

Toluene

Safety data sheet in the 16-section GHS format · CAS 108-88-3

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1. Identification of the substance and of the supplier

Product name	Toluene
Synonyms	methylbenzene, toluol, phenylmethane, C7H8, methyl benzene
C.A.S. number	108-88-3 (EC 203-625-9; EU CLP Annex VI Index No. 601-021-00-3)
Molecular formula	C7H8 (C6H5CH3)
Grade supplied	99.8% min (IS 537) · 98.8–99.5% industrial
Product group	Solvents & Organic Chemicals
Identified uses	Paints, coatings, inks and adhesives, Feedstock to benzene and xylenes, Pharmaceutical and agrochemical process solvent, Toluene diisocyanate (TDI), Benzoic acid and benzaldehyde, Rubber, extraction and carbon black
Supplier	Velora Chemicals Private Limited
Emergency contact	Medical, fire or spill emergency — call the emergency services first: 112 (all-India), 101 fire, 108 ambulance. Velora Chemicals Private Limited does not at present operate a 24-hour chemical emergency advice line, and this sheet does not pretend otherwise. Every consignment despatched by road carries an emergency information panel under rule 134 of the Central Motor Vehicles Rules 1989 bearing a number from which expert advice on this material can be obtained, and the producer's safety data sheet issued with the consignment carries the producer's own 24-hour number where one is operated. For product, grade and documentation queries in business hours: +91 99255 22674.

2. Hazards identification

GHS signal word	Danger; pictograms GHS02 (flame), GHS07 (exclamation mark) and GHS08 (health hazard). Three pictograms only - no GHS09 and no GHS06 on the strength of the harmonised entry
Hazard classification	EU CLP Annex VI harmonised entry (Index No. 601-021-00-3), six classes: Flam. Liq. 2, H225 - highly flammable liquid and vapour; Skin Irrit. 2, H315 - causes skin irritation; Repr. 2, H361d - suspected of damaging the unborn child (developmental only, Category 2 - not H360, not H361f); STOT SE 3, H336 - may cause drowsiness or dizziness; STOT RE 2, H373 - may cause damage to organs through prolonged or repeated exposure (inhalation route); Asp. Tox. 1, H304 - may be fatal if swallowed and enters airways. Some suppliers additionally self-classify Aquatic Chronic 3, H412, and Eye Irrit. 2, H319; neither is harmonised. Toluene carries NO carcinogenicity or mutagenicity classification - IARC Group 3, ACGIH A4. Do not transfer benzene's classification to it. Commercial toluene containing 0.1% or more benzene must however be classified and labelled as a Carc. 1A, H350 AND Muta. 1B, H340 mixture - the CLP generic concentration limit is 0.1% for both, and quoting H350 alone is incomplete. IS 537 caps benzene in toluene at 500 mg/kg, that is 0.05%, below the threshold, so IS 537 grade is not a carcinogenic mixture on that account. The 98.8-99.5% industrial grade carries NO standard benzene limit: the benzene figure on the producer's certificate of analysis for the lot governs its classification and labelling, and Velora will obtain that figure on request before order

3. Composition / information on ingredients

Substance	Toluene
C.A.S. number	108-88-3 (EC 203-625-9; EU CLP Annex VI Index No. 601-021-00-3)
Molecular weight	92.14 g/mol (PubChem; 92.1384 g/mol NIST)
Composition	Toluene, CAS 108-88-3. The classification-relevant impurity is BENZENE (CAS 71-43-2, Carc. 1A H350, Muta. 1B H340): at 0.1% or more it changes the classification and labelling of the material as a mixture. IS 537 grade is capped at 500 mg/kg (0.05%) benzene; the industrial grade has no standard cap and the producer's certificate of analysis for the lot governs. Other impurities are non-aromatics and traces of other aromatics per the grade.

4. First-aid measures

Eye contact	Flush the eyes with plain water or saline for at least 15 minutes, or until pain resolves (ATSDR Medical Management Guidelines). Remove contact lenses if easily possible, then continue rinsing. Do not let the casualty rub the eyes. Refer for medical attention.
Skin contact	Remove contaminated clothing and footwear FIRST and double-bag it, then flush the skin and hair with plenty of water for AT LEAST 15 MINUTES and wash with mild soap. (The sources differ on duration: ATSDR gives a 2-3 minute flush followed by washing with mild soap, ILO ICSC 0078 gives at least 15 minutes. Where there is any doubt, continue for 15 minutes.) The order matters and it is the opposite of the sequence used for a corrosive: toluene's flash point is about 4 C, far below ambient temperature anywhere in India, so a soaked garment keeps evolving a flammable vapour cloud around the casualty and the rescuers for as long as it is worn, and it holds solvent against the skin, prolonging absorption and defatting. The decontamination point must have no ignition sources - no vehicles, no electrical switching, no hot work, no smoking. Leather footwear usually cannot be decontaminated and is discarded. Note that ILO ICSC 0078 gives the opposite order; that is its generic template for corrosives and is the wrong priority for a flammable solvent.
Inhalation	Move to fresh air at once. DO NOT ENTER a pit, sump, bund, tank or other low-lying or enclosed space to reach a casualty without self-contained breathing apparatus and a standby person - toluene vapour is about 3.1 times heavier than air, it collects in exactly those places, and an unprotected rescuer becomes the second casualty. Keep the casualty at rest, half-upright if breathing is difficult; give oxygen if available; refer immediately for medical attention. If the casualty is unconscious but breathing normally, place in the recovery position and monitor breathing. IF NOT BREATHING NORMALLY, BEGIN CPR IMMEDIATELY - chest compressions with ventilation through a bag-valve mask or other barrier device, never direct mouth-to-mouth, because the mouth may be contaminated with solvent - and send for an automated defibrillator and an ambulance. Keep the casualty still and calm and avoid startling or exerting them. NOTE TO PHYSICIAN: toluene sensitises the myocardium to catecholamines. ATSDR advises that sympathomimetic agents such as adrenaline (epinephrine) and isoproterenol could precipitate fatal arrhythmias and should be avoided unless clinically unavoidable, that cardiac monitoring is advised, and that for prolonged or resistant arrhythmias beta-blockers may be more effective than lidocaine. This is a clinical treatment decision for a physician. It is NOT an instruction to a first-aider to withhold resuscitation or an adrenaline auto-injector.
Ingestion	Rinse the mouth. DO NOT induce vomiting. Give nothing to drink. Keep at rest and refer immediately for medical attention (ILO ICSC 0078; ATSDR). Toluene is Asp. Tox. 1, H304 - its low viscosity and surface tension mean that even a small volume reaching the airway on vomiting causes severe, potentially fatal chemical pneumonitis, so inducing vomiting converts a swallowing incident into a lung injury. Do not give milk, oil, fats or alcohol; they increase absorption and alcohol enhances toluene's toxicity. The effects of aspiration may not appear for several hours or even days, so an apparently well casualty still needs medical observation. Gastric lavage only by medical personnel with the airway protected.

5. Fire-fighting measures

Flash point	4 °C closed cup (ILO ICSC 0078; PubChem). Literature values span 4-6 °C closed cup - NIOSH gives 4.4 °C (40 °F), producer sheets 5-6 °C. No authoritative open-cup figure exists. Autoignition 480 °C; explosive limits 1.1-7.1 vol% in air
Suitable extinguishing media	This material has a flash point and burns. Use alcohol-resistant foam, dry chemical powder or carbon dioxide; water spray or fog to cool surrounding surfaces and containers. Confirm the medium against the producer's safety data sheet for the grade supplied.
Unsuitable extinguishing media	Do not use a high-pressure water jet: it will spread the material and the fire. A vapour flash-back to the source and re-ignition of cooled but still-hot material are both foreseeable; do not approach a container that may be pressurised or a pool fire without cover.
Special hazards arising from the substance	Vapour is about 3.1 times heavier than air; it travels along the ground, collects in bunds, sumps and drum bays, and can flash back to the source from a distant ignition point. The contents are highly flammable (H225) and the headspace of a closed drum is within or above the flammable range at Indian ambient temperature. Containers in a fire will pressurise and may rupture - cool with water spray from a protected position and withdraw immediately if a relief device sounds or a tank discolours. Toluene floats on water and will carry fire with the run-off. Combustion gives dense black smoke, carbon monoxide and unburnt aromatic hydrocarbons. EMPTY DRUMS RETAIN FLAMMABLE VAPOUR and must not be cut, welded, ground, flame-cleaned or heated.
Advice for fire-fighters	Fire-fighters must wear self-contained breathing apparatus and full protective clothing. Keep unnecessary personnel away and upwind. Prevent firefighting run-off from entering drains, surface water or groundwater.

6. Accidental release measures

ELIMINATE ALL IGNITION SOURCES FIRST - no smoking, no flames, no sparks, no hot work; shut down and isolate non-flameproof electrical equipment in the area and stop vehicle movement. Keep unnecessary personnel away and upwind, and ventilate. Evacuate and isolate the area for at least 50 m in all directions; for a large spill consider downwind evacuation of at least 300 m; and if a tank, tanker or drum stack is involved in fire, isolate and evacuate 800 m in all directions and fight only from the maximum distance with unmanned monitors (Emergency Response Guidebook Guide 130, the guide assigned to UN 1294). Wear the protective equipment in section 8 before approaching, and self-contained breathing apparatus for anything more than a minor spill in the open air. **DO NOT TOUCH OR WALK THROUGH** spilled material. Use only non-sparking tools and bonded, earthed equipment. Stop the leak if it is safe to do so, then bund or dike the spill. Absorb with sand, earth or other inert NON-COMBUSTIBLE absorbent - NOT sawdust or any other combustible material - and collect into labelled, closable containers for disposal under section 13. Keep out of drains, sewers and watercourses: a sewer filling with a vapour three times heavier than air is an explosion waiting for an ignition source. Do not return spilled material to the original container.

7. Handling and storage

- **Flash point 4 °C closed cup. That is the fact everything else follows from.** It is below ambient temperature across almost all of India for almost all of the year — the Himalayan belt in winter is the only real exception — so assume the headspace of a toluene drum or tank is within or above the flammable range at all times. Flammable limits in air are 1.1% to 7.1% by volume; autoignition is 480 °C. Vapour is 3.1 times heavier than air, so it collects in drum bays, sumps, tank pits and bunds and can travel to a distant ignition source and flash back. Treat any low-lying space where toluene is handled as a confined space for rescue purposes, and classify the storage area for hazardous-area electrical equipment accordingly.
- **PPE and facilities.** Chemical splash goggles, and a face shield over them for decanting, drum pumping or sampling. Viton or laminate-film gloves for transfer work (nitrile is not suitable — see below). Antistatic footwear and clothing, and no synthetic outerwear that can hold a charge. An organic-vapour respirator with a type A cartridge for routine work where vapour control is imperfect, and air-supplied breathing apparatus above the IDLH of 500 ppm or for any tank or sump entry. An eyewash station and a safety shower within immediate reach of every point where toluene is opened — the first-aid instruction below asks for fifteen minutes of irrigation, and that is only possible if the plumbing is there.
- **Fire: foam, dry chemical powder or carbon dioxide. Do not use a direct water jet.** Protein or AFFF foam is the usual choice for toluene, which is not water-miscible; alcohol-resistant foam also works. A jet floats burning toluene — relative density about 0.87 — and spreads the fire. Water spray may be used to cool containers and to protect people, and it must be kept up after knock-down, because CO₂ and dry powder do not cool and hot steel re-ignites. **Firefighters must wear**

positive-pressure self-contained breathing apparatus and full protective clothing; toluene burns with dense black smoke and produces carbon monoxide, and structural firefighting kit alone gives limited protection. ERG Guide 130, the guide assigned to UN 1294, gives the distances: isolate a spill or leak at least 50 m in all directions; for a large spill consider downwind evacuation of 300 m; and **for a fire involving a tank, tanker or drum stack, isolate and evacuate 800 m in all directions** and fight from maximum distance with unmanned monitors. Withdraw immediately if you hear rising sound from a venting safety device or see a tank discolour, and never approach a tank engulfed in fire. Fight from upwind. Toluene-soaked clothing and rags are themselves an ignition risk and must not be carried through a hot or flammable area.

- **Spill and leak.** Eliminate every ignition source first — no smoking, no flames, no sparks, and shut down non-classified electrical equipment in the area — then ventilate. Do not touch or walk through spilled material. Use non-sparking tools and earthed, bonded equipment. Dike ahead of a large spill; absorb a small one with sand, earth or another inert non-combustible absorbent (not sawdust) into closed containers for disposal. **Keep it out of drains, sewers and watercourses** — toluene is harmful to aquatic life and a sewer full of a vapour 3.1 times heavier than air is an explosion waiting for an ignition source. Wear breathing apparatus for anything more than a minor spill in open air.

- **Toluene is a static accumulator, and bonding and earthing are not optional.** Its electrical conductivity is about 5 pS/m, against the 50 pS/m threshold below which a liquid is treated as a non-conductive static accumulator — a ten-fold margin on the wrong side. Combined with a flash point below ambient, that is the classic drum- and tanker-filling ignition scenario. The Solvents Industry Association's Guidance Note 47 gives figures worth holding your own operation to: a maximum resistance to earth of 10 ohms as a metal-to-metal continuity check; fill velocity below 1 m/s until the inlet pipe is submerged, then up to 7 m/s and typically 2–3 m/s; and 1 m/s throughout if a second, water phase is present, because water carryover sharply raises charge generation. Tanker-bottom water is a real field problem, which is also why IS 537 caps water at 500 mg/kg. These are general figures — design to your own hazardous-area classification and to your producer's SDS. API RP 2003 and NFPA 77 are the underlying standards, and bonding alone may not fully remove the hazard.

- **Nitrile and EPDM both fail in toluene — and nitrile is India's default seal material.** This is where drum pumps, transfer hoses and tanker couplings actually leak. Toluene is unsuitable with nitrile (NBR/Buna-N), HNBR, EPDM, neoprene, natural rubber, butyl, silicone and polyurethane. It is good with FKM/Viton, with some swell, and very good with perfluoroelastomers such as Kalrez or Chemraz; PTFE is treated as fully resistant. So use **Viton or PTFE** for pump seals, hose liners, valve seats, gaskets and hose couplings — and note that EPDM is the usual wrong substitution when nitrile is unavailable, because it is the default for water and steam service. Nitrile gloves are unsuitable for immersion or sustained contact for the same reason. We do not publish glove breakthrough times.

- **Metals: ordinary carbon steel is correct.** Toluene as specified is dry (water 500 mg/kg maximum) and non-acidic, and is not corrosive to iron, so mild-steel tanks and drums are the standard and are chemically fine. Stainless steel 304 or 316 is used where colour and iron pickup matter — pharma and coatings buyers protecting Saybolt or Pt-Co colour — because carbon steel, especially in reconditioned drums or long storage, and especially if water has been allowed in, can contribute rust fines and colour degradation. That is a quality point rather than a corrosion one. Polyethylene and polystyrene are unsuitable, which rules out HDPE jerrycans and IBCs and any polystyrene-containing fitting. Toluene is a strong solvent for most conventional tank coatings and will lift them; use a solvent-resistant system or unlined carbon steel.

- **Incompatibilities.** Strong oxidisers and strong bases. Toluene reacts violently with nitric acid and with nitrating (mixed nitric/sulphuric) acid — that is not theoretical, since mixed acid is the nitration route to dinitrotoluene and TNT and it runs away readily. Concentrated sulphuric acid on its own sulphonates toluene rather than reacting violently, but the reaction is exothermic and oleum and fuming acid are genuinely hazardous with it, so treat all strong acids as incompatible. Also: halogenated compounds and alkyl halides in the presence of Lewis acids such as aluminium chloride, which has caused documented explosions, and sulphur dichloride, which has ruptured a tank. Keep separated from all of these and from heat, sparks, open flame and every ignition source.

- **Hazard classification.** Under the EU harmonised classification (CLP Annex VI, index 601-021-00-3) toluene is Flam. Liq. 2 H225; Repr. 2 H361d, suspected of damaging the unborn child; STOT RE 2 H373; STOT SE 3 H336, may cause drowsiness or dizziness; Asp. Tox. 1 H304, may be fatal if swallowed and enters airways; and Skin Irrit. 2 H315. Signal word **Danger**; pictograms flame, exclamation mark and health hazard. Toluene is not classified as a carcinogen or mutagen, and ACGIH records it A4, not classifiable as a human carcinogen — its exposure limit is low because of neurotoxicity and developmental effect, not cancer. Some suppliers additionally self-classify an aquatic hazard (H412); that is not part of the harmonised entry, so work to the classification on the SDS that comes with your lot.

- **H361d deserves a line of its own.** It is the reproductive entry, specifically for the unborn child, and it is the most-checked line on a toluene label. California lists toluene under Proposition 65 for developmental toxicity. Exposure of pregnant and breastfeeding workers should be excluded or rigorously controlled. Long-term exposure may affect the central nervous system, cause colour vision impairment, and cause hearing loss — toluene is ototoxic, and it acts synergistically with noise,

which matters in a plant that has both.

- **Exposure limits, and why there is no Indian number to quote you.** There is **no numerical Indian statutory limit for toluene currently in force**, and it is worth being precise about why, because a good deal of Indian safety documentation is wrong on this. The **Factories Act 1948 was repealed on 21 November 2025** by the Occupational Safety, Health and Working Conditions Code, 2020, so its Second Schedule entry for toluene — 100 ppm (375 mg/m³) eight-hour TWA and 150 ppm (560 mg/m³) fifteen-minute STEL — is no longer a live statutory limit. The Code did not carry those numbers across: its Second Schedule is a list of matters to be provided for in standards under section 18(2)(f), not a table of values. Numbers arrive only by notification under **section 88**, under which it is the **Central** Government, in consultation with the National Occupational Safety and Health Advisory Board, that specifies permissible limits — not the States, which is the opposite of what is often said. No notification covering toluene had been issued when this page was written, and Central and State rules under the Code were still being notified, so confirm the transitional position in your State. **Design to the ACGIH TLV of 20 ppm (75 mg/m³) eight-hour TWA**, which is far tighter, is health-based, and is the better basis in any event; it carries a biological exposure index, an A4 (not classifiable as a human carcinogen) notation and no STEL. ACGIH also carries an **ototoxicant notation** — toluene damages hearing, and worse in combination with noise — which is missing from most safety data sheets and belongs in your occupational-health assessment rather than only in your air monitoring. On the skin notation the sources disagree: ACGIH's own substance listing does not show one while OSHA's annotated table reports one, so verify against the current TLV booklet rather than taking it from us. Skin absorption is in any case a systemic route in its own right and not merely an irritation route. For reference, the US OSHA PEL is 200 ppm TWA with a 300 ppm ceiling and a 500 ppm maximum peak for a single period of up to ten minutes, unrevised since 1971; NIOSH's REL is 100 ppm TWA and 150 ppm STEL with an IDLH of 500 ppm; the EU indicative limit is 50 ppm TWA and 100 ppm STEL with a skin notation.
- **First aid. Skin — clothing off first.** Remove contaminated clothing and footwear immediately, under the shower if one is to hand, because a soaked garment is both an ignition risk and a reservoir holding toluene against the skin, and toluene is absorbed through intact skin. Then rinse the skin with plenty of water for at least 15 minutes and wash with soap and water. Bag the clothing away from any ignition source and launder it before reuse. **Eyes:** rinse immediately with plenty of clean water for at least 15 minutes, holding the eyelids apart; remove contact lenses if easily possible and keep rinsing; refer for medical attention. **Inhalation:** move to fresh air, rest in a half-upright position, give oxygen if breathing is laboured, and refer for medical attention. The vapour is heavier than air, so a collapsed worker in a sump, bund or drum bay is a confined-space rescue — a rescuer without breathing apparatus becomes the second casualty.
- **First aid, continued. If the casualty is unconscious but breathing normally:** place them in the recovery position, on their side, monitor breathing, and never give anything by mouth or hold them upright. **If they are not breathing normally, start CPR at once** — chest compressions with ventilation through a bag-valve mask or other barrier device, never mouth-to-mouth to a solvent casualty — and send for an AED and an ambulance. **Keep any significantly exposed casualty still and calm, and avoid startling or exerting them: toluene sensitises the heart to adrenaline, and sudden alarm or exertion can trigger a fatal arrhythmia.** Tell the receiving clinician that toluene is cardiotoxic; a 12-lead ECG is indicated in anyone significantly exposed, and adrenaline should be used with caution. **If swallowed: do not induce vomiting, and give nothing to drink.** Rinse the mouth with water only if the person is fully conscious. The reason is H304 — toluene has low viscosity and low surface tension, so vomiting risks drawing it into the lungs, and the resulting chemical pneumonitis is far more dangerous than the swallowed dose. In every case get immediate medical attention and send the SDS with the casualty; have your nearest poison centre and hospital numbers posted at the store, and on a road incident call the emergency number on the shipping paper.
- **Transport: UN 1294, TOLUENE, Class 3 flammable liquid, Packing Group II**, flammable-liquid label, under the UN Model Regulations and correspondingly under ADR/RID, IMDG and ICAO/IATA. Packing group II, not III — a flash point below 23 °C with an initial boiling point above 35 °C puts it in II, and III is a common error on a Class 3 consignment note. Under CMVR 1989 **rule 131** the consignor's duties are the consignor's: a vehicle validly registered to carry the goods, first-aid and safety equipment on board, the transporter fully and adequately informed, and the driver trained in the dangers. **Rule 134** then requires the emergency information panel, which must carry the consignor's own name and telephone number — or that of someone from whom expert advice can be had — alongside the emergency services number. Note also that rule 75 of the Petroleum Rules 2002 requires a licence for the transport of petroleum Class A in bulk by road.
- **Petroleum licensing — read this before you order.** Toluene is petroleum within the meaning of the Petroleum Act 1934, and the Act defines Class A petroleum as petroleum having a flash point below 23 °C — so at 4 °C toluene is unambiguously **Class A**, and its storage is licensed by the Petroleum and Explosives Safety Organisation under the Petroleum Rules 2002. The exemptions in the Act are narrow and it is worth knowing exactly how narrow. **Section 8(1) exempts from licence only petroleum Class A “not intended for sale”, and only up to thirty litres;** section 8(2) requires even that to be kept in securely stoppered glass or stoneware receptacles of not more than one litre, or metal receptacles of not more than twenty-five litres. The much larger exemptions in section 7 — 2,500 litres of Class B, 45,000 litres of Class C — name only

those two classes and **do not extend to Class A at all**. The only bigger Class A allowance, in section 9, is confined to one hundred litres held as motive-power fuel for a registered vehicle or stationary engine. So a single drum is already above every exemption in the Act, and material held for sale is outside section 8 whatever the quantity. Take your own position with PESO under the Petroleum Rules 2002, and satisfy yourself about the licensing position of any supplier you buy from and of the transporter who brings it. The same flash-point test catches acetone, isopropyl alcohol and methanol.

- **Other Indian regulation.** Toluene is a listed hazardous chemical under the Manufacture, Storage and Import of Hazardous Chemical Rules 1989, at serial 628 of Schedule 1 Part II, and it meets the Part I criteria for a very highly flammable liquid (flash point at or below 23 °C with an initial boiling point above 35 °C). It is not named in Schedule 2 or Schedule 3, so no major-accident-hazard threshold attaches to it by name, but check whether the generic flammable-liquid categories bite at your storage volume.

- **One thing this page will not help you with.** Toluene is abused as an inhalant, and in India correction-fluid and “whitener” abuse among adolescents and street populations is documented and serious. The EU restricts toluene at or above 0.1% by weight in adhesives and spray paints supplied to the general public (REACH Annex XVII entry 48). Velora supplies bulk only — drums — and does not sell retail packs. That is a deliberate policy, not an inconvenience.

Storage: Fireproof store, containers kept well closed and upright in the original labelled container, cool, well ventilated, out of direct sunlight, away from heat, hot surfaces, sparks, open flame and all ignition sources; no smoking. Separated from strong oxidants and from strong acids and bases. Store in an area with no drain or sewer connection. Bond and earth all containers and transfer equipment; use non-sparking tools and flameproof electrical fittings; nitrogen blanketing and vapour recovery for bulk tanks. Segregate from food and feed. In India toluene's flash point is below 23 C, which makes it petroleum Class A under the Petroleum Act 1934 and the Petroleum Rules 2002: storage above the exempt quantities, and movement in bulk by road, are separately licensed by PESO. Storage and handling also fall under the Manufacture, Storage and Import of Hazardous Chemical Rules 1989.

8. Exposure controls / personal protection

Occupational exposure limits. ACGIH TLV-TWA 20 ppm (75 mg/m³); A4, not classifiable as a human carcinogen; BEI. ACGIH also carries an OTO (ototoxicant) notation - toluene's hearing-loss hazard in combination with noise, which is missing from most safety data sheets and belongs in the occupational-health assessment. Sources disagree on whether a skin notation currently applies: ACGIH's own substance page does not show one while OSHA's annotated table reports one, so verify against the current TLV booklet rather than relying on this sheet. No ACGIH STEL. NIOSH REL 100 ppm TWA, STEL 150 ppm, IDLH 500 ppm. OSHA PEL 200 ppm TWA, 300 ppm ceiling, 500 ppm peak for up to 10 minutes (Cal/OSHA is stricter at 10 ppm TWA). EU IOELV 50 ppm 8-hour and 100 ppm STEL, with a skin notation. For India see the note in section 15.

Personal protection. Respiratory protection: for routine work, engineering control rather than respirators; where vapour concentrations are or may be above the limit, an organic-vapour respirator with an A-type (brown) filter, and POSITIVE-PRESSURE SELF-CONTAINED BREATHING APPARATUS for a spill response, for tank or confined-space entry, and for any situation where the concentration is unknown or oxygen may be deficient. Eye protection: chemical splash goggles to EN 166, with a face shield for drum decanting and sampling. Hands: nitrile gloves give poor protection against toluene and are for incidental contact only - use laminate (Barrier/Silver Shield) or viton for immersion or prolonged contact, and check the breakthrough time on the glove manufacturer's own chemical-resistance data for toluene. Body: antistatic, flame-retardant coveralls and antistatic footwear. Bond and earth all containers and transfer equipment before decanting.

Engineering controls. Enclose every transfer, tipping, bag-slitting and sampling point and fit local exhaust extraction at each, and keep airborne concentrations below the limit in force at the place of use. Provide an eyewash within reach of the working position, and a safety shower wherever the material is classified corrosive or irritant or is handled in quantity. Do not eat, drink or smoke in the handling area; wash before breaks. Where no limit is stated above, occupational exposure limits vary by jurisdiction: check the limit in force at the place of use and the producer's sheet for the grade supplied, and record which value your assessment adopted. Select eye, skin and respiratory protection on the strength of a measured or modelled exposure assessment, not on this sheet alone.

9. Physical and chemical properties

Appearance	Clear, colourless, mobile liquid with a sweet, pungent, benzene-like odour. Odour must not be relied on as a warning property - toluene causes olfactory fatigue
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Physical state	Liquid at ambient temperature and pressure
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Melting / freezing point	-95 C (ILO ICSC 0078; NIST triple point 178.15 K; NIOSH -139 F)
Boiling point	110.6 C at 101.3 kPa (PubChem; NIST 383.8 +/- 0.2 K). ICSC rounds to 111 C
Relative density	0.866-0.867 g/cm ³ at 20 C; relative density 0.87 (water = 1) (ILO ICSC 0078; NIOSH). Producer grade range 0.846-0.873 g/cm ³ at 15 C. Note: the figure 0.8623 g/cm ³ is the 25 C value and is widely mislabelled as 20 C
Solubility in water	Slightly soluble - approximately 526 mg/L at 25 C (PubChem); 573-587 mg/L at 20 C (producer SDS). Miscible with ethanol, diethyl ether, acetone and most organic solvents. It is NOT insoluble, which is why spill containment and the no-drain rule matter
pH	Not applicable (non-aqueous, non-electrolyte). No pH can be measured; a figure of 7 would be meaningless
Flash point	4 C closed cup (ILO ICSC 0078; PubChem). Literature values span 4-6 C closed cup - NIOSH gives 4.4 C (40 F), producer sheets 5-6 C. No authoritative open-cup figure exists. Autoignition 480 C; explosive limits 1.1-7.1 vol% in air
Auto-ignition / ignition temperature	480 C (ILO ICSC 0078; producer SDS)
Explosive / dust-explosion properties	Not explosive as a substance, but the vapour forms explosive mixtures with air. Explosive limits 1.1-7.1 vol% in air (ILO ICSC 0078; NIOSH); one producer gives 1.2-7.0 vol%.
Vapour pressure	Approximately 21 mmHg (2.8 kPa) at 20 C (NIOSH); 3.8 kPa / 28.4 mmHg at 25 C (ILO ICSC 0078; PubChem). A figure of 36 mmHg at 20 C circulating on one producer sheet is inconsistent with every other source and should not be used.
Vapour density	3.1 (air = 1) - heavier than air, so vapour collects in pits, sumps, bunds, drum bays and sewers and can travel to a distant ignition source and flash back.
Partition coefficient (log Pow)	2.69 (ILO ICSC 0078)
Particle characteristics	Not applicable (liquid)
Molecular weight	92.14 g/mol (PubChem; 92.1384 g/mol NIST)

10. Stability and reactivity

Incompatible materials	Strong oxidisers and oxidants - reacts violently (NIOSH; ILO ICSC 0078). Strong acids and strong bases. Concentrated nitric and sulphuric acid (nitration, strongly exothermic); halogens and nitrating mixtures. Attacks natural rubber and some plastics and coatings. Keep away from all ignition sources and from accumulated static
Conditions to avoid	Fireproof store, containers kept well closed and upright in the original labelled container, cool, well ventilated, out of direct sunlight, away from heat, hot surfaces, sparks, open flame and all ignition sources; no smoking. Separated from strong oxidants and from strong acids and bases. Store in an area with no drain or sewer connection. Bond and earth all containers and transfer equipment; use non-sparking tools and flameproof electrical fittings; nitrogen blanketing and vapour recovery for bulk tanks. Segregate from food and feed. In India toluene's flash point is below 23 C, which makes it petroleum Class A under the Petroleum Act 1934 and the Petroleum Rules 2002: storage above the exempt quantities, and movement in bulk by road, are separately licensed by PESO. Storage and handling also fall under the Manufacture, Storage and Import of Hazardous Chemical Rules 1989.

11. Toxicological information

Acute toxicity: low by the oral and dermal routes; the inhalation route is the one that matters. ASPIRATION HAZARD: Asp. Tox. 1, H304, may be fatal if swallowed and enters airways - this is the basis of the do-not-induce-vomiting instruction in

section 4. Skin: Skin Irrit. 2, H315; repeated or prolonged contact defats the skin and causes dermatitis, and toluene is absorbed through intact skin. Eyes: irritant. Inhalation: STOT SE 3, H336, may cause drowsiness or dizziness; central nervous system depression progressing from headache, dizziness and euphoria to incoordination, unconsciousness and respiratory arrest. CARDIAC: toluene sensitises the myocardium to catecholamines and high exposures can cause fatal arrhythmia - the mechanism behind 'sudden sniffing death'. Repeated exposure: STOT RE 2, H373, by inhalation; the target organs reported are the central nervous system, the auditory system (ACGIH carries an ototoxicant notation, and the hazard is worse in combination with noise), the kidney and the liver. Reproductive toxicity: Repr. 2, H361d, suspected of damaging the unborn child - developmental only. It does NOT carry a fertility classification. CARCINOGENICITY AND MUTAGENICITY: toluene carries NO classification for either. IARC places it in Group 3, not classifiable as to carcinogenicity to humans (Monographs Vol. 71, 1999) and ACGIH assigns A4. Toluene is not myelotoxic: aplastic anaemia and leukaemia are BENZENE effects and must not be attributed to toluene - but see section 3 on benzene as an impurity, which can change the classification of the material as a mixture. Biological monitoring: ACGIH publishes a BEI.

12. Ecological information

Not classified as hazardous to the aquatic environment in the CLP Annex VI harmonised entry, and the producer sheets reviewed state that toluene is NOT a marine pollutant and not environmentally hazardous for transport purposes. Some suppliers nonetheless self-classify Aquatic Chronic 3, H412, harmful to aquatic life with long lasting effects; that is self-classification and not harmonised. Toluene is slightly water-soluble at roughly 0.5 g/L, which is why the no-drain-or-sewer rule and spill containment matter: it is mobile in water as well as floating on it. Log Pow 2.69; it is biodegradable and not expected to be strongly bioaccumulative. Prevent any release to drains, surface water and groundwater, and treat aqueous effluent before discharge.

13. Disposal considerations

Dispose of the substance and its container through an authorised facility under the Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016 where the waste is scheduled under those Rules, and otherwise as non-hazardous industrial waste, in each case under the conditions of the State Pollution Control Board consent in force at the site. Whether a particular waste stream is scheduled depends on the substance and on what it has been mixed with, so classify the waste before consigning it. Do not reuse empty containers for any other purpose.

14. Transport information

UN number	UN 1294
Class	Class 3, flammable liquids. No subsidiary risk. ADR classification code F1, label 3 only, Kemler hazard identification number 33, tunnel restriction code (D/E). Not a marine pollutant
Packing group	II
Proper shipping name	TOLUENE

15. Regulatory information

Supply in India is subject to the Manufacture, Storage and Import of Hazardous Chemical Rules, 1989 where the substance is scheduled, and to any product-specific licensing named on the product page. Classification and labelling follow the GHS as adopted in the jurisdiction of use.

Note: Occupational exposure limits. ACGIH TLV-TWA 20 ppm (75 mg/m³), A4 not classifiable as a human carcinogen, with ototoxicant and BEI notations; sources disagree on whether a skin notation currently applies, so verify against the current TLV booklet. No ACGIH STEL. NIOSH REL 100 ppm TWA, STEL 150 ppm, IDLH 500 ppm. OSHA PEL 200 ppm TWA, 300 ppm ceiling, 500 ppm peak for up to 10 minutes. EU IOELV 50 ppm 8 h / 100 ppm STEL with skin notation. INDIA: no numerical statutory limit for toluene is currently in force. The Factories Act 1948 was repealed on 21 November 2025 by the Occupational Safety, Health and Working Conditions Code, 2020, so its Second Schedule entry (107) for toluene - 100 ppm / 375 mg/m³ as an 8-hour TWA and 150 ppm / 560 mg/m³ as a 15-minute STEL - is no longer a live statutory limit. Under SECTION 88 of the Code it is the CENTRAL Government, in consultation with the National Occupational Safety and Health Advisory Board, that is to specify permissible limits of exposure by notification; the power does not sit with the States, and the Code's Second Schedule is a list of matters to be provided for in standards under section 18(2)(f), not a table of numbers. No notification covering toluene had been issued when this sheet was compiled. Central and State rules under the Code were still being notified at the time of writing, so confirm the transitional position in your State. Design to the ACGIH TLV of 20 ppm, which is the tighter and the better basis in any event. Many Indian safety data sheets still cite the repealed Factories Act figure as current law. Toluene's hearing-loss hazard in combination with noise - the ACGIH OTO notation - is missing from most sheets and is worth recording in the occupational-health assessment. Vapour pressure approximately 21 mmHg at 20 C (NIOSH) / 3.8 kPa at 25 C (ICSC); a figure of 36 mmHg at 20 C circulating on one producer sheet is

inconsistent with every other source. Log Pow 2.69. Do not confuse toluene with toluene diisocyanate or with toluidine - different substances, different CAS numbers, radically different hazards. Toluol is an acceptable synonym, but older commercial usage of toluol sometimes meant mixed aromatics, so identify by CAS number. India has no CLP-equivalent that makes the Annex VI entry legally binding; it is presented here as the harmonised EU classification Velora has adopted. The EU harmonised entry stated in section 2 was confirmed against four independent EU safety data sheets citing Annex VI Index No. 601-021-00-3, all in exact agreement, and independently re-checked. Note that India has no CLP-equivalent that makes the Annex VI entry legally binding here; it is presented as the harmonised EU classification Velora has adopted.

16. Other information

Version	1.0
Date of issue	07 October 2026
Supersedes	No previous version
Regulatory basis as at the date of issue	EU CLP Regulation 1272/2008 as amended, Annex VI Index No. 601-021-00-3; UN Model Regulations and the IMDG Code for UN 1294; ADR 2025; US Emergency Response Guidebook Guide 130; and, in India, the Petroleum Act 1934 and Petroleum Rules 2002 (petroleum Class A), the Manufacture, Storage and Import of Hazardous Chemical Rules 1989, the Central Motor Vehicles Rules 1989 rule 134, and the Occupational Safety, Health and Working Conditions Code, 2020.

How this sheet was compiled and what governs. This sheet was prepared by Velora Chemicals Private Limited as the supplier, from PubChem, the ECHA CLP inventory including Annex VI harmonised classifications, ILO International Chemical Safety Cards and published producer safety data sheets. Values that could not be confirmed from those sources are shown as "Not available" rather than estimated. **The producer's safety data sheet for the specific grade and lot supplied is the governing document** and is issued with the consignment; where the two differ, the producer's sheet prevails. This sheet carries no warranty of the properties of any particular batch. Velora Chemicals Private Limited is a bulk supplier and trader, not a manufacturer.

Sources consulted: PubChem CID 1140; ILO ICSC 0078; NIOSH Pocket Guide NPGD0619; NIST Chemistry WebBook; ATSDR Medical Management Guidelines for Toluene; UN Model Regulations / ADR-IMDG dangerous goods list for UN 1294; EU CLP Regulation 1272/2008 Annex VI Index 601-021-00-3 as cited in four independent producer and supplier safety data sheets; IARC Monographs Vol. 71; ACGIH and OSHA annotated exposure-limit tables; Occupational Safety, Health and Working Conditions Code 2020 (repeal of the Factories Act 1948, in force 21 November 2025).