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**2. Hazard(s) identification**

**Classification of the chemical**

**Regulation (EC) No 1272/2008**

- Flam. Liq. 2; H225
- Repr. 2; H361d
- Skin Irrit. 2; H315
- STOT SE 3; H336
- STOT RE 2; H373
- Asp. Tox. 1; H304
- Aquatic Chronic 3; H412

Full text of hazard statements: see SECTION 16.

**Label elements**

**Regulation (EC) No 1272/2008**

**Hazard components for labelling**

toluene

**Signal word:** Danger

**Pictograms:**



**Hazard statements**

- H225 Highly flammable liquid and vapor
- 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 (central nervous system) through prolonged or repeated exposure if inhaled
- H412 Harmful to aquatic life with long lasting effects

**Precautionary statements**

- P210 Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
- P260 Do not breathe mist/vapors/spray.
- P280 Wear protective gloves/protective clothing and eye protection/face protection.
- P301+P310 If swallowed: Immediately call a poison center/doctor.
- P331 Do NOT induce vomiting.
- P403+P235 Store in a well-ventilated place. Keep cool.

**Hazards not otherwise classified**

No data available

**3. Composition/information on ingredients**

**Mixtures**

**Chemical characterization**

Hydrocarbons, aromatic

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**Relevant ingredients**

CAS No	Components			Quantity
	EC No	Index No	REACH No	
	Classification (Regulation (EC) No 1272/2008)			
108-88-3	toluene			95 - < 100 %
	203-625-9	601-021-00-3	01-2119471310-51	
	Flam. Liq. 2, Repr. 2, Skin Irrit. 2, STOT SE 3, STOT RE 2, Asp. Tox. 1, Aquatic Chronic 3; H225 H361d H315 H336 H373 H304 H412			

Full text of H and EUH statements: see section 16.

**Specific Conc. Limits, M-factors and ATE**

CAS No	EC No	Components	Quantity
	Specific Conc. Limits, M-factors and ATE		
108-88-3	203-625-9	toluene	95 - < 100 %
	inhalation: LC50 = 28,1 mg/l (vapours); dermal: LD50 = > 5000 mg/kg; oral: LD50 = 5580 mg/kg		

**Further Information**

This product does not contain substances of very high concern according to Regulation (EC) No 1907/2006 (REACH), Article 57 above the respective regulatory concentration limit of = 0.1 % (w/w).

**4. First-aid measures**
**Description of first aid measures**
**General information**

No data available

**After inhalation**

Provide fresh air.

If breathing is irregular or stopped, administer artificial respiration.

Call a physician immediately.

**After contact with skin**

Wash immediately with: Water

Take off immediately all contaminated clothing and wash it before reuse.

Call a physician immediately.

**After contact with eyes**

In case of contact with eyes flush immediately with plenty of flowing water for 10 to 15 minutes holding eyelids apart and consult an ophthalmologist.

Remove contact lenses, if present and easy to do. Continue rinsing.

**After ingestion**

Observe risk of aspiration if vomiting occurs.

Call a physician immediately.

**Most important symptoms and effects, both acute and delayed**

Irritant, Headache

Dizziness, Dizziness

Vomiting, Inebriation

Spasms, Circulatory collapse

Respiratory complaints, Dyspnoea

Unconsciousness

**Indication of any immediate medical attention and special treatment needed**

No data available

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**5. Fire-fighting measures**

**Extinguishing media**

**Suitable extinguishing media**

- Foam.
- Extinguishing powder
- Carbon dioxide (CO<sub>2</sub>)

**Unsuitable extinguishing media**

no restriction

**Specific hazards arising from the chemical**

- Combustible liquids
- Beware of reignition.
- Hazardous combustion products
- In case of fire may be liberated:
- Carbon dioxide (CO<sub>2</sub>), Carbon monoxide
- Vapors are heavier than air, spread along floors and form explosive mixtures with air.
- Heating causes rise in pressure with risk of bursting.

**Special protective equipment and precautions for fire-fighters**

- In case of fire: Wear self-contained breathing apparatus.
- In case of fire and/or explosion do not breathe fumes.
- Avoid contact with skin, eyes and clothes.

**Additional information**

- Collect contaminated fire extinguishing water separately. Do not allow entering drains or surface water.
- Move undamaged containers from immediate hazard area if it can be done safely.
- Use water spray jet to protect personnel and to cool endangered containers.

**6. Accidental release measures**

**Personal precautions, protective equipment and emergency procedures**

**General advice**

- Keep away from sources of ignition - No smoking.
- This material can be ignited by heat, sparks, flames, or other sources of ignition (e.g., static electricity, pilot lights, mechanical/electrical equipment, and electronic devices such as cell phones, computers, calculators, and pagers which have not been certified as intrinsically safe).
- Take precautionary measures against static discharge.

**For non-emergency personnel**

- Provide adequate ventilation.
- Use personal protection equipment.
- Avoid contact with skin, eyes and clothes.
- Remove persons to safety.
- Emergency procedures
- Consult an expert
- Do not breathe dust/fume/gas/mist/vapors/spray.

**For emergency responders**

Precautionary statements For emergency responders : Personal protection equipment (PPE): see section 8

**Environmental precautions**

- Do not allow to enter into surface water or drains.
- The vapors are heavier than air and can accumulate in high concentrations on the ground, in cavities, channels and cellars.
- Danger of explosion

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**Methods and material for containment and cleaning up**
**For containment**

- Cover drains.
- Prevent spread over a wide area (e.g. by containment or oil barriers).
- Collect in closed and suitable containers for disposal.
- Absorb with liquid-binding material (sand, diatomaceous earth, acid- or universal binding agents).

**For cleaning up**

- Clean contaminated articles and floor according to the environmental legislation.

**Other information**

- Provide adequate ventilation.
- Do not breathe dust/fume/gas/mist/vapors/spray.
- Wear breathing apparatus if exposed to vapors/dusts/aerosols.

**Reference to other sections**

- Safe handling: see section 7
- Personal protection equipment (PPE): see section 8
- Disposal: see section 13

**7. Handling and storage**
**Precautions for safe handling**
**Advice on safe handling**

- Avoid exposure - obtain special instructions before use.
- Read label before use. Handle and open container with care.
- When using do not eat, drink, smoke, sniff. Keep container tightly closed.
- Use personal protection equipment. Use extractor hood (laboratory).
- Do not breathe gas/fume/vapor/spray. Provide adequate ventilation.

**Advice on protection against fire and explosion**

- Take precautionary measures against static discharge. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

**Advice on general occupational hygiene**

- Keep away from food, drink and animal feedingstuffs.
- Draw up and observe skin protection programme.
- The choice of body protection depends on the concentration and quantity of hazardous substances. The chemical resistance of the protective agents should be clarified with their suppliers.

**Further information on handling**

- Take off immediately all contaminated clothing and wash it before reuse.
- Draw up and observe skin protection programme. Wash hands and face before breaks and after work and take a shower if necessary. If handled uncovered, arrangements with local exhaust ventilation have to be used.
- Store in a place accessible by authorized persons only.

**Conditions for safe storage, including any incompatibilities**
**Requirements for storage rooms and vessels**

- Keep in a cool, well-ventilated place.
- Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
- Keep container tightly closed.

**Hints on joint storage**

- Take national regulations into account.

**Further information on storage conditions**

- Keep cool. Protect from sunlight.

**Specific end use(s)**

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Laboratory chemicals  
Only for laboratory and analysis purposes.

**8. Exposure controls/personal protection**
**Control parameters**
**Exposure limits**

CAS No	Substance	ppm	mg/m <sup>3</sup>	Category	Origin
108-88-3	Toluene	200	-	TWA (8 h)	PEL
		C 300	-	Ceiling	PEL
		500	-	Peak (10 min)	PEL
108-88-3	Toluene	100	375	TWA (8 h)	REL
		150	560	STEL (15 min)	REL
108-88-3	Toluene	20	-	TWA (8 h)	ACGIH-2025

**Biological Exposure Indices (BEI-ACGIH)**

CAS No	Substance	Determinant	Value	Test material	Sampling time
108-88-3	TOLUENE	Toluene	0.02 mg/L	blood	Prior to last shift of workweek

**DNEL/DMEL values**

CAS No	Substance	DNEL type	Exposure route	Effect	Value
108-88-3	toluene	Worker DNEL, long-term	inhalation	systemic	192 mg/m <sup>3</sup>
		Worker DNEL, acute	inhalation	systemic	384 mg/m <sup>3</sup>
		Worker DNEL, long-term	inhalation	local	192 mg/m <sup>3</sup>
		Worker DNEL, acute	inhalation	local	384 mg/m <sup>3</sup>
		Worker DNEL, long-term	dermal	systemic	384 mg/kg bw/day
		Consumer DNEL, long-term	inhalation	systemic	56,5 mg/m <sup>3</sup>
		Consumer DNEL, acute	inhalation	systemic	226 mg/m <sup>3</sup>
		Consumer DNEL, long-term	inhalation	local	56,5 mg/m <sup>3</sup>
		Consumer DNEL, acute	inhalation	local	226 mg/m <sup>3</sup>
		Consumer DNEL, long-term	dermal	systemic	226 mg/kg bw/day
		Consumer DNEL, long-term	oral	systemic	8,13 mg/kg bw/day

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**PNEC values**

CAS No	Substance	
Environmental compartment		Value
108-88-3	toluene	
Freshwater		0,68 mg/l
Freshwater (intermittent releases)		0,68 mg/l
Marine water		0,68 mg/l
Freshwater sediment		16,39 mg/kg
Marine sediment		16,39 mg/kg
Microorganisms in sewage treatment plants (STP)		13,61 mg/l
Soil		2,89 mg/kg

**Exposure controls**
**Appropriate engineering controls**

Technical measures and the application of suitable work processes have priority over personal protection equipment.

If handled uncovered, arrangements with local exhaust ventilation have to be used.

**Individual protection measures, such as personal protective equipment**
**Eye/face protection**

goggles

Face protection umbrella

**Hand protection**

Tested protective gloves must be worn. The quality of the protective gloves resistant to chemicals must be chosen as a function of the specific working place concentration and quantity of hazardous substances. For special purposes, it is recommended to check the resistance to chemicals of the protective gloves mentioned above together with the supplier of these gloves.

**Skin protection**

Take off immediately all contaminated clothing and wash it before reuse.

Wear fire resistant or flame retardant clothing.

Wash hands and face before breaks and after work and take a shower if necessary.

**Respiratory protection**

Respiratory protection necessary at: aerosol or mist formation

The entrepreneur has to ensure that maintenance, cleaning and testing of respiratory protective devices are carried out according to the instructions of the producer. These measures have to be properly documented. A respiratory protection program that meets OSHA's 29 CFR 1910.134 requirements must be followed whenever workplace conditions warrant a respirator's use.

**Thermal hazards**

No data available

**Environmental exposure controls**

Do not allow to enter into surface water or drains.

Due to danger of explosion, prevent leakage of vapors into cellars, flues and ditches.

Danger of explosion

**9. Physical and chemical properties**
**Information on basic physical and chemical properties**

Physical state:	Liquid
Color:	clear
Odor:	like: Hydrocarbons, aromatic

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Odour threshold:	No data available
Melting point/freezing point:	-95 °C
Boiling point or initial boiling point and boiling range:	110,6 °C
Flammability:	No data available
Lower explosion limits:	1,1 vol. %
Upper explosion limits:	7,1 vol. %
Flash point:	4,4 °C
Auto-ignition temperature:	480 °C
Decomposition temperature:	No data available
pH-Value:	No data available
Viscosity / kinematic: (at 20 °C)	0,7 mm <sup>2</sup> /s
Water solubility: (at 20 °C)	0,52 g/l
Solubility in other solvents No data available	
Dissolution rate:	No data available
Partition coefficient n-octanol/water:	log Pow: 2,65
Dispersion stability:	No data available
Vapor pressure: (at 20 °C)	29,3 hPa
Vapor pressure: (at 50 °C)	123 hPa
Density:	0,87 g/cm <sup>3</sup>
Relative density:	No data available
Bulk density:	No data available
Relative vapour density:	No data available
Particle characteristics:	No data available

**Other information**
**Information with regard to physical hazard classes**
**Explosive properties**

Vapors are heavier than air, spread along floors and form explosive mixtures with air.

Sustained combustibility: Sustained combustibility

**Self-ignition temperature**

Solid: No data available

Gas: No data available

**Oxidizing properties**

No data available

**Other safety characteristics**

Evaporation rate: No data available

Solvent separation test: No data available

Solvent content: 100,00 %

Solid content: 0

Sublimation point: No data available

Softening point: No data available

Pour point: No data available

 Viscosity / dynamic:  
(at 20 °C) 0,6 mPa·s

Flow time: No data available

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**Further Information**

No data available

**10. Stability and reactivity**

**Reactivity**

Vapours may form explosive mixtures with air.

**Chemical stability**

The product is stable under storage at normal ambient temperatures.

**Possibility of hazardous reactions**

- Oxidising agent
- Nitric acid
- Acetic acid
- Strong acid
- silver

**Conditions to avoid**

Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

**Incompatible materials**

- Plastic articles
- Rubber articles

**Hazardous decomposition products**

in case of fire, see:  
SECTION 5: Fire fighting measures

**Further information**

No data available

**11. Toxicological information**

**Information on toxicological effects**

**Toxicokinetics, metabolism and distribution**

Avoid exposure - obtain special instructions before use.

**Acute toxicity**

Based on available data, the classification criteria are not met.

- Irritation to respiratory tract
- Resorption (by inhalation)
- Resorption (dermal)

**ATEmix calculated**

ATE (oral) > 2000 mg/kg; ATE (dermal) > 2000 mg/kg; ATE (inhalation vapour) > 20 mg/l; ATE (inhalation dust/mist) > 5 mg/l

CAS No	Components					
	Exposure route	Dose	Species	Source	Method	
108-88-3	toluene					
	oral	LD50 mg/kg	5580	Rat	Toxicology 4, 5-15 (1975)	EU Method B.1
	dermal	LD50 mg/kg	> 5000	Rabbit	American Industrial Hygiene Association	Study investigated mortality in groups o
	inhalation (4 h) vapour	LC50	28,1 mg/l	Rat	Study report (1980)	OECD Guideline 403

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**Irritation and corrosivity**

Skin corrosion/irritation: Causes skin irritation

Serious eye damage/eye irritation: Based on available data, the classification criteria are not met.

Prolonged or repeated skin contact may cause removal of natural fat from the skin resulting in dermatitis (skin inflammation).

**Sensitizing effects**

Based on available data, the classification criteria are not met.

**Carcinogenic/mutagenic/toxic effects for reproduction**

Suspected of damaging the unborn child (toluene)

Germ cell mutagenicity: Based on available data, the classification criteria are not met.

Carcinogenicity: Based on available data, the classification criteria are not met.

**Specific target organ toxicity (STOT) - single exposure**

May cause drowsiness or dizziness (toluene)

**Specific target organ toxicity (STOT) - repeated exposure**

May cause damage to organs through prolonged or repeated exposure (toluene)

**Aspiration hazard**

May be fatal if swallowed and enters airways

**Route(s) of Entry**

No data available

**Specific effects in experiment on an animal**

No data available

**Additional information on tests**

No data available

**Practical experience**

No data available

**Information on other hazards**

**Endocrine disrupting properties**

This product does not contain a substance that has endocrine disrupting properties with respect to non-target organisms as no components meets the criteria.

**Other information**

Prolonged or repeated skin contact may cause removal of natural fat from the skin resulting in dermatitis (skin inflammation).

**Further information**

Irritant, Headache

Dizziness, Dizziness

Vomiting, Inebriation

Spasms, Circulatory collapse

Respiratory complaints, Dyspnoea

Unconsciousness

**12. Ecological information**

**Ecotoxicity**

Harmful to aquatic life with long lasting effects

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CAS No	Components					
	Aquatic toxicity	Dose	[h]   [d]	Species	Source	Method
108-88-3	toluene					
	Acute fish toxicity	LC50 5,5 mg/l	96 h	Oncorhynchus kisutch	Transactions A. Fish. Soc. 110, 430-436.	Fry were exposed to toluene in a flow th
	Acute algae toxicity	ErC50 > 433 mg/l	96 h	Pseudokirchneriella subcapitata	REACH Registration Dossier	Method: other
	Acute crustacea toxicity	EC50 11,5 mg/l	48 h	Daphnia magna	REACH Registration Dossier	Method: other
	Fish toxicity	NOEC 1,39 mg/l	40 d	Oncorhynchus kisutch	Transactions A. Fish. Soc. 110, 430-436.	Fry were exposed to toluene in a flow th
	Algae toxicity	NOEC > 400 mg/l	7 d	Scenedesmus quadricauda	REACH Registration Dossier	Method: other
	Crustacea toxicity	NOEC 0,74 mg/l	7 d	Ceriodaphnia dubia	Ecotoxicol. Environ. Saf. 39, 136-146. (	other: US EPA 600/4-91-003

**Persistence and degradability**

There are no data available on the mixture itself.

**Bioaccumulative potential**

There are no data available on the mixture itself.

**Partition coefficient n-octanol/water**

CAS No	Components	Log Pow
108-88-3	toluene	2,73

**BCF**

CAS No	Components	BCF	Species	Source
108-88-3	toluene	90	Leuciscus idus melanotus	Chemosphere 14 (10).

**Mobility in soil**

There are no data available on the mixture itself.

**Results of PBT and vPvB assessment**

The substances in the mixture do not meet the PBT/vPvB criteria according to REACH, annex XIII.

**Endocrine disrupting properties**

This product does not contain a substance that has endocrine disrupting properties with respect to non-target organisms as no components meets the criteria.

**Other adverse effects**

Do not allow to enter into surface water or drains.

**Further information**

Avoid release to the environment.

**13. Disposal considerations**
**Waste treatment methods**
**Disposal recommendations**

Waste disposal according to directive 2008/98/EC, covering waste and dangerous waste.

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Send to a physico-chemical treatment facility under observation of official regulations .

Do not mix with other wastes.

Do not empty into drains.

**Contaminated packaging**

Handle contaminated packages in the same way as the substance itself.

Waste codes/waste designations according to EWC/AVV

**14. Transport information**
**Land transport (ADR/RID)**

<b><u>UN number or ID number:</u></b>	UN 1294
<b><u>UN proper shipping name:</u></b>	TOLUENE
<b><u>Transport hazard class(es):</u></b>	3
<b><u>Packing group:</u></b>	II
Hazard label:	3
Classification Code:	F1
Limited quantity:	1 L
Excepted quantity:	E2
Transport category:	2
Hazard No:	33
Tunnel restriction code:	D/E

**Inland waterways transport (ADN)**

<b><u>UN number or ID number:</u></b>	UN 1294
<b><u>UN proper shipping name:</u></b>	TOLUENE
<b><u>Transport hazard class(es):</u></b>	3
<b><u>Packing group:</u></b>	II
Hazard label:	3
Classification Code:	F1
Limited quantity:	1 L
Excepted quantity:	E2

**Marine transport (IMDG)**

<b><u>UN number or ID number:</u></b>	UN 1294
<b><u>UN proper shipping name:</u></b>	TOLUENE
<b><u>Transport hazard class(es):</u></b>	3
<b><u>Packing group:</u></b>	II
Hazard label:	3
Special Provisions:	-
Limited quantity:	1 L
Excepted quantity:	E2
EmS:	F-E, S-D

**Air transport (ICAO-TI/IATA-DGR)**

<b><u>UN number or ID number:</u></b>	UN 1294
<b><u>UN proper shipping name:</u></b>	TOLUENE
<b><u>Transport hazard class(es):</u></b>	3
<b><u>Packing group:</u></b>	II
Hazard label:	3
Limited quantity Passenger:	1 L
Passenger LQ:	Y341
Excepted quantity:	E2
IATA-packing instructions - Passenger:	353
IATA-max. quantity - Passenger:	5 L
IATA-packing instructions - Cargo:	364

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IATA-max. quantity - Cargo:

60 L

**Environmental hazards**

ENVIRONMENTALLY HAZARDOUS: No

**15. Regulatory information**
**Safety, health and environmental regulations/legislation specific for the substance or mixture**
**EU regulatory information**

Restrictions on use (REACH, annex XVII):

Entry 3, Entry 40, Entry 48, Entry 75

Information according to Directive 2012/18/EU (SEVESO III):

P5c FLAMMABLE LIQUIDS

**National regulatory information**

Employment restrictions:

Observe employment restrictions for young people. Observe employment restrictions for child bearing mothers and nursing. Observe employment restrictions for women of child-bearing age.

Water hazard class (D):

3 - highly hazardous to water

**16. Other information**
**Abbreviations and acronyms**

Flam. Liq. 2: Flammable liquids, category 2

Asp. Tox. 1: Aspiration hazard, category 1

Skin Irrit. 2: Skin irritation, category 2

Repr. 2: Reproductive toxicity, category 2

STOT SE 3: Specific target organ toxicity single exposure, category 3

STOT RE 2: Specific target organ toxicity repeated exposure, category 2

Aquatic Chronic 3: Chronic aquatic hazard, category 3

**Classification for mixtures and used evaluation method according to regulation (EC) No 1272/2008**

Classification	Classification procedure
Flam. Liq. 2; H225	On basis of test data
Repr. 2; H361d	Calculation method
Skin Irrit. 2; H315	Calculation method
STOT SE 3; H336	Calculation method
STOT RE 2; H373	Calculation method
Asp. Tox. 1; H304	Calculation method
Aquatic Chronic 3; H412	Calculation method

**Relevant H statements (full text)**

H225	Highly flammable liquid and vapor
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 (central nervous system) through prolonged or repeated exposure if inhaled
H373	May cause damage to organs through prolonged or repeated exposure
H412	Harmful to aquatic life with long lasting effects

**Other data**

Provide appropriate information, instructions and training to users.

The above information describes exclusively the safety requirements of the product and is based on our

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present-day knowledge. The information is intended to give you advice about the safe handling of the product named in this safety data sheet, for storage, processing, transport and disposal. The information cannot be transferred to other products. In the case of mixing the product with other products or in the case of processing, the information on this safety data sheet is not necessarily valid for the new made-up material. The information is based on the present level of our knowledge. It does not, however, give assurance of product properties and establishes no contract legal rights. The receiver of our product is singularly responsible for adhering to existing laws and regulations.

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*(The data for the relevant ingredients were taken respectively from the last version of the sub-contractor's safety data sheet.)*