Material Safety Data Sheet

Section 1. Chemical Product and Company Identification

Product Name: TOLUENE

MSDS# 000000133

Historic MSDS#: 05467 Amoco, 10027

Supplier
- Amoco Oil Company
  200 East Randolph
  Chicago, Illinois 60601
  USA
- BP Oil Company
  200 East Randolph Drive
  Chicago, Illinois 60601
  USA

EMERGENCY HEALTH INFORMATION:
1 (800) 447-8735

EMERGENCY SPILL INFORMATION:
1 (800) 424-9300

CHEMTREC (USA)

OTHER PRODUCT INFORMATION:
1 (866) 4 BP - MSDS (866-427-6737 Toll Free - North America)
email: bpcares@bp.com

Section 2. Composition, Information on Ingredients

<table>
<thead>
<tr>
<th>Name</th>
<th>CAS #</th>
<th>% by Weight</th>
<th>Exposure Limits</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) TOLUENE</td>
<td>108-88-3</td>
<td>&gt;99</td>
<td>ACGIH (United States, 1996). Skin</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>TWA: 188 mg/m³</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>TWA: 50 ppm</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>OSHA Final Rule (United States, 1989).</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>STEL: 560 mg/m³</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>STEL: 150 ppm</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>TWA: 375 mg/m³</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>TWA: 100 ppm</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>OSHA Transitional Rule (United States, 1993).</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>AMP: 500 ppm</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Period: 10 minute(s).</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>CEIL: 300 ppm</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>TWA: 200 ppm</td>
</tr>
</tbody>
</table>

Section 3. Hazards Identification

Physical state: Liquid.
Color: Clear. Colorless.

Emergency Overview: WARNING!
- Highly flammable liquid and vapor.
- Causes eye irritation.
- Inhalation of vapor/aerosol concentrations above the recommended exposure limits causes headaches,
  drowsiness, and nausea, and may lead to unconsciousness or death.
- Aspiration hazard if swallowed- can enter lungs and cause damage.
- Do not ingest. Avoid contact with skin and clothing. Do not breathe vapor or mist. Keep away from heat, sparks
  and flame. Keep container closed. Use only with adequate ventilation. Wash thoroughly after handling. Risk of
  cancer depends on duration and level of exposure.

POTENTIAL HEALTH EFFECTS
- Eyes: Causes eye irritation.
- Skin: Prolonged or repeated contact can defat the skin and lead to irritation and/or dermatitis. Absorbed through skin.

Continued on Next Page
Inhalation of vapor/aerosol concentrations above the recommended exposure limits causes headaches, drowsiness, and nausea, and may lead to unconsciousness or death. May cause respiratory tract irritation.

Aspiration hazard if swallowed- can enter lungs and cause damage. Ingestion may cause gastrointestinal irritation and diarrhea.

See Toxicological Information (section 11)

**Section 4. First Aid Measures**

**Eye Contact**
In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention immediately.

**Skin Contact**
Wash exposed skin with soap and water. Remove contaminated clothing and shoes. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention if irritation develops.

**Inhalation**
If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

**Ingestion**
If swallowed, do NOT induce vomiting. Never give anything by mouth to an unconscious person. Get medical attention immediately.

**Section 5. Fire Fighting Measures**

**Flammability of the Product**
Flammable liquid.

**Autoignition Temperature**
480°C (896°F)

**Flash Points**
CLOSED CUP: 4°C (39.2°F).

**Flammable Limits**
LOWER: 1.2%  UPPER: 7.8%

**Products of Combustion**
carbon oxides (CO, CO2)  and  other hazardous substances.

**Unusual fire/explosion hazards**
Highly flammable liquid and vapor. Vapor may cause flash fire. Vapors may form explosive mixtures with air. Vapors may accumulate in low or confined areas, travel considerable distance to source of ignition and flash back. Runoff to sewer may create fire or explosion hazard. Hot containers may explode. Note that contaminated clothing may be a fire hazard.

This material is not explosive as defined by established regulatory criteria. This material is combustible/flammable and is sensitive to fire, heat, and static discharge.

**Fire Fighting Media and Instructions**
SMALL FIRE: Use DRY chemical powder;
LARGE FIRE: Use DRY chemicals, CO2, water spray or foam. Water may be ineffective. Cool containing vessels with water jet in order to prevent pressure build-up, autoignition or explosion.

DO NOT FIGHT FIRE WHEN IT REACHES MATERIAL. Withdraw from fire and let it burn. Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. First move people out of line-of-sight of the scene and away from windows.

**Protective Clothing (Fire)**
Fire fighters should wear positive pressure self-contained breathing apparatus (SCBA) and full turnout gear. Firefighters’ protective clothing will provide limited protection.

**Section 6. Accidental Release Measures**

**Large Spill and Leak**
Immediately contact emergency personnel. Eliminate all ignition sources. Keep unnecessary personnel away. Use suitable protective equipment (Section 8). Follow all fire fighting procedures (Section 5). Do not touch or walk through spilled material.

If emergency personnel are unavailable, contain spilled material. For small spills add absorbent (soil may be used in the absence of other suitable materials) scoop up material and place in a sealed, liquid-proof container. For large spills dike spilled material or otherwise contain material to ensure runoff does not reach a waterway. Place spilled material in an appropriate container for disposal. Minimize contact of spilled material with soils to prevent runoff to surface waterways. See Section 13 for Waste Disposal Information.

**Section 7. Handling and Storage**

**Handling**
Keep away from heat, sparks and flame. Keep container closed. Use only with adequate ventilation. Avoid breathing vapors or spray mists. To avoid fire or explosion, dissipate static electricity during transfer by grounding and bonding containers and equipment before transferring material. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Wash thoroughly after handling.

**Storage**
Store in a segregated, approved and labeled area. Segregate from oxidizing materials. Keep container tightly closed and sealed until ready to use. Avoid all possible sources of ignition (spark or flame). The container for this product can present explosion or fire hazards, even when emptied! To avoid risk of injury, do not cut, puncture, or weld on or near this container. Since the emptied containers retain product residue, follow label warnings even after container is emptied.

*Continued on Next Page*
Section 8. Exposure Controls, Personal Protection

Engineering Controls
Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.

Personal Protection

Eyes
Avoid contact with eyes. Chemical splash goggles.

Skin and Body
Avoid prolonged or repeated contact with skin. Wear protective clothing if prolonged or repeated contact is likely.

Respiratory
Use with adequate ventilation. Avoid breathing vapor or mist. If ventilation is inadequate, use a NIOSH certified respirator with an organic vapor cartridge and P95 particulate filter.

Hands
Wear protective gloves if prolonged or repeated contact is likely.

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>Exposure Limits</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) TOLUENE</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ACGIH (United States, 1996). Skin</td>
</tr>
<tr>
<td></td>
<td>TWA: 188 mg/m³</td>
</tr>
<tr>
<td></td>
<td>TWA: 50 ppm</td>
</tr>
<tr>
<td></td>
<td>OSHA Final Rule (United States, 1989).</td>
</tr>
<tr>
<td></td>
<td>STEL: 560 mg/m³</td>
</tr>
<tr>
<td></td>
<td>STEL: 150 ppm</td>
</tr>
<tr>
<td></td>
<td>TWA: 375 mg/m³</td>
</tr>
<tr>
<td></td>
<td>TWA: 100 ppm</td>
</tr>
<tr>
<td></td>
<td>OSHA Transitional Rule (United States, 1993).</td>
</tr>
<tr>
<td></td>
<td>AMP: 500 ppm</td>
</tr>
<tr>
<td></td>
<td>Period: 10 minute(s).</td>
</tr>
<tr>
<td></td>
<td>CEIL: 300 ppm</td>
</tr>
<tr>
<td></td>
<td>TWA: 200 ppm</td>
</tr>
</tbody>
</table>

Consult local authorities for acceptable exposure limits.

Section 9. Physical and Chemical Properties

<table>
<thead>
<tr>
<th>Physical state</th>
<th>Liquid.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Odor</td>
<td>Aromatic.</td>
</tr>
<tr>
<td>pH</td>
<td>7 [Neutral.]</td>
</tr>
<tr>
<td>Color</td>
<td>Clear. Colorless.</td>
</tr>
<tr>
<td>Molecular Formula</td>
<td>C₇H₈</td>
</tr>
<tr>
<td>Boiling/Condensation Point</td>
<td>110.5°C (230.9°F) (1013 millibars)</td>
</tr>
<tr>
<td>Melting/Freezing Point</td>
<td>-95°C (-139°F)</td>
</tr>
<tr>
<td>Critical Temperature</td>
<td>318.7°C (610.7°F)</td>
</tr>
<tr>
<td>Specific Gravity</td>
<td>0.867 (Water = 1)</td>
</tr>
<tr>
<td>Vapor Pressure</td>
<td>2.9 kPa (21.8 mmHg) (at 20°C)</td>
</tr>
<tr>
<td>Vapor Density</td>
<td>3.18 (Air = 1)</td>
</tr>
<tr>
<td>Odor Threshold</td>
<td>Not available.</td>
</tr>
<tr>
<td>Evaporation Rate</td>
<td>2 compared to (n-BUTYL ACETATE=1)</td>
</tr>
<tr>
<td>VOC</td>
<td>100 (g/l).</td>
</tr>
<tr>
<td>Viscosity</td>
<td>Dynamic: 0.59 cP at 20°C</td>
</tr>
<tr>
<td>LogKow</td>
<td>2.6</td>
</tr>
<tr>
<td>Solubility</td>
<td>negligible &lt; 0.1% at 20°C</td>
</tr>
</tbody>
</table>

Section 10. Stability and Reactivity

Stability and Reactivity
The product is stable.

Conditions to avoid
Keep away from sources of ignition.

Incompatibility with Various Substances
Highly reactive with oxidizing agents, acids. Avoid chlorine, fluorine, and other strong oxidizers, nitric and sulfuric acids. May react violently or can be explosive when mixed with bromine, trifluoride, dinitrogen tetroxide, tetranitromethane, uranium hexafluoride or dinitrogen tetrafluoride.

Hazardous Decomposition Products
None identified.

Hazardous Polymerization
Will not occur.

Continued on Next Page
Section 11. Toxicological Information

Acute toxicity
Acute oral toxicity (LD50): >5000 mg/kg [Rat].
Acute dermal toxicity (LD50): >10000 mg/kg [Rabbit].
Acute toxicity of the vapor (LC50): 5060 ppm 4 hour(s) [Rat].

Chronic toxicity
CARCINOGENIC EFFECTS: No component of this product at levels greater than 0.1% is identified as a carcinogen by ACGIH or the International Agency for Research on Cancer (IARC). No component of this product present at levels greater than 0.1% is identified as a carcinogen by the U.S. National Toxicology Program (NTP) or the U.S. Occupational Safety and Health Act (OSHA).

Aspiration of this material into the lungs can cause chemical pneumonia and can be fatal. Aspiration into the lungs can occur while vomiting after ingestion of this material. Toluene: Deliberate inhalation to concentrated levels of toluene may cause brain and nervous system damage and possibly death. Mental and/or growth retardation may also occur in children of women who deliberately inhale toluene (usually at thousands of ppm). Pregnant rats exposed to toluene at levels greater than approximately 1500 ppm caused adverse fetal developmental effects.
Prolonged, high exposure to toluene has resulted in hearing loss in laboratory animals.

MUTAGENIC EFFECTS: No component of this product at levels greater than 0.1% is classified by established regulatory criteria as a mutagen.

TERATOGENIC EFFECTS/DEVELOPMENTAL TOXICITY: No component of this product at levels greater than 0.1% is classified by established regulatory criteria as teratogenic or embryotoxic.

REPRODUCTION TOXICITY: No component of this product at levels greater than 0.1% is classified by established regulatory criteria as a reproductive toxin.

Other information
Aspiration of this material into the lungs can cause chemical pneumonia and can be fatal. Aspiration into the lungs can occur while vomiting after ingestion of this material. Toluene: Deliberate inhalation to concentrated levels of toluene may cause brain and nervous system damage and possibly death. Mental and/or growth retardation may also occur in children of women who deliberately inhale toluene (usually at thousands of ppm). Pregnant rats exposed to toluene at levels greater than approximately 1500 ppm caused adverse fetal developmental effects.
Prolonged, high exposure to toluene has resulted in hearing loss in laboratory animals.

Section 12. Ecological Information

Ecotoxicity
24 mg/l [LC50], 96 hours [Fish (Bluegill)].
11.5 mg/l [EC50], 48 hours [Daphnia (daphnia)].
>400 mg/l [IC50], 96 hours [Algae (Algae)].

Persistence Potential
This product is readily biodegradable.

Mobility
This product is not likely to move rapidly with surface or groundwater flows because of its low water solubility of: < 0.1% at 20°C.

Bioaccumulative potential
This product is not expected to bioaccumulate through food chains in the environment.

Section 13. Disposal Considerations

Waste Information
Avoid contact of spilled material and runoff with soil and surface waterways. Burn in an appropriate incinerator or offer to a licensed hazardous waste disposal contractor. Dispose of in accordance with all applicable local and national regulations.

Remarks
The container for this product can present explosion or fire hazards, even when emptied! To avoid risk of injury, do not cut, puncture, or weld on or near this container. Since the emptied containers retain product residue, follow label warnings even after container is emptied.

Consult your local or regional authorities.

Section 14. Transport Information

DOT Classification
3

RQ, TOLUENE, 3, UN1294, II

Marine Pollutant
Not pollutant.

Special Provisions for Transport
Reportable Quantity
1000 lbs. (453.6 kg)

ADR/RID Classification
UN number
UN1294

Continued on Next Page
Section 15. Regulatory Information

U.S. Regulations

US INVENTORY (TSCA): Listed on inventory.
- SARA Title III Section 302 Extremely Hazardous Substances (40 CFR Part 355): This product is not regulated under Section 302 of SARA and 40 CFR Part 355.
- SARA Title III Sections 311/312 Hazardous Categorization (40 CFR Part 370): TOLUENE: Fire Hazard, Immediate (Acute) Health Hazard, Delayed (Chronic) Health Hazard
- SARA 313 toxic chemical notification and release reporting: TOLUENE
- CERCLA Sections 102a/103 Hazardous Substances (40 CFR Part 302.4): TOLUENE: 1000 lbs. (453.6 kg)

State Regulations

Pennsylvania RTK: TOLUENE: (environmental hazard, generic environmental hazard)
- Florida: TOLUENE
- Minnesota: TOLUENE
- Massachusetts RTK: TOLUENE
- New Jersey: TOLUENE

California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer, birth defects or other reproductive harm, which would require a warning under the statute: TOLUENE
- California prop. 65 (acceptable daily intake level): TOLUENE: 7000 mg/day (value), 13000 mg/day (inhalation)
- California prop. 65: This product contains the following ingredients for which the State of California has found to cause birth defects which would require a warning under the statute: TOLUENE

Other Regulations

AUSTRALIAN INVENTORY (AICS): Listed on inventory.
- CANADA INVENTORY (DSL): Listed on inventory.
- CHINA INVENTORY (IECS): Listed on inventory.
- EC INVENTORY (EINECS/ELINCS): Listed on inventory.
- JAPAN INVENTORY (ENCS): Listed on inventory.
- KOREA INVENTORY (ECL): Listed on inventory.
- PHILIPPINE INVENTORY (PICCS): Listed on inventory.

Section 16. Other Information

Label Requirements

WARNING !
- Highly flammable liquid and vapor.
- Causes eye irritation.
- Inhalation of vapor/aerosol concentrations above the recommended exposure limits causes headaches, drowsiness, and nausea, and may lead to unconsciousness or death.
- Aspiration hazard if swallowed- can enter lungs and cause damage.

Continued on Next Page
Hazardous Material Information System (U.S.A.)

National Fire Protection Association (U.S.A.)

HISTORY

Version: 1
Prepared by: Product Stewardship

Notice to Reader

NOTICE: This Material Safety Data Sheet is based upon data considered to be accurate at the time of its preparation. Despite our efforts, it may not be up to date or applicable to the circumstances of any particular case. We are not responsible for any damage or injury resulting from abnormal use, from any failure to follow appropriate practices or from hazards inherent in the nature of the product.

This Material Safety Data Sheet conforms to the requirements of ANSI Z400.1.