

# Benzene

## Safety Data Sheet

according to Regulation (EU) 2015/830

Date of issue: 01/06/2022 Version: 0.0

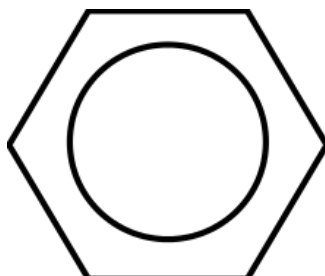
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### SECTION 1: Identification of the substance/mixture and of the company/undertaking

#### 1.1. Product identifier

Product form : Substance  
Substance name : Benzene  
EC Index-No. : 601-020-00-8  
EC-No. : 200-753-7  
CAS-No. : 71-43-2  
Type of product : Pure substance  
Formula :  $C_6H_6$   
Chemical structure :



Synonyms : annulene / Benzene / benzene concentrate, full range / benzene concentrate, heartcut / benzene, heartcut SCF31RAP / benzene, pure / bicarburet of hydrogen / carbon oil / coal naphtha / cyclohexatriene / mineral naphtha / nitration benzene / petroleum benzene / phene / phenyl hydride

#### 1.2. Relevant identified uses of the substance or mixture and uses advised against

##### 1.2.1. Relevant identified uses

Use of the substance/mixture : Solvent  
Chemical intermediate  
Chemical raw material  
Laboratory chemical

##### 1.2.2. Uses advised against

No additional information available

#### 1.3. Details of the supplier of the safety data sheet

ISOLAB Laborgeräte GmbH  
Am Dillhof 2 - 63863 Eschau / GERMANY  
Tel: + 49 93 74 / 978 55-0  
Fax: +49 93 74 / 978 55-29  
[prodsafe@isolab.de](mailto:prodsafe@isolab.de)

#### 1.4. Emergency telephone number

Country	Organisation/Company	Address	Emergency number	Comment
Germany	Giftnotruf der Charité CBF, Haus VIII (Wirtschaftgebäude), UG	Hindenburgdamm 30 12203 Berlin	+49 30 19240	

### SECTION 2: Hazards identification

#### 2.1. Classification of the substance or mixture

##### Classification according to Regulation (EC) No. 1272/2008 [CLP]

Flammable liquid, Category 2 H225  
Carcinogenicity, Category 1A, H350  
Germ cell mutagenicity, Category 1B H340  
STOT RE, Category 1 H372  
Aspiration hazard, Category 1 H304  
Eye irritation, Category 2 H319  
Skin irritation, Category 2 H315  
Chronic aquatic toxicity, Category 3 H415

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

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### Adverse physicochemical, human health and environmental effects

No additional information available

## 2.2. Label elements

### Labelling according to Regulation (EC) No. 1272/2008 [CLP]

Hazard pictograms (CLP) :



Signal word (CLP) :

Danger

Hazard statements (CLP) :

H340 - May cause genetic defects.  
H350 - May cause cancer.  
H225 - Highly flammable liquid and vapour.  
H304 - May be fatal if swallowed and enters airways.  
H315 - Causes skin irritation.  
H319 - Causes serious eye irritation.  
H372 - Causes damage to organs (Blood) through prolonged or repeated exposure.  
H412 - Harmful to aquatic life with long lasting effects.

Precautionary statements (CLP) :

P201 - Obtain special instructions before use.  
P210 - Keep away from heat, sparks, open flames or hot surfaces. – No smoking.  
P240 - Ground/bond container and receiving equipment.  
P273 - Avoid release to the environment.  
P301 + P330 + P331 - IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.  
P302 + P352 - IF ON SKIN: Wash with plenty of soap and water.  
P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.  
P314 - Get medical advice/ attention if you feel unwell. Storage  
P403 + P233 - Store in a well-ventilated place. Keep container tightly closed.

## 2.3. Other hazards

No additional information available

## SECTION 3: Composition/information on ingredients

### 3.1. Substances

Name	Product identifier	%
Benzene	(CAS-No.) 71-43-2 (EC-No.) 200-753-7 (EC Index-No.) 601-020-00-8	100

Full text of 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

: Check the vital functions. Unconscious: maintain adequate airway and respiration. Respiratory arrest: artificial respiration or oxygen. Cardiac arrest: perform resuscitation. Victim conscious with laboured breathing: half-seated. Victim in shock: on his back with legs slightly raised. Vomiting: prevent asphyxia/aspiration pneumonia. Prevent cooling by covering the victim (no warming up). Keep watching the victim. Give psychological aid. Keep the victim calm, avoid physical strain. Depending on the victim's condition: doctor/hospital. Never give alcohol to drink.

First-aid measures after inhalation

: Remove the victim into fresh air. Respiratory problems: consult a doctor/medical service.

First-aid measures after skin contact

: Wash immediately with lots of water. Soap may be used. Do not apply (chemical) neutralizing agents. Take victim to a doctor if irritation persists.

First-aid measures after eye contact

: Rinse immediately with plenty of water. Do not apply neutralizing agents. Take victim to an ophthalmologist if irritation persists.

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First-aid measures after ingestion : Rinse mouth with water. Do not induce vomiting. Call Poison Information Centre (www.big.be/antigif.htm). Consult a doctor/medical service if you feel unwell. Ingestion of large quantities: immediately to hospital. Take the container/vomit to the doctor/hospital.

### 4.2. Most important symptoms and effects, both acute and delayed

Symptoms/effects after inhalation : Central nervous system depression. Headache. Feeling of weakness. Nausea. Dizziness. Mental confusion. Excited/restless. Coordination disorders. Disturbances of consciousness. Disturbances of heart rate. Respiratory difficulties. FOLLOWING SYMPTOMS MAY APPEAR LATER: Change in the haemogramme/blood composition.

Symptoms/effects after skin contact : Tingling/irritation of the skin.

Symptoms/effects after eye contact : Irritation of the eye tissue.

Symptoms/effects after ingestion : Risk of aspiration pneumonia. Irritation of the gastric/intestinal mucosa. Central nervous system depression. Symptoms similar to those listed under inhalation. AFTER ABSORPTION OF HIGH QUANTITIES: Affection of the renal tissue. Change in urine composition.

Chronic symptoms : ON CONTINUOUS/REPEATED EXPOSURE/CONTACT: Red skin. Dry skin. Itching. Cracking of the skin. Change in the haemogramme/blood composition. Impairment of the blood forming system. Affection of the bone marrow. Enlargement of the lymph glands. Weakening of the immune system. Impairment of the nervous system. Feeling of weakness. Paleness. Dizziness. Loss of appetite. Sleeplessness. Impaired memory. Impaired concentration.

### 4.3. Indication of any immediate medical attention and special treatment needed

No additional information available

## SECTION 5: Fire-fighting measures

### 5.1. Extinguishing media

Suitable extinguishing media : Preferably: polyvalent foam. Alcohol-resistant foam. BC powder. Carbon dioxide. Water spray.

Unsuitable extinguishing media : Solid water jet ineffective as extinguishing medium.

### 5.2. Special hazards arising from the substance or mixture

Fire hazard : DIRECT FIRE HAZARD. Highly flammable. Gas/vapour flammable with air within explosion limits. INDIRECT FIRE HAZARD. May build up electrostatic charges: risk of ignition. May be ignited by sparks. Gas/vapour spreads at floor level: ignition hazard. Reactions involving a fire hazard: see "Reactivity Hazard".

Explosion hazard : DIRECT EXPLOSION HAZARD. Gas/vapour explosive with air within explosion limits. INDIRECT EXPLOSION HAZARD. may be ignited by sparks. Reactions with explosion hazards: see "Reactivity Hazard".

### 5.3. Advice for firefighters

Firefighting instructions : Cool tanks/drums with water spray/remove them into safety. Do not move the load if exposed to heat. Take account of toxic fire-fighting water. Use water moderately and if possible collect or contain it.

Protection during firefighting : Heat/fire exposure: compressed air/oxygen apparatus.

## SECTION 6: Accidental release measures

### 6.1. Personal precautions, protective equipment and emergency procedures

#### 6.1.1. For non-emergency personnel

Protective equipment : Gloves. Protective goggles. Head/neck protection. Protective clothing. Large spills/in enclosed spaces: compressed air apparatus. Large spills/in enclosed spaces: gas-tight suit. See "Material-Handling" to select protective clothing.

Emergency procedures : Keep upwind. Mark the danger area. Consider evacuation. Seal off low-lying areas. Close doors and windows of adjacent premises. Stop engines and no smoking. No naked flames or sparks. Spark- and explosionproof appliances and lighting equipment. Keep containers closed. Wash contaminated clothes.

#### 6.1.2. For emergency responders

No additional information available

### 6.2. Environmental precautions

Prevent soil and water pollution. Prevent spreading in sewers.

### 6.3. Methods and material for containment and cleaning up

For containment : Contain released substance, pump into suitable containers. Consult "Material-handling" to select material of containers. Plug the leak, cut off the supply. Dam up the liquid spill. Try to reduce evaporation. Measure the concentration of the explosive gas-air mixture. Dilute/disperse combustible gas/vapour with water curtain. Provide equipment/receptacles with earthing. Do not use compressed air for pumping over spills.

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Methods for cleaning up : Prevent evaporation by covering with: foam. Take up liquid spill into a non combustible material e.g.: sand, earth, vermiculite or kieselguhr. Scoop absorbed substance into closing containers. See "Material-handling" for suitable container materials. Carefully collect the spill/leftovers. Damaged/cooled tanks must be emptied. Do not use compressed air for pumping over spills. Clean contaminated surfaces with an excess of water. Take collected spill to manufacturer/competent authority. Wash clothing and equipment after handling.

### 6.4. Reference to other sections

No additional information available

## SECTION 7: Handling and storage

### 7.1. Precautions for safe handling

Precautions for safe handling : Comply with the legal requirements. Use only in well-ventilated areas. Remove contaminated clothing immediately. Clean contaminated clothing. Handle uncleaned empty containers as full ones. Thoroughly clean/dry the installation before use. Do not discharge the waste into the drain. Do not use compressed air for pumping over. Use spark-/explosionproof appliances and lighting system. Take precautions against electrostatic charges. Keep away from naked flames/heat. Keep away from ignition sources/sparks. Observe very strict hygiene - avoid contact. Keep container tightly closed. Measure the concentration in the air regularly.

### 7.2. Conditions for safe storage, including any incompatibilities

Storage temperature : > 5 °C  
Heat and ignition sources : KEEP SUBSTANCE AWAY FROM: heat sources. ignition sources.  
Information on mixed storage : KEEP SUBSTANCE AWAY FROM: oxidizing agents. (strong) acids. halogens.  
Storage area : Ventilation at floor level. Fireproof storeroom. Keep locked up. Unauthorized persons are not admitted. Protect against frost. Provide for a tub to collect spills. Provide the tank with earthing. Store only in a limited quantity. May be stored under inert gas. Meet the legal requirements.  
Special rules on packaging : SPECIAL REQUIREMENTS: closing. clean. correctly labelled. meet the legal requirements. Secure fragile packagings in solid containers.  
Packaging materials : SUITABLE MATERIAL: steel. stainless steel. monel steel. iron. glass. polypropylene. MATERIAL TO AVOID: No data available.

### 7.3. Specific end use(s)

No additional information available

## SECTION 8: Exposure controls/personal protection

### 8.1. Control parameters

Benzene (71-43-2)		
EU	Local name	Benzene (Num:C1)
EU	IOELV TWA (mg/m <sup>3</sup> )	3.25 mg/m <sup>3</sup> (Benzene; EU; Time-weighted average exposure limit 8 h; Limit value for occupational exposure)
EU	IOELV TWA (ppm)	1 ppm (Benzene; EU; Time-weighted average exposure limit 8 h; Limit value for occupational exposure)
EU	Notes	skin. SCOEL Recommendations (Ongoing)
Austria	Local name	Benzol
Austria	MAK (mg/m <sup>3</sup> )	3.2 mg/m <sup>3</sup>
Austria	MAK (ppm)	1 ppm
Austria	MAK Short time value (mg/m <sup>3</sup> )	12.8 mg/m <sup>3</sup>
Austria	MAK Short time value (ppm)	4 ppm
Austria	Remark (AT)	H
Belgium	Local name	Benzène # Benzeen
Belgium	Limit value (mg/m <sup>3</sup> )	3.25 mg/m <sup>3</sup> (Benzène; Belgium; Time-weighted average exposure limit 8 h)
Belgium	Limit value (ppm)	1 ppm (Benzène; Belgium; Time-weighted average exposure limit 8 h)

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Belgium	Remark (BE)	C: La mention C signifie que l'agent en question relève du champ d'application de l'arrêté royal du 2 décembre 1993 concernant la protection des travailleurs contre les risques liés à l'exposition à des agents cancérigènes et mutagènes au travail. # De vermelding C betekent dat het betrokken agens valt onder het toepassingsgebied van het koninklijk besluit van 2 december 1993 betreffende de bescherming van de werknemers tegen de risico's van blootstelling aan kankerverwekkende en mutagene agentia op het werk D:La mention D signifie que la résorption de l'agent, via la peau, les muqueuses ou les yeux, constitue une partie importante de l'exposition totale. Cette résorption peut se faire tant par contact direct que par présence de l'agent dans l'air. # De vermelding D betekent dat de opname van het agens via de huid, de slijmvliezen of de ogen een belangrijk deel van de totale blootstelling vormt. Deze opname kan het gevolg zijn van zowel direct contact als zijn aanwezigheid in de lucht
Bulgaria	Local name	Бензен
Bulgaria	OEL TWA (mg/m <sup>3</sup> )	3.25 mg/m <sup>3</sup>
Bulgaria	Notes	Кожа (възможна е значителна резорбция чрез кожата); • (Химични агенти, за които са определени гранични стойности във въздуха на работната среда за Европейската общност)
Croatia	Local name	Benzen
Croatia	GVI (granična vrijednost izloženosti) (mg/m <sup>3</sup> )	3.25 mg/m <sup>3</sup>
Croatia	GVI (granična vrijednost izloženosti) (ppm)	1 ppm
Croatia	Naznake (HR)	K (Skin): (naznaka da tvar može štetno djelovati kroz kožu); F (lako zapaljivo); T (otrovno); Karc. kat. 1 (tvari za koje je dokazano da su karcinogene za ljude); Muta. kat. 2 (tvari koje su vjerojatno mutagene za ljude); EU0 (naznaka da se radi o tvarima za koje su utvrđene obvezujuće granične vrijednosti izloženosti prema Direktivi 2003/18/ EC, Direktivi 99/38/EC i Direktivi 98/24/EC)
Czech Republic	Local name	Benzen
Czech Republic	Expoziční limity (PEL) (mg/m <sup>3</sup> )	3 mg/m <sup>3</sup>
Czech Republic	Expoziční limity (PEL) (ppm)	0.94 ppm
Czech Republic	Expoziční limity (NPK-P) (mg/m <sup>3</sup> )	10 mg/m <sup>3</sup>
Czech Republic	Expoziční limity (NPK-P) (ppm)	3.1 ppm
Czech Republic	Remark (CZ)	D, P
Denmark	Local name	Benzen
Denmark	Grænseværdie (langvarig) (mg/m <sup>3</sup> )	1.6 mg/m <sup>3</sup>
Denmark	Grænseværdie (langvarig) (ppm)	0.5 ppm
Denmark	Anmærkninger (DK)	E (betyder, at stoffet har en EF-grænseværdi); H (betyder, at stoffet kan optages gennem huden); K (betyder, at stoffet anses for at kunne være kræftfremkaldende)
Estonia	Local name	Benseen
Estonia	OEL TWA (mg/m <sup>3</sup> )	1.5 mg/m <sup>3</sup>
Estonia	OEL TWA (ppm)	0.5 ppm
Estonia	OEL STEL (mg/m <sup>3</sup> )	9 mg/m <sup>3</sup>
Estonia	OEL STEL (ppm)	3 ppm
Finland	Local name	Bentseeni
Finland	HTP-arvo (8h) (mg/m <sup>3</sup> )	3.25 mg/m <sup>3</sup>
Finland	HTP-arvo (8h) (ppm)	1 ppm

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<b>Benzene (71-43-2)</b>		
Finland	Huomautus (FI)	iho, liite 3 (SITOVAT RAJA-ARVOT) ja liite 9 (BENTSEENIPITOISUUDEN MITTAAMINEN)
France	Local name	Benzène
France	VME (mg/m <sup>3</sup> )	3.25 mg/m <sup>3</sup> (Benzène; France; Time-weighted average exposure limit 8 h; VRC: Valeur réglementaire contraignante)
France	VME (ppm)	1 ppm (Benzène; France; Time-weighted average exposure limit 8 h; VRC: Valeur réglementaire contraignante)
France	Note (FR)	Valeurs réglementaires contraignantes; substance classée cancérigène de catégorie 1a et mutagène de catégorie 1b; risque de pénétration percutanée
Hungary	Local name	BENZOL
Hungary	MK-érték	3 mg/m <sup>3</sup>
Hungary	Megjegyzések (HU)	k, b, i; BEM
Ireland	Local name	Benzene
Ireland	OEL (8 hours ref) (mg/m <sup>3</sup> )	3 mg/m <sup>3</sup>
Ireland	OEL (8 hours ref) (ppm)	1 ppm
Ireland	Notes (IE)	BOELV, Sk, Carc.1A, Muta.1B
Latvia	Local name	Benzols
Latvia	OEL TWA (mg/m <sup>3</sup> )	3.25 mg/m <sup>3</sup>
Latvia	OEL TWA (ppm)	1 ppm
Lithuania	Local name	Benzenas (benzolas)
Lithuania	IPRV (mg/m <sup>3</sup> )	3.25 mg/m <sup>3</sup>
Lithuania	IPRV (ppm)	1 ppm
Lithuania	TPRV (mg/m <sup>3</sup> )	19 mg/m <sup>3</sup>
Lithuania	TPRV (ppm)	6 ppm
Lithuania	Remark (LT)	K (kancerogeninis poveikis); M (mutageninis poveikis); O (medžiaga į organizmą gali prasiskverbti pro nepažeistą odą)
Netherlands	Local name	Benzeen
Netherlands	Grenswaarde TGG 8H (mg/m <sup>3</sup> )	3.25 mg/m <sup>3</sup> (Benzeen; Netherlands; Time-weighted average exposure limit 8 h; Public occupational exposure limit value)
Netherlands	Grenswaarde TGG 8H (ppm)	1 ppm (Benzeen; Netherlands; Time-weighted average exposure limit 8 h; Public occupational exposure limit value)
Netherlands	Remark (MAC)	H (Huidopname) Stoffen die relatief gemakkelijk door de huid kunnen worden opgenomen, hetgeen een substantiële bijdrage kan betekenen aan de totale inwendige blootstelling, hebben in de lijst een Haanduiding. Bij deze stoffen moeten naast maatregelen tegen inademing ook adequate maatregelen ter voorkoming van huidcontact worden genomen.
Poland	Local name	Benzen
Poland	NDS (mg/m <sup>3</sup> )	1.6 mg/m <sup>3</sup>
Portugal	Local name	Benzeno
Portugal	OEL TWA (ppm)	0.5 ppm
Portugal	OEL STEL (ppm)	2.5 ppm
Romania	Local name	Benzen
Romania	OEL TWA (mg/m <sup>3</sup> )	3.25 mg/m <sup>3</sup>
Romania	OEL TWA (ppm)	1 ppm
Slovenia	Local name	benzen
Slovenia	OEL TWA (mg/m <sup>3</sup> )	3.25 mg/m <sup>3</sup>
Slovenia	OEL TWA (ppm)	1 ppm

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Slovenia	OEL STEL (mg/m <sup>3</sup> )	13 mg/m <sup>3</sup>
Slovenia	OEL STEL (ppm)	4 ppm
Spain	Local name	Benceno
Spain	VLA-ED (mg/m <sup>3</sup> )	3.25 mg/m <sup>3</sup>
Spain	VLA-ED (ppm)	1 ppm
Spain	Notes	Vía dérmica (Indica que, en las exposiciones a esta sustancia, la aportación por la vía cutánea puede resultar significativa para el contenido corporal total si no se adoptan medidas para prevenir la absorción. En estas situaciones, es aconsejable la utilización del control biológico para poder cuantificar la cantidad global absorbida del contaminante. Para más información véase el Apartado 5 de este documento), VLB® (Agente químico que tiene Valor Límite Biológico específico en este documento), v (Real Decreto 1124/2000, de 16 de junio (BOE nº 145 de 17 de junio de 2000), por el que se modifica el Real Decreto 665/1997, de 12 de mayo, sobre la protección de los trabajadores contra los riesgos relacionados con la exposición a agentes cancerígenos durante el trabajo), r (Esta sustancia tiene establecidas restricciones a la fabricación, la comercialización o el uso en los términos especificados en el "Reglamento (CE) nº 1907/2006 sobre Registro, Evaluación, Autorización y Restricción de sustancias y preparados químicos" (REACH) de 18 de diciembre de 2006 (DOUE L 369 de 30 de diciembre de 2006). Las restricciones de una sustancia pueden aplicarse a todos los usos o sólo a usos concretos. El anexo XVII del Reglamento REACH contiene la lista de todas las sustancias restringidas y especifica los usos que se han restringido).
Sweden	Local name	Bensen
Sweden	nivågränsvärde (NVG) (mg/m <sup>3</sup> )	1.5 mg/m <sup>3</sup>
Sweden	nivågränsvärde (NVG) (ppm)	0.5 ppm
Sweden	kortidsvärde (KTV) (mg/m <sup>3</sup> )	9 mg/m <sup>3</sup>
Sweden	kortidsvärde (KTV) (ppm)	3 ppm
Sweden	Anmärkning (SE)	C (Ämnet är cancerframkallande Risk för cancer finns även vid annan exponering än via inandning. För vissa cancerframkallande ämnen som inte har gränsvärden gäller förbud eller tillståndskrav enligt föreskrifterna om kemiska arbetsmiljörisker); H (Ämnet kan lätt upptas genom huden Det föreskrivna gränsvärdet bedöms ge tillräckligt skydd endast under förutsättning att huden är skyddad mot exponering för ämnet ifråga); V (Vägledande kortidsgränsvärde ska användas som ett rekommenderat högsta värde som inte bör överskridas)
United Kingdom	Local name	Benzene
United Kingdom	WEL TWA (mg/m <sup>3</sup> )	3.25 mg/m <sup>3</sup> Benzene; United Kingdom; Time-weighted average exposure limit 8 h; Workplace exposure limit (EH40/2005)
United Kingdom	WEL TWA (ppm)	1 ppm Benzene; United Kingdom; Time-weighted average exposure limit 8 h; Workplace exposure limit (EH40/2005)
United Kingdom	Remark (WEL)	Carc (Capable of causing cancer and/or heritable genetic damage. See paragraphs 49–51), Sk (Can be absorbed through the skin. The assigned substances are those for which there are concerns that dermal absorption will lead to systemic toxicity)
Iceland	Local name	Bensen
Iceland	OEL (8 hours ref) (mg/m <sup>3</sup> )	1.6 mg/m <sup>3</sup>
Iceland	OEL (8 hours ref) (ppm)	0.5 ppm

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<b>Benzene (71-43-2)</b>		
Iceland	Notes (IS)	H,K
Russian Federation	Local name	Бензол+
Russian Federation	OEL Ceiling (mg/m <sup>3</sup> )	15 mg/m <sup>3</sup>
Russian Federation	OEL TWA (mg/m <sup>3</sup> )	5 mg/m <sup>3</sup>
Russian Federation	Remark (RU)	2 класс опасности - высокоопасное; п (пары и/или газы); К (канцерогены); + (соединения, при работе с которыми требуется специальная защита кожи и глаз; символ проставлен вслед за наименованием вещества)
Norway	Local name	Benzen
Norway	Grenseverdier (AN) (mg/m <sup>3</sup> )	3 mg/m <sup>3</sup>
Norway	Grenseverdier (AN) (ppm)	1 ppm
Norway	Merknader (NO)	G (EU har fastsatt en bindende grenseverdi for stoffet); H (Kjemikalier som kan tas opp gjennom huden); K (Kjemikalier som skal betraktes som kreftfremkallende)
Switzerland	Local name	Benzol
Switzerland	VME (mg/m <sup>3</sup> )	1.6 mg/m <sup>3</sup>
Switzerland	VME (ppm)	0.5 ppm
Switzerland	Remark (CH)	H B C1 <sub>A</sub> M1 <sub>B</sub> - Leukämie <sup>KT HU</sup> - BG, DFG, HSE, NIOSH
Turkey	Local name	Benzen
Turkey	OEL TWA (mg/m <sup>3</sup> )	3.25 mg/m <sup>3</sup>
Turkey	OEL TWA (ppm)	1 ppm
Turkey	Comments	Deri
Australia	Local name	Benzene
Australia	TWA (mg/m <sup>3</sup> )	3.2 mg/m <sup>3</sup>
Australia	TWA (ppm)	1 ppm
Australia	Remark (AU)	Carcinogenicity Category 1A – Known to have carcinogenic potential for humans. The classification of a chemical into this category is based largely on human evidence from studies that have established a causal relationship between human exposure and the development of cancer.
USA - ACGIH	Local name	Benzene
USA - ACGIH	ACGIH TWA (ppm)	0.5 ppm (Benzene; USA; Time-weighted average exposure limit 8 h; TLV - Adopted Value)
USA - ACGIH	ACGIH STEL (ppm)	2.5 ppm (Benzene; USA; Short time value; TLV - Adopted Value)
USA - ACGIH	Remark (ACGIH)	Leukemia

## 8.2. Exposure controls

### Materials for protective clothing:

GIVE EXCELLENT RESISTANCE: PVA. polyethylene/ethylenevinylalcohol. GIVE GOOD RESISTANCE: tetrafluoroethylene. viton. GIVE LESS RESISTANCE: No data available. GIVE POOR RESISTANCE: butyl rubber. natural rubber. neoprene. polyethylene. PVC. polyurethane. nitrile rubber. neoprene/natural rubber

### Hand protection:

Gloves

### Eye protection:

Safety glasses

### Skin and body protection:

Head/neck protection. Protective clothing

### Respiratory protection:

Wear gas mask with filter type A if conc. in air > exposure limit



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### SECTION 9: Physical and chemical properties

#### 9.1. Information on basic physical and chemical properties

Physical state	: Liquid
Appearance	: Liquid.
Molecular mass	: 78.11 g/mol
Colour	: Pure substance: colourless. Unpurified: light yellow.
Odour	: Aromatic odour.
Odour threshold	: 4.68 ppm 15.2 mg/m <sup>3</sup>
pH	: No data available
Relative evaporation rate (butylacetate=1)	: 5.1
Relative evaporation rate (ether=1)	: 2.8
Melting point	: 5.5 °C
Freezing point	: No data available
Boiling point	: 80.1 °C
Flash point	: -11 °C
Critical temperature	: 289 °C
Auto-ignition temperature	: 498 °C
Decomposition temperature	: No data available
Flammability (solid, gas)	: No data available
Vapour pressure	: 101 hPa (20 °C)
Vapour pressure at 50 °C	: 358 hPa (50 °C)
Critical pressure	: 49250 hPa
Relative vapour density at 20 °C	: 2.7
Relative density	: 0.88
Relative density of saturated gas/air mixture	: 1.2
Density	: 0.88 g/cm <sup>3</sup> (20 °C)
Solubility	: Insoluble in water. Soluble in ethanol. Soluble in ether. Soluble in acetone. Soluble in chloroform. Soluble in tetrachloromethane. Soluble in acetic acid. Soluble in carbondisulfide. Soluble in oils/fats. Water: 1.88 g/l at 23.5 °C Ethanol: Complete Ether: Complete Acetone: Complete
Log Pow	: 2.13 (Experimental value)
Viscosity, kinematic	: No data available
Viscosity, dynamic	: 0.00065 Pa.s (20 °C)
Explosive properties	: No data available
Oxidising properties	: No data available
Explosive limits	: 1.2 - 8.0 %(V)

#### 9.2. Other information

Minimum ignition energy	: 0.2 mJ
Specific conductivity	: 0.005 pS/m
Saturation concentration	: 320 g/m <sup>3</sup>
VOC content	: 100 %
Other properties	: Gas/vapour heavier than air at 20°C. Clear. Volatile. Substance has neutral reaction. May generate electrostatic charges.

### SECTION 10: Stability and reactivity

#### 10.1. Reactivity

Upon combustion: CO and CO<sub>2</sub> are formed. Violent to explosive reaction with many compounds e.g.: with (some) halogens, with (strong) oxidizers and with (some) acids. Spontaneously flammable on exposure to some compounds.

#### 10.2. Chemical stability

Stable under normal conditions.

#### 10.3. Possibility of hazardous reactions

No additional information available

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### 10.4. Conditions to avoid

No additional information available

### 10.5. Incompatible materials

No additional information available

### 10.6. Hazardous decomposition products

No additional information available

## SECTION 11: Toxicological information

### 11.1. Information on toxicological effects

Acute toxicity : Not classified

Benzene (71-43-2)	
LD50 oral rat	Literature study; 5970 mg/kg
LD50 dermal rabbit	> 8260 mg/kg
LC50 inhalation rat (mg/l)	43.767 mg/l/4h (Rat; Experimental value)
LC50 inhalation rat (ppm)	13700 ppm/4h (Rat; Experimental value)

Skin corrosion/irritation : Causes skin irritation.  
Serious eye damage/irritation : Causes serious eye irritation.  
Respiratory or skin sensitisation : Not classified  
Germ cell mutagenicity : May cause genetic defects.  
Carcinogenicity : May cause cancer.  
Reproductive toxicity : Not classified  
STOT-single exposure : Not classified  
STOT-repeated exposure : Causes damage to organs through prolonged or repeated exposure.  
Aspiration hazard : May be fatal if swallowed and enters airways.  
IARC group : 1

## SECTION 12: Ecological information

### 12.1. Toxicity

Ecology - general : Not classified as dangerous for the environment according to the criteria of Regulation (EC) No 1272/2008.  
Ecology - air : Not classified as dangerous for the ozone layer (Regulation (EC) No 1005/2009). Not included in the list of fluorinated greenhouse gases (Regulation (EC) No 842/2006). TA-Luft Klasse 5.2.7.1.1/III.  
Ecology - water : Ground water pollutant. Toxic to fishes. Toxic to invertebrates (Daphnia). Harmful to algae. Inhibits photosynthesis of algae. Toxic to plankton. Harmful to aquatic plants. Taste alteration in fishes/aquatic organisms.

Benzene (71-43-2)	
LC50 fish 1	5.3 mg/l (LC50; 96 h; Salmo gairdneri)
EC50 Daphnia 2	10 mg/l (EC50; OECD 202: Daphnia sp. Acute Immobilisation Test; 48 h; Daphnia magna)
Threshold limit algae 1	100 mg/l (ErC50; OECD 201: Alga, Growth Inhibition Test; 72 h; Pseudokirchneriella subcapitata; Static system; Fresh water; Experimental value)

### 12.2. Persistence and degradability

Benzene (71-43-2)	
Persistence and degradability	Readily biodegradable in water. Ozonation in water. Forming sediments in water. Biodegradable in the soil. Low potential for adsorption in soil. Photolysis in the air.
Biochemical oxygen demand (BOD)	2.18 g O <sub>2</sub> /g substance
Chemical oxygen demand (COD)	2.15 g O <sub>2</sub> /g substance
ThOD	3.1 g O <sub>2</sub> /g substance
BOD (% of ThOD)	0.7

### 12.3. Bioaccumulative potential

Benzene (71-43-2)	
BCF fish 1	19 (BCF)

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Benzene (71-43-2)	
BCF fish 2	< 10 (BCF; OECD 305: Bioconcentration: Flow-Through Fish Test; 3 days; Leuciscus idus; Flow-through system; Fresh water; Experimental value)
BCF other aquatic organisms 1	30 (BCF; 24 h; Chlorella sp.)
Log Pow	2.13 (Experimental value)
Bioaccumulative potential	Low potential for bioaccumulation (BCF < 500).

### 12.4. Mobility in soil

Benzene (71-43-2)	
Surface tension	0.029 N/m (20 °C)
Log Koc	Koc,134.1; QSAR

### 12.5. Results of PBT and vPvB assessment

No additional information available

### 12.6. Other adverse effects

No additional information available

## SECTION 13: Disposal considerations

### 13.1. Waste treatment methods






Product/Packaging disposal recommendations : Remove waste in accordance with local and/or national regulations. Hazardous waste shall not be mixed together with other waste. Different types of hazardous waste shall not be mixed together if this may entail a risk of pollution or create problems for the further management of the waste. Hazardous waste shall be managed responsibly. All entities that store, transport or handle hazardous waste shall take the necessary measures to prevent risks of pollution or damage to people or animals. Recycle by distillation. Incinerate under surveillance with energy recovery. Do not discharge into drains or the environment. Do not discharge into surface water (Directive 2000/60/EC, Council Decision 2455/2001/EC). Obtain the consent of pollution control authorities before discharging to wastewater treatment plants.

Additional information : LWCA (the Netherlands): KGA category 03. Hazardous waste according to Directive 2008/98/EC.

European List of Waste (LoW) code : 07 01 04\* - other organic solvents, washing liquids and mother liquors

## SECTION 14: Transport information

In accordance with ADR / RID / IMDG / IATA / ADN

ADR	IMDG	IATA	ADN	RID
<b>14.1. UN number</b>				
1114	1114	1114	1114	1114
<b>14.2. UN proper shipping name</b>				
BENZENE	BENZENE	Benzene	BENZENE	BENZENE
<b>Transport document description</b>				
UN 1114 BENZENE, 3, II, (D/E)	UN 1114 BENZENE, 3, II (-11°C c.c.)	UN 1114 Benzene, 3, II	UN 1114 BENZENE, 3, II	UN 1114 BENZENE, 3, II
<b>14.3. Transport hazard class(es)</b>				
3	3	3	3	3
				
<b>14.4. Packing group</b>				
II	II	II	II	II
<b>14.5. Environmental hazards</b>				
Dangerous for the environment : No	Dangerous for the environment : No Marine pollutant : No	Dangerous for the environment : No	Dangerous for the environment : No	Dangerous for the environment : No
No supplementary information available				

### 14.6. Special precautions for user

#### - Overland transport

Classification code (ADR) : F1

Limited quantities (ADR) : 1I

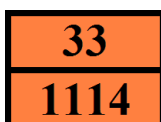
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Excepted quantities (ADR) : E2  
Packing instructions (ADR) : P001, IBC02, R001  
Mixed packing provisions (ADR) : MP19  
Portable tank and bulk container instructions (ADR) : T4  
Portable tank and bulk container special provisions (ADR) : TP1  
Tank code (ADR) : LGBF  
Vehicle for tank carriage : FL  
Transport category (ADR) : 2  
Special provisions for carriage - Operation (ADR) : S2, S20  
Hazard identification number (Kemler No.) : 33  
Orange plates :



Tunnel restriction code (ADR) : D/E  
EAC code : 3WE  
APP code : A(fl)

### - Transport by sea

Transport regulations (IMDG) : Subject  
Limited quantities (IMDG) : 1 L  
Excepted quantities (IMDG) : E2  
Packing instructions (IMDG) : P001  
IBC packing instructions (IMDG) : IBC02  
Tank instructions (IMDG) : T4  
Tank special provisions (IMDG) : TP1  
EmS-No. (Fire) : F-E  
EmS-No. (Spillage) : S-D  
Stowage category (IMDG) : B  
Stowage and handling (IMDG) : SW2  
Flash point (IMDG) : -11°C c.c.  
Properties and observations (IMDG) : Colourless liquid with a characteristic odour. Flashpoint: -11°C c.c. Explosive limits: 1.4% to 8% Freezing point 5°C, flashes below its freezing point. Immiscible with water. Narcotic. Exposure to this substance may produce serious chronic effects of a toxic nature.  
MFAG-No : 130

### - Air transport

Transport regulations (IATA) : Subject to the provisions  
PCA Excepted quantities (IATA) : E2  
PCA Limited quantities (IATA) : Y341  
PCA limited quantity max net quantity (IATA) : 1L  
PCA packing instructions (IATA) : 353  
PCA max net quantity (IATA) : 5L  
CAO packing instructions (IATA) : 364  
CAO max net quantity (IATA) : 60L  
ERG code (IATA) : 3H

### - Inland waterway transport

Classification code (ADN) : F1  
Limited quantities (ADN) : 1 L  
Excepted quantities (ADN) : E2  
Carriage permitted (ADN) : T  
Equipment required (ADN) : PP, EX, A  
Ventilation (ADN) : VE01  
Number of blue cones/lights (ADN) : 1

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### - Rail transport

Transport regulations (RID)	: Subject
Classification code (RID)	: F1
Limited quantities (RID)	: 1L
Excepted quantities (RID)	: E2
Packing instructions (RID)	: P001, IBC02, R001
Mixed packing provisions (RID)	: MP19
Portable tank and bulk container instructions (RID)	: T4
Portable tank and bulk container special provisions (RID)	: TP1
Tank codes for RID tanks (RID)	: LGBF
Transport category (RID)	: 2
Colis express (express parcels) (RID)	: CE7
Hazard identification number (RID)	: 33

### 14.7. Transport in bulk according to Annex II of Marpol and the IBC Code

Not applicable

## SECTION 15: Regulatory information

### 15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

#### 15.1.1. EU-Regulations

No REACH Annex XVII restrictions  
Benzene is not on the REACH Candidate List  
Benzene is not on the REACH Annex XIV List

VOC content : 100 %

#### 15.1.2. National regulations

##### Germany

VwVwS Annex reference : Water hazard class (WGK) 3, severe hazard to waters (Classification according to VwVwS, Annex 1 or 2; ID No. 29)

WGK remark : Classification water polluting in compliance with Verwaltungsvorschrift wassergefährdender Stoffe (VwVwS) of 27 July 2005 (Anhang 2)

12th Ordinance Implementing the Federal Immission Control Act - 12.BImSchV : Is not subject of the 12. BImSchV (Hazardous Incident Ordinance)

##### Netherlands

Waterbezwaarlijkheid : 1 - Black list substance

SZW-lijst van kankerverwekkende stoffen : Benzene is listed

SZW-lijst van mutagene stoffen : Benzene is listed

NIET-limitatieve lijst van voor de voortplanting giftige stoffen – Borstvoeding : The substance is not listed

NIET-limitatieve lijst van voor de voortplanting giftige stoffen – Vruchtbaarheid : The substance is not listed

NIET-limitatieve lijst van voor de voortplanting giftige stoffen – Ontwikkeling : The substance is not listed

##### Denmark

Classification remarks : Emergency management guidelines for the storage of flammable liquids must be followed

Recommendations Danish Regulation : Young people below the age of 18 years are not allowed to use the product  
Pregnant/breastfeeding women working with the product must not be in direct contact with the product  
The requirements from the Danish Working Environment Authorities regarding work with carcinogens must be followed during use and disposal

### 15.2. Chemical safety assessment

No additional information available

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### SECTION 16: Other information

Abbreviations and acronyms:

ADN	European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways
ADR	European Agreement concerning the International Carriage of Dangerous Goods by Road
ATE	Acute Toxicity Estimate
BCF	Bioconcentration factor
CLP	Classification Labelling Packaging Regulation; Regulation (EC) No 1272/2008
EC50	Median effective concentration
IARC	International Agency for Research on Cancer
IATA	International Air Transport Association
IMDG	International Maritime Dangerous Goods
LC50	Median lethal concentration
LD50	Median lethal dose
PBT	Persistent Bioaccumulative Toxic
REACH	Registration, Evaluation, Authorisation and Restriction of Chemicals Regulation (EC) No 1907/2006
RID	Regulations concerning the International Carriage of Dangerous Goods by Rail
SDS	Safety Data Sheet
vPvB	Very Persistent and Very Bioaccumulative

Data sources : REGULATION (EC) No 1272/2008 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006.

Full text of H- and EUH-statements:	
Asp. Tox. 1	Aspiration hazard, Category 1
Carc. 1A	Carcinogenicity, Category 1A
Eye Irrit. 2	Serious eye damage/eye irritation, Category 2
Flam. Liq. 2	Flammable liquids, Category 2
Muta. 1B	Germ cell mutagenicity, Category 1B
Skin Irrit. 2	Skin corrosion/irritation, Category 2
STOT RE 1	Specific target organ toxicity — Repeated exposure, Category 1
H225	Highly flammable liquid and vapour
H304	May be fatal if swallowed and enters airways
H315	Causes skin irritation
H319	Causes serious eye irritation
H340	May cause genetic defects
H350	May cause cancer
H372	Causes damage to organs through prolonged or repeated exposure
H412	Harmful to aquatic life with long lasting effects

SDS ISOLAB

*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*