

**MATERIAL SAFETY DATA SHEET**  
**PETROLEUM BENZENE**

Date of issue: 13.07.2004  
Reviewed on: 01.12.2009 – 6th Edition

**1. IDENTIFICATION OF THE SUBSTANCE/MIXTURE (PREPARATION) AND OF THE COMPANY/UNDERTAKING**

**1.1 Identification of the substance / mixture (preparation)**

Commercial name: Petroleum benzene  
Chemical name: Benzene  
Registration number: not applicable.

**1.2 Use of the substance / mixture (preparation)**

Chemical synthesis.

**1.3 Company / undertaking identification**

■ UNIPETROL RPA, s.r.o., Záluží 1, 436 70 Litvínov, Czech Republic

☎: +420 476 161 111  
fax: +420 476 619 553  
[unipetrolrpa@unipetrol.cz](mailto:unipetrolrpa@unipetrol.cz)  
[www.unipetrolrpa.cz](http://www.unipetrolrpa.cz)

- Trade Division Director: ☎: +420 476 164 281 fax: +420 476 163 691  
[jaroslava.svobodova@unipetrol.cz](mailto:jaroslava.svobodova@unipetrol.cz)
- Sales administrator: ☎: +420 476 165 001 fax: +420 476 163 691
- Person responsible for the MSDS [ludmila.krejcikova@unipetrol.cz](mailto:ludmila.krejcikova@unipetrol.cz)

**1.4 Emergency telephone numbers in case of accident**

- UNIPETROL RPA, s.r.o. ☎: +420 476 163 111 (non stop)  
☎: +420 476 162 111 (non stop)
- CENTRE OF THE CZECH MINISTRY OF HEALTH  
Toxicological Information Centre Prague (TIS), CZ ☎: +420 224 919 293 (non stop)  
Na bojišti 1, 128 08 Praha 2, Czech Republic ☎: +420 224 915 402 (non stop)  
e-mail: [tis@mbox.cesnet.cz](mailto:tis@mbox.cesnet.cz)  
fax: +420 224 914 570

**2. HAZARD IDENTIFICATION**

**2.1 Classification of the substance / mixture (preparation)**

Product is classified as dangerous according to the Czech Act No. 356/2003 Sb. and Regulation (EC) No 1272/2008 (Directive 67/548/EEC or Directive 1999/45/EC):

**HIGHLY FLAMMABLE**  
**CARCINOGENIC CAT.1**  
**MUTAGENIC CAT.2**  
**TOXIC**  
**HARMFUL**  
**IRRITANT**

<b>F; R 11</b>	<b>Carc.Cat.1; R 45</b>	<b>Mut.Cat.2; R 46</b>	<b>T; R 48/23/24/25</b>	<b>Xn; R 65</b>	<b>Xi; R 36/38</b>
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**2.2 Information pertaining to particular dangers for human**

Toxic substance with carcinogenic and mutagenic effects. Acute intoxication leads to central nervous system attenuation and narcotic effects occur. After swallowing possibility of aspiration (passage into the lung) and danger of chemical pneumonia (pulmonary oedema). Product irritates eyes and skin. High vapour concentrations irritate respiratory system and eyes and may lead to fast coma and death. Liquid is absorbed through skin and may develop allergic eruption. Chronic effects cause bone marrow damage, haemopoiesis disorder and may develop leukaemia.

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### **2.3 Information pertaining to particular dangers for the environment**

Possible adverse effects on aquatic organisms.

### **2.4 Other adverse effects**

Highly flammable and easily ignitable substance. Danger of ignition at normal temperature. Readily evaporates and vapours form with air toxic and explosive mixtures heavier than air. Mixtures keep above ground and after ignition they spread fast into far distances. Ignition possible when exposed to hot surfaces, sparks, naked flames and by electrostatic discharges too. The substance is practically insoluble in water, floats on the water level and forms toxic and explosive mixtures above the water level. Risk of explosion if emptied into drains or released into wastewater. Attacks rubber and plastics.

## **3. COMPOSITION / INFORMATION ON INGREDIENTS**

Chemical substance (CAS No. 71-43-2, ES No 200-753-7)

## **4. FIRST AID MEASURES**

### **4.1 General advice**

**IMMEDIATE MEDICAL ATTENTION IS REQUIRED AFTER INHALATION OR AFTER SWALLOWING.**

In case of health troubles or doubts, seek medical advice immediately and show this Material Safety Data Sheet. Ensure activity of vitally important functions until the arrival of the doctor (artificial respiration, inhalation of oxygen, heart massage). If patient is unconscious, or in case of danger of blackout (apsychia), transport patient in a stabilised position. In case of first degree burns (painful redness), and second degree burns (painful blisters), cool the affected area with cold running water for a long time. In case of third degree burns (redness, cracking pale skin, usually without pain), do not cool affected skin, dress the area with sterile dry gauze only.

### **4.2 Inhalation**

Remove patient to fresh air, keep him warm and in order to rest quietly. Avoid walking. Seek medical advice.

SYMPTOMS AND EFFECTS: irritation, headache, dizziness, weakness, stupefaction, irritant coughing, convulsions, unconsciousness, possible respiratory inhibition or arrest.

### **4.3 Skin contact**

Immediately take off all contaminated clothing and footwear. Flush effected area with copious quantities of lukewarm water and soap or with another suitable cleaning agent. Use a mild cream to treat skin after complete washing. Seek medical advice.

SYMPTOMS AND EFFECTS: mild irritation, degreasing, absorption, eruptioning and blistering.

### **4.4 Eye contact**

Immediately flush eyes with clean lukewarm water and continue flushing for at least 15 minutes – keep the eyelids widely apart and flush thoroughly with mild water stream from the inner to the outer canthus. Seek medical advice.

SYMPTOMS AND EFFECTS: severe irritation, cornea damage.

### **4.5 Swallowing**

If patient is conscious and without convulsion, immediately try to induce vomiting. Give 1 – 3 spoonfuls of paraffin oil or at least 20 pulverized pills of activated carbon. Never give anything by mouth to an unconscious person, just put patient into a stabilised position. Seek medical advice immediately.

SYMPTOMS AND EFFECTS: nausea, vomiting, convulsions, irregular heartbeat.

## **5. FIRE-FIGHTING MEASURES**

### **5.1 Suitable extinguishing media**

Foam, powder, CO<sub>2</sub>.

Cool containers with water spray.

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### **5.2 Extinguishing media to be avoided**

Water.

### **5.3 Caution about specific danger in case of fire and fire-fighting procedures**

Danger of violent reaction or explosion. Vapours may travel considerable far distances and cause subsequent ignition. Vapours are heavier than air, may cumulate along the ground and in enclosed spaces – danger of explosion. Do not empty into drains. When burning, it emits carbon monoxide, carbon dioxide and irritant fumes. Containers with the substance exposed to excessive heat may explode.

### **5.4 Special protective equipment for fire-fighters**

Wear full protective fire-resistant clothing and self-contained breathing apparatus.

## **6. ACCIDENTAL RELEASE MEASURES**

### **6.1 Person-related safety precautions**

Isolate hazard area. Evacuate all unauthorised personnel not participating in rescue operations from the area. Avoid entry into danger area. Remove all possible sources of ignition. Stop traffic and switch off the motors of the engines. Do not smoke and do not handle with naked flame. Use explosion-proof lamps and non-sparking tools. Avoid contact with the substance. Apply recommended full protective personal equipment to paralyse the accident. When escaping from the contaminated area, wear mask with cartridge A against organic vapours. In case of general average, evacuate personnel from danger area. In places under the ground level and in enclosed spaces (including drains) risk of explosion and accumulation of toxic vapours.

### **6.2 Precautions for protection of the environment**

Prevent from further leaks of substance. Enclose and dike area. Do not allow substance to enter soil, water and sewage systems. In case of substance discharge to water courses or water containers, inform water consumers immediately, stop service and exploitation of water.

### **6.3 Recommended methods for cleaning and disposal**

Pump off substance safely, soak up residues with compatible porous material and forward for disposal in closed containers. Dispose of under valid legal waste regulations.

## **7. HANDLING AND STORAGE**

### **7.1 Information for safe handling**

Observe all fire-fighting measures (no smoking, do not handle with naked flame and remove all possible sources of ignition). Take precautionary measures against static discharges. Wear recommended personal protective equipment and observe instructions to prevent possible contact of substance with skin and eyes and inhalation. Avoid leak to environment.

### **7.2 Information for storage**

Storerooms should meet the requirements for the fire safety of constructions and electrical facilities and should be in conformity with valid regulations. Store in cool, well-ventilated place with effective exhaust, away from heat and all sources of ignition. Store in tightly closed container. Do not store together with oxidizing agents. Take precautionary measures against static discharges. Avoid leak to environment.

### **7.3 Information for specific use**

Not applicable.

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**8. EXPOSURE CONTROLS/PERSONAL PROTECTION**

**8.1 Exposure limit values**

Czech Republic (Order-in-Council No 361/2007 Sb.):

Name	PEL [mg.m <sup>-3</sup> ]	NPK-P [mg.m <sup>-3</sup> ]
benzene	3	10

PEL Permissible exposure level of a chemical substance in the environment air

NPK-P Highest permissible concentration of a chemical substance in the environment air

European Union (Directive 2006/15/EC): no limits set

Recommended determination method in the workplace atmosphere: gas chromatography, detector tube

**8.2 Occupational exposure controls**

Collective protection measures

General and local ventilation, effective exhaust, hermetisation.

Individual protection measures

Personal protective equipment (PPE) for the protection of eyes, hands and skin corresponding with the performed labour has to be kept at disposition for the employees. In cases, where the workplace exposure control limits cannot be observed with the help of technical equipment or where it is not possible to ensure that the respiratory system exposure does not represent a health hazard for the personnel, adequate respiratory protection have to be kept at disposition. In the case of continuous use of this equipment during constant work, safety breaks have to be scheduled, if the PPE-character requires this. All PPE have to be kept in disposable state and the damaged or contaminated equipment has to be replaced immediately.

RECOMMENDED PERSONAL PROTECTIVE EQUIPMENT (PPE):

- *respiratory protection:* protective mask with canister A (brown coloured, protecting against organic vapours), self-contained breathing apparatus
- *eye protection:* safety goggles, full face-shield

- *hand protection:* protective gloves

	<i>glove material</i>	<i>layer thickness</i>	<i>breakthrough time</i>
routine work (possibility of staining)	nitrile	0,4 mm	10 Min.
outflow / accident disposal	viton	0,7 mm	480 Min.

*The protective gloves to be used must comply with the specifications of EC directive 89/686/EEC and the resultant standard EN374, for example KCL 730 Camatril®/Velours (splash contact) and 890 Vitoject® (outflow). The breakthrough times stated above were determined by KCL in laboratory tests acc. to EN374 with samples of the recommended glove types. The recommended time applies to the product stated in the safety data sheet as well as to the purpose specified here. Under conditions deviating from those stated in EN374 please contact the supplier of CE-approved gloves (e.g. KCL CZ s.r.o., Suderova 2013, 709 00 Ostrava 9, www.klc.de.)*

- *skin protection:* protective coveralls – antistatic design recommended, impervious when handling big amounts (nitrile rubber), sealed leather footwear (free from synthetic adhesives)
- *General safety and hygienic measures:* Observe personal hygienic regulations. Take off immediately all contaminated clothing. Do not eat, drink or smoke during work! Wash thoroughly hands and uncovered body parts with soap and water after handling and before eating or drinking, and treat skin with a mild skin restoring cream.

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### 8.3 Environmental exposure controls

Proceed in accordance with valid air and water legislative regulations.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

### 9.1 General information

- Physical state at 20°C: liquid
- Colour: colourless
- Odour: aromatic

### 9.2 Important health, safety and environmental information

- pH-value: not applicable
- Boiling point [°C]: 80,1
- Flash point [°C]: -10,5
- Inflammability: highly flammable
- Explosion limits - lower [Vol. %]: 1,3  
- - upper [Vol. %]: 7,5
- Oxidising properties: none
- Vapour pressure at 20°C [kPa]: 10,1
- Density at 20°C [kg.m<sup>-3</sup>]: 880
- Solubility: ethanol, diethyl ether, chloroform, carbon disulfide, acetone
- Solubility in water at 20°C [g.l<sup>-1</sup>]: 2
- Partition coefficient n-octanol/ water [log Kow]: 2,13
- Viscosity at 20°C [mPa.s]: 0,66
- Vapour density (air=1): 2,7
- Evaporation rate: not applicable

### 9.3 Other information

- Melting point / solidification point [°C]: 5,53
- Ignition temperature [°C]: > 450
- Fire point [°C]: 2
- Heat value [MJ.kg<sup>-1</sup>]: 38,519
- Danger class: I.
- Heat class: T1
- Explosion class: II A
- Flame temperature [°C]: 2396

## 10. STABILITY AND REACTIVITY

### 10.1 Conditions to avoid

Concentrations within the explosion limits, sources of ignition, high temperature, sun radiation.

### 10.2 Material to avoid

Explosive reaction with chlorine (on light), with acid and kalium permanganate, with diborane, nitric acid, nitrosyl perchlorate, silver perchlorate, oxygen, ozone, permanganic acid. Violent reactions with iodine fluoride, ignition with sodium peroxide. Hazardous reactions with concentrated mineral acids, halogens, melted sulphur. Dissolves non-polar rubber.

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**10.3 Hazardous decomposition products**

Thermal decomposition generates carbon monoxide and carbon dioxide.

**11. TOXICOLOGICAL INFORMATION**

**11.1 Acute effects**

Toxic substance with carcinogenic and mutagenic effects. Acute intoxication leads to central nervous system attenuation and narcotic effects occur. After swallowing possibility of aspiration (passage into the lung) and danger of chemical pneumonia (pulmonary oedema). Product irritates eyes and skin. High vapour concentrations irritate respiratory system and eyes and may lead to fast coma and death. Liquid is absorbed through skin and may develop allergic eruption.

Inhalation: irritation, headache, dizziness, weakness, stupefaction, irritant coughing, convulsions, unconsciousness, possible respiratory inhibition or arrest.

Eyes: severe irritation, cornea damage.

Skin: mild irritation, degreasing, absorption, eruptioning and blistering.

Swallowing: nausea, vomiting, convulsions, irregular heartbeat.

Acute toxicity

LD<sub>50</sub> oral - rat 930 mg.kg-1

LD<sub>50</sub> dermal - rabbit > 9400 mg.kg-1

LC<sub>50</sub> inhalation - rat 10000 ppm/7hod

Acute irritation

Skin: rabbit: 15 mg / 24 h. - MLD (slight)

Eye: rabbit: 2 mg / 24 h. SEV (severe)

**11.2 Repeated dose toxicity**

Chronic effects cause bone marrow damage, haemopoiesis disorder and may develop leukaemia.

**11.3 Sensitisation**

May cause skin allergy.

**11.4 CMR effects (carcinogenity, mutagenicity, toxicity for reproduction)**

Proved carcinogenic effects for humans (IARC group 1).

Substance has mutagenic effects.

Substance may have adverse effect on reproduction.

**11.5 Toxicokinetics, metabolism, distribution**

Not applicable.

**12. ECOLOGICAL INFORMATION**

**12.1 Ecotoxicity**

LC<sub>50</sub>, 96 h., fish: 32 mg.l-1 (Pimephales promelas)

EC50, 48 h., daphnia: < 13 - 200 mg.l-1

IC50, 48 h., algae: 525 mg.l<sup>-1</sup> (Chlorella vulgaris)

**12.2 Mobility**

Not applicable.

**12.3 Persistence and degradability**

Substance is biodegradable, its biodegradability is low.

**12.4 Bioaccumulative potential**

Bioaccumulation in aquatic organism is low, in mammals significant.

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### 12.5 Results of PBT assessment

Not applicable.

### 12.6 Other adverse effects

According to the Water-Act No 254/2001 Sb. the product is considered to be a defective substance and a hazardous substance according to Annex No 1 to the Water-Act.

## 13. DISPOSAL CONSIDERATIONS

### 13.1 Recommended disposal methods for the substance / mixture (preparation)

Product reuse or disposal in accordance with valid waste legislative regulations.

Recommended method: Energetic utilization (combustion)

Recommended classification according to Waste Catalogue: 07 01 04

### 13.2 Recommended disposal methods for contaminated packaging

Product is transported in tank-vehicles or by means of pipeline.

### 13.3 Waste management measures that control exposure of humans and environment

Proceed in accordance with valid health, air and water legislative regulations.

### 13.4 Waste regulation

Czech Republic

Act No 185/2001 Sb. on wastes and on the amendment of some additional acts, as amended.

Regulation No 381/2001 Sb. establishing the Waste Catalogue, as amended.

European Union

Directive 2006/12/ES on waste

## 14. TRANSPORT INFORMATION

### 14.1 Transport classification

- Land transport (ADR / RID)
- Name: BENZENE
- UN-Number: 1114
- Class: 3
- Classification code: F1
- Packing group: II
- Hazard identification No: 33
- Symbol/label: 3

### 14.2 Special transport precautionary measures

Not applicable.

## 15. REGULATORY INFORMATION



### 15.1 Chemical Safety Assessment

Not applicable.

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**15.2 Labelling of the substance / mixture (preparation)**

<i>name</i>	<p><b>PETROLEUM BENZENE</b> BENZENE ES: 200-753-7 “EC label“</p>	
<i>graphic symbol of danger</i>	 <p>Highly flammable</p>	 <p>Toxic</p>
<i>R-phrases</i>	<p>45-46-11-36/38-48/23/24/25-65</p>	<p>May cause cancer. May cause heritable genetic damage. Highly flammable. Irritating to eyes and skin. Also toxic: danger of serious damage to health by prolonged exposure through inhalation, in contact with skin and if swallowed. Also harmful: may cause lung damage if swallowed.</p>
<i>S-phrases</i>	<p>53-45</p>	<p>Avoid exposure - obtain special instructions before use. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).</p> <p><b>Restricted to professional users.</b></p>
	<p>Company:</p>	<p>UNIPETROL RPA, s.r.o. Záluží 1, 436 70 Litvínov Czech Republic ☎: +420 476 161 111, +420 476 162 111, +420 476 163 111</p>

**15.3 Regulatory Data relating to the substance / mixture (preparation)**

European Community  
Regulation (EC) No 1907/2006 REACH  
Regulation (EC) No 1272/2008  
Restrictions Regulation (EC) No 1907/2006 (REACH)– Annex XVII  
Regulation (EC) No 689/2008 of the European Parliament and of the Council concerning the export and import of dangerous chemicals  
Czech Republic  
Act No 356/2003 Sb., on chemical substances and chemical preparations and on the amendment of some additional acts, as amended  
Act No 258/2000 Sb. on the Protection of Public Health and on the amendments of some related acts, as amended.  
Act No 254/2001 Sb. on Waters and on the amendment of some additional acts, as amended  
Order-in-Council No 361/2007 Sb., regulating Safety Occupational Health Conditions in the workplace, as amended.

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#### **16. OTHER INFORMATION**

Full text of relevant R-phrases referred to under headings 2 and/or 3

- R 45 May cause cancer.
- R 46 May cause heritable genetic damage.
- R 11 Highly flammable.
- R 36/38 Irritating to eyes and skin.
- R 48/23/24/25 Toxic: danger of serious damage to health by prolonged exposure through inhalation, in contact with skin and if swallowed.
- R 65 Harmful: may cause lung damage if swallowed.

Fulfilling the obligations related to Regulation (EC) No. 1907/2006 - REACH

The stated chemical substance was pre-registered in accordance with the REACH regulation.

Training instructions

Personnel handling the product has to be acquainted demonstrably with its hazardous properties, with health and environmental protection principles related to the product and first aid principles (Act No 258/2000 Sb., as amended).

Usage restriction

Product can be used in manufacturing only, where the benzene emissions do not exceed exposure limit values.

Access to information

Employer must in accordance with Articles 35 of the Regulation (EC) No 1907/2006 enable access to the information from MSDS workers and their representatives who this product use or may be exposed to in the course of their work.

Sources of data used to compile the Material Safety Data Sheet

Record on the classification of hazardous properties of the product

Annex No. 1 to the Regulation No 232/2004 Sb., as amended.

Annex No VI to the Regulation (EC) No 1272/2008 (Table No 3.2)

Annex No 1F to the Directive No 2008/58/EC

Annex No 1A to the Directive No 2009/2/ES

First aid principles in case of exposition to chemical substances (doc. MUDr. Daniela Pelclová et al.)

Declaration from 18.02.2006 (Prof. MUDr. Pelclová, Toxicological Information Centre)

Revised information

26.10.2005: Revised data under headings 2, 3.1, 3.2, 11.1, 12.5, 15.1, 15.2 and 16

01.12.2006: Revised data under headings 1, 2, 8, 13 and 16

01.03.2007: Revised data under headings 1 and 16

01.06.2007: General update according to Regulation (EC) No 1907/2006 REACH

01.12.2009: Revised data under headings 1, 2.1, 8.1, 15, 16 and "Statement"

**Statement:** *This Material Safety Data Sheet has been elaborated in accordance with the Regulation (EC) No 1907/2006. This MSDS contains information necessary for the protection of health and environment. The information does not substitute the quality specification of products and should not be construed as any guarantee of suitability for particular applications. The data contained are based on the present state of knowledge and current national legislation. The user is responsible for ensuring that the requirements of relevant regional legislation are complied with.*

According to an authorisation form on behalf of UNIPETROL RPA s.r.o., elaborated by:  
Environmental and Standardisation Department HSE&Q, UNIPETROL SERVICES, s.r.o.