1. Identification

Product Name: Toluene

Cat No. :
T324-1; T324-4; T324-20; T324-200; T324-500; T324CU-1300; T324FB-19; T324FB-50; T324FB-115; T324FB-200; T324POP-200; T324POPB-200; T324RB-19; T324RB-115; T324RB-200; T324RS-19; T324RS-28; T324RS-50; T324RS-115; T324RS-200; T324S-4; T324SK-4; T324SS-28; T324SS-50; T324SS-115; T324SS-200

Synonyms: Tol; Methylbenzene

Recommended Use: Laboratory chemicals.

Uses advised against: No Information available

Details of the supplier of the safety data sheet:

Company: Fisher Scientific
One Reagent Lane
Fair Lawn, NJ 07410
Tel: (201) 796-7100

Emergency Telephone Number:
CHEMTREC®, Inside the USA: 800-424-9300
CHEMTREC®, Outside the USA: 001-703-527-3887

2. Hazard(s) Identification

Classification:
This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

<table>
<thead>
<tr>
<th>Hazard Category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Category 2</td>
<td>Flammable liquids</td>
</tr>
<tr>
<td>Category 2</td>
<td>Skin Corrosion/irritation</td>
</tr>
<tr>
<td>Category 2</td>
<td>Reproductive Toxicity</td>
</tr>
<tr>
<td>Category 3</td>
<td>Specific target organ toxicity (single exposure)</td>
</tr>
<tr>
<td>Category 2</td>
<td>Target Organs - Respiratory system, Central nervous system (CNS).</td>
</tr>
<tr>
<td>Category 2</td>
<td>Specific target organ toxicity - (repeated exposure)</td>
</tr>
<tr>
<td>Category 2</td>
<td>Target Organs - Kidney, Liver, spleen, Blood.</td>
</tr>
<tr>
<td>Category 1</td>
<td>Aspiration Toxicity</td>
</tr>
</tbody>
</table>

Label Elements:

Signal Word: Danger

Hazard Statements:
Highly flammable liquid and vapor
May be fatal if swallowed and enters airways
Causes skin irritation
May cause respiratory irritation
May cause drowsiness or dizziness
Suspected of damaging the unborn child
May cause damage to organs through prolonged or repeated exposure

**Precautionary Statements**

**Prevention**
Obtain special instructions before use
Do not handle until all safety precautions have been read and understood
Use personal protective equipment as required
Wash face, hands and any exposed skin thoroughly after handling
Wear eye/face protection
Do not breathe dust/fume/gas/mist/vapors/spray
Use only outdoors or in a well-ventilated area
Keep away from heat/sparks/open flames/hot surfaces. - No smoking
Keep container tightly closed
Ground/bond container and receiving equipment
Use explosion-proof electrical/ventilating/lighting/equipment
Use only non-sparking tools
Take precautionary measures against static discharge
Keep cool

**Response**
IF exposed or concerned: Get medical attention/advice

**Inhalation**
IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing

**Skin**
If skin irritation occurs: Get medical advice/attention
IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower
Wash contaminated clothing before reuse

**Ingestion**
IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician
Do NOT induce vomiting

**Fire**
In case of fire: Use CO2, dry chemical, or foam for extinction

**Storage**
Store locked up
Store in a well-ventilated place. Keep container tightly closed

**Disposal**
Dispose of contents/container to an approved waste disposal plant

**Hazards not otherwise classified (HNOC)**
None identified

---

### 3. Composition / information on ingredients

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-No</th>
<th>Weight %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toluene</td>
<td>108-88-3</td>
<td>&gt;95</td>
</tr>
</tbody>
</table>

### 4. First-aid measures

**General Advice**
Remove from exposure, lie down. Take off contaminated clothing and shoes immediately.
Eye Contact
Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Immediate medical attention is required.

Skin Contact
Wash off immediately with plenty of water for at least 15 minutes. Immediate medical attention is required.

Inhalation
Move to fresh air. If breathing is difficult, give oxygen. Do not use mouth-to-mouth resuscitation if victim ingested or inhaled the substance; induce artificial respiration with a respiratory medical device. Immediate medical attention is required. Aspiration into lungs can produce severe lung damage.

Ingestion
Clean mouth with water and drink afterwards plenty of water. Do not induce vomiting. Call a physician or Poison Control Center immediately. If vomiting occurs naturally, have victim lean forward. Aspiration hazard.

Most important symptoms/effects
Breathing difficulties. Symptoms of overexposure may be headache, dizziness, tiredness, nausea and vomiting

Notes to Physician
Treat symptomatically

5. Fire-fighting measures

Suitable Extinguishing Media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide. Cool closed containers exposed to fire with water spray.

Unsuitable Extinguishing Media
No information available

Flash Point
4 °C / 39.2 °F

Method
No information available

Autoignition Temperature
535 °C / 995 °F

Explosion Limits
Upper
7.1 vol %

Lower
1.1 vol %

Sensitivity to Mechanical Impact
No information available

Sensitivity to Static Discharge
No information available

Specific Hazards Arising from the Chemical
Flammable. Containers may explode when heated. Vapors may form explosive mixtures with air. Vapors may travel to source of ignition and flash back.

Hazardous Combustion Products
Carbon monoxide (CO) Carbon dioxide (CO₂)

Protective Equipment and Precautions for Firefighters
As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear. Thermal decomposition can lead to release of irritating gases and vapors.

NFPA

<table>
<thead>
<tr>
<th>Health</th>
<th>Flammability</th>
<th>Instability</th>
<th>Physical hazards</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>3</td>
<td>0</td>
<td>N/A</td>
</tr>
</tbody>
</table>

6. Accidental release measures

Personal Precautions
Use personal protective equipment. Ensure adequate ventilation. Keep people away from and upwind of spill/leak. Avoid contact with skin, eyes and inhalation of vapors. Remove all sources of ignition. Take precautionary measures against static discharges.

Environmental Precautions
Should not be released into the environment. Do not flush into surface water or sanitary sewer system. Local authorities should be advised if significant spillages cannot be contained. See Section 12 for additional ecological information.

Methods for Containment and Clean
Provide adequate ventilation. Soak up with inert absorbent material. Keep in suitable,
7. Handling and storage

Handling
Wear personal protective equipment. Do not get in eyes, on skin, or on clothing. Avoid ingestion and inhalation. Keep away from open flames, hot surfaces and sources of ignition. Use only non-sparking tools. Use explosion-proof equipment. Take precautionary measures against static discharges. To avoid ignition of vapors by static electricity discharge, all metal parts of the equipment must be grounded.

Storage
Keep containers tightly closed in a dry, cool and well-ventilated place. Flammables area. Keep away from heat and sources of ignition.

8. Exposure controls / personal protection

Exposure Guidelines

<table>
<thead>
<tr>
<th>Component</th>
<th>ACGIH TLV</th>
<th>OSHA PEL</th>
<th>NIOSH IDLH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toluene</td>
<td>TWA: 20 ppm</td>
<td>(Vacated) TWA: 100 ppm</td>
<td>TWA: 500 ppm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(Vacated) TWA: 375 mg/m³</td>
<td>TWA: 100 ppm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ceiling: 300 ppm</td>
<td>TWA: 375 mg/m³</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(Vacated) STEL: 150 ppm</td>
<td>STEL: 150 ppm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(Vacated) STEL: 560 mg/m³</td>
<td>STEL: 560 mg/m³</td>
</tr>
<tr>
<td></td>
<td></td>
<td>TWA: 200 ppm</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Component</th>
<th>Quebec</th>
<th>Mexico OEL (TWA)</th>
<th>Ontario TWAEV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toluene</td>
<td>TWA: 50 ppm</td>
<td>TWA: 50 ppm</td>
<td>TWA: 20 ppm</td>
</tr>
<tr>
<td>Toluene</td>
<td>TWA: 188 mg/m³</td>
<td>TWA: 188 mg/m³</td>
<td></td>
</tr>
</tbody>
</table>

Legend
- ACGIH - American Conference of Governmental Industrial Hygienists
- OSHA - Occupational Safety and Health Administration
- NIOSH IDLH: The National Institute for Occupational Safety and Health Immediately Dangerous to Life or Health

Engineering Measures
Ensure that eyewash stations and safety showers are close to the workstation location. Use explosion-proof electrical/ventilating/lighting/equipment. Ensure adequate ventilation, especially in confined areas.

Personal Protective Equipment

Eye/face Protection
Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA’s eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin and body protection
Wear appropriate protective gloves and clothing to prevent skin exposure.

Respiratory Protection
Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Hygiene Measures
Handle in accordance with good industrial hygiene and safety practice.

9. Physical and chemical properties

<table>
<thead>
<tr>
<th>Physical State</th>
<th>Liquid</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>Colorless</td>
</tr>
<tr>
<td>Odor</td>
<td>aromatic</td>
</tr>
<tr>
<td>Odor Threshold</td>
<td>1.74 ppm</td>
</tr>
<tr>
<td>pH</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Melting Point/Range</td>
<td>-95 °C / -139 °F</td>
</tr>
</tbody>
</table>
### 10. Stability and reactivity

**Reactive Hazard**

None known, based on information available.

**Stability**

Stable under normal conditions.

**Conditions to Avoid**


**Incompatible Materials**

Strong oxidizing agents, Strong acids

**Hazardous Decomposition Products**

Carbon monoxide (CO), Carbon dioxide (CO₂)

**Hazardous Polymerization**

Hazardous polymerization does not occur.

**Hazardous Reactions**

None under normal processing.

### 11. Toxicological information

**Acute Toxicity**

**Product Information**

**Component Information**

<table>
<thead>
<tr>
<th>Component</th>
<th>LD50 Oral</th>
<th>LD50 Dermal</th>
<th>LC50 Inhalation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toluene</td>
<td>&gt; 5000 mg/kg (Rat)</td>
<td>12000 mg/kg (Rabbit)</td>
<td>26700 ppm (Rat) 1 h</td>
</tr>
</tbody>
</table>

**Toxicologically Synergistic Products**

No information available

**Delayed and immediate effects as well as chronic effects from short and long-term exposure**

**Irritation**

Irritating to eyes, respiratory system and skin

**Sensitization**

No information available

**Carcinogenicity**

The table below indicates whether each agency has listed any ingredient as a carcinogen.

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-No</th>
<th>IARC</th>
<th>NTP</th>
<th>ACGIH</th>
<th>OSHA</th>
<th>Mexico</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toluene</td>
<td>108-88-3</td>
<td>Not listed</td>
<td>Not listed</td>
<td>Not listed</td>
<td>Not listed</td>
<td>Not listed</td>
</tr>
</tbody>
</table>

**Mutagenic Effects**

Not mutagenic in Ames Test

**Reproductive Effects**

Experiments have shown reproductive toxicity effects on laboratory animals.

**Developmental Effects**

Developmental effects have occurred in experimental animals.
Teratogenicity
Possible risk of harm to the unborn child.

STOT - single exposure
Respiratory system Central nervous system (CNS)
STOT - repeated exposure
Kidney Liver spleen Blood

Aspiration hazard
No information available

Symptoms / effects, both acute and delayed
Symptoms of overexposure may be headache, dizziness, tiredness, nausea and vomiting

Endocrine Disruptor Information
No information available

Other Adverse Effects
The toxicological properties have not been fully investigated.

12. Ecological information

Ecotoxicity
Do not empty into drains.

<table>
<thead>
<tr>
<th>Component</th>
<th>Freshwater Algae</th>
<th>Freshwater Fish</th>
<th>Microtox</th>
<th>Water Flea</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toluene</td>
<td>12.5 mg/L EC50 = 72 h 433 mg/L EC50 &gt; 96 h</td>
<td>50-70 mg/L LC50 96 h 5-7 mg/L LC50 96 h 15-19 mg/L LC50 96 h 28 mg/L LC50 96 h 12 mg/L LC50 96 h</td>
<td>EC50 = 19.7 mg/L 30 min</td>
<td>11.5 mg/L EC50 = 48 h 5.46 - 9.83 mg/L EC50 48 h</td>
</tr>
</tbody>
</table>

Persistence and Degradability
Soluble in water Persistence is unlikely based on information available.

Bioaccumulation/ Accumulation
No information available.

Mobility
Will likely be mobile in the environment due to its water solubility.

<table>
<thead>
<tr>
<th>Component</th>
<th>log Pow</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toluene</td>
<td>2.65</td>
</tr>
</tbody>
</table>

13. Disposal considerations

Waste Disposal Methods
Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. Chemical waste generators must also consult local, regional, and national hazardous waste regulations to ensure complete and accurate classification.

<table>
<thead>
<tr>
<th>Component</th>
<th>RCRA - U Series Wastes</th>
<th>RCRA - P Series Wastes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toluene - 108-88-3</td>
<td>U220</td>
<td>-</td>
</tr>
</tbody>
</table>

14. Transport information

DOT

<table>
<thead>
<tr>
<th>UN-No</th>
<th>Proper Shipping Name</th>
<th>Hazard Class</th>
<th>Packing Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>UN1294</td>
<td>TOLUENE</td>
<td>3</td>
<td>II</td>
</tr>
</tbody>
</table>

TDG

<table>
<thead>
<tr>
<th>UN-No</th>
<th>Proper Shipping Name</th>
<th>Hazard Class</th>
<th>Packing Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>UN1294</td>
<td>TOLUENE</td>
<td>3</td>
<td>II</td>
</tr>
</tbody>
</table>

IATA

<table>
<thead>
<tr>
<th>UN-No</th>
<th>Proper Shipping Name</th>
<th>Hazard Class</th>
<th>Packing Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>UN1294</td>
<td>TOLUENE</td>
<td>3</td>
<td>II</td>
</tr>
</tbody>
</table>

IMDG/IMO

<table>
<thead>
<tr>
<th>UN-No</th>
<th>Proper Shipping Name</th>
<th>Hazard Class</th>
<th>Packing Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>UN1294</td>
<td>TOLUENE</td>
<td>3</td>
<td>II</td>
</tr>
</tbody>
</table>
**15. Regulatory information**

**International Inventories**

<table>
<thead>
<tr>
<th>Component</th>
<th>TSCA</th>
<th>DSL</th>
<th>NDSL</th>
<th>EINECS</th>
<th>ELINCS</th>
<th>NLP</th>
<th>PICCS</th>
<th>ENCS</th>
<th>AICS</th>
<th>IECSC</th>
<th>KECL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toluene</td>
<td>X</td>
<td>X</td>
<td>-</td>
<td>203-625-9</td>
<td>-</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

Legend:
- **X** - Listed
- **E** - Indicates a substance that is the subject of a Section 5(e) Consent order under TSCA.
- **F** - Indicates a substance that is the subject of a Section 5(f) Rule under TSCA.
- **N** - Indicates a polymeric substance containing no free-radical initiator in its inventory name but is considered to cover the designated polymer made with any free-radical initiator regardless of the amount used.
- **P** - Indicates a commenced PMN substance
- **R** - Indicates a substance that is the subject of a Section 6 risk management rule under TSCA.
- **S** - Indicates a substance that is identified in a proposed or final Significant New Use Rule
- **T** - Indicates a substance that is the subject of a Section 4 test rule under TSCA.
- **XU** - Indicates a substance exempt from reporting under the Inventory Update Rule, i.e. Partial Updating of the TSCA Inventory Data Base Production and Site Reports (40 CFR 710(B)).
- **Y1** - Indicates an exempt polymer that has a number-average molecular weight of 1,000 or greater.
- **Y2** - Indicates an exempt polymer that is a polyester and is made only from reactants included in a specified list of low concern reactants that comprises one of the eligibility criteria for the exemption rule.

**U.S. Federal Regulations**

**TSCA 12(b)**
Not applicable

**SARA 313**

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-No</th>
<th>Weight %</th>
<th>SARA 313 - Threshold Values %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toluene</td>
<td>108-88-3</td>
<td>&gt;95</td>
<td>1.0</td>
</tr>
</tbody>
</table>

**SARA 311/312 Hazardous Categorization**

- **Acute Health Hazard**
  - Yes
- **Chronic Health Hazard**
  - Yes
- **Fire Hazard**
  - Yes
- **Sudden Release of Pressure Hazard**
  - No
- **Reactive Hazard**
  - No

**Clean Water Act**

<table>
<thead>
<tr>
<th>Component</th>
<th>CWA - Hazardous Substances</th>
<th>CWA - Reportable Quantities</th>
<th>CWA - Toxic Pollutants</th>
<th>CWA - Priority Pollutants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toluene</td>
<td>X</td>
<td>1000 lb</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

**Clean Air Act**

<table>
<thead>
<tr>
<th>Component</th>
<th>HAPS Data</th>
<th>Class 1 Ozone Depletors</th>
<th>Class 2 Ozone Depletors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toluene</td>
<td>X</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**OSHA** Occupational Safety and Health Administration
Not applicable

**CERCLA**
This material, as supplied, contains one or more substances regulated as a hazardous substance under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302)

<table>
<thead>
<tr>
<th>Component</th>
<th>Hazardous Substances RQs</th>
<th>CERCLA EHS RQs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toluene</td>
<td>1000 lb 1 lb</td>
<td>-</td>
</tr>
</tbody>
</table>

**California Proposition 65**
This product contains the following Proposition 65 chemicals:

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-No</th>
<th>California Prop. 65</th>
<th>Prop 65 NSRL</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toluene</td>
<td>108-88-3</td>
<td>Developmental</td>
<td>-</td>
<td>Developmental</td>
</tr>
</tbody>
</table>
Toluene

Female Reproductive

<table>
<thead>
<tr>
<th>State Right-to-Know Component</th>
<th>Massachusetts</th>
<th>New Jersey</th>
<th>Pennsylvania</th>
<th>Illinois</th>
<th>Rhode Island</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toluene</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

U.S. Department of Transportation

Reportable Quantity (RQ): Y
DOT Marine Pollutant N
DOT Severe Marine Pollutant N

U.S. Department of Homeland Security
This product does not contain any DHS chemicals.

Other International Regulations

Mexico - Grade
Serious risk, Grade 3

Canada
This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all the information required by the CPR

WHMIS Hazard Class
B2 Flammable liquid
D2A Very toxic materials

16. Other information

Prepared By
Regulatory Affairs
Thermo Fisher Scientific
Email: EMSDS.RA@thermofisher.com

Creation Date 11-Jun-2009
Revision Date 24-Oct-2014
Print Date 24-Oct-2014
Revision Summary This document has been updated to comply with the US OSHA HazCom 2012 Standard replacing the current legislation under 29 CFR 1910.1200 to align with the Globally Harmonized System of Classification and Labeling of Chemicals (GHS)

Disclaimer
The information provided on this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guide for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered as a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other material or in any process, unless specified in the text.

End of SDS