

Material Safety Data Sheet

acc. to OSHA and ANSI

Printing date 05/01/2009

Reviewed on 05/21/2007

1 Identification of substance:**Product details:****Product name:** Toluene**Stock number:** 19376**Manufacturer/Supplier:**

Alfa Aesar, A Johnson Matthey Company
 Johnson Matthey Catalog Company, Inc.
 30 Bond Street
 Ward Hill, MA 01835-8099
 Emergency Phone: (978) 521-6300
 CHEMTREC: (800) 424-9300
 Web Site: www.alfa.com

Information Department: Health, Safety and Environmental Department**Emergency information:**

During normal hours the Health, Safety and Environmental Department. After normal hours call Chemtrec at (800) 424-9300.

2 Composition/Data on components:**Chemical characterization:****Description: (CAS#)**

Toluene (CAS#108-88-3): 100%

Identification number(s):**EINECS Number:** 203-625-9**Index number:** 601-021-00-3**3 Hazards identification****Hazard description:**

Xn Harmful
 F Highly flammable

Information pertaining to particular dangers for man and environment

R 11 Highly flammable.
 R 38 Irritating to skin.
 R 48/20 Harmful: danger of serious damage to health by prolonged exposure through inhalation.
 R 63 Possible risk of harm to the unborn child
 R 65 Harmful: may cause lung damage if swallowed.
 R 67 Vapours may cause drowsiness and dizziness

Classification system**HMIS ratings (scale 0-4)****(Hazardous Materials Identification System)**

HEALTH	2
FIRE	3
REACTIVITY	1

Health (acute effects) = 2
 Flammability = 3
 Reactivity = 1

GHS label elements**Danger**

2.6/2 - Highly flammable liquid and vapour.

**Danger**

3.10/1 - May be fatal if swallowed and enters airways.
 3.7/2 - Suspected of damaging fertility or the unborn child.
 3.9/2 - May cause damage to organs through prolonged or repeated exposure.

**Warning**

3.2/2 - Causes skin irritation.
 3.8/3 - May cause drowsiness or dizziness.

Prevention:

Obtain special instructions before use.
 Do not handle until all safety precautions have been read and understood.

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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.
 Do not breathe dust/fume/gas/mist/vapours/spray.
 Avoid breathing dust/fume/gas/mist/vapours/spray.
 Wash thoroughly after handling.
 Use only outdoors or in a well-ventilated area.
 Wear protective gloves/protective clothing/eye protection/face protection.
 Use personal protective equipment as required.

Response:

IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.
 IF ON SKIN: Wash with plenty of soap and water.
 IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.
 IF INHALED: Remove to fresh air and keep at rest in a position comfortable for breathing.
 IF exposed or concerned: Get medical advice/attention.
 Call a POISON CENTER or doctor/physician if you feel unwell.
 Get medical advice/attention if you feel unwell.
 Specific treatment (see label).
 Do NOT induce vomiting.
 If skin irritation occurs: Get medical advice/attention.
 Take off contaminated clothing and wash before reuse.
 In case of fire: Use for extinction: CO2, powder or water spray.

Storage:

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

Disposal:

Dispose of contents/container in accordance with local/regional/national/international regulations.

4 First aid measures**After inhalation**

Supply fresh air. If required, provide artificial respiration. Keep patient warm.
 Seek immediate medical advice.

After skin contact

Immediately wash with water and soap and rinse thoroughly.
 Seek immediate medical advice.

After eye contact

Rinse opened eye for several minutes under running water. Then consult a doctor.

After swallowing Seek immediate medical advice.

5 Fire fighting measures

Suitable extinguishing agents CO2, sand, extinguishing powder. Do not use water.

For safety reasons unsuitable extinguishing agents Water

Special hazards caused by the material, its products of combustion or resulting gases:

In case of fire, the following can be released:

Carbon monoxide and carbon dioxide

Protective equipment:

Wear self-contained respirator.
 Wear fully protective impervious suit.

6 Accidental release measures**Person-related safety precautions:**

Wear protective equipment. Keep unprotected persons away.

Ensure adequate ventilation

Keep away from ignition sources

Measures for environmental protection:

Do not allow material to be released to the environment without proper governmental permits.

Measures for cleaning/collecting:

Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).

Dispose contaminated material as waste according to item 13.

Ensure adequate ventilation.

Keep away from ignition sources.

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Additional information:

See Section 7 for information on safe handling
 See Section 8 for information on personal protection equipment.
 See Section 13 for disposal information.

7 Handling and storage**Handling****Information for safe handling:**

Keep container tightly sealed.
 Store in cool, dry place in tightly closed containers.
 Ensure good ventilation at the workplace.

Information about protection against explosions and fires:

Keep ignition sources away.
 Protect against electrostatic charges.
 Fumes can combine with air to form an explosive mixture.

Storage

Requirements to be met by storerooms and receptacles: Store in a cool location.
Information about storage in one common storage facility: Store away from oxidizing agents.
Further information about storage conditions:
 Keep container tightly sealed.
 Store in cool, dry conditions in well sealed containers.

8 Exposure controls and personal protection**Additional information about design of technical systems:**

Properly operating chemical fume hood designed for hazardous chemicals and having an average face velocity of at least 100 feet per minute.

Components with limit values that require monitoring at the workplace:

Toluene

	ppm
ACGIH TLV	50 (skin); Not classified as a human carcinogen
Austria MAK	100
Belgium TWA	100; 150-STEEL
Denmark TWA	35 (skin)
Finland TWA	100; 150-STEEL (skin)
France VME	100; 150-VLE
Germany MAK	50
Hungary TWA	100; 300-STEEL (skin)
Japan OEL	50
Korea TLV	50
Netherlands MAC-TGG	40
Norway TWA	25
Poland TWA	100 mg/m ³ ; 350 mg/m ³ -STEEL
Russia TWA	100; 50-STEEL
Sweden NGV	50; 100-TKV (skin)
Switzerland MAK-W	50; 250-KZG-W
United Kingdom TWA	50; 150-STEEL
OSHA PEL	200

Additional information: No data**Personal protective equipment****General protective and hygienic measures**

The usual precautionary measures for handling chemicals should be followed.
 Keep away from foodstuffs, beverages and feed.
 Remove all soiled and contaminated clothing immediately.
 Wash hands before breaks and at the end of work.

Breathing equipment: Use suitable respirator when high concentrations are present.**Protection of hands:**

Check protective gloves prior to each use for their proper condition.
 Impervious gloves

Material of gloves

The selection of suitable gloves not only depends on the material, but also on quality.
 Quality will vary from manufacturer to manufacturer.

Eye protection: Safety glasses**Body protection:** Protective work clothing.

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9 Physical and chemical properties:**General Information**

Form: Liquid
 Color: Colorless
 Odor: Aromatic

Change in condition

Melting point/Melting range: -93°C (-135°F)
 Boiling point/Boiling range: 111°C (232°F)
 Sublimation temperature / start: Not determined

Flash point: 4°C (39°F)

Ignition temperature: Not determined

Decomposition temperature: Not determined

Explosion limits:

Lower: Not determined
 Upper: Not determined

Vapor pressure: Not determined

Density at 20°C (68°F): 0.867 g/cm³**10 Stability and reactivity****Thermal decomposition / conditions to be avoided:**

Decomposition will not occur if used and stored according to specifications.

Materials to be avoided: Oxidizing agents**Dangerous reactions** No dangerous reactions known**Dangerous products of decomposition:** Carbon monoxide and carbon dioxide**11 Toxicological information****Acute toxicity:****LD/LC50 values that are relevant for classification:**

Oral	LD50	4 gm/kg (mam) 636 mg/kg (rat)
	LDLo	50 mg/kg (human) 719 µL/kg (man)
	LD50	14100 µL/kg (rabbit)
Inhalative	LC50	30000 mg/m ³ (mam)
	LC50/4H	49000 mg/m ³ /4H (rat)
	LCLo	1600 ppm (guinea pig)
Irritation of skin	mild	435 mg (rabbit)
	moderate	20 mg/24H (rabbit) 500 mg (rabbit)
	mild	0.870 mg (rabbit)
Irritation of eyes		100 mg/30S (rabbit)
	severe	2 mg/24H (rabbit)

Primary irritant effect:**on the skin:** Irritant to skin and mucous membranes.**on the eye:** Irritating effect.**Sensitization:** No sensitizing effects known.**Other information (about experimental toxicology):**

Reproductive effects have been observed on tests with laboratory animals.

Mutagenic effects have been observed on tests with bacteria.

Mutagenic effects have been observed on tests with insects.

Mutagenic effects have been observed on tests with laboratory animals.

Subacute to chronic toxicity:

Toluene is a skin and eye irritant. Exposure may cause impairment of coordination and reaction time. Chronic poisoning may result in blood, bone marrow or liver injury.

Subacute to chronic toxicity:

The Registry of Toxic Effects of Chemical Substances (RTECS) reports the following effects in laboratory animals:

Cardiac - other changes.

Cardiac - changes in heart weight.

Lungs, Thorax, or Respiration - acute pulmonary edema.

Lungs, Thorax, or Respiration - other changes.

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Liver - other changes.
 Liver - changes in liver weight.
 Brain and Coverings - recordings from specific areas of CNS.
 Brain and Coverings - changes in brain weight.
 Brain and Coverings - other degenerative changes.
 Sense Organs and Special Senses (Ear) - changes in cochlear structure or function.
 Nutritional and Gross Metabolic - weight loss or decreased weight gain.
 Kidney, Ureter, Bladder - proteinuria.
 Kidney, Ureter, Bladder - other changes in urine composition.
 Kidney, Ureter, Bladder - changes in bladder weight.
 Kidney, Ureter, Bladder - other changes.
 Related to Chronic Data - death.
 Biochemical - Enzyme inhibition, induction, or change in blood or tissue levels - transaminases.
 Biochemical - Neurotransmitters or modulators (purative) - dopamine in striatum.
 Biochemical - Enzyme inhibition, induction, or change in blood or tissue levels - phosphatases.
 Biochemical - Metabolism (Intermediary) - lipids including transport.
 Endocrine - changes in thymus weight.
 Immunological including Allergic - decreased immune response.
 Behavioral - antipsychotic.
 Behavioral - ataxia.
 Behavioral - hallucinations, distorted perceptions.
 Behavioral - changes in motor activity (specific assay).
 Behavioral - alteration of operant conditioning.
 Behavioral - changes in psychophysiological tests.
 Behavioral - general anesthetic.
 Behavioral - somnolence (general depressed activity).
 Behavioral - irritability.
 Behavioral - convulsions or effect on seizure threshold.
 Behavioral - muscle contraction or spasticity.
 Autonomic Nervous System - other (direct) parasympathomimetic.
 Blood - changes in bone marrow (not otherwise specified).
 Blood - pigmented or nucleated red blood cells.
 Blood - other changes.
 Blood - changes in erythrocyte (RBC) count.
 Blood - changes in leukocyte (WBC) count.
 Blood - changes in cell count (unspecified).
 Sense Organs and Special Senses (Olfaction) - effect, not otherwise specified.
 Musculoskeletal - other changes.
 Reproductive - Effects on Embryo or Fetus - fetotoxicity (except death, e.g., stunted fetus).
 Reproductive - Effects on Newborn - growth statistics (e.g., reduced weight gain).
 Reproductive - Effects on Newborn - biochemical and metabolic.
 Reproductive - Effects on Newborn - physical.
 Reproductive - Paternal Effects - spermatogenesis.
 Reproductive - Specific Developmental Abnormalities - musculoskeletal system.
 Reproductive - Maternal Effects - other effects.
 Reproductive - Effects on Newborn - behavioral.
 Reproductive - Effects on Newborn - delayed effects.
 Reproductive - Effects on Embryo or Fetus - fetal death.
 Reproductive - Specific Developmental Abnormalities - craniofacial (including nose and tongue).
 Reproductive - Specific Developmental Abnormalities - urogenital system.
 Reproductive - Fertility - abortion.
 Reproductive - Specific Developmental Abnormalities - cardiovascular (circulatory) system.
Additional toxicological information:
 To the best of our knowledge the acute and chronic toxicity of this substance is not fully known.
 EPA-D: Not classifiable as to human carcinogenicity: inadequate human and animal evidence of carcinogenicity or no data are available.
 IARC-3: Not classifiable as to carcinogenicity to humans.
 ACGIH A4: Not classifiable as a human carcinogen: Inadequate data on which to classify the agent in terms of its carcinogenicity in humans and/or animals.

12 Ecological information:**General notes:**

Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system.
 Do not allow material to be released to the environment without proper governmental permits.

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13 Disposal considerations**Product:****Recommendation** Consult state, local or national regulations to ensure proper disposal.**Uncleaned packagings:****Recommendation:** Disposal must be made according to official regulations.**14 Transport information****DOT regulations:**

Hazard class: 3
Identification number: UN1294
Packing group: II
Proper shipping name (technical name): TOLUENE
Label: 3

Land transport ADR/RID (cross-border)

ADR/RID class: 3 (F1) Flammable liquids
Danger code (Kemler): 33
UN-Number: 1294
Packaging group: II
Description of goods: 1294 TOLUENE

Maritime transport IMDG:

IMDG Class: 3
UN Number: 1294
Label: 3
Packaging group: II
Proper shipping name: TOLUENE

Air transport ICAO-TI and IATA-DGR:

ICAO/IATA Class: 3
UN/ID Number: 1294
Label: 3
Packaging group: II
Proper shipping name: TOLUENE

UN "Model Regulation": UN1294, TOLUENE, 3, II

15 Regulations**Product related hazard informations:****Hazard symbols:**

Xn Harmful
 F Highly flammable

Risk phrases:

11 Highly flammable.
 38 Irritating to skin.
 48/20 Harmful: danger of serious damage to health by prolonged exposure through inhalation.
 63 Possible risk of harm to the unborn child

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65 Harmful: may cause lung damage if swallowed.

67 Vapours may cause drowsiness and dizziness

Safety phrases:

36/37 Wear suitable protective clothing and gloves.

46 If swallowed, seek medical advice immediately and show this container or label.

62 If swallowed, do not induce vomiting: seek medical advice immediately and show this container or label

National regulations

All components of this product are listed in the U.S. Environmental Protection Agency Toxic Substances Control Act Chemical substance Inventory.

This product contains a chemical known to the state of California to cause cancer or reproductive toxicity.

Information about limitation of use:

For use only by technically qualified individuals.

This product is subject to the reporting requirements of section 313 of the Emergency Planning and Community Right to Know Act of 1986 and 40CFR372.

16 Other information:

Employers should use this information only as a supplement to other information gathered by them, and should make independent judgement of suitability of this information to ensure proper use and protect the health and safety of employees. This information is furnished without warranty, and any use of the product not in conformance with this Material Safety Data Sheet, or in combination with any other product or process, is the responsibility of the user.

Department issuing MSDS: Health, Safety and Environmental Department.**Contact:** Zachariah Holt**Abbreviations and acronyms:**

ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)

RID: Règlement international concernant le transport des marchandises dangereuses par chemin de fer (Regulations Concerning the International Transport of Dangerous Goods by Rail)

IMDG: International Maritime Code for Dangerous Goods

DOT: US Department of Transportation

IATA: International Air Transport Association

IATA-DGR: Dangerous Goods Regulations by the "International Air Transport Association" (IATA)

ICAO: International Civil Aviation Organization

ICAO-TI: Technical Instructions by the "International Civil Aviation Organization" (ICAO)

GHS: Globally Harmonized System of Classification and Labelling of Chemicals

EINECS: European Inventory of Existing Commercial Chemical Substances

CAS: Chemical Abstracts Service (division of the American Chemical Society)

HMIS: Hazardous Materials Identification System (USA)

LC50: Lethal concentration, 50 percent

LD50: Lethal dose, 50 percent

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