SECTION 1: Identification

1.1. Identification

Product form	:	Substance
Trade name	:	Toluene
Chemical name	:	Toluene
CAS-No.	:	108-88-3
Product code	:	P409 / P409C / P409Q
Formula	:	C7H8
Synonyms	:	Benzene, methyl- / Methylbenzene / Phenylmethane / TOLUENE / Methylphenylene

1.2. Recommended use and restrictions on use

Recommended use	:	Manufacture of paints, varnishes and similar coatings, printing ink and mastics, Production of foam-based objects, Use in Agrochemicals

1.3. Supplier

US office:

Braskem S.A.

5100 Westheimer Rd - Suite 495

Houston, 77056 - USA

Manufacturer:

Braskem S.A.
Rua Eteno, 1561, Polo Petroquímico de Camaçari
Camaçari, BA, CEP: 42810-000, Brasil

Braskem S.A.
BR 386 – Rodovia Tabaí-Canoas, km 419, Via do Contorno, 850
Triunfo, RS, CEP: 95853-000, Brasil

Braskem S.A.
Av. Presidente Costa e Silva, 1178 – Capuava
Santo André, SP, CEP: 09270-001, Brasil

Contact Email	:	productsafety@braskem.com
Emergency Telephone Number (CHEMTREC)	:	1-800-424-9300

SECTION 2: Hazard(s) identification

2.1. Classification of the substance or mixture

GHS-US classification

Flammable liquids Category 2	H225	Highly flammable liquid and vapor
Skin corrosion/irritation Category 2	H315	Causes skin irritation
Reproductive toxicity Category 2	H361	Suspected of damaging fertility or the unborn child
Specific target organ toxicity (single exposure) Category 3	H336	May cause drowsiness or dizziness
Specific target organ toxicity (repeated exposure) Category 2	H373	May cause damage to organs (central nervous system) through prolonged or repeated exposure
Aspiration hazard Category 1	H304	May be fatal if swallowed and enters airways

2.2. GHS Label elements, including precautionary statements

GHS-US labeling

Hazard pictograms (GHS-US) :

GHS02 GHS07 GHS08

Signal word (GHS-US) : Danger

Hazard statements (GHS-US) :
H225 - Highly flammable liquid and vapor
H304 - May be fatal if swallowed and enters airways
H315 - Causes skin irritation
H336 - May cause drowsiness or dizziness
H361 - Suspected of damaging fertility or the unborn child
H373 - May cause damage to organs (central nervous system) through prolonged or repeated exposure

Precautionary statements (GHS-US) :
P201 - Obtain special instructions before use
P202 - Do not handle until all safety precautions have been read and understood
P210 - Keep away from heat, sparks, open flames, hot surfaces, No smoking. - No smoking
P233 - Keep container tightly closed
P240 - Ground/Bond container and receiving equipment
P241 - Use explosion-proof electrical, lighting, ventilating equipment
P242 - Use only non-sparking tools
P243 - Take precautionary measures against static discharge
P260 - Do not breathe mist, spray, vapors
P264 - Wash hands thoroughly after handling
P271 - Use only outdoors or in a well-ventilated area
P280 - Wear eye protection, protective gloves
P301+P310 - If swallowed: Immediately call a POISON CENTER
P302+P352 - If on skin: Wash with plenty of water
P303+P361+P353 - If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower
P304+P340 - If inhaled: Remove person to fresh air and keep comfortable for breathing
P308+P313 - If exposed or concerned: Get medical advice/attention
P312 - Call a doctor, a POISON CENTER if you feel unwell
P314 - Get medical advice/attention if you feel unwell
P331 - Do NOT induce vomiting
P332+P313 - If skin irritation occurs: Get medical advice/attention
P362+P364 - Take off contaminated clothing and wash it before reuse
P370+P378 - In case of fire: Use dry extinguishing powder, carbon dioxide (CO2), sand to extinguish
P403+P233 - Store in a well-ventilated place. Keep container tightly closed
P403+P235 - Store in a well-ventilated place. Keep cool
P405 - Store locked up
P501 - Dispose of contents/container to comply with applicable local, national and international regulation.

2.3. Other hazards which do not result in classification

Other hazards not contributing to the classification : Handling this product may result in electrostatic accumulation. Use proper grounding procedures.

2.4. Unknown acute toxicity (GHS US)

Not applicable

SECTION 3: Composition/Information on ingredients

3.1. Substances

Name	Product identifier	%
Toluene (Main constituent)	(CAS-No.) 108-88-3	> 99

Full text of hazard classes and H-statements: see section 16

3.2. Mixtures

Not applicable

SECTION 4: First-aid measures

4.1. Description of first aid measures

First-aid measures general : Consult a doctor/medical service if you feel unwell.

First-aid measures after inhalation : Move the affected person away from the contaminated area and into the fresh air. If not breathing, give artificial respiration. Give oxygen or artificial respiration as needed. Immediately call a poison center or doctor/physician.

First-aid measures after skin contact : Remove contaminated clothing and shoes. Rinse immediately with plenty of water (for at least 15 minutes). Get medical advice/attention. Wash clothing before re-using.

First-aid measures after eye contact : Rinse immediately with plenty of water. Remove contact lenses, if present and easy to do. Continue rinsing. Continue to rinse eye with clean water for 20-30 minutes, retracting eyelids often. Get medical advice/attention.

First-aid measures after ingestion : Do not induce vomiting. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Never give anything by mouth to an unconscious person. If swallowed, rinse mouth with water (only if the person is conscious). Seek immediate medical advice.

4.2. Most important symptoms and effects (acute and delayed)

Symptoms/effects : Symptoms may include dizziness, headache, nausea and loss of coordination. Suspected of damaging the unborn child.

Symptoms/effects after inhalation : May cause irritation to the respiratory tract. Inhalation may cause irritation, cough, shortness of breath. Depression of the central nervous system, headaches, dizziness, drowsiness, loss of coordination.

Symptoms/effects after skin contact : Causes skin irritation. Repeated or prolonged skin contact may cause dermatitis and defatting.

Symptoms/effects after eye contact : Causes eye irritation. Redness of the eye tissue.

Symptoms/effects after ingestion : May be fatal if swallowed and enters airways. May result in aspiration into the lungs, causing chemical pneumonia. Depression of the central nervous system, headaches, dizziness, drowsiness, loss of coordination.

Chronic symptoms : Visual disturbances. Loss of coordination. Auditory disturbances. Damage to kidneys and liver.

4.3. Immediate medical attention and special treatment, if necessary

Treat symptomatically.

SECTION 5: Fire-fighting measures

5.1. Suitable (and unsuitable) extinguishing media

Suitable extinguishing media : carbon dioxide (CO2), dry chemical powder, foam. Water fog.

Unsuitable extinguishing media : Do not use a solid water stream as it may scatter and spread fire.

5.2. Specific hazards arising from the chemical

Fire hazard : Highly flammable liquid and vapor. Incomplete combustion releases dangerous carbon monoxide, carbon dioxide and other toxic gases. vapors may cause fire/explosion if source of ignition is present. Heavier than air, vapors may travel long distances along ground, ignite and flash back to source. Material can accumulate some static charge during transfer. Agitation can cause buildup of electrostatic charge.

Explosion hazard : Prolonged exposure to fire may cause containers to rupture/explode.

Reactivity : Forms explosive complexes with silver perchlorate. Forms highly explosive mixture with tetranitromethane.

5.3. Special protective equipment and precautions for fire-fighters

Firefighting instructions : Cool closed containers exposed to fire with water spray.

Protection during firefighting : Extra personal protection: complete protective clothing including self-contained breathing apparatus. For further information refer to section 8: "Exposure controls/personal protection".

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

General measures : Keep away from open flames, hot surfaces and sources of ignition.

6.1.1. For non-emergency personnel

Protective equipment : Wear suitable protective clothing, gloves and eye/face protection. For further information refer to section 8: "Exposure controls/personal protection".

Emergency procedures : Evacuate unnecessary personnel.

6.1.2. For emergency responders

Protective equipment	:	Wear suitable protective clothing, gloves and eye/face protection. For further information refer to section 8: "Exposure controls/personal protection".
Emergency procedures	:	Eliminate every possible source of ignition. Stop leaks if it can be done without personal risk.

6.2. Environmental precautions

Do not allow uncontrolled discharge of product into the environment. Absorb remaining liquid with sand or inert absorbent and remove to safe place. Prevent spillage from spreading by using sand or earth. Use water spray to disperse the vapors. Do not flush down sewers. Notify authorities if product enters sewers or public waters.

6.3. Methods and material for containment and cleaning up

For containment	:	Contain any spills with dikes or absorbents to prevent migration and entry into sewers or streams.
Methods for cleaning up	:	Absorb remaining liquid with sand or inert absorbent and remove to safe place. Keep the recovered product for subsequent recycling. Place in an appropriate container and dispose of the contaminated material at a licensed site.

6.4. Reference to other sections

For further information refer to section 8: "Exposure controls/personal protection". For disposal of residues refer to section 13: "Disposal considerations".

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Additional hazards when processed	:	Container remains hazardous when empty. Continue to observe all precautions.
Precautions for safe handling	:	Ground/bond container and receiving equipment. Use grounded electrical/mechanical equipment. Take precautionary measures against static discharge. Electrostatic charges may be generated during handling.
Hygiene measures	:	Wash hands before breaks and after work. Do not eat, drink or smoke when using this product. Wash contaminated clothing before reuse.

7.2. Conditions for safe storage, including any incompatibilities

Technical measures	:	Provide adequate ventilation. Use only non-sparking tools. Use only explosion-proof equipment. Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure. Ground/bond container and receiving equipment.
Storage conditions	:	Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Store in dry, cool, well-ventilated area. Keep in original containers closed. Store only in a limited quantity.
Incompatible materials	:	Nitric acid. Sulfuric acid. Strong oxidizing agents. tetranitromethane. Silver perchlorate. uranium hexafluoride.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Toluene (108-88-3)		
ACGIH	ACGIH TWA (ppm)	20 ppm
ACGIH	Remark (ACGIH)	Visual impair; female repro;
OSHA	Remark (OSHA)	(2) See Table Z-2.

8.2. Appropriate engineering controls

Appropriate engineering controls	:	Provide local exhaust or general room ventilation to minimize vapor concentrations. Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure.

8.3. Individual protection measures/Personal protective equipment

Hand protection:

VITON gloves. protective gloves: PVA

Eye protection:

Chemical goggles or safety glasses. Contact lenses should not be worn

Respiratory protection:

An approved organic vapor respirator/supplied air or self-contained breathing apparatus must be used when vapor concentration exceeds applicable exposure limits

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state	:	Liquid
Color	:	Colorless
Odor	:	Aromatic
Odor threshold	:	No data available
pH	:	No data available
Melting point	:	-95 to -94.5 °C
Freezing point	:	No data available
Boiling point	:	110.6 °C
Flash point	:	4.4 °C
Relative evaporation rate (butyl acetate=1)	:	No data available
Flammability (solid, gas)	:	No data available
Vapor pressure	:	22 mm Hg (20°C)
Relative vapor density at 20 °C	:	3.1
Relative density	:	0.866 g/cm³ @ 20°C
Solubility	:	Water: Insoluble Acetone: 100 (mg/mL) @ 18°C
Log Pow	:	2.11 - 2.8
Auto-ignition temperature	:	480 °C
Decomposition temperature	:	No data available
Viscosity, kinematic	:	No data available
Viscosity, dynamic	:	No data available
Explosion limits	:	1,2 – 7,1%
Explosive properties	:	No data available
Oxidizing properties	:	No data available

9.2. Other information

No additional information available

SECTION 10: Stability and reactivity

10.1. Reactivity

Forms explosive complexes with silver perchlorate. Forms highly explosive mixture with tetranitromethane.

10.2. Chemical stability

Stable at ambient temperature and under normal conditions of use.

10.3. Possibility of hazardous reactions

Reacts violently with. Incompatible materials.

10.4. Conditions to avoid

Keep away from open flames, hot surfaces and sources of ignition. Avoid static electricity discharges.

10.5. Incompatible materials

Nitric acid. Sulfuric acid. Strong oxidizing agents. tetranitromethane. silver perchlorate. uranium hexafluoride.

10.6. Hazardous decomposition products

No hazardous decomposition products known at room temperature. Incomplete combustion releases dangerous carbon monoxide, carbon dioxide and other toxic gases.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Likely routes of exposure	:	Inhalation; Ingestion; Skin and eye contact
Acute toxicity	:	Not classified

Toluene (108-88-3)	
LD50 oral rat	2600 mg/kg
LD50 dermal rabbit	12000 mg/kg
LC50 inhalation rat (mg/l)	12.5 mg/l/4h

Skin corrosion/irritation : Causes skin irritation.

Serious eye damage/irritation : Not classified

Respiratory or skin sensitization : Not classified

Germ cell mutagenicity : Not classified

Carcinogenicity : Not classified

Toluene (108-88-3)	
IARC group	3 - Not classifiable

Reproductive toxicity : Suspected of damaging fertility or the unborn child.

Specific target organ toxicity – single exposure : May cause drowsiness or dizziness.

Specific target organ toxicity – repeated exposure : May cause damage to organs (central nervous system) through prolonged or repeated exposure.

Aspiration hazard : May be fatal if swallowed and enters airways.

(Based on available data, the classification criteria are not met)

Symptoms/effects after inhalation : May cause irritation to the respiratory tract. Inhalation may cause irritation, cough, shortness of breath. Depression of the central nervous system, headaches, dizziness, drowsiness, loss of coordination.

Symptoms/effects after skin contact : Causes skin irritation. Repeated or prolonged skin contact may cause dermatitis and defatting.

Symptoms/effects after eye contact : Causes eye irritation. Redness of the eye tissue.

Symptoms/effects after ingestion : May be fatal if swallowed and enters airways. May result in aspiration into the lungs, causing chemical pneumonia. Depression of the central nervous system, headaches, dizziness, drowsiness, loss of coordination.

Chronic symptoms : Visual disturbances. Loss of coordination. Auditory disturbances. Damage to kidneys and liver.

SECTION 12: Ecological information

12.1. Toxicity

Toluene (108-88-3)	
LC50 fish 1	15.22 - 19.05 mg/l (Exposure time: 96 h - Species: Pimephales promelas [flow-through])
EC50 Daphnia 1	5.46 - 9.83 mg/l (Exposure time: 48 h - Species: Daphnia magna [Static])
LC50 fish 2	12.6 mg/l (Exposure time: 96 h - Species: Pimephales promelas [static])
LC50 other aquatic organisms 2	3.78 (2 days)
EC50 Daphnia 2	11.5 mg/l (Exposure time: 48 h - Species: Daphnia magna)
LOEC (acute)	2.76 mg/l (aquatic vertebrates - 7 days)
LOEC (chronic)	2.77 mg/l (fish - 40 days)
NOEC (acute)	10 mg/l 72 hours- Algae
NOEC (chronic)	1.39 mg/l (fish - 40 days)

12.2. Persistence and degradability

Toluene (108-88-3)	
Persistence and degradability	Readily biodegradable. not persistent.
BOD (% of ThOD)	69 % ThOD (5 days in non-adapted effluent)

12.3. Bioaccumulative potential

Toluene (108-88-3)	
Log Pow	2.11 - 2.8
Bioaccumulative potential	not bioaccumulable.

12.4. Mobility in soil

No additional information available

12.5. Other adverse effects

No additional information available

SECTION 13: Disposal considerations

13.1. Disposal methods

Regional legislation (waste) : Disposal must be done according to official regulations. Consult an expert on waste disposal or treatment.

Product/Packaging disposal recommendations : Dispose of this material and its container at hazardous or special waste collection point. Consult an expert on waste disposal or treatment.

Additional information : Container remains hazardous when empty. Continue to observe all precautions.

SECTION 14: Transport information

Classification for LAND transport: DOT

UN Number : UN1294
Proper Shipping Name : Toluene
Class / Division : 3 - Flammable liquid
Packing group : II
Reportable quantity : Toluene

Classification for SEA transport: IMO - IMDG

UN Number : UN1294
Proper Shipping Name : TOLUENE
Class / Division : 3 - Flammable liquid
Packing group : II
Marine pollutant : Toluene
Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code:
Product name : Toluene

Classification for AIR transport: IATA – ICAO

UN Number : UN1294
Proper Shipping Name : Toluene
Class / Division : 3 - Flammable liquid
Packing group : II

This information is not intended to convey all specific regulatory or operational requirements/information relating to this product, therefore it cannot be considered exhaustive. See guidelines of US DOT, IMDG and IATA regulations before transporting the product. The transportation organization is responsible for compliance with laws, regulations and rules for the transport of the material.

SECTION 15: Regulatory information

15.1. US Federal regulations

Toluene (108-88-3)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory Subject to reporting requirements of United States SARA Section 313	
CERCLA RQ	1000 lb
SARA Section 313 - Emission Reporting	1 %

15.2. International regulations

CANADA

Toluene (108-88-3)
Listed on the Canadian DSL (Domestic Substances List)

EU-Regulations

Toluene (108-88-3)
Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)

National regulations

Toluene (108-88-3)
Listed on the AICS (Australian Inventory of Chemical Substances) Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China) Listed on the Japanese ENCS (Existing & New Chemical Substances) inventory Listed on the Korean ECL (Existing Chemicals List) Listed on NZIoC (New Zealand Inventory of Chemicals) Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances) Japanese Poisonous and Deleterious Substances Control Law Japanese Pollutant Release and Transfer Register Law (PRTR Law) Listed on the Canadian IDL (Ingredient Disclosure List) Listed on INSQ (Mexican National Inventory of Chemical Substances) Listed on CICR (Turkish Inventory and Control of Chemicals) Listed on the TCSI (Taiwan Chemical Substance Inventory)

15.3. US State regulations

Toluene (108-88-3)	
U.S. - California - Proposition 65 - Carcinogens List	No
U.S. - California - Proposition 65 - Developmental Toxicity	Yes
U.S. - California - Proposition 65 - Reproductive Toxicity - Female	No
U.S. - California - Proposition 65 - Reproductive Toxicity - Male	No

SECTION 16: Other information

Full text of H-phrases:

H225	Highly flammable liquid and vapor
H304	May be fatal if swallowed and enters airways
H315	Causes skin irritation
H336	May cause drowsiness or dizziness
H361	Suspected of damaging fertility or the unborn child
H373	May cause damage to organs through prolonged or repeated exposure

Braskem - SDS_US_GHS_HazCom_2012 (modified 161213)

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product. It warns that the handling of any chemical substance requires the previous knowledge of its hazards for the user. It is up to the user of the product company providing this SDS to and promote the training of its employees about possible risks come upon of the product. The information contained herein is not absolute, but only general information on the use of the chemical and indication of safety and security measures.