

SAFETY DATA SHEET

Product: TOLUENE

Revision: 00

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SECTION 1: IDENTIFICATION

GHS Product identifier:	TOLUENE.
Recommended use of the chemical and restrictions on use:	Industrial use.
Supplier's details:	COMPANHIA BRASILEIRA DE ESTIRENO. Rua Hidrogênio, 1879 - Polo Petroquímico – Camaçari – BA - CEP: 42810-140, Brasil. (+55 71) 3415-6990. COMPANHIA BRASILEIRA DE ESTIRENO. Av. Nove de Abril, 1296 – Vila Elisabeth - Cubatão – SP, CEP: 11510-001, Brasil. (+55 13) 3023-5890 / (+55 13) 3023-5891.
Emergency phone number:	0800 110 8270 Pró-Química.

SECTION 2: HAZARD IDENTIFICATION

Classification of the substance or mixture:	Flammable liquids – Category 2. Aspiration hazard – Category 1. Skin corrosion/irritation – Category 2. Reproductive toxicity – Category 2. Specific target organ toxicity following single exposure – Category 3. Specific target organ toxicity following repeated exposure – Category 2. Hazardous to the aquatic environment, short-term (acute) – Category 2. Hazardous to the aquatic environment, long-term (chronic) – Category 3.
Classification system adopted:	Globally Harmonized System of Classification and Labelling of Chemicals (GHS), United Nations, 2023.
Other hazards which do not result in classification:	Sparks can ignite the liquid and vapor. This can cause a fire or explosion.

GHS label elements, including precautionary statements

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Pictograms:	
Signal word:	DANGER
Hazard statement(s):	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. H361 Suspected of damaging fertility or the unborn child. H373 May cause damage to the hearing organs and central nervous system through prolonged or repeated exposure. H401 Toxic to aquatic life. H412 Harmful to aquatic life with long lasting effects.
Precautionary statement(s):	PREVENTION 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, lighting equipment. P242 Use non-sparking tools. P243 Take action to prevent static discharges. P260 Do not breathe mist and vapours. P264 Wash hands thoroughly after handling. P271 Use only outdoors or with adequate ventilation. P273 Avoid release to the environment. P280 Wear protective gloves, protective clothing, eye protection, face protection and hearing protection. RESPONSE PRECAUTIONARY P319 Get medical help if you feel unwell. P301 + P316 IF SWALLOWED: Get emergency medical help immediately. P304 + P340 IF INHALED: Remove person to fresh air and keep

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comfortable for breathing.

P332 + P317 If skin irritation occurs: Get medical help.

P362 + P364 Take off contaminated clothing and wash it before reuse.

P370 + P378 In case of fire: Use water fog, dry chemical powder, foam and carbon dioxide (CO₂) to extinguish.

P303 + P361 + P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse affected areas with water or shower.

STORAGE

P405 Store locked up.

P403 + P233 Store in a well-ventilated place. Keep container tightly closed.

P403 + P235 Store in a well-ventilated place. Keep cool.

DISPOSAL

P501 Eliminate the content and the container of compliance with local, state and federal laws.

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS**SUBSTANCES**

Chemical identity: Toluene.

Common name(s),
synonym(s) of the substance: Methylbenzene, Phenylmethane, Toluol.

CAS number: 108-88-3.

Impurities and stabilizing additives which are themselves classified and which contribute to the classification of the substance:

There are no known impurities that contribute to the hazard.

SECTION 4: FIRST-AID MEASURES**Routes of exposure**

Inhalation: Remove the victim to a ventilated area and keep him/her at rest in a position that is comfortable for breathing. If he/she feels unwell,

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	contact a POISON CENTER or a doctor. Take this SDS with you.
Skin:	In case of skin contact, immediately remove all contaminated clothing. Wash immediately with plenty of running water for at least 15 minutes. Wash contaminated clothing before reusing. Seek medical attention and bring this SDS.
Eye:	Rinse thoroughly with water for several minutes. If you wear contact lenses, remove them if easy to do so and rinse again. Seek medical attention immediately. Bring this SDS.
Ingestion:	Do not induce vomiting. Do not give anything by mouth to an unconscious person. Wash the victim's mouth with plenty of water. If vomiting occurs, tilt the patient forward or place him or her on the left side (up if possible) to keep the airway open and prevent aspiration. Keep the patient quiet and maintain a normal body temperature. Consult a POISON CENTER or physician. Bring this SDS.
Most important symptoms/effects, acute and delayed:	May be fatal if swallowed and enters the respiratory tract. Causes skin irritation with redness, dryness and flaking. May cause drowsiness or dizziness. Suspected of causing harm to the unborn baby. May cause damage to the hearing organs and central nervous system through prolonged or repeated exposure, fatigue, muscle weakness, confusion, incoordination, dilated pupils and accommodation disorders.
Indication of immediate medical attention and special treatment needed, if necessary:	Avoid contact with the product when assisting the victim. Treatment for exposure should be directed at controlling the patient's symptoms and clinical condition. If the victim is not breathing, apply artificial respiration. Administer oxygen if the victim is having difficulty breathing. In case of contact with the skin, do not rub the affected area.

SECTION 5: FIRE-FIGHTING MEASURES

Suitable extinguishing media:	Suitable: Water fog, dry chemical powder, foam and carbon dioxide (CO ₂). Not recommended: direct water jets.
Specific hazards arising from the chemical:	Very dangerous when exposed to excessive heat or other sources of ignition such as sparks, open flames or flames from matches and cigarettes, welding operations, pilot lights and electric motors. May

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accumulate static charge due to flow or agitation. Vapors from heated liquid may ignite due to static discharge. Vapors may form explosive mixtures with air. Vapors may travel to an ignition source and cause flashback. Can travel great distances causing flashback or new fires in both open and confined spaces. Containers may explode if heated. Most of these vapors are heavier than air and may spread along the ground and accumulate in low or enclosed areas such as basements, manholes, etc.

Danger of explosion in closed or open spaces or in manholes.

Special protective actions for fire-fighters:

Positive pressure self-contained breathing apparatus (SCBA) and full protective clothing. Containers and tanks involved in the fire may be cooled with water fog.

SECTION 6: ACCIDENTAL RELEASE MEASURES**Personal precautions, protective equipment and emergency procedures**

For non-emergency personnel:

Isolate the leak from sources of ignition. Evacuate the area to a radius of at least 100 meters. Keep unauthorized personnel away from the area. Stop the leak if this can be done without risk. Prevent sparks or flames. Do not smoke. Do not touch damaged containers or spilled material unless wearing suitable clothing. Avoid exposure to the product. Stay away from low areas and keep the wind at your back. Use personal protective equipment as described in Section 8.

For emergency responders:

Use full PPE with safety glasses, PVC or latex safety gloves, suitable protective clothing and closed shoes. The material used must be waterproof. In the event of a leak, where exposure is high, the use of respiratory protection equipment against organic vapors is recommended; in high exposure, the use of self-contained breathing apparatus (SCBA) with positive pressure is recommended. Isolate the leak from sources of ignition. Evacuate the area within a radius of at least 100 meters. Keep unauthorized persons away from the area. Stop the leak if this can be done without risk.

Environmental precautions:

Prevent the product from reaching soil and watercourses. Notify the relevant authorities if the product has caused environmental pollution (if it has reached watercourses or if it has contaminated soil or vegetation).

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Methods and materials for
containment and cleaning up:

Use water mist or vapor suppressant foam to reduce vapor dispersion. Use natural or spill containment barriers. Collect the spilled product and place it in appropriate containers. Absorb the remaining product with dry sand, earth, vermiculite, or any other inert material. Place the adsorbed material in appropriate containers and remove them to a safe location. Use non-sparking tools to collect the absorbed material. For final disposal, proceed in accordance with Section 13 of this SDS. For large spills, the liquid should be confined in a dike away from the spill for later appropriate disposal. Water fog may be used to reduce vapors. For final disposal, proceed in accordance with Section 13 of this SDS.

SECTION 7: HANDLING AND STORAGE**Precautions for safe handling**Safe handling of the
substance or mixture:

Schedule first aid before starting any activity with the product. The use of the product is restricted to professionals. Attention - Avoid exposure - obtain special instructions before use. Handle in a ventilated area or with a general ventilation/local exhaust system. Avoid formation of vapor or mists. Avoid exposure to the product. Avoid contact with incompatible materials. Use personal protective equipment as described in section 8.

General hygiene:

Wash your hands and face thoroughly after handling and before eating, drinking, smoking or using the toilet. Contaminated clothing should be changed and washed before reuse. Remove contaminated clothing and protective equipment before entering eating areas.

Conditions for safe storage, including any incompatibilitiesTechnical measures for
prevention of fire and
explosion:

Keep away from heat, sparks, open flames and hot surfaces. — Do not smoke. Keep container tightly closed. Ground the container and receiver during transfers. Use only non-sparking tools. Avoid the build-up of electrostatic charges. Use explosion-proof electrical, ventilation and lighting equipment.

Adequate conditions:

Store in a well-ventilated, dry, cool place away from sunlight. Keep container closed. Containers that have been opened should be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to prevent

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environmental contamination. See Section 10 for incompatible materials.

Packaging compatibilities: It is recommended to keep them in their original packaging.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

	<table><tr><th>Chemical agent</th><th>TWA-TLV (ACGIH, 2025)</th></tr><tr><td>Toluene, OTO; A4</td><td>20 ppm</td></tr></table>	Chemical agent	TWA-TLV (ACGIH, 2025)	Toluene, OTO; A4	20 ppm
Chemical agent	TWA-TLV (ACGIH, 2025)				
Toluene, OTO; A4	20 ppm				
Occupational exposure limit:	A4: Not classified as a human carcinogen (ACGIH). OTO: Ototoxic.				
Biological limit:	BEI (ACGIH, 2025): <u>Toluene</u>: Toluene in blood (before the las shift of the week): 0.02 mg/L. Toluene in urine (end of the shift): 0.03 mg/L. o-Cresol in urine (a) (end of the shift): 0.3 mg/g creatinine B. (a): with hydrolysis. B: Background.				
Other limits and values:	Toluene: IDLH 500 ppm (NIOSH, 2017).				
Appropriate engineering controls:	Use explosion-proof ventilation equipment. Provide mechanical ventilation and direct exhaust to the outside environment. Ventilation rates should be commensurate with the conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne contamination levels below recommended exposure limits.				
Individual protection measures, such as personal protective equipment (PPE)					
Eye/face protection:	It is recommended to wear wide-vision safety glasses and a visor.				
Skin protection:	It is recommended to use waterproof and chemical-resistant gloves, such as PVC, which must be approved, and to ensure safe handling, a risk assessment must be carried out.				

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	Protective clothing and, if necessary, flame-retardant anti-static clothing and anti-static safety shoes.
Respiratory protection:	It is recommended to use a respirator with a filter for organic vapors. It is recommended that a risk assessment be carried out to adequately define respiratory protection considering the conditions of use of the product.
Thermal hazards:	There are no known thermal hazards from the products.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Physical state:	Liquid.
Colour:	Not available.
Odour:	Not available.
Melting point/freezing point:	Not available.
Boiling point or initial boiling point and boiling range:	111°C.
Flammability:	Flammable.
Lower and upper explosion limit /flammability limit:	Not available.
Flash point:	4.4°C.
Auto-ignition temperature:	Not available.
Decomposition temperature:	Not available.
pH:	Not applicable.
Kinematic viscosity:	Not available.
Solubility:	Immiscible in water. (0.05% at 25°C).
Partition coefficient n-octanol/water (log value):	Log kow: 2.11 – 2.80.
Vapour pressure:	22 hPa at 20°C.
Density and/or relative density:	0.87 g/cm ³ .

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Relative vapour density: Not available.

Particle characteristics: Not applicable.

Other information: Not available.

SECTION 10: STABILITY AND REACTIVITY

Reactivity: Stable product under normal temperature and pressure conditions.

Chemical stability: No reactivity of the product is expected.

Possibility of hazardous reactions: May react when in contact with incompatible products.

Conditions to avoid: High temperatures, ignition source, light and contact with incompatible materials.

Incompatible material: High temperatures, ignition source, light and contact with incompatible materials.

Hazardous decomposition products: Decomposition of the product may release toxic gases.

SECTION 11: TOXICOLOGICAL INFORMATION

Acute toxicity: The product is not expected to show acute toxicity by oral, dermal and inhalation routes.

Toluene:LD₅₀ (oral, rats): > 5,000 mg/kg.LD₅₀ (dermal, rabbits): > 5,000 mg/kg.LC₅₀ (inhalation, rats, 4h): > 20 mg/L.

Skin corrosion/irritation: Contact with the product causes skin irritation, with flaking, pain and redness.

Toluene:

A skin irritation test conducted on rabbits showed that the compound causes skin irritation in exposed animals.

Serious eye damage/irritation: The product is not expected to cause eye irritation.

Toluene:

Eye irritation test with rabbits (OECD 405) did not cause eye irritation in the eyes of exposed animals.

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Respiratory or skin sensitization:	The product is not expected to cause respiratory or skin sensitization. <u>Toluene:</u> A skin sensitization test conducted with guinea pigs did not show any sensitizing potential of the compound, with a negative result for skin sensitization.
Germ cell mutagenicity:	The product is not expected to cause germ cell mutagenicity. <u>Toluene:</u> <i>In vitro</i> and <i>in vivo</i> studies have shown negative results.
Carcinogenicity:	The product is not expected to have carcinogenic potential. <u>Toluene:</u> Toluene is classified as group 3 by IARC: Not classified as carcinogenic to humans. Toluene is classified as group A4 by ACGIH: Not classified as carcinogenic to humans.
Reproductive toxicity:	Suspected of damaging fertility or the unborn child. <u>Toluene:</u> Exposure to the product may harm fertility or the fetus, with an increased incidence of miscarriage, abnormal development and malformation of newborns and a decrease in plasma concentrations of luteinizing hormone and testosterone. The ACGIH describes that Toluene causes effects on the female reproductive system and miscarriages.
STOT - Single exposure:	May cause drowsiness or dizziness.
STOT - Repeated exposure:	May cause damage to the hearing organs and central nervous system through repeated or prolonged exposure, fatigue, muscle weakness, confusion, incoordination, dilated pupils and accommodation disorders. <u>Toluene:</u> The compound is ototoxic and causes damage to the central nervous system and hearing as described by ACGIH.
Aspiration hazard:	May be fatal if swallowed and enters airways.

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SECTION 12: ECOLOGICAL INFORMATION

Toxicity:	Toxic to aquatic organisms. Harmful to aquatic organisms with long lasting effects. <u>Toluene:</u> LC₅₀ (<i>Oncorhynchus kisutch</i>, 96h): 9.36 mg/L. EC₅₀ (<i>Daphnia magna</i>, 48h): 6 mg/L. ECr₅₀ (Green algae, 72h): 12.5 mg/L. NOEC (<i>Ceriodaphnia dubia</i>, 7 days): 0.74 mg/L. NOEC (<i>Oncorhynchus kisutch</i>, 40 days): > 1 mg/L.
Persistence and degradability:	The product is not expected to be persistent; it is expected to be rapidly degraded. <u>Toluene:</u> Biodegradability: rapid.
Bioaccumulative potential:	The product is expected to have low bioaccumulative potential in aquatic organisms. <u>Toluene:</u> BCF: 90. Log know: 2.11 – 2.80.
Mobility in soil:	No adsorption potential is expected in soil.
Other adverse effects:	No other effects of the product are known.

SECTION 13: DISPOSAL CONSIDERATIONS**Elimination methods**

Product:	Treatment and disposal should be evaluated specifically for each product. Keep the remaining product in its original, tightly closed container. Disposal should be carried out as directed for the product.
Product remains:	Keep the remaining product in its original packaging and tightly closed. Dispose of according to the product's guidelines.
Packaging used:	Do not reuse empty packaging. These may contain product residue and should be kept sealed and sent for proper disposal as specified for the product.

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SECTION 14: TRANSPORT INFORMATION

Road:	UN - "United Nations" Recommendations on the TRANSPORT OF DANGEROUS GOODS. Model Regulations
UN Number:	1294
UN Proper Shipping Name:	TOLUENE
Transport hazard class(es):	3
Packing group:	II
Rail:	Convention concerning International Carriage by Rail (COTIF) Appendix C - Regulations concerning the International Carriage of Dangerous Goods by Rail - RID
UN Number:	1294
UN Proper Shipping Name:	TOLUENE
Transport hazard class(es):	3
Packing group:	II
Sea:	IMO – International Maritime Organization International Maritime Dangerous Goods Code (IMDG Code)
UN Number:	1294
UN Proper Shipping Name:	TOLUENE
Transport hazard class(es):	3
Packing group:	II
Marine pollutant:	The product is not considered a marine pollutant (IMO).
EmS:	F-E, S-D
Air:	IATA - International Air Transport Association Dangerous Goods Regulation (DGR)
UN Number:	1294
UN Proper Shipping Name:	TOLUENE
Transport hazard class(es):	3
Packing group:	II
Special precautions for user:	There is no need of special precautions.
Transport in bulk according to Annex II of MARPOL 73/78	Consult regulations: - International Maritime Organization. MARPOL: Articles, protocols,

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and the IBC Code: annexes, unified interpretations of the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto, consolidated edition. IMO, London, 2006.

- International Maritime Organization. IBC code: International code for the construction and equipment of shipping carrying dangerous chemicals in bulk: With Standards and guidelines relevant to the code. IMO, London, 2007.

SECTION 15: REGULATORY INFORMATION

Chemical regulations	Convention concerning Safety in the use of Chemicals at Work (Convention 170) - International Labour Organization, 1990. SGA. Globally Harmonized System of Classification and Labeling of Chemical Products. 10. Ed. New York: United Nations, 2023.
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SECTION 16: OTHER INFORMATION

This SDS was prepared based on current knowledge about the proper product handling and under normal conditions of use, in accordance with the application specified on the packaging. Any other use of the product involving their combination with other materials, and use various forms of those indicated, are the responsibility of the user. Warns that the handling of any chemical substance requires the prior knowledge of its hazards for the user. In the workplace it is for the user company's product promotes training of its collaborators about the possible risks arising from exposure to the chemical.

SDS prepared in May 2025.

Abbreviations:

ACGIH – American Conference of Governmental Industrial Hygienists

AIHA – American Industrial Hygiene Association

BCF – Bioconcentration Factor

BEI – Biological Exposure Index

CAS – Chemical Abstracts Service

C – Ceiling

EC₅₀ – Effective Concentration 50%LC₅₀ – Lethal Concentration 50%

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LD₅₀ – Lethal Dose 50%
ERPG - Emergency Response Planning Guidelines
LEL – Lower Explosive Limit
UEL – Upper Explosive Limit
NIOSH – National Institute of Occupational Safety and Health
OSHA – Occupational Safety & Health Administration
PEL – Permissible Exposure Limit
REL – Recommended Exposure Limit
STEL – Short Term Exposure Limit
TLV – Threshold Limit Value
TWA – Time Weighted Average

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ECHEM. The Global Portal to Information on Chemical Substances OECD. Available at: <https://www.echemportal.org/echemportal/substancesearch/substancesearch_execute.action>. Access: May 2025.

IARC – INTERNATIONAL AGENCY FOR RESEARCH ON CANCER. Available at: <<http://monographs.iarc.fr/ENG/Classification/index.php>>. Access: May 2025.

NIOSH – NATIONAL INSTITUTE OF OCCUPATIONAL AND SAFETY. International Chemical Safety Cards. Available at: <<http://www.cdc.gov/niosh/>>. Access: May 2025.

NJ. STATE OF NEW JERSEY - Department of Health. Available at: <<http://nj.gov/health/eoh/rtkweb/odispubr.shtml>>. Access: May 2025.

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