

SAFETY DATA SHEET



Revision: 3.0 Date: 14 April 2021

ACCORDING TO OSHA HCS (29 CFR 1910.1200)

Toluene

SECTION 1: IDENTIFICATION

Product identifier

Product name
CAS No. 108-88-3

Other means of identification

Toluol; phenylmethane; methylbenzene; benzene, methyl-;

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

Identified Use(s) Refinery feedstock.
Uses advised against Anything other than the above.

Details of the supplier of the safety data sheet

Supplier Vitol Inc.
2925 Richmond Ave, 11th Floor
Houston, TX 77098
Telephone (713) 230-1000
Fax 713-230-1185
E-mail (competent person) SDSHOU@vitol.com

Emergency telephone number

Emergency Phone No. Chemtrec: US/Canada: 1-800-424-9300 (24h)
Mexico: 800 681 9531 (24h)

SECTION 2: HAZARDS IDENTIFICATION

Classification of the substance or mixture in accordance with paragraph (d) of 29 CFR 1910.1200

Physical hazards Flammable Liquid, Category 2
Health hazards Aspiration hazard, Category 1
Skin Corrosion/Irritation, Category 2
Specific target organ toxicity — single exposure, Category 3 (Narcotic effects)
Reproductive toxicity, Category 2
Specific target organ toxicity — repeated exposure, Category 2
Environmental hazards Hazardous to the aquatic environment, Chronic, Category 3

Label elements

Hazard Pictogram(s)



Signal Word(s)

DANGER

Hazard Statement(s)

Highly flammable liquid and vapour.
May be fatal if swallowed and enters airways.
Causes skin irritation.
May cause drowsiness or dizziness.
Suspected of damaging fertility or the unborn child.
May cause damage to organs through prolonged or repeated exposure.
Harmful to aquatic life with long lasting effects.

Precautionary Statement(s)

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

SAFETY DATA SHEET



Revision: 3.0 Date: 14 April 2021

ACCORDING TO OSHA HCS (29 CFR 1910.1200)

Toluene

Obtain special instructions before use.
Do not breathe vapour.
Wear protective gloves/eye protection/face protection.
IF SWALLOWED: Immediately call a POISON CENTER/doctor.
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
Immediately call a POISON CENTER/doctor.
Do NOT induce vomiting.
Avoid release to environment.
Dispose of contents in accordance with local, state or national legislation.

Other hazards

None known

Percent of the mixture consists of ingredient(s) of unknown acute toxicity:

0% of the mixture consists of ingredients of unknown acute inhaled toxicity.
0% of the mixture consists of ingredients of unknown acute oral toxicity.
0% of the mixture consists of ingredients of unknown acute dermal toxicity.

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

Substances

Chemical identity of the substance	%W/W	CAS No.	EC No.
Toluene	>99	108-88-3	203-625-9

SECTION 4: FIRST AID MEASURES



Description of first aid measures

Self-protection of the first aider

Avoid all contact. Do not breathe vapour. Eliminate sources of ignition. If it is suspected that fumes are still present, the responder should wear an appropriate mask or self-contained breathing apparatus. Drench contaminated clothing with water before removing to avoid risk of sparks from static electricity. Do not use mouth-to-mouth resuscitation. No action should be taken involving personal risk. Wear appropriate personal protective equipment, avoid direct contact. Avoid exposure during pregnancy. Do not ingest. If swallowed then seek immediate medical assistance.

Inhalation

IF INHALED: If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. Apply artificial respiration only if patient is not breathing but do not use mouth to mouth resuscitation. Get medical advice/attention if you feel unwell.

Skin contact

IF ON SKIN (or hair): Remove contaminated clothing immediately and wash affected skin with plenty of water or soap and water. If irritation persists, get medical attention.

Eye contact

IF IN EYES: Hold eyelids apart and flush eyes with plenty of water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical attention. If irritation develops and persists, get medical attention.

Ingestion

IF SWALLOWED: rinse mouth. Do NOT induce vomiting. If unconscious, place in recovery position and get medical attention immediately. Wash out mouth with water and give small quantities of water to drink. Do not give anything by mouth to an unconscious person. Get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. Do not wait for symptoms to appear.

Most important symptoms and effects, both acute and delayed

May be fatal if swallowed and enters airways. Causes skin irritation. May cause drowsiness or dizziness. Suspected of damaging fertility or the unborn child. May cause damage to organs through prolonged or repeated exposure.

SAFETY DATA SHEET



Revision: 3.0 Date: 14 April 2021

ACCORDING TO OSHA HCS (29 CFR 1910.1200)

Toluene

Indication of any immediate medical attention and special treatment needed

Notes to a physician:

Treat symptomatically.

IF SWALLOWED: Do not induce vomiting because of risk of aspiration into the lungs. If aspiration is suspected obtain immediate medical attention. If vomiting occurs spontaneously, keep head below hips to prevent aspiration into the lungs.

SECTION 5: FIREFIGHTING MEASURES

Extinguishing media

Suitable extinguishing media

Extinguish with sand or dry chemical. Foam, Carbon dioxide, Water fog or dry powder

Unsuitable extinguishing media

Do not use water jet. Direct water jet may spread the fire.

Special hazards arising from the substance or mixture

Highly flammable liquid and vapour. Will float and can be reignited on surface water. A mixture of solid and liquid particulates and gases including unidentified organic and inorganic compounds. May form explosive mixture with air. Prevent liquid entering sewers, basements and any watercourses. Vapours are heavier than air and may travel considerable distances to a source of ignition and flashback.

Advice for firefighters

Fight fire with normal precautions from a reasonable distance. Fire fighters should wear complete protective clothing including self-contained breathing apparatus. Keep containers cool by spraying with water if exposed to fire. Avoid release to the environment. Dike fire control water for later disposal.

SECTION 6: ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Caution - spillages may be slippery. Ensure operatives are trained to minimise exposures. Ensure suitable personal protection during removal of spillages. Eliminate sources of ignition. Shut off leaks if without risk. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Avoid all contact. Do not breathe vapour. Ensure adequate ventilation. Do not ingest. If swallowed then seek immediate medical assistance. Do not use sparking tools. Use non-sparking ventilation systems, approved explosion-proof equipment, and intrinsically safe electrical systems. Avoid exposure during pregnancy.

Methods and material for containment and cleaning up

Provided it is safe to do so, isolate the source of the leak. Use non-sparking equipment when picking up flammable spill. The vapour is heavier than air; beware of pits and confined spaces. Ensure that the equipment is adequately grounded. Allow small spillages to evaporate provided there is adequate ventilation. Wear flame-resistant antistatic protective clothing. Wear chemical protection suit and breathing apparatus.

SECTION 7: HANDLING AND STORAGE

Precautions for safe handling

Obtain special instructions before use. Keep away from sources of ignition - No smoking. Use only outdoors or in a well-ventilated area. Prevent vapour build up by providing adequate ventilation during and after use. May form explosive mixtures with air. Take action to prevent static discharges. Use non-sparking tools. All parts of the plant and equipment should be electrically bonded together and connected to earth. Electrical continuity should be checked at regular intervals. Antistatic clothing and footwear should be used. The vapour is heavier than air; beware of pits and confined spaces. Avoid all contact with substance. Do not ingest. If swallowed then seek immediate medical assistance. Do not breathe vapour. See Section: 8. Keep good industrial hygiene. Wash hands thoroughly after handling. Contaminated clothing should be thoroughly cleaned.

Conditions for safe storage, including any incompatibilities

Light hydrocarbon vapours can build up in the headspace of containers. These can cause flammability / explosion hazards. Bund storage facilities to prevent soil and water pollution in the event of spillage. Keep only in original packaging. Keep containers properly sealed when not in use. Protect from sunlight. Containers of this material may be hazardous when empty since they retain product residue. Empty container may contain product residue which may result in flammable or explosive vapours inside the container.

Storage temperature

Stable at ambient temperatures.

SAFETY DATA SHEET



Revision: 3.0 Date: 14 April 2021

ACCORDING TO OSHA HCS (29 CFR 1910.1200)

Toluene

Incompatible materials

Strong oxidising agents

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

Occupational exposure limits

SUBSTANCE	CAS No.	LTEL (8 hr TWA ppm)	LTEL (8 hr TWA mg/m ³)	STEL (ppm)	STEL (mg/m ³)	Note
Toluene	108-88-3	100	375	150	560	NIOSH
		-	-	300	-	OSHA
		20	-	-	-	ACGIH

Note: OSHA PELs 1910.1000 TABLE Z-1/2/3 (delete as appropriate)/ NIOSH RELs / ACGIH TLVs

Biological exposure indicies

Not established

SUBSTANCE	CAS No.	Determinant	Biological Exposure Indices	Sampling Time	Note
Toluene	108-88-3	Toluene in blood	0.02 mg/l	Prior to last shift of workweek	-
		Toluene in urine	0.03 mg/l	End of shift	-
		o-Cresol in urine with hydrolysis	0.3 mg/g creatinine	End of shift	B

Source: ACGIH: American Conference of Governmental Industrial Hygienists - Biological Exposure Index (BEI) 2019

Note:

B: Background

Appropriate engineering controls

Provide adequate ventilation, including appropriate local extraction if dusts, fumes or vapours are likely to be evolved. Store in a cool/low-temperature, well-ventilated (dry) place away from heat and ignition sources. Guarantee that the eye flushing systems and safety showers are located close to the working place.

Individual protection measures, such as personal protective equipment

Fuels are typically used, transferred and transported in closed systems. If exposure is likely (i.e. during sampling) the following advice may be appropriate. Keep good industrial hygiene. Always wash hands before smoking, eating and drinking. Do not eat, drink or smoke at the work place. Avoid all contact. Do not breathe vapour. Avoid exposure during pregnancy.

Protective clothing should be selected specifically for the working place, depending on concentration and quantity of the hazardous substances handled. The resistance of the protective clothing to chemicals should be ascertained with the respective supplier.

Eye/ face protection



Use eye protection according to EN 166, designed to protect against liquid splashes.

Skin protection



Hand protection: Wear impervious gloves (recommended: EN374). Gloves should be changed regularly to avoid permeation problems. Breakthrough time of the glove material: refer to the information provided by the gloves' producer. Protective index 6, corresponding > 480 minutes of permeation time according to EN 374. Efficiency of at least 80%.
Recommended: Nitrile rubber;
Flouroelastomer (Minimum thickness – 0.5 – 0.65mm).

Body protection: Wear anti-static clothing and shoes.

Small scale: Wear suitable coveralls to prevent exposure to the skin.
Large scale: Chemical protection suit.

SAFETY DATA SHEET



Revision: 3.0 Date: 14 April 2021

ACCORDING TO OSHA HCS (29 CFR 1910.1200)

Toluene

Respiratory protection



When the product is heated / In case of inadequate ventilation wear respiratory protection. The use of a high efficiency filter (recommended: EN143) is recommended. Filter type A1.

Closed system(s): Not normally required.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Appearance	Colourless liquid
Odour	Sweet, pungent, Benzene-like
Odour threshold	1.6 ppm
pH	Not applicable.
Melting point/freezing point	-95°C (-139°F)
Initial boiling point and boiling range	110.6°C (231.1°F)
Flash point	CLOSED CUP: 4.4444°C (40°F). (Setaflash) OPEN CUP: 16°C (60.8°F).
Evaporation rate	Not determined
Flammability (solid, gas)	Not applicable - Liquid
Upper/lower flammability or explosive limits	Not determined
Vapour pressure	3.8 kPa (@ 25°C)
Vapour density	3.1 (Air = 1)
Relative density	Not determined
Solubility(ies)	Solubility in water: 0.561 g/l @ 25 deg. C.
Partition coefficient: n-octanol/water	Not determined
Auto-ignition temperature	Not determined
Decomposition temperature	Not determined
Viscosity	Not determined

SECTION 10: STABILITY AND REACTIVITY

Reactivity	Stable under normal conditions. Reacts with - Strong oxidising agents
Chemical stability	Stable under normal conditions. Hazardous polymerisation will not occur.
Possibility of hazardous reactions	Highly flammable liquid and vapour. May form explosive mixture with air. Vapours are heavier than air and may travel considerable distances to a source of ignition and flashback.
Conditions to avoid	Elevated temperature. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Keep away from direct sunlight.
Incompatible materials	Keep away from strong oxidizing substances.
Hazardous decomposition products	A mixture of solid and liquid particulates and gases including unidentified organic and inorganic compounds. Decomposes in a fire giving off toxic fumes: COx, H2S, SOx,

SECTION 11: TOXICOLOGICAL INFORMATION

Information on toxicological effects	
Acute toxicity - Ingestion	Based upon the available data, the classification criteria are not met. Calculated acute toxicity estimate (ATE) >2,000 mg/kg.
Acute toxicity - Inhalation	Based upon the available data, the classification criteria are not met. Calculated acute toxicity estimate (ATE) >2,000 mg/kg.
Acute toxicity - Skin contact	Based upon the available data, the classification criteria are not met. Calculated acute toxicity estimate (ATE) > 5 mg/L (Vapour)
Skin corrosion/irritation	Skin Corrosion/Irritation, Category 2: Causes skin irritation. Irritating to skin. (rabbit) (EU Method B.4)
Serious eye damage/irritation	Based upon the available data, the classification criteria are not met.
Respiratory or skin sensitisation	Based upon the available data, the classification criteria are not met.
Germ cell mutagenicity	Based upon the available data, the classification criteria are not met.
Carcinogenicity	Based upon the available data, the classification criteria are not met.
Reproductive toxicity	Reproductive toxicity, Category 2: Suspected of damaging fertility or the unborn child. Reproductive toxicity: NOAEC (rat) (inhalation exposure) mg/m ³ : 2261. (Ono,

SAFETY DATA SHEET



Revision: 3.0 Date: 14 April 2021

ACCORDING TO OSHA HCS (29 CFR 1910.1200)

Toluene

STOT - single exposure	1996)
STOT - repeated exposure	Developmental toxicity: NOAEC (rat) (inhalation exposure) mg/m ³ : 4522. (Thiel, 1997)
Aspiration hazard	Based upon the available data, the classification criteria are not met. Specific target organ toxicity — repeated exposure, Category 2: May cause damage to organs through prolonged or repeated exposure. Causes dizziness. (Human volunteers) (SCOEL, 2001) Aspiration hazard, Category 1: May be fatal if swallowed and enters airways. Dynamic viscosity: 0.56 mPa s (@25°C) Surface tension: 27.93nM (@25°C)
Information on likely routes of exposure	
Inhalation	Possible – accidental exposure
Ingestion	Possible – accidental exposure
Skin contact	Possible – accidental exposure
Eye contact	Unlikely – accidental exposure
Early onset symptoms related to exposure	Causes skin irritation. May cause drowsiness or dizziness
Delayed health effects from exposure	May be fatal if swallowed and enters airways. Suspected of damaging fertility or the unborn child. May cause damage to organs through prolonged or repeated exposure.
Exposure levels and health effects	See Section: 8
Interactive effects	May be fatal if swallowed and enters airways.
Other information	
OSHA Designated Carcinogen	Not listed
NIOSH Occupational Carcinogen List	Not listed
NTP Report on Carcinogens	Not listed
IARC Monographs	Listed

SECTION 12: ECOLOGICAL INFORMATION

Toxicity	Hazardous to the aquatic environment, Chronic, Category 3: Harmful to aquatic life with long lasting effects. Chronic Toxicity: NOEC (Fish) mg/l (40 days) 1.4 (Moles, 1981)
Persistence and degradability	Readily biodegradable. 69% Degradation in Water (5 days) (Bridie et al. 1979)
Bioaccumulative potential	The substance has low potential for bioaccumulation. BCF: 90 (Freitag D et al. 1985)
Mobility in soil	The substance is predicted to have high mobility in soil. Koc: 205 (European Chemicals Bureau, 2003)
Other adverse effects	None known.

SECTION 13: DISPOSAL CONSIDERATIONS

Waste treatment methods	Dispose of this material and its container as hazardous waste. Do not empty into drains, dispose of this material and its container at hazardous or special waste collection point. Disposal should be in accordance with local, state or national legislation. Containers of this material may be hazardous when empty since they retain product residue.
--------------------------------	--

SECTION 14: TRANSPORT INFORMATION

	Road/rail (ADR/RID)	Sea transport (IMDG)	Air (ICAO/IATA)
UN number	UN1294	UN1294	UN1294
UN proper shipping name	Toluene	Toluene	Toluene
Transport hazard class(es)	3	3	3
Packing group	II	II	II

SAFETY DATA SHEET



Revision: 3.0 Date: 14 April 2021

ACCORDING TO OSHA HCS (29 CFR 1910.1200)

Toluene

Environmental hazards	Not applicable	Not classified as a Marine Pollutant.	Not applicable
Special precautions for user	See Section: 2		
Transport in bulk according to Annex II of Marpol and the IBC Code	Not applicable		

SECTION 15: REGULATORY INFORMATION

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

US Federal Regulations

TSCA Chemical Data Reporting (CDR) Rule	Listed
NIOSH Occupational Carcinogen List	
EPCRA Section 313	Listed (De Minimis limit: 1%)
CWA 307- Toxic	Listed
CERCLA - Hazardous Substances	Listed (RQ = 1000 lbs)
CWA Section 311 List of Hazardous Substances	Listed

US State Regulations

Proposition 65 (California)	Listed
Massachusetts, New Jersey, Pennsylvania, Rhode Island- State Right to Know Lists	Listed
New York -State Right to Know Lists	Listed
Minnesota - State Right to Know Lists	Listed
Massachusetts – Toxic Use reduction act	Listed

Non-Regional

IARC Monographs	Listed
-----------------	--------

SECTION 16: OTHER INFORMATION

The following sections contain revisions or new statements: Updated substance / mixture classification. Updated version and date. New format has been issued, all sections have been updated to include new information. Review SDS with care.

Version	3.0
Revision Date	14 April 2021
Date of First Issue	Not available. 2 ND ISSUE RELEASED JUNE, 15 2015

This Safety Data Sheet was prepared in accordance with US Regulation OSHA HCS (29 CFR 1910.1200)

References:

Existing Safety Data Sheet (SDS),
EU Harmonised Classification and Existing ECHA registration for Toluene (CAS No. 108-88-3).

Literature Sources:

1. Ono A, Sekita K, Ogawa Y, Hirose A, Suzuki S, Saito M, Naito K, Kaneko T, Furuya T, Kawashima K, Yasuhara K, Matsumoto K, Tanaka S, Inoue T and Kurokawa Y. 1996. Reproductive and developmental toxicity studies of toluene II. Effects of inhalation exposure on fertility in rats. *Journal of Environmental Pathology Toxicology and Oncology* 15, 9-20.
2. Thiel R and Chahoud I. 1997. Postnatal development and behaviour of Wistar rats after prenatal toluene exposure. *Arch Toxicol* (1997) 71, 258-265. Lide D (Ed.). 2008. *CRC Handbook of Chemistry and Physics*, 89th Edition. CRC Press Inc. Boca Raton. USA.
3. Scientific Committee on Occupational Exposure Limits, 2001. Recommendation from the Scientific Committee on Occupational Exposure Limits for toluene.
4. Moles A, Bates S, Rice SD, Korn S. 1981. Reduced growth of Coho salmon fry exposed to two petroleum components, toluene and naphthalene in fresh water. *Transactions A. Fish. Soc.* 110, 430-436.
5. Bridie, Wolff and Winter. 1979. BOD and COD of some petrochemicals. *Water Research* 13, 627-630.
6. Freitag D, Ballhorn L, Geyer H, Korte F. 1985. Environmental Hazard profile of organic chemicals. *Chemosphere* 14 (10). 1589-1616.
7. European Chemicals Bureau. 2003. Technical Guidance Document on Risk Assessment - Part III. European Commission - Joint Research Centre. EUR 20418 EN/3.

Classification of the substance or mixture in accordance with paragraph (d) of 29 CFR 1910.1200

Classification procedure

SAFETY DATA SHEET



Revision: 3.0 Date: 14 April 2021

ACCORDING TO OSHA HCS (29 CFR 1910.1200)

Toluene

Flammable Liquid, Category 2	Flash point / Boiling Point (°C)
Aspiration hazard, Category 1	High percentage inclusion of components with aspiration hazard
Skin Corrosion/Irritation, Category 2	Threshold calculation
Specific target organ toxicity — single exposure, Category 3 (Narcotic effects)	Threshold calculation
Reproductive toxicity, Category 2	Threshold calculation
Specific target organ toxicity — repeated exposure, Category 2	Threshold calculation
Hazardous to the aquatic environment, Chronic, Category 3	Summation Calculation

LEGEND

ADR/RID	ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road / RID: Regulations concerning the international railway transport of dangerous goods
ATE	Acute Toxicity Estimate
BCF	Bioconcentration factor (BCF)
CAS	Chemical Abstracts Service
CERCLA	Comprehensive Environmental Response Compensation and Liability Act
CWA	Clean Water Act
EC	European Community
ECHA	European Chemicals Agency
EPCRA	Emergency Planning and Community Right-to-Know Act
EN	European Standard
EU	European Union
IARC	International Agency for Research on Cancer
ICAO/IATA	International Civil Aviation Organization / International Air Transport Association
IMDG	IMDG: International Maritime Dangerous Goods
LC50	Lethal concentration at which 50% of the population is killed
LD50	Lethal dose at which 50% of the population is killed
LTEL	Long term exposure limit
OECD	Organisation for Economic Cooperation and Development
OSHA	The Occupational Safety & Health Administration
STEL	Short term exposure limit
TSCA	Toxic Substance Control Act
TWA	Time Weighted Average
UN	United Nations

Training advice: Consideration should be given to the work procedures involved and the potential extent of exposure as they may determine whether a higher level of protection is required.

Disclaimers

Information contained in this publication or as otherwise supplied to Users is believed to be accurate and is given in good faith, but it is for the Users to satisfy themselves of the suitability of the product for their own particular purpose. VITOL INC gives no warranty as to the fitness of the product for any particular purpose and any implied warranty or condition (statutory or otherwise) is excluded except to the extent that exclusion is prevented by law. VITOL INC accepts no liability for loss or damage (other than that arising from death or personal injury caused by defective product, if proved), resulting from reliance on this information. Freedom under Patents, Copyright and Designs cannot be assumed.