

1. Product and Company Identification

Material name	TOLUENE
Version #	02
Revision date	08-30-2011
CAS #	108-88-3
Product Codes	J.T.Baker: 5375, 5584, 5812, 9336, 9351, 9364, 9456, 9457, 9459, 9460, 9462, 9466, 9472, 9476 Macron: 4483, 8604, 8608, V560
Synonym(s)	Methylbenzene; Toluol; Phenylmethane
Manufacturer	Avantor Performance Materials, Inc.
Address	3477 Corporate Parkway Suite #200 Center Valley, PA 18034 US
Customer Service	855-282-6867
24 Hour Emergency	908-859-2151
Chemtrec	800-424-9300

2. Hazards Identification

Emergency overview	DANGER Flammable liquid and vapor. Will be easily ignited by heat, spark or flames. Harmful if inhaled or absorbed through skin. Harmful or fatal if swallowed. Causes skin and eye irritation. Causes respiratory tract irritation. High vapor concentrations may cause drowsiness and irritation of the eyes or respiratory tract. May damage fertility or the unborn child. Prolonged exposure may cause chronic effects.
OSHA regulatory status	This product is considered hazardous under 29 CFR 1910.1200 (Hazard Communication).
Potential health effects	
Routes of exposure	Inhalation. Ingestion. Skin contact. Eye contact.
Eyes	Causes eye irritation. High vapor/aerosol concentrations may be irritating.
Skin	Harmful if absorbed through skin. Causes skin irritation. Prolonged or repeated contact with skin may cause redness, itching, irritation and eczema/chapping.
Inhalation	Harmful if inhaled. May cause irritation to the mucous membranes and upper respiratory tract. In high concentrations, vapors and aerosol mists have a narcotic effect and may cause headache, fatigue, dizziness and nausea.
Ingestion	Harmful or fatal if swallowed. Ingestion may result in vomiting; aspiration (breathing) of vomitus into lungs must be avoided as even small quantities may result in aspiration pneumonitis.
Target organs	Eyes. Respiratory system. Skin. Nervous System. Reproductive organs. Kidneys. Auditory organs.
Chronic effects	Can cause nervous system damage. May cause adverse reproductive effects - such as birth defects, miscarriages, or infertility based on animal data. Frequent or prolonged contact may defat and dry the skin, leading to discomfort and dermatitis.
Potential environmental effects	Toxic to aquatic organisms.

3. Composition / Information on Ingredients

Components	CAS #	Percent
TOLUENE	108-88-3	99 - 100

4. First Aid Measures

First aid procedures

Eye contact	Immediately flush with plenty of water for at least 15 minutes. If easy to do, remove contact lenses. Get medical attention.
Skin contact	In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention. Wash contaminated clothing before reuse. Destroy or thoroughly clean contaminated shoes.
Inhalation	Move to fresh air. If breathing is difficult, give oxygen. If breathing stops, provide artificial respiration. Get medical attention immediately.
Ingestion	Call a physician or poison control center immediately. Do not induce vomiting. If vomiting occurs, the head should be kept low so that stomach vomit doesn't enter the lungs.
Notes to physician	Treat symptomatically. Symptoms may be delayed.
General advice	Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves. Show this safety data sheet to the doctor in attendance.

5. Fire Fighting Measures

Flammable properties	HIGHLY FLAMMABLE! Vapors may cause a flash fire or ignite explosively. Vapors may travel considerable distance to a source of ignition and flash back. Heat may cause the containers to explode.
Extinguishing media	
Suitable extinguishing media	Water spray. Foam. Dry powder. Carbon dioxide (CO ₂).
Unsuitable extinguishing media	Do not use water jet as an extinguisher, as this will spread the fire.
Protection of firefighters	
Specific hazards arising from the chemical	Can be ignited easily and burns vigorously. Vapor from the solvent may accumulate in container headspace resulting in flammability hazard.
Protective equipment and precautions for firefighters	Firefighters must use standard protective equipment including flame retardant coat, helmet with face shield, gloves, rubber boots, and in enclosed spaces, SCBA. Withdraw immediately in case of rising sound from venting safety device or any discoloration of tanks due to fire. Move containers from fire area if you can do so without risk. For massive fire in cargo area, use unmanned hose holder or monitor nozzles, if possible. If not, withdraw and let fire burn out. Some of these materials, if spilled, may evaporate leaving a flammable residue. Cool containers exposed to flames with water until well after the fire is out.
Special protective equipment for fire-fighters	As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.
Specific methods	In the event of fire and/or explosion do not breathe fumes. Use water spray to cool unopened containers.
Hazardous combustion products	Carbon monoxide and carbon dioxide.

6. Accidental Release Measures

Personal precautions	Wear appropriate protective equipment and clothing during clean-up. Keep unnecessary personnel away. Keep upwind. Keep out of low areas. Ventilate closed spaces before entering them. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Local authorities should be advised if significant spillages cannot be contained.
Environmental precautions	Prevent further leakage or spillage if safe to do so. Do not contaminate water. Avoid discharge into drains, water courses or onto the ground.
Methods for containment	ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area). Stop the flow of material, if this is without risk. Prevent entry into waterways, sewer, basements or confined areas. Dike the spilled material, where this is possible.

Methods for cleaning up

Use only non-sparking tools. All equipment used when handling the product must be grounded.

Large Spills: Use a non-combustible material like vermiculite, sand or earth to soak up the product and place into a container for later disposal. Dike far ahead of spill for later disposal.

Small Spills: Wipe up with absorbent material (e.g. cloth, fleece). Collect in a non-combustible container for prompt disposal.

Never return spills in original containers for re-use. Clean surface thoroughly to remove residual contamination. Clean up in accordance with all applicable regulations.

J. T. Baker SOLUSORB® solvent adsorbent is recommended for spills of this product.

7. Handling and Storage

Handling

DO NOT handle, store or open near an open flame, sources of heat or sources of ignition. Protect material from direct sunlight. Take precautionary measures against static discharges. Wear appropriate personal protective equipment. Avoid breathing mist or vapor. Avoid contact with eyes, skin, and clothing. Do not taste or swallow. Use only with adequate ventilation. Wash thoroughly after handling. See Section 8 of the MSDS for Personal Protective Equipment.

Storage

Keep away from food, drink and animal feedingstuffs. Keep out of the reach of children. Keep container tightly closed in a cool, well-ventilated place. Ground container and transfer equipment to eliminate static electric sparks. Comply with all national, state, and local codes pertaining to the storage, handling, dispensing, and disposal of flammable liquids.

8. Exposure Controls / Personal Protection

ACGIH

Material

Type

Value

TOLUENE (108-88-3)

BEL

0.3000 mg/g

0.0200 mg/l

0.0300 mg/l

TWA

20.0000 ppm

Occupational exposure limits

U.S. - OSHA

Material

Type

Value

TOLUENE (108-88-3)

Ceiling

300.0000 ppm

TWA

200.0000 ppm

Engineering controls

Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level. Explosion proof exhaust ventilation should be used.

Personal protective equipment

Eye / face protection

Chemical goggles and face shield are recommended.

Skin protection

Wear appropriate chemical resistant clothing. Wear appropriate chemical resistant gloves.

Respiratory protection

Respirator type: Chemical respirator with organic vapor cartridge and full facepiece. Use a positive-pressure air-supplied respirator if there is any potential for an uncontrolled release, exposure levels are not known, or any other circumstances where air-purifying respirators may not provide adequate protection.

General hygiene considerations

Provide eyewash station and safety shower. Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants.

9. Physical & Chemical Properties

Appearance	Clear.
Color	Colorless.
Odor	Aromatic. Sweet.
Odor threshold	Not available.
Physical state	Liquid.
Form	Liquid.
pH	Not available.
Melting point	-139 °F (-94.9 °C)
Freezing point	-139 °F (-94.9 °C)
Boiling point	231.8 °F (110.6 °C)
Flash point	39.2 °F (4 °C) Closed Cup
Evaporation rate	2.24 BuAc
Flammability limits in air, upper, % by volume	7.1 %
Flammability limits in air, lower, % by volume	1.1 %
Vapor pressure	3.786 kPa at 25°C
Vapor density	3.1
Specific gravity	0.8636
Relative density	Not available.
Solubility (water)	0.7 g/l at 74°F
Partition coefficient (n-octanol/water)	2.73
Auto-ignition temperature	896 °F (480 °C)
Percent volatile	100 %
Molecular weight	92.14 g/mol
Molecular formula	C7-H8

10. Chemical Stability & Reactivity Information

Chemical stability	Stable under normal temperature conditions.
Conditions to avoid	Heat, flames and sparks.
Incompatible materials	Strong oxidizing agents. Chlorine.
Hazardous decomposition products	At thermal decomposition temperatures, carbon monoxide and carbon dioxide.
Possibility of hazardous reactions	Hazardous polymerization does not occur.

11. Toxicological Information

Toxicological data

Product

TOLUENE (108-88-3)

Test Results

Acute Dermal LD50 Rabbit: 12124 mg/kg

Acute Inhalation LC50 Rat: 8000 ppm 4.00 Hours

Acute Oral LD50 Rat: 636 mg/kg

Sensitization

Not a skin sensitizer.

Acute effects

Harmful if inhaled or absorbed through skin. Harmful or fatal if swallowed.

Local effects

Irritating to eyes, respiratory system and skin. High vapor concentrations may cause drowsiness and irritation of the eyes or respiratory tract.

Chronic effects	Toluene: Concentrated, prolonged or deliberate inhalation may cause brain and nervous system damage. Prolonged and repeated exposure of pregnant animals (> 1500 ppm) have been reported to cause adverse fetal developmental effects. Frequent or prolonged contact may defat and dry the skin, leading to discomfort and dermatitis.
Carcinogenicity	This product is not considered to be a carcinogen by IARC, ACGIH, NTP, or OSHA.
ACGIH Carcinogens	
TOLUENE (CAS 108-88-3)	A4 Not classifiable as a human carcinogen.
IARC Monographs. Overall Evaluation of Carcinogenicity	
TOLUENE (CAS 108-88-3)	3 Not classifiable as to carcinogenicity to humans.
Skin corrosion/irritation	Causes skin irritation.
Epidemiology	No epidemiological data is available for this product.
Mutagenicity	No data available to indicate product or any components present at greater than 0.1% are mutagenic or genotoxic.
Neurological effects	High vapor/aerosol concentrations (attainable only at elevated temperatures) may cause central nervous system effects such as dizziness, drowsiness or headaches. Central and/or peripheral nervous system damage.
Reproductive effects	Possible risk of harm to the unborn child.
Teratogenicity	Components in this product have been shown to cause birth defects and reproductive disorders in laboratory animals.
Symptoms and target organs	Irritation. Upper respiratory tract irritation. Drowsiness and dizziness. Birth defects.

12. Ecological Information

Ecotoxicological data	
Product	Test Results
TOLUENE (108-88-3)	EC50 Water flea (Daphnia magna): 5.46 mg/l 48.00 hours LC50 Coho salmon, silver salmon (Oncorhynchus kisutch): 5.5 mg/l 96.00 hours LC50 Fathead minnow (Pimephales promelas): 12.6 mg/l 96.00 hours
Ecotoxicity	Toxic to aquatic life.
Environmental effects	Toxic to aquatic organisms. Bioaccumulation is unlikely to be significant because of the low water solubility of this product. An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Persistence and degradability	Expected to be readily biodegradable.
Partition coefficient (n-octanol/water)	2.73

13. Disposal Considerations

Waste codes

US RCRA Hazardous Waste U List: Reference

TOLUENE (CAS 108-88-3)	U220
Disposal instructions	Dispose of this material and its container to hazardous or special waste collection point. Incinerate the material under controlled conditions in an approved incinerator. All wastes must be handled in accordance with local, state and federal regulations.
Contaminated packaging	Since emptied containers retain product residue, follow label warnings even after container is emptied. Residual vapors may explode on ignition; do not cut, drill, grind, or weld on or near this container. Offer rinsed packaging material to local recycling facilities.

14. Transport Information

DOT

Basic shipping requirements:

UN number	UN1294
Proper shipping name	Toluene
Hazard class	3
Packing group	II

Additional information:

Special provisions	IB2, T4, TP1
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Basic shipping requirements:

Labels required	3
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Additional information:

Packaging exceptions	150
Packaging non bulk	202
Packaging bulk	242
Reportable quantity	1000
ERG number	130

IATA

Basic shipping requirements:

UN number	1294
Proper shipping name	Toluene
Hazard class	3
Packing group	II

Additional information:

ERG code	3L
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IMDG

Basic shipping requirements:

UN number	1294
Proper shipping name	TOLUENE
Hazard class	3
Packing group	II



DOT



IATA



IMDG

15. Regulatory Information

US federal regulations

This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.
All components are on the U.S. EPA TSCA Inventory List.

US EPCRA (SARA Title III) Section 313 - Toxic Chemical: De minimis concentration

TOLUENE (CAS 108-88-3)	1.0 %
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US EPCRA (SARA Title III) Section 313 - Toxic Chemical: Listed substance

TOLUENE (CAS 108-88-3)	Listed.
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CERCLA (Superfund) reportable quantity

TOLUENE: 1000.0000

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories
 Immediate Hazard - Yes
 Delayed Hazard - Yes
 Fire Hazard - Yes
 Pressure Hazard - No
 Reactivity Hazard - No

Section 311 hazardous chemical
 Yes

Clean Air Act (CAA)
 HAPS list

Clean Water Act (CWA)
 Hazardous substance
 Priority pollutant
 Toxic pollutant

Safe Drinking Water Act (SDWA)
 1 mg/l
 1 mg/l

Inventory status

Country(s) or region	Inventory name	On inventory (yes/no)*
Australia	Australian Inventory of Chemical Substances (AICS)	Yes
Canada	Domestic Substances List (DSL)	Yes
Canada	Non-Domestic Substances List (NDSL)	No
China	Inventory of Existing Chemical Substances in China (IECSC)	Yes
Europe	European Inventory of Existing Commercial Chemical Substances (EINECS)	Yes
Europe	European List of Notified Chemical Substances (ELINCS)	No
Japan	Inventory of Existing and New Chemical Substances (ENCS)	Yes
Korea	Existing Chemicals List (ECL)	Yes
New Zealand	New Zealand Inventory	Yes
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	Yes
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

*A "Yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s)

State regulations
 WARNING: This product contains a chemical known to the State of California to cause birth defects or other reproductive harm.

US - California Proposition 65 - Carcinogens & Reproductive Toxicity (CRT): Listed substance

TOLUENE (CAS 108-88-3) Listed.

US - California Proposition 65 - CRT: Listed date/Developmental toxin

TOLUENE (CAS 108-88-3) Listed: January 1, 1991 Developmental toxin.

US - California Proposition 65 - CRT: Listed date/Female reproductive toxin

TOLUENE (CAS 108-88-3) Listed: August 7, 2009 Female reproductive toxin.

US - New Jersey Community RTK (EHS Survey): Reportable threshold

TOLUENE (CAS 108-88-3) 500 LBS

US - Pennsylvania RTK - Hazardous Substances: Listed substance

TOLUENE (CAS 108-88-3) Listed.

Saf-T-Data

Health: 2 - Moderate (Life)
 Flammability: 3 - Severe (Flammable)
 Reactivity: 1 - Slight
 Contact: 2 - Moderate (Life)
 Lab Protective Equip: DB - GOGGLES & SHIELD; LAB COAT & APRON; VENT HOOD; PROPER GLOVES; CLASS B EXTINGUISHER
 Storage Color Code: R - Red (Flammable)

16. Labeling Info

Label Hazard Warning

DANGER

FLAMMABLE LIQUID AND VAPOR. Will be easily ignited by heat, spark or flames. Harmful if inhaled or absorbed through skin. Harmful or fatal if swallowed. Irritating to eyes, respiratory system and skin. High vapor concentrations may cause drowsiness and irritation of the eyes or respiratory tract. May cause harm to the unborn child. Prolonged exposure may cause chronic effects.

Label Precautions

Keep away from heat, sparks and flame. Avoid breathing dust/fume/gas/mist/vapors/spray. Avoid contact with eyes, skin, and clothing. Do not taste or swallow. Use only with adequate ventilation. Wash thoroughly after handling. Keep container closed.

Label First Aid

Immediately flush eyes with plenty of water for at least 15 minutes. Immediately flush skin with plenty of water. If gas/fume/vapor/dust/mist from the material is inhaled, remove the affected person immediately to fresh air. Get medical attention. IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician. Do not induce vomiting without advice from poison control center. Do not use mouth-to-mouth method if victim ingested the substance. If vomiting occurs, keep head low so that stomach content doesn't get into the lungs.

17. Other Information

NFPA ratings

Health: 2
Flammability: 3
Instability: 0

Disclaimer

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Issue date

08-30-2011

This data sheet contains changes from the previous version in section(s):

Exposure Controls / Personal Protection: Respiratory protection