Sk) 574 mg/m³(Sk)

WEL = Workplace Exposure Limit

Biological limit values

No information available, No information available, No information available No information has been received from the manufacturers of the substance.

DNEL

Industry - Inhalation; Short term : 384 (local and systemic) mg/m³

Taken from the ECHA website: List of Registered Substances -Toxicity data.

Refers to the pure substance toluene.

Industry - Dermal; Long term : 384 (systemic) mg/m³

Industry - Inhalation; Long term : 192 (local and systemic) mg/m³

Consumer - Inhalation; Short term : 226 (local and systemic) mg/m³

Consumer - Dermal; Long term : 226 (systemic) mg/kg/day

Consumer - Inhalation; Long term : 56.5 (systemic) mg/m³

Consumer - Oral; Long term : 8.13 (systemic) mg/kg/day

Consumer - Inhalation; Long term : 56.5 (local) mg/m³

TOLUENE LRG

PNEC

- Fresh water; 0.68 mg/l
- Taken from the ECHA website: List of Registered Substances - Ecotoxicity data.
Refers to the pure substance toluene.
- Marine water; 0.68 mg/l
 - STP; 13.61 mg/l
 - Sediment; 16.39 (freshwater) mg/kg
 - Sediment; 16.39 (marine water) mg/kg
 - Soil; 2.89 mg/kg

8.2. Exposure controls

Appropriate engineering controls

Provide adequate general and local exhaust ventilation. Ventilation systems and extraction facilities should be flame-proof. If vapours or mists are generated, work in a fume cupboard.

Eye/face protection

Wear approved chemical safety goggles conforming to EN 166.

Hand protection

Use protective gloves. Viton rubber (fluoro rubber). Laminate of polyethylene and ethylene vinyl alcohol (PE/EVOH). It should be noted that liquid may penetrate the gloves. Frequent changes are recommended. Gloves should conform to EN 374 (Chemical and Micro-organisms hazards). For gloves involving total immersion 1.0mm thickness (if available) are recommended, at least 0.5mm and breakthrough time of >480 minutes. For splash resistance use minimum 0.5mm thickness and breakthrough time > 240 minutes. The most suitable glove should be chosen in consultation with the glove supplier/manufacturer, who can provide information about the breakthrough time of the glove material. Gloves showing signs of degradation should be changed to avoid skin contamination. When removing used gloves apply proper technique by avoiding skin contact with the outer surface. When packages of the product are being handled during storage or transport it is advisable to wear protective gloves to prevent damage to the skin. Gloves should have a breakthrough time sufficient for the amount of handling but allow dexterity for safe movement and handling.

Other skin and body protection

Wear suitable protective clothing as protection against splashing or contamination. Wear plastic apron and full length gloves if handling large amounts. If there is a risk of splashing then wear a face shield. Wear suitable protective clothing during transport, handling and storage operations connected with the product. Wear suitable protective footwear during handling of the product. When treating spillages it is recommended to wear protective boots, consult with the supplier as to the compatibility. Wear anti-static footwear. Protective clothing should conform to the general requirements of EN 340:2003. Also consider EN 13034:2005; EN 14605:2005; EN 943:2002 dependent upon the situation resulting in exposure. Safety footwear should conform to standards EN 344 - 347. Have facilities in place to wash eyes in case of contact. If handling large amounts it is recommended to have a safety shower.

Hygiene measures

Wash hands at the end of each work shift and before eating, smoking and using the toilet. Remove clothing when contamination will result in exposure to the substance, segregate and wash before re-use. Do not eat, drink or smoke in the work area. Remove contaminated clothing when entering eating areas or other places that could lead to contamination of others with the product.

TOLUENE LRG

Respiratory protection	Wear suitable respiratory protection if vapours or mists are generated. When the concentration of atmospheric vapours is sufficient to cause skin irritation it is advisable to wear full face respiratory protection. Wear a respirator fitted with the following cartridge: Organic vapour filter. Type A. Consult with the supplier as to the compatibility of the equipment with the chemical of concern. When vapours are generated during spill clean up operations and exposure of operators is likely then respiratory equipment should be worn. CAUTION: Air purifying respirators do not protect the user in oxygen deficient atmospheres, use air supplied system. Respiratory protection should conform to the following standards. BS EN 136: Full face masks. BS EN 140: Half-face masks. Powered air respirators should meet requirements of EN146 and EN12941. Airline fed respirators should meet the requirements of EN 270 and EN1835. Respiratory protection should be maintained in a proper condition and inspected at the frequency specified by current legislation.
Environmental exposure controls	See section 6 for details. No chemical safety report or exposure scenarios are available.

SECTION 9: Physical and Chemical Properties

9.1. Information on basic physical and chemical properties

Appearance	Liquid.
Colour	Colourless.
Odour	Characteristic.
Odour threshold	Not available. No registered information Not available. No registered information
pH	Not available. No registered information
Melting point	- 95°C
Initial boiling point and range	111°C @
Flash point	4°C CC (Closed cup).
Evaporation rate	2.4
Evaporation factor	Not available. No registered information
Flammability (solid, gas)	No.
Upper/lower flammability or explosive limits	Upper flammable/explosive limit: 7.0 Lower flammable/explosive limit: 1.4
Vapour pressure	3000 Pa @ °C
Vapour density	3.14
Relative density	0.866 g/cm ³ @ @ 20°C
Bulk density	Not relevant. Only applicable to solids.
Solubility(ies)	0.0515 @ °C Insoluble in water.
Partition coefficient	log Pow: 2.73 pH 7 @ 20C
Auto-ignition temperature	535°C
Decomposition Temperature	Not available. No registered information
Viscosity	0.424 mPa s @ 50°C
Explosive properties	Formation of explosive vapour / air mixtures. More sensitive to shock than m-dinitrobenzene: No. More sensitive to friction than m-dinitrobenzene: No.

TOLUENE LRG

Oxidising properties	Does not meet the criteria for classification as oxidising.
Comments	This information was taken from the ECHA website and refers to toluene as a pure substance.
9.2. Other information	
Other information	The following information was obtained from referencing literature sources. This refers to toluene.
Refractive index	1.496 @ 20C
Molecular weight	92.14
Volatility	100
Critical temperature	318°C
Volatile organic compound	This product contains a maximum VOC content of Yes . Toluene can contribute to the formation of low level ozone and smog.

SECTION 10: Stability and reactivity

10.1. Reactivity

Reactivity The following materials may react violently with the product: Strong oxidisers. Bromine Chlorine Hydrochloric acid - sulphuric acid mixture Flourine Nitric acid Nitrogen dioxide Silver chloride Reactions with the following materials may cause explosions: Strong oxidising agents. Strong acids Forms nitrotoluenes on reaction with nitric acid in prescence of sulphuric acid, many of these can be explosive. Attacks plastics, rubber and coatings, ensure any materials used to contain the substance are compatible and will not be affected by contact.

10.2. Chemical stability

Stability Stable when stored in sealed container at normal temperatures and in a suitable location. Evaporation will occur if the containers are not sealed correctly. Agitation of the substance in storage containers may produce a build up of electrostatic charge. Forms explosive mixtures with air.

10.3. Possibility of hazardous reactions

Possibility of hazardous reactions Hazardous reactions as specified in section 10.1. Heat and gaseous products may be formed that would build up pressure in a sealed container, do not mix with incompatible materials. Will not polymerise.

10.4. Conditions to avoid

Conditions to avoid Avoid sources of heat and ignition. Avoid direct sunlight and moisture. Avoid storage with incompatible materials. Avoid storage in freezing conditions. Avoid storage near to unprotected drainage systems. It is advisable to store the product within some form of containment to prevent spillages reaching drainage systems. Situations that would produce vibration or agitation of the substance in storage containers as there is the potential to build up static charge, particularly in metal or compatible plastic containers. Do not allow the storage container to be left exposed to the atmosphere. Avoid storage in an unstable manner or in a situation that would result in exposure to the product.

10.5. Incompatible materials

Materials to avoid Nitric acid. Bromine Nitrogen oxides. Strong oxidising agents. Chlorine Fluorine Silver compounds. Sulphuric acid in the prescence of hydrochloric and nitric acid. Some plastics, rubber and coatings.

10.6. Hazardous decomposition products

Hazardous decomposition products At elevated temperatures the formation of methane and benzene can occur.

TOLUENE LRG

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Toxicological effects	The following information has been taken from the ECHA website and refers to toluene as a pure substance.
Other health effects	Toxic to Reproduction Category 3. Pregnant women should not be exposed to this product.
<u>Acute toxicity - oral</u>	
Acute toxicity oral (LD₅₀ mg/kg)	5,000.0
Species	Rat
Notes (oral LD₅₀)	EU Method B.1 (Acute toxicity (oral))
<u>Acute toxicity - dermal</u>	
Acute toxicity dermal (LD₅₀ mg/kg)	5,000.0
Species	Rabbit
<u>Acute toxicity - inhalation</u>	
Acute toxicity inhalation (LC₅₀ vapours mg/l)	20.0
Species	Rat
Notes (inhalation LC₅₀)	OECD Guideline 403 (Acute inhalation toxicity).
ATE inhalation (vapours mg/l)	20.0
<u>Skin corrosion/irritation</u>	
Animal data	Dose: 0.5 ml of pure toluene, 4 hours and observed for 7 days , Rabbit Erythema/eschar score: A mean erythema score exceeding 2 at day 7. Oedema score: 1.43 at 72 hours. Tests on rabbits up to 7 days. Irritating.
Human skin model test	No information available.
Extreme pH	No information available.
<u>Serious eye damage/irritation</u>	
Serious eye damage/irritation	Not irritating. Tests on rabbits, OECD Guideline 405, Acute eye Irritation / Corrosion.
<u>Respiratory sensitisation</u>	
Respiratory sensitisation	There is no evidence that the material can lead to respiratory hypersensitivity.
<u>Skin sensitisation</u>	
Skin sensitisation	- Guinea pig: Not applicable. Not sensitising.
<u>Germ cell mutagenicity</u>	
Genotoxicity - in vitro	Gene mutation:: Negative., With and without metabolic activation. OECD Guideline 476 (In vitro Mammalian Cell Gene Mutation Test).
Genotoxicity - in vivo	Chromosome aberration: Negative.
<u>Carcinogenicity</u>	
Carcinogenicity	NOAEC for carcinogenicity was 4522 mg/m ³ , Inhalation, Rat Not a carcinogen.
<u>Reproductive toxicity</u>	

TOLUENE LRG

Reproductive toxicity - fertility	Two-generation study - NOAEC 2000 ppm (fertility - female); 600ppm (fertility - male) , Inhalation, Rat Suspected reproductive toxicant based on limited evidence. Exposure of pregnant women to toluene has resulted in physical abnormalities of children and abortion.
Reproductive toxicity - development	Maternal toxicity: - NOAEC: 750 ppm , Inhalation, Rat
<u>Specific target organ toxicity - single exposure</u>	
STOT - single exposure	Drowsiness and dizziness
Target organs	Brain
<u>Specific target organ toxicity - repeated exposure</u>	
STOT - repeated exposure	Prolonged exposure can cause reversible damage to the liver and kidneys. Neuropsychological effects may develop after short and long term exposure. Chronic exposure may be connected with organic brain syndrome. There is a possibility that long term exposure may affect the hearing system.
Target organs	Brain Central nervous system Kidneys Liver
<u>Aspiration hazard</u>	
Aspiration hazard	Possible aspiration hazard upon vomiting.
General information	
	The substance is only classified as irritating to skin, however temporary irritation would be experienced upon eye contact and irritation of the respiratory system will occur, for these reasons statements have been included in the relevant sections.
Inhalation	Harmful by inhalation. Low concentration: Headache. Fatigue Vapours may cause drowsiness and dizziness. Irritating to respiratory system. High concentration: Irritation of eyes and lacrimation. Loss of memory, impairment of reaction time, narcosis. Coma and possibly death at very high concentrations.
Ingestion	Harmful: may cause lung damage if swallowed. Low concentration: Stomach pain and vomiting. Nausea. Irritation of the mouth, the oesophagus and the gastrointestinal tract. Central nervous system depression. High concentration: Enlarged liver. Unconsciousness, coma and possibly death.
Skin contact	Irritating to skin. May be absorbed through the skin. Product has a defatting effect on skin. Repeated exposure may cause skin dryness or cracking. May cause secondary inflammation.
Eye contact	Irritating to eyes. A single exposure may cause the following adverse effects: Corneal damage.
Acute and chronic health hazards	Absorption of large quantities can lead to inebriation, unconsciousness, respiratory arrest and cardiovascular failure.

SECTION 12: Ecological Information

Ecotoxicity Although not classified as environmentally hazardous, harmful effects cannot be excluded in the event of improper handling or disposal. Do not allow to enter drinking water, waste water or soil. The substance is expected to evaporate from water surfaces and soil readily, when absorbed into soil it will be broken down by micro-organisms.

12.1. Toxicity

Acute toxicity - fish LC50, 96 hours, 96 hours: 5.5 mg/l,
Oncorhynchus kisutch, flow through, freshwater, test - mortality.

Acute toxicity - aquatic invertebrates EC₅₀, 48 hours, 48 hours: 3.8 mg/l,
Species: Ceriodaphnia dubia.

TOLUENE LRG

Acute toxicity - aquatic plants	EC ₅₀ , 3 hours, 3 hours: 134 mg/l, Species: Chlamydomonas angulosa. EC50 for reduced photosynthesis rate.
Acute toxicity - microorganisms	EC ₅₀ , : 84 mg/l, Activated sludge Inhibition of nitrification: test species Nitrosomonas sp. IC50 value also reported as 84 mg/L.
Acute toxicity - terrestrial	LC ₅₀ , 28 days, 28 days: > 150 , Eisenia Fetida (Earthworm) LC50 was found to be >150 but <280 mg/kg.
Chronic toxicity - fish early life stage	NOEC, : 1.39 mg/l, 40 day study using Oncorhynchus kisutch. Flow through, freshwater.
Short term toxicity - embryo and sac fry stages	Not available. No registered information.
Chronic toxicity - aquatic invertebrates	NOEC, : 0.74 mg/l, 7 day study period on Ceriodaphnia dubia.

12.2. Persistence and degradability

Phototransformation	Air. - DT ₅₀ 50: 2.59 days Acceptable estimation of half-life, based on reaction rate with hydroxyl radcals.
Stability (hydrolysis)	Scientifically unjustified. Toluene is not hydrolysed.
Biodegradation	The substance is readily biodegradable. - Degradation (%) 69: 5 days 10ml effluent from biological sanitary waste. BOD / ThOD. - Degradation (%) 81: 5 days 10ml effluent from a biological sanitary waste treatment plant. COD / ThOD. The substance is readily biodegradable.

12.3. Bioaccumulative potential

Bioaccumulative potential	The substance has a low bioaccumulation potential in fish and molluscs and a rapid elimination rate indicates toluene is not likely to accumulate in the food chain. BCF: 8, Clupea harengus (Herring) Concentration of 0.09mg/l over 2 days. A worst case scenario was achieved with Leuciscus idus melanotus (Ide) over 3 days, BCF = 90.
Partition coefficient	log Pow: 2.73 pH 7 @ 20C

12.4. Mobility in soil

Mobility	The substance will evaporate readily from soil surfaces and be broken by microbial action. It is possible that some will be transferred through the soil layers in groundwater.
Adsorption/desorption coefficient	Soil - Koc: > 34 @ °C Adsorption coefficient quoted values range from 34 - 120. Information not considered as reliable.
Surface tension	27.73 mN/m @ 25°C

12.5. Results of PBT and vPvB assessment

Results of PBT and vPvB assessment	This substance is not classified as PBT or vPvB according to current EU criteria.
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12.6. Other adverse effects

Other adverse effects	Potential for ozone and smog creation. Damaging effects of fire on the environment. May effect germination and growth rates of plants if soil contamination occurs.
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TOLUENE LRG

SECTION 13: Disposal considerations

13.1. Waste treatment methods

General information

Any waste material is classed as hazardous waste, it should only be disposed of through licenced waste handlers and treatment sites. Do not allow unauthorised disposal to the environment. Avoid sources of ignition when handling waste. If operators are exposed to vapours during the disposal process then suitable respiratory protection should be worn. All other personal protective equipment as described in section 8 should be worn. When handling waste, the safety precautions applying to handling of the product should be considered.

Disposal methods

Waste material should not be disposed of directly to drain. Uncleaned empty containers should be treated as hazardous waste. Avoid unauthorised disposal. Do not dump illegally onto land or into water. Dispose of waste to licensed waste disposal site in accordance with the requirements of the local Waste Disposal Authority. The recommended method for treatment of waste residues is either reclamation or incineration by specialist disposal company. Reuse or recycle products wherever possible. When dealing with waste always consider the waste management hierarchy of Prevention, Preparation for re-use, Recycling, Recovery and Disposal. It is advisable to minimise waste at source if possible, then re-use, recover or recycle wherever possible before considering waste disposal options.

SECTION 14: Transport information

14.1. UN number

UN No. (ADR/RID)	1294
UN No. (IMDG)	1294
UN No. (ICAO)	1294

14.2. UN proper shipping name

Proper shipping name (ADR/RID)	TOLUENE
Proper shipping name (IMDG)	TOLUENE
Proper shipping name (ICAO)	TOLUENE
Proper shipping name (ADN)	TOLUENE

14.3. Transport hazard class(es)

ADR/RID class	3
ADR/RID label	3
IMDG class	3
ICAO class/division	3

Transport labels



14.4. Packing group

ADR/RID packing group	II
IMDG packing group	II
ICAO packing group	II

TOLUENE LRG

14.5. Environmental hazards

Environmentally hazardous substance/marine pollutant

No.

14.6. Special precautions for user

EmS F-E, S-D

Emergency Action Code 3YE

14.7. Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code

Transport in bulk according to Not applicable.

Annex II of MARPOL 73/78
and the IBC Code

SECTION 15: Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

National regulations	The Chemicals (Hazard Information and Packaging for Supply) Regulations 2009 (SI 2009 No. 716). Control of Substances Hazardous to Health Regulations 2002 (as amended).
EU legislation	Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) (as amended). Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures (as amended). Regulation (EU) 453/2010.
Guidance	Workplace Exposure Limits EH40. ECHA Guidance on the compilation of safety data sheets 2014.

15.2. Chemical safety assessment

Information from the manufacturer of the raw material has not been received regarding Chemical Safety Assessments, Exposure Scenarios or a Chemical Safety Report.

SECTION 16: Other information

General information	This datasheet is not intended to be a replacement for a full risk assessment, these should always be carried out by competent persons.
Key literature references and sources for data	ECHA website. Raw material safety data sheets. Web-based literature. Wiley Guide to Chemical Incompatibilities. Health Protection Agency Information.
Revision comments	Change to section 15
Revision date	27/04/2016
Revision	2
Supersedes date	30/07/2015
SDS number	21045
SDS status	Approved.

TOLUENE LRG

Risk phrases in full

R11 Highly flammable.
R38 Irritating to skin.
R48/20 Harmful: danger of serious damage to health by prolonged exposure through inhalation.
R63 Possible risk of harm to the unborn child.
R65 Harmful: may cause lung damage if swallowed.
R67 Vapours may cause drowsiness and dizziness.

Hazard statements in full

H225 Highly flammable liquid and vapour.
H304 May be fatal if swallowed and enters airways.
H315 Causes skin irritation.
H336 May cause drowsiness or dizziness.
H361d Suspected of damaging the unborn child.
H373 May cause damage to organs through prolonged or repeated exposure.