



MATERIAL SAFETY DATA SHEET (MSDS/SDS)

TOLUENE

SECTION 1 — IDENTIFICATION

1.1 Product identifier

Product Name:

Toluene

Chemical Name:

Toluene

IUPAC Name:

Methylbenzene

Synonyms:

- Methylbenzene
- Toluol
- Methyl Benzol
- Phenylmethane
- Monomethyl Benzene

CAS Number:

108-88-3

EC Number:

203-625-9

UN Number:

UN 1294

Chemical Formula:

C_7H_8

Structural Formula:

$C_6H_5CH_3$



Molecular Weight:

92.14 g/mol

Chemical Family:

Aromatic Hydrocarbon

Product Form:

Liquid

1.2 Recommended uses

Toluene is used as:

- Industrial solvent
- Paint and coating solvent
- Printing-ink solvent
- Adhesive solvent
- Rubber-processing solvent
- Resin solvent
- Cleaning and degreasing solvent
- Chemical intermediate
- Feedstock for benzene production
- Feedstock for benzoic acid production
- Feedstock for toluene diisocyanate production
- Fuel and petroleum-industry component

1.3 Uses advised against

- Household or consumer use without appropriate controls
- Intentional inhalation
- Use in confined spaces without ventilation
- Use near flames, sparks, or hot surfaces
- Any use contrary to applicable legislation
- Use in food, pharmaceutical, or cosmetic applications unless specifically permitted

1.4 Supplier information

Supplier:

BASEKIM KIMYASAL URUNLER IC VE DIS TIC. LTD. STI.



Website:

basekim.com

Ankara Office:

No. 6, Fahrettin Pasa St. (613), Ilkbahar, Cankaya, Ankara, Türkiye

Telephone:

+90 312 514 70 55

Istanbul Office:

No. 219, Sogut St., No. 20, T4A Block, Maslak, Sariyer, Istanbul, Türkiye

Telephone:

+90 212 807 22 33

Dubai Office:

No. 3509, The Burlington Tower, Business Bay, Dubai, United Arab Emirates

Telephone:

+971 4 236 98 30

Emergency Telephone:

To be assigned and verified by the supplier.

SECTION 2 — HAZARD IDENTIFICATION

2.1 GHS classification

Toluene is classified as:

- Flammable Liquids — Category 2
- Aspiration Hazard — Category 1
- Skin Irritation — Category 2
- Reproductive Toxicity — Category 2
- Specific Target Organ Toxicity, Single Exposure — Category 3, narcotic effects
- Specific Target Organ Toxicity, Repeated Exposure — Category 2
- Hazardous to the Aquatic Environment, Chronic — Category 3, where applicable under the adopted jurisdiction



2.2 Label elements

Signal Word:
Danger

GHS Pictograms:

- GHS02 — Flame
- GHS07 — Exclamation Mark
- GHS08 — Health Hazard

2.3 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 through prolonged or repeated exposure.
- **H412:** Harmful to aquatic life with long-lasting effects, where applicable.

2.4 Precautionary statements

Prevention

- **P201:** Obtain special instructions before use.
- **P202:** Do not handle until all safety precautions have been read and understood.
- **P210:** Keep away from heat, hot surfaces, sparks, open flames, and other ignition sources. No smoking.
- **P233:** Keep container tightly closed.
- **P240:** Ground and bond container and receiving equipment.
- **P241:** Use explosion-proof electrical, ventilating, and lighting equipment.
- **P242:** Use non-sparking tools.
- **P243:** Take action to prevent static discharge.
- **P260:** Do not breathe vapor, mist, or spray.
- **P261:** Avoid breathing vapor or mist.
- **P271:** Use only outdoors or in a well-ventilated area.
- **P273:** Avoid release to the environment.
- **P280:** Wear protective gloves, protective clothing, and eye or face protection.



Response

- **P301 + P310:** IF SWALLOWED: Immediately call a poison center or physician.
- **P331:** Do not induce vomiting.
- **P302 + P352:** IF ON SKIN: Wash with plenty of soap and water.
- **P303 + P361 + P353:** IF ON SKIN OR HAIR: Remove immediately all contaminated clothing. Rinse skin with water or shower.
- **P304 + P340:** IF INHALED: Remove person to fresh air and keep comfortable for breathing.
- **P308 + P313:** If exposed or concerned: Get medical advice or attention.
- **P312:** Call a poison center or physician if you feel unwell.
- **P370 + P378:** In case of fire: Use foam, dry chemical, carbon dioxide, or water fog to extinguish.

Storage

- **P403 + P233:** Store in a well-ventilated place. Keep container tightly closed.
- **P403 + P235:** Store in a well-ventilated place. Keep cool.
- **P405:** Store locked up.

Disposal

- **P501:** Dispose of contents and container through an authorized waste contractor in accordance with applicable regulations.

2.5 Other hazards

- Vapors are heavier than air and may travel to a distant ignition source.
- Vapor may collect in pits, drains, tanks, and other low areas.
- Containers may retain flammable vapor after emptying.
- Static electricity may ignite vapor.
- High vapor concentrations may cause loss of coordination, unconsciousness, or other serious central nervous system effects.
- Liquid entering the lungs during swallowing or vomiting may cause serious lung injury.
- The product may be absorbed through the skin.
- The product is a volatile organic compound.



SECTION 3 — COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substance

Component	CAS Number	EC Number	Concentration
Toluene	108-88-3	203-625-9	Approximately $\geq 99.8\%$
Hydrocarbon impurities	Various	Various	Balance

Impurities must be confirmed using the current Certificate of Analysis.

Benzene and other impurities must be disclosed where their concentrations exceed applicable regulatory thresholds.

SECTION 4 — FIRST-AID MEASURES

4.1 Eye contact

Immediately rinse cautiously with clean water for at least 15 minutes.

Hold eyelids open during rinsing.

Remove contact lenses if present and easy to do.

Continue rinsing.

Obtain medical attention if pain, redness, tearing, or visual disturbance persists.

4.2 Skin contact

Immediately remove contaminated clothing and footwear.

Wash affected skin thoroughly with soap and plenty of water.

Do not use solvents to clean the skin.

Obtain medical attention if irritation develops or persists.

Wash contaminated clothing before reuse.



Discard contaminated leather articles that cannot be effectively cleaned.

4.3 Inhalation

Immediately move the exposed person to fresh air.

Keep the person at rest and comfortable for breathing.

Do not allow the affected person to walk without assistance if dizzy or confused.

If breathing is difficult, trained personnel may administer oxygen.

If breathing has stopped, begin appropriate resuscitation and obtain emergency medical assistance.

Seek immediate medical attention after significant exposure.

4.4 Ingestion

Immediately contact a poison center or physician.

Do not induce vomiting.

Aspiration into the lungs may occur during vomiting.

Do not give anything by mouth to an unconscious person.

If vomiting occurs naturally, keep the person's head below hip level to reduce aspiration risk.

Obtain immediate medical attention.

4.5 Most important symptoms and effects

Possible symptoms include:

- Eye and skin irritation
- Headache
- Dizziness
- Drowsiness
- Confusion



- Weakness
- Poor coordination
- Nausea
- Central nervous system depression
- Loss of consciousness
- Dermatitis after repeated contact
- Respiratory effects if aspirated
- Possible liver, kidney, nervous system, or hearing effects after repeated excessive exposure

4.6 Advice to physicians

Treat symptomatically.

Aspiration may cause chemical pneumonitis.

Because of aspiration risk, gastric lavage and induced vomiting are generally inappropriate unless directed by a medical toxicologist.

Monitor respiratory and central nervous system function.

SECTION 5 — FIRE-FIGHTING MEASURES

5.1 Suitable extinguishing media

Use:

- Alcohol-resistant foam
- Dry chemical powder
- Carbon dioxide
- Water fog or fine water spray

5.2 Unsuitable extinguishing media

Do not use a direct high-pressure water jet because it may spread burning liquid.

5.3 Specific hazards

Toluene is a highly flammable liquid.



Vapor may form explosive mixtures with air.

Vapor may travel along floors or through drains and ignite at a distant source.

Containers exposed to heat may rupture or explode.

Hazardous combustion products may include:

- Carbon monoxide
- Carbon dioxide
- Dense smoke
- Irritating hydrocarbon decomposition products

5.4 Firefighting procedures

Evacuate the area.

Approach from upwind.

Stop the leak only when it can be done safely.

Cool exposed containers with water spray.

Do not allow firefighting water to enter drains or waterways.

5.5 Protective equipment for firefighters

Wear:

- Positive-pressure self-contained breathing apparatus
- Full structural firefighting protective clothing



SECTION 6 — ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions

- Evacuate unnecessary personnel.
- Remove all ignition sources.
- Stop engines and electrical equipment that are not explosion-proof.
- Prohibit smoking, flames, sparks, and hot work.
- Ventilate the area.
- Avoid breathing vapor.
- Avoid contact with skin and eyes.
- Wear appropriate personal protective equipment.
- Approach the spill from upwind.

6.2 Environmental precautions

Prevent entry into:

- Drains
- Sewers
- Surface water
- Groundwater
- Soil
- Confined underground areas

Notify the appropriate authority where required.

6.3 Small-spill cleanup

Absorb with:

- Sand
- Earth
- Vermiculite
- Diatomaceous earth
- Non-combustible universal absorbent

Use non-sparking tools.

Place recovered material in grounded, compatible, tightly closed containers.



6.4 Large-spill cleanup

Stop the source when safe.

Dike the spill using non-combustible material.

Recover free liquid using explosion-proof pumping equipment.

Use grounded and bonded equipment.

Apply vapor-suppressing foam where appropriate.

Do not flush with water.

6.5 Emergency considerations

Toluene vapor is heavier than air.

Test low areas and confined spaces before entry.

Only trained emergency personnel using appropriate respiratory protection should enter areas with unknown vapor concentrations.

SECTION 7 — HANDLING AND STORAGE

7.1 Safe handling

- Handle only in well-ventilated areas.
- Avoid breathing vapor or mist.
- Avoid skin and eye contact.
- Keep away from ignition sources.
- Do not smoke.
- Use explosion-proof ventilation and electrical equipment.
- Ground and bond containers during transfer.
- Use non-sparking tools.
- Take precautions against static electricity.
- Do not use compressed air for transfer or cleaning.
- Keep containers closed when not in use.
- Do not cut, weld, grind, drill, or heat empty containers.



- Do not eat, drink, or smoke in handling areas.
- Wash thoroughly after handling.
- Remove contaminated clothing promptly.

7.2 Storage conditions

Store:

- In an approved flammable-liquid storage area
- In tightly closed, correctly labeled containers
- In a cool, dry, well-ventilated location
- Away from direct sunlight
- Away from heat, sparks, and flames
- Away from oxidizing agents
- Away from incompatible chemicals
- Away from food and animal feed

Maintain suitable fire-control and spill-control equipment.

Protect containers from physical damage.

Bulk storage tanks should be grounded, bonded, vented, and designed for flammable solvents.

7.3 Packaging compatibility

Suitable materials may include:

- Carbon steel
- Stainless steel
- Compatible solvent-resistant linings

Seal, gasket, hose, and coating compatibility must be confirmed before use.



SECTION 8 — EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Occupational exposure limits

Exposure limits vary by jurisdiction.

Common United States values include:

Authority	Limit
NIOSH REL — 8-hour TWA	100 ppm / 375 mg/m ³
NIOSH REL — Short-term limit	150 ppm / 560 mg/m ³
NIOSH IDLH	500 ppm
OSHA PEL — 8-hour TWA	200 ppm
OSHA Ceiling	300 ppm
OSHA Maximum Peak	500 ppm for 10 minutes

Applicable national limits must be checked before use.

8.2 Engineering controls

Use:

- Closed-transfer systems where practical
- Local exhaust ventilation
- Explosion-proof general ventilation
- Vapor monitoring where exposure is possible

Provide:

- Emergency eyewash
- Safety shower
- Appropriate fire suppression
- Spill-control equipment

8.3 Eye and face protection

Wear chemical splash goggles.



Use a face shield in addition to goggles where significant splashing is possible.

8.4 Hand protection

Wear solvent-resistant gloves selected using manufacturer permeation data.

Potentially suitable materials include:

- Viton or fluoroelastomer
- Laminated barrier materials
- Other gloves specifically rated for aromatic hydrocarbons

Thin disposable nitrile gloves may offer only limited short-term splash protection and must not be assumed suitable for prolonged contact.

8.5 Skin protection

Wear:

- Solvent-resistant protective clothing
- Chemical-resistant apron where splashing is possible
- Antistatic protective clothing where required
- Chemical-resistant safety footwear

8.6 Respiratory protection

Where ventilation cannot maintain exposure below applicable limits, use an approved respirator suitable for organic vapor.

For unknown concentrations, oxygen-deficient atmospheres, emergencies, or concentrations at or above IDLH, use:

- Positive-pressure self-contained breathing apparatus; or
- Positive-pressure supplied-air respirator with auxiliary escape SCBA

Respirator use must follow an appropriate respiratory-protection program.



SECTION 9 — PHYSICAL AND CHEMICAL PROPERTIES

Property	Typical Value
Appearance	Clear, colorless liquid
Odor	Sweet, pungent, aromatic odor
Molecular formula	C ₇ H ₈
Molecular weight	92.14 g/mol
Boiling point	Approximately 110.6°C
Freezing point	Approximately -95°C
Flash point	Approximately 4°C, closed cup
Auto-ignition temperature	Approximately 480°C
Relative density	Approximately 0.865–0.870 at 20°C
Vapor pressure	Approximately 2.8 kPa at 20°C
Vapor density	Approximately 3.1, air = 1
Water solubility	Slight; approximately 0.5 g/L at ambient temperature
Log partition coefficient	Approximately 2.7
Dynamic viscosity	Approximately 0.56 mPa·s at 25°C
Lower explosive limit	Approximately 1.1% by volume
Upper explosive limit	Approximately 7.1% by volume
Evaporation rate	Rapid relative to many industrial solvents
pH	Not applicable
Flammability	Highly flammable liquid and vapor
Oxidizing properties	Not oxidizing
Explosive properties	Vapor-air mixtures may be explosive
Refractive index	Approximately 1.496 at 20°C

Values are typical and are not guaranteed batch specifications.



SECTION 10 — STABILITY AND REACTIVITY

10.1 Reactivity

No dangerous reaction is expected under recommended storage and handling conditions.

10.2 Chemical stability

Stable under normal ambient conditions.

10.3 Possibility of hazardous reactions

Vapor may form explosive mixtures with air.

Hazardous polymerization is not expected.

10.4 Conditions to avoid

Avoid:

- Heat
- Sparks
- Flames
- Hot surfaces
- Static discharge
- Vapor accumulation
- Confined spaces
- Contact with incompatible materials

10.5 Incompatible materials

- Strong oxidizing agents
- Nitric acid
- Peroxides
- Halogens
- Other highly reactive oxidants

10.6 Hazardous decomposition products

Fire or thermal decomposition may produce:



- Carbon monoxide
- Carbon dioxide
- Smoke
- Irritating hydrocarbon fumes

SECTION 11 — TOXICOLOGICAL INFORMATION

11.1 Routes of exposure

- Inhalation
- Skin absorption
- Skin contact
- Eye contact
- Ingestion

11.2 Acute effects

High vapor concentrations may cause:

- Headache
- Dizziness
- Drowsiness
- Confusion
- Nausea
- Poor coordination
- Central nervous system depression
- Unconsciousness

11.3 Skin corrosion or irritation

Causes skin irritation.

Repeated contact may remove natural skin oils and cause dryness, cracking, or dermatitis.

11.4 Eye irritation

Vapor or liquid may cause eye irritation, tearing, redness, and discomfort.



11.5 Aspiration toxicity

May be fatal if swallowed and enters the airways.

Aspiration may cause serious chemical lung injury.

11.6 Reproductive toxicity

Suspected of damaging the unborn child.

Pregnant workers or workers planning pregnancy should follow occupational-health guidance and minimize exposure.

11.7 Repeated exposure

Prolonged or repeated excessive exposure may affect:

- Central nervous system
- Hearing
- Kidneys
- Liver

11.8 Carcinogenicity

Toluene is not generally classified as a human carcinogen by the principal classification systems.

Product-specific benzene content must be controlled because benzene has a different and more severe hazard classification.

11.9 Mutagenicity

Toluene is not generally classified as a germ-cell mutagen.

11.10 Sensitization

Not generally expected to cause respiratory or skin sensitization.



SECTION 12 — ECOLOGICAL INFORMATION

12.1 Ecotoxicity

Toluene may be harmful to aquatic organisms.

Avoid release to the environment.

12.2 Persistence and degradability

Toluene is expected to biodegrade under suitable aerobic environmental conditions.

12.3 Bioaccumulative potential

Moderate bioaccumulation potential may exist, but substantial long-term biomagnification is not generally expected.

12.4 Mobility in soil

Toluene is volatile and moderately mobile.

It may migrate through soil and contaminate groundwater following a large release.

12.5 Other adverse effects

The product is a volatile organic compound and may contribute to photochemical ozone formation.

Large releases may harm wastewater-treatment systems and aquatic environments.



SECTION 13 — DISPOSAL CONSIDERATIONS

Dispose of product and contaminated absorbents as hazardous or regulated solvent waste in accordance with applicable laws.

Preferred options may include:

- Solvent recovery
- Recycling
- Authorized high-temperature incineration

Do not discharge into drains, soil, or waterways.

Empty containers may contain flammable vapor.

Do not cut, weld, puncture, grind, or burn empty containers.

Use an authorized waste contractor.

Waste codes must be assigned according to the source and condition of the waste.

SECTION 14 — TRANSPORT INFORMATION

14.1 ADR/RID, IMDG and ICAO/IATA

UN Number:

UN 1294

UN Proper Shipping Name:

TOLUENE

Transport Hazard Class:

3 — Flammable Liquid

Packing Group:

II

Hazard Identification Number:

33, where applicable

**Emergency Response Guide:**

130, where applicable

Marine Pollutant:

Generally no under standard transport classification; verify applicable shipment rules.

Tunnel Restriction Code:

D/E, where applicable under ADR

14.2 Labels

Flammable Liquid — Class 3

14.3 Special precautions

- Keep away from ignition sources.
- Use approved packaging.
- Keep containers closed and upright.
- Protect from heat and physical damage.
- Ensure appropriate dangerous-goods documentation.
- Comply with quantity limitations and mode-specific regulations.

SECTION 15 — REGULATORY INFORMATION

This document is structured with reference to:

- Globally Harmonized System of Classification and Labelling of Chemicals
- OSHA Hazard Communication Standard, 29 CFR 1910.1200
- Regulation (EC) No. 1907/2006 — REACH
- Regulation (EC) No. 1272/2008 — CLP
- ADR
- RID
- IMDG Code
- ICAO Technical Instructions
- IATA Dangerous Goods Regulations

Regulatory inventory status and restrictions must be confirmed for each destination country.



Toluene may be subject to restrictions concerning:

- Consumer products
- Paints and adhesives
- Workplace exposure
- Volatile organic compound emissions
- Reproductive hazards
- Air emissions
- Hazardous waste
- Major-hazard installations

SECTION 16 — OTHER INFORMATION

Document control

Document Title:

Material Safety Data Sheet — Toluene

Revision Number:

1.0 Draft

Issue Date:

To be assigned

Prepared For:

BASEKIM

Prepared By:

Technical / Regulatory Department

Full hazard statements

- H225: Highly flammable liquid and vapor.
- H304: May be fatal if swallowed and enters airways.
- H315: Causes skin irritation.
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- H361d: Suspected of damaging the unborn child.
- H373: May cause damage to organs through prolonged or repeated exposure.
- H412: Harmful to aquatic life with long-lasting effects.



Manufacturer verification required

Before official issue, verify:

1. Guaranteed toluene purity.
2. Benzene concentration.
3. Other aromatic and non-aromatic impurities.
4. Product-specific GHS classification in every destination market.
5. Current occupational-exposure limits.
6. Physical-property values against the Certificate of Analysis.
7. Supplier emergency telephone number.
8. REACH registration and chemical-inventory status.
9. Transport requirements for the package size and shipping route.
10. Document issue date, document number, approval, and revision history.

Disclaimer

The information in this draft is based on publicly available safety information and typical properties of high-purity industrial toluene.

This document is provided for technical and regulatory review. It must not be released as an official supplier Safety Data Sheet until the manufacturer has confirmed the composition, impurity profile, classification, exposure controls, physical data, transport status, and destination-country regulatory requirements.

The information is not a warranty of product performance or suitability for a particular application.