We create chemistry

Safety data sheet

BASF Safety data sheet according to Regulation UK SI 2019/758 and UK SI 2020/1577 as amended from time to time.
Date / Revised: 13.03.2026 Version: 5.0
Date / Previous version: 28.08.2023 Previous version: 4.0
Product: **ETHYLBENZENE**

(ID no. 30054550/SDS_GEN_GB/EN)
Date of print 01.06.2026

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

1.1. Product identifier

ETHYLBENZENE

Chemical name: Benzene, ethyl-
CAS Number: 100-41-4

REACH registration number: 01-2119489370-35-0009, 01-2119489370-35-0002, 01-2119489370-35-0004, 01-2119489370-35-0005, 01-2119489370-35-0037, 01-2119489370-35-0006

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

Recommended use: Monomer for manufacturing of polymers

For the detailed identified uses of the product see appendix of the safety data sheet.

1.3. Details of the supplier of the safety data sheet

Company:
BASF SE
67056 Ludwigshafen
GERMANY

Contact address:
BASF plc
4th and 5th Floors, 2 Stockport Exchange
Railway Road, Stockport, SK1 3GG
UNITED KINGDOM

Telephone: +44 161 475 3000
E-mail address: product-safety-uk-and-ireland@basf.com

1.4. Emergency telephone number

International emergency number:
Telephone: +49 180 2273-112

SECTION 2: Hazards Identification

2.1. Classification of the substance or mixture

According to GB-CLP Regulations UK SI 2019/720 and UK SI 2020/1567

Asp. Tox. 1	H304 May be fatal if swallowed and enters airways.
Flam. Liq. 2	H225 Highly flammable liquid and vapour.
Acute Tox. 4 (Inhalation - vapour)	H332 Harmful if inhaled.
STOT RE 2	H373 May cause damage to organs (Auditory organ) through prolonged or repeated exposure.
Aquatic Chronic 3	H412 Harmful to aquatic life with long lasting effects.

For the classifications not written out in full in this section the full text can be found in section 16.

2.2. Label elements

According to GB-CLP Regulations UK SI 2019/720 and UK SI 2020/1567

Pictogram:

Signal Word:
Danger

Hazard Statement:

H225	Highly flammable liquid and vapour.
H332	Harmful if inhaled.
H304	May be fatal if swallowed and enters airways.
H373	May cause damage to organs (Auditory organ) through prolonged or repeated exposure.
H412	Harmful to aquatic life with long lasting effects.

Precautionary Statements (Prevention):

P271	Use only outdoors or in a well-ventilated area.
P210	Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P280	Wear protective gloves and eye protection or face protection.
P243	Take action to prevent static discharges.
P260	Do not breathe dust/gas/mist/vapours.
P273	Avoid release to the environment.
P241	Use explosion-proof electrical, ventilating and lighting equipment.
P233	Keep container tightly closed.
P240	Ground and bond container and receiving equipment.
P242	Use non-sparking tools.

Precautionary Statements (Response):

P312	Call a POISON CENTER or physician if you feel unwell.
P304 + P340	IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P303 + P361 + P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower.
P314	Get medical advice/attention if you feel unwell.
P301 + P310	IF SWALLOWED: Immediately call a POISON CENTER or physician.
P331	Do NOT induce vomiting.
P370 + P378	In case of fire: Use water spray, dry powder, foam or carbon dioxide for extinction.

Precautionary Statements (Storage):

P405	Store locked up.
P403 + P235	Store in a well-ventilated place. Keep cool.

Precautionary Statements (Disposal):

P501	Dispose of contents and container to hazardous or special waste collection point.

Hazard determining component(s) for labelling: ethylbenzene, toluene, benzene

2.3. Other hazards

According to GB-CLP Regulations UK SI 2019/720 and UK SI 2020/1567

See section 12 - Results of PBT and vPvB assessment.

Product does not contain a substance above legal limits included in the list established in accordance with Article 59(1) of Regulation (EC) No 1907/2006 for having endocrine disrupting properties or is identified to have endocrine disrupting properties in accordance with the criteria set out in Commission Delegated Regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605.

SECTION 3: Composition/Information on Ingredients

3.1. Substances

Chemical nature

ethylbenzene (Content (W/W): 100 %)
CAS Number: 100-41-4
EC-Number: 202-849-4
INDEX-Number: 601-023-00-4

Hazardous ingredients (GHS)

ethylbenzene

Content (W/W): > 0 % - <= 100 %	Asp. Tox. 1
CAS Number: 100-41-4	Flam. Liq. 2
EC-Number: 202-849-4	Acute Tox. 4 (Inhalation - vapour)
INDEX-Number: 601-023-00-4	STOT RE (Auditory organ) 2
	Aquatic Chronic 3
	H225, H332, H304, H373, H412

toluene

Content (W/W): > 0 % - < 1 %	Asp. Tox. 1
CAS Number: 108-88-3	Flam. Liq. 2
EC-Number: 203-625-9	STOT RE (Central nervous system) 2
INDEX-Number: 601-021-00-3	Skin Irrit. 2
	STOT SE 3 (drowsiness and dizziness)
	Repr. 2 (unborn child)
	Aquatic Chronic 3
	H225, H315, H304, H336, H361d, H373, H412

benzene

Content (W/W): > 0 % - < 0.2 %	Asp. Tox. 1
CAS Number: 71-43-2	Flam. Liq. 2
EC-Number: 200-753-7	Skin Irrit. 2
INDEX-Number: 601-020-00-8	Eye Irrit. 2
	Muta. 1B
	Carc. 1A
	Aquatic Chronic 3
	STOT RE (Blood) 1
	H225, H319, H315, H304, H350, H340, H372, H412

For the classifications not written out in full in this section, including the hazard classes and the hazard statements, the full text is listed in section 16.

3.2. Mixtures

Not applicable

SECTION 4: First-Aid Measures

4.1. Description of first aid measures

First aid personnel should pay attention to their own safety. If the patient is likely to become unconscious, place and transport in stable sideways position (recovery position). Immediately remove contaminated clothing.

If inhaled:
Keep patient calm, remove to fresh air, seek medical attention.

On skin contact:
Immediately wash thoroughly with soap and water, seek medical attention.

On contact with eyes:
Wash affected eyes for at least 15 minutes under running water with eyelids held open.

On ingestion:
Immediately rinse mouth and then drink 200-300 ml of water, seek medical attention.

4.2. Most important symptoms and effects, both acute and delayed
Symptoms: Information, i.e. additional information on symptoms and effects may be included in the GHS labeling phrases available in Section 2 and in the Toxicological assessments available in Section 11.

Hazards: Information, i.e. additional information on symptoms and effects may be included in the GHS labeling phrases available in Section 2 and in the Toxicological assessments available in Section 11. (Further) symptoms and / or effects are not known so far

4.3. Indication of any immediate medical attention and special treatment needed
Treatment: Treat according to symptoms (decontamination, vital functions), no known specific antidote.

SECTION 5: Fire-Fighting Measures

5.1. Extinguishing media
Suitable extinguishing media:
water spray, dry powder, foam, carbon dioxide

Unsuitable extinguishing media for safety reasons:
No data available.

5.2. Special hazards arising from the substance or mixture
Advice: Highly flammable. Cool endangered containers with water-spray. See SDS section 7 - Handling and storage.

5.3. Advice for fire-fighters
Special protective equipment:
Wear a self-contained breathing apparatus. Special protective equipment for firefighters

Further information:
Evacuate area of all unnecessary personnel. Fight fire from maximum distance.

Extend fire extinguishing measures to the surroundings. Dispose of fire debris and contaminated extinguishing water in accordance with official regulations.

SECTION 6: Accidental Release Measures

High risk of slipping due to leakage/spillage of product.

Release of substance/product can cause fire or explosion. Shut off or stop source of leak. Shut off or stop released substance/product under safe conditions.

Pack in tightly closed containers for disposal.

6.1. Personal precautions, protective equipment and emergency procedures

Handle in accordance with good industrial hygiene and safety practice.

Avoid all sources of ignition: heat, sparks, open flame. Use antistatic tools.

6.2. Environmental precautions

Discharge into the environment must be avoided.

6.3. Methods and material for containment and cleaning up

Pick up with suitable appliance and dispose of. Spills should be contained, solidified, and placed in suitable containers for disposal. Dispose of absorbed material in accordance with regulations.

6.4. Reference to other sections

Information regarding exposure controls/personal protection and disposal considerations can be found in section 8 and 13.

SECTION 7: Handling and Storage

7.1. Precautions for safe handling

Handle in accordance with good industrial hygiene and safety practice.

Protection against fire and explosion:
Avoid all sources of ignition: heat, sparks, open flame. Ground all transfer equipment properly to prevent electrostatic discharge.

7.2. Conditions for safe storage, including any incompatibilities

Storage stability:
May be kept indefinitely if stored properly.

7.3. Specific end use(s)

See exposure scenario(s) in the attachment to this safety data sheet.

SECTION 8: Exposure Controls/Personal Protection

8.1. Control parameters

Components with occupational exposure limits

Observe the appropriate occupational exposure limit.

100-41-4: ethylbenzene (Content (W/W): 100 %)
Skin Designation (WEL/EH 40 (UK))
The substance can be absorbed through the skin.
TWA value 441 mg/m3 ; 100 ppm (WEL/EH 40 (UK))
STEL value 552 mg/m3 ; 125 ppm (WEL/EH 40 (UK))
Ceiling limit value/factor: 15 min
TWA value 442 mg/m3 ; 100 ppm (OEL (EU))
indicative
STEL value 884 mg/m3 ; 200 ppm (OEL (EU))
indicative
Skin Designation (OEL (EU))
The substance can be absorbed through the skin.

PNEC
freshwater: 0.1 mg/l

marine water: 0.01 mg/l

intermittent release: 0.1 mg/l

sediment (freshwater): 13.7 mg/kg

soil: 2.68 mg/kg

STP: 9.6 mg/l

oral (secondary poisoning): 0.02 mg/kg

DNEL
worker:
Short-term exposure - local effects, Inhalation: 293 mg/m3

worker:
Long-term exposure- systemic effects, Inhalation: 77 mg/m3, 17.73 ppm

worker:
Long-term exposure- systemic effects, dermal: 180 mg/kg

consumer:
Long-term exposure- systemic effects, Inhalation: 15 mg/m3

consumer:
Long-term exposure- systemic effects, oral: 1.6 mg/kg

8.2. Exposure controls

Personal protective equipment

Respiratory protection:
Gas filter for gases/vapours of organic compounds (boiling point >65 °C, e. g. EN 14387 Type A)

Hand protection:
Suitable materials also with prolonged, direct contact (Recommended: Protective index 6, corresponding > 480 minutes of permeation time according to EN ISO 374-1):
fluoroelastomer (FKM) - 0.7 mm coating thickness
Manufacturer's directions for use should be observed because of great diversity of types.

Eye protection:
Safety glasses with side-shields (frame goggles) (e.g. EN 166)

Body protection:
Body protection must be chosen depending on activity and possible exposure, e.g. apron, protecting boots, chemical-protection suit (according to EN 14605 in case of splashes or EN ISO 13982 in case of dust)., Low flammability, oil resistant protective clothing (e.g. in accordance with EN 465), protection boots (f.e. according to EN 20346), antistatic

General safety and hygiene measures
Avoid contact with the skin, eyes and clothing. Avoid inhalation of vapour. Keep away from food, drink and animal feeding stuffs. At the end of the shift the skin should be cleaned and skin-care agents applied.

Environmental exposure controls
All appropriate measures must be taken to prevent the release of this product to the environment and to limit the dispersion of any release when it occurs. Suitable risk management measures should be in place.

SECTION 9: Physical and Chemical Properties

9.1. Information on basic physical and chemical properties

Form:	liquid	
Colour:	colourless, clear	
Odour:	aromatic	
Odour threshold:	not determined	
pH value:	not applicable	
Melting point:	-94.9 °C (1,013 hPa) Literature data.	
Boiling point:	136.1 °C (1,013.3 hPa)	(measured)
Flash point:	23 °C	(Directive 92/69/EEC, A.9, closed cup)
Flammability:	Highly flammable.	(derived from flash - and boiling point)

Lower explosion limit:		
	For liquids not relevant for classification and labelling., The lower explosion point may be 5 - 15 °C below the flash point.	
Upper explosion limit:		
	For liquids not relevant for classification and labelling.	
Ignition temperature:	430 °C Literature data.	
Vapour pressure:	9.52 hPa (20 °C) dynamic	(OECD Guideline 104)
Density:	0.86 - 0.87 g/cm3 (20 °C) Literature data.	
Relative density:	0.86 - 0.87 (20 °C) Literature data.	
Relative vapour density (air):	3.66 (20 °C) Heavier than air.	(calculated)
Solubility in water:	0.2 g/l (25 °C)	(Directive 84/449/EEC, A.6)
Partitioning coefficient n-octanol/water (log Kow):	3.6 (20 °C; pH value: 7.8)	(Directive 92/69/EEC, A.8)
Self ignition:	Based on its structural properties the product is not classified as self-igniting.	Test type: Spontaneous self-ignition at room-temperature.
Thermal decomposition:	No data available.	
Viscosity, dynamic:	0.671 mPa.s (20 °C) The value was determined by calculation from the detected kinematic viscosity.	(OECD Guideline 114)
Viscosity, kinematic:	0.773 mm2/s (20 °C)	(OECD Guideline 114)
	0.641 mm2/s (40 °C)	(OECD Guideline 114)
Explosion hazard:	Based on the chemical structure there is no indication of explosive properties.	
Fire promoting properties:	Based on its structural properties the product is not classified as oxidizing.	

9.2. Other information

Self heating ability:	not applicable, the product is a liquid	
pKA:	The substance does not dissociate.	
Adsorption/water - soil:	KOC: 518; log KOC: 2.71	(calculated)
Surface tension:	71.2 mN/m (23 °C; 0.0582 g/l)	(Directive 92/69/EEC, A.5)
Grain size distribution:	The substance / product is marketed or used in a non solid or granular form.	
Molar mass:	106.17 g/mol	

SECTION 10: Stability and Reactivity

10.1. Reactivity
When heated can give off ignitable vapours.

Corrosion to metals:	Corrosive effects to metal are not anticipated.	
Formation of flammable gases:	Remarks:	Forms no flammable gases in the presence of water.

10.2. Chemical stability
The product is stable if stored and handled as prescribed/indicated.

10.3. Possibility of hazardous reactions
No hazardous reactions if stored and handled as prescribed/indicated.

10.4. Conditions to avoid
Avoid all sources of ignition: heat, sparks, open flame.

10.5. Incompatible materials

Substances to avoid:
inorganic acids, Friedel-Crafts catalysts

10.6. Hazardous decomposition products

No hazardous decomposition products if stored and handled as prescribed/indicated.

SECTION 11: Toxicological Information

11.1. Information on toxicological effects

Acute toxicity

Assessment of acute toxicity:
Of moderate toxicity after short-term inhalation. Virtually nontoxic after a single skin contact. Of low toxicity after single ingestion.

Experimental/calculated data:
LD50 rat (oral): 3,500 mg/kg
Literature data.

LC50 rat (by inhalation): 17.2 mg/l 4 h
Literature data. The vapour was tested.

LD50 rabbit (dermal): 15,354 mg/kg
Literature data.

Irritation

Assessment of irritating effects:
May cause slight irritation to the skin. May cause slight irritation to the eyes.

Experimental/calculated data:
Skin corrosion/irritation
rabbit: non-irritant
Literature data.

Serious eye damage/irritation
rabbit: Irritant.

Respiratory/Skin sensitization

Assessment of sensitization:
The substance did not cause skin sensitization in humans.

Experimental/calculated data:
Patch-Test human: Non-sensitizing. (Human patch test)
Literature data.

Germ cell mutagenicity

Assessment of mutagenicity:
Most of the results from the available studies show no evidence of a mutagenic effect.

Carcinogenicity

Assessment of carcinogenicity:
Indication of possible carcinogenic effect in animal tests. The effect is caused by an animal specific mechanism that has no human counter part. A clear indication of an increased risk of cancer in humans has so far not been shown. IARC (International Agency for Research on Cancer) has classified this substance as group 2B (The agent is possibly carcinogenic to humans).

Reproductive toxicity

Assessment of reproduction toxicity:
The results of animal studies gave no indication of a fertility impairing effect. Repeated oral uptake of the substance did not cause damage to the reproductive organs.

Developmental toxicity

Assessment of teratogenicity:
No indications of a developmental toxic / teratogenic effect were seen in animal studies.

Specific target organ toxicity (single exposure)

Assessment of STOT single:
Causes temporary irritation of the respiratory tract.

Repeated dose toxicity and Specific target organ toxicity (repeated exposure)

Assessment of repeated dose toxicity:
The substance may cause damage to the liver after repeated ingestion of high doses, as shown in animal studies. The substance may cause deafness after repeated inhalation. The substance may cause deafness after repeated ingestion.

Aspiration hazard

May also damage the lung at swallowing (aspiration hazard).

SECTION 12: Ecological Information

12.1. Toxicity

Assessment of aquatic toxicity:
Acutely toxic for aquatic organisms. Depending on local conditions and existing concentrations, disturbances in the biodegradation process of activated sludge are possible.

Toxicity to fish:
LC50 (96 h) 4.2 mg/l, Oncorhynchus mykiss (OECD Guideline 203, semistatic)
Literature data.

Aquatic invertebrates:
EC50 (48 h) 1.8 - 2.4 mg/l, Daphnia magna (Daphnia test acute, static)
Literature data.

Aquatic plants:

EC50 (72 h) 5.4 mg/l (growth rate), Selenastrum capricornutum (Algal growth inhibition test, static)
The statement of the toxic effect relates to the analytically determined concentration.

No observed effect concentration (96 h) 3.4 mg/l (growth rate), Selenastrum capricornutum (OECD Guideline 201, static)
The statement of the toxic effect relates to the analytically determined concentration.

Microorganisms/Effect on activated sludge:
EC50 (24 h) 96 mg/l, Nitrosomonas sp. (Inhibition of nitrification, aquatic)
Literature data.

Chronic toxicity to fish:
Study scientifically not justified.

Chronic toxicity to aquatic invertebrates:
No observed effect concentration (7 d) 1 mg/l, Ceriodaphnia dubia (semistatic)
Literature data.

Assessment of terrestrial toxicity:
Toxic effects have been observed in studies with soil living organisms.

Soil living organisms:
LC50 (48 h) 0,047 mg/cm2, Eisenia foetida (OECD Guideline 207, filter paper)
Literature data.

Terrestrial plants:
No data available.

Other terrestrial non-mammals:
No data available.

12.2. Persistence and degradability

Assessment biodegradation and elimination (H2O):
Readily biodegradable (according to OECD criteria).

Elimination information:
70 - 80 % TIC of the ThIC (28 d) (ISO 14593) (aerobic, activated sludge) Readily biodegradable (according to OECD criteria).

Assessment of stability in water:
According to structural properties, hydrolysis is not expected/probable.
Study scientifically not justified.

12.3. Bioaccumulative potential

Assessment bioaccumulation potential:
Does not significantly accumulate in organisms.

Bioaccumulation potential:

Bioconcentration factor (BCF): 1 (42 d), Oncorhynchus kisutch (other)

Literature data.

12.4. Mobility in soil

Assessment transport between environmental compartments:
Volatility: The substance will rapidly evaporate into the atmosphere from the water surface.
Adsorption in soil: Adsorption to solid soil phase is not expected.

12.5. Results of PBT and vPvB assessment

According to Annex XIII of Regulation (EC) No.1907/2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH): The product does not fulfill the criteria for PBT (Persistent/bioaccumulative/toxic) and vPvB (very persistent/very bioaccumulative). Self classification

12.6. Other adverse effects

No indications of other environmental hazards have been identified.

SECTION 13: Disposal Considerations

13.1. Waste treatment methods

Dispose of in accordance with national, state and local regulations.

The UK Environmental Protection (Duty of Care) Regulations (EP) and amendments should be noted (United Kingdom).
This product and any uncleaned containers must be disposed of as hazardous waste in accordance with the 2005 Hazardous Waste Regulations and amendments (United Kingdom)

Contaminated packaging:
Disposal must be made according to official regulations.

SECTION 14: Transport Information

Land transport

ADR

UN number or ID number:	UN1175
UN proper shipping name:	ETHYLBENZENE
Transport hazard class(es):	3
Packing group:	II
Environmental hazards:	no
Special precautions for user:	Tunnel code: D/E

RID

UN number or ID number:	UN1175
UN proper shipping name:	ETHYLBENZENE
Transport hazard class(es):	3
Packing group:	II
Environmental hazards:	no
Special precautions for user:	None known

Inland waterway transport

ADN

UN number or ID number:	UN1175
UN proper shipping name:	ETHYLBENZENE
Transport hazard class(es):	3
Packing group:	II
Environmental hazards:	no
Special precautions for user:	None known

Transport in inland waterway vessel

UN number or ID number:	UN1175
UN proper shipping name:	ETHYLBENZENE
Transport hazard class(es):	3, N3
Packing group:	II
Environmental hazards:	yes
Type of inland waterway vessel:	N
Cargo tank design:	2
Cargo tank type:	2

Sea transport

IMDG

UN number or ID number:	UN 1175
UN proper shipping name:	ETHYLBENZENE
Transport hazard class(es):	3
Packing group:	II
Environmental hazards:	no Marine pollutant: NO
Special precautions for user:	

Air transport

IATA/ICAO

UN number or ID number:	UN 1175
UN proper shipping name:	ETHYLBENZENE
Transport hazard class(es):	3
Packing group:	II
Environmental hazards:	No Mark as dangerous for the environment is needed
Special precautions for user:	None known

14.1. UN number or ID number
See corresponding entries for “UN number or ID number” for the respective regulations in the tables above.

14.2. UN proper shipping name
See corresponding entries for “UN proper shipping name” for the respective regulations in the tables above.

14.3. Transport hazard class(es)
See corresponding entries for “Transport hazard class(es)” for the respective regulations in the tables above.

14.4. Packing group
See corresponding entries for “Packing group” for the respective regulations in the tables above.

14.5. Environmental hazards
See corresponding entries for “Environmental hazards” for the respective regulations in the tables above.

14.6. Special precautions for user
See corresponding entries for “Special precautions for user” for the respective regulations in the tables above.

14.7. Maritime transport in bulk according to IMO instruments

Regulation:	IBC-Code
Product name:	Ethylbenzene
Pollution category:	Y
Ship Type:	2

Further information
This product is subject to the most recent edition of "The Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations" and their amendments (United Kingdom).

SECTION 15: Regulatory Information

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

Prohibitions, Restrictions and Authorizations

UK REACH SI, Annex XVII, Marketing and Use Restrictions
Number on List: 3
Concentration limit: 0.1 %

UK REACH SI, Annex XVII, Marketing and Use Restrictions
Number on List: 40
Concentration limit: 0.1 %

Directive 2012/18/EU - Control of Major Accident Hazards involving dangerous substances (EU):
List entry in regulation: P5b

If other regulatory information applies that is not already provided elsewhere in this safety data sheet, then it is described in this subsection.

The data should be considered when making any assessment under the Control of Substances Hazardous to Health Regulations (COSHH), and related guidance, for example, 'COSHH Essentials' (United Kingdom).
This product may be subject to the Control of Major Accident Hazards Regulations (COMAH), and amendments if specific threshold tonnages are exceeded (United Kingdom).

15.2. Chemical Safety Assessment

Chemical Safety Assessment performed

SECTION 16: Other Information

Assessment of the hazard classes according to UN GHS criteria (most recent version)

Aquatic Acute 2
Flam. Liq. 2
Acute Tox. 4 (Inhalation - vapour)
Acute Tox. 5 (oral)
STOT RE (Auditory organ) 2
Asp. Tox. 1
Aquatic Chronic 3

Full text of the classifications, including the hazard classes and the hazard statements, if mentioned in section 2 or 3:

Asp. Tox.	Aspiration hazard
Flam. Liq.	Flammable liquids
Acute Tox.	Acute toxicity
STOT RE	Specific target organ toxicity — repeated exposure
Aquatic Chronic	Hazardous to the aquatic environment - chronic
Skin Irrit.	Skin irritation
STOT SE	Specific target organ toxicity — single exposure
Repr.	Reproductive toxicity
Eye Irrit.	Eye irritation
Muta.	Germ cell mutagenicity
Carc.	Carcinogenicity
H225	Highly flammable liquid and vapour.
H332	Harmful if inhaled.
H304	May be fatal if swallowed and enters airways.
H373	May cause damage to organs (Auditory organ) through prolonged or repeated exposure.
H412	Harmful to aquatic life with long lasting effects.
H315	Causes skin irritation.
H336	May cause drowsiness or dizziness.
H361d	Suspected of damaging the unborn child.
H319	Causes serious eye irritation.
H350	May cause cancer.
H340	May cause genetic defects.
H372	Causes damage to organs (Blood) through prolonged or repeated exposure.

Abbreviations

ADR = The European Agreement concerning the International Carriage of Dangerous Goods by Road. ADN = The European Agreement concerning the International Carriage of Dangerous Goods by Inland waterways. ATE = Acute Toxicity Estimates. CAO = Cargo Aircraft Only. CAS = Chemical Abstract Service. CLP = Classification, Labelling and Packaging of substances and mixtures. DIN = German national organization for standardization. DNEL = Derived No Effect Level. EC50 = Effective concentration median for 50% of the population. EC = European Community. EN = European Standards. IARC = International Agency for Research on Cancer. IATA = International Air Transport Association. IBC-Code = Intermediate Bulk Container code. IMDG = International Maritime Dangerous Goods Code. ISO = International Organization for Standardization. STEL = Short-Term Exposure Limit. LC50 = Lethal concentration median for 50% of the population. LD50 = Lethal dose median for 50% of the population. TLV = Threshold Limit Value. MARPOL = The International Convention for the Prevention of Pollution from Ships. NEN = Dutch Norm. NOEC = No Observed Effect Concentration. OEL = Occupational Exposure Limit. OECD = Organization for Economic Cooperation and Development. PBT = Persistent, Bioaccumulative and Toxic. PMT = Persistent, Mobile and Toxic. PNEC = Predicted No Effect Level. PPM = Parts per million. RID = The European Agreement concerning the International Carriage of Dangerous Goods by Rail. TWA = Time Weight Average. UN-number = UN number at transport. vPvB = very Persistent and very Bioaccumulative. vPvM = very Persistent and very Mobile.

The data contained in this safety data sheet are based on our current knowledge and experience and describe the product only with regard to safety requirements. This safety data sheet is neither a Certificate of Analysis (CoA) nor technical data sheet and shall not be mistaken for a specification agreement. Identified uses in this safety data sheet do neither represent an agreement on the

corresponding contractual quality of the substance/mixture nor a contractually designated use. It is the responsibility of the recipient of the product to ensure any proprietary rights and existing laws and legislation are observed.

Vertical lines in the left hand margin indicate an amendment from the previous version.

Annex: Exposure Scenarios

Index

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1. Short title of exposure scenario

Manufacture of substance
IS; ERC1; PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC15

Control of exposure and risk management measures

Contributing exposure scenario	
Use descriptors covered	ESVOC SpERC 1.1.v1: ESVOC SpERC 1.1.v1
Operational conditions	
Annual amount per site	1,220 kt
Minimum emission days per year	350
Emission factor air	0.1 %
Emission factor water	0.002 %
Emission factor soil	0.01 %
Receive Surf. Water (Flow Rate).	18,000 m3/d
Dilution factor river	10
Dilution factor coast	100
Risk Management Measures	
Air treatment measures considered suitable are, e.g.	Adsorption
Wastewater treatment measures considered suitable are, e.g.	Acclimated biological treatment
Soil treatment measures considered suitable are, e.g.	No application of sludge to soil
Type of STP	Municipal STP

Assumed sewage treatment plant flow (m3/d)	2,000 m3/d
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Environment
Risk Characterization Ratio (RCR)	0.234104
	Risk from environmental exposure is driven by freshwater.
Maximum amount of safe use	1,489 t/d
Risk from environmental exposure is driven by freshwater.	

Contributing exposure scenario	
Use descriptors covered	PROC1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions. Use domain: industrial
Operational conditions	
Concentration of the substance	ethylbenzene Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance during use	10000 Pa
Process temperature	70 °C
	Corresponds to a vapour pressure > 5.0 hPa ≤ 100.0 hPa.
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Ensure doors and windows are opened (general ventilation).	
In case of potential exposure:, Use suitable chemically resistant gloves., Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	0.0343 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.00019
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	0.0442 mg/m³
Risk Characterization Ratio (RCR)	0.000574
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra	

Contributing exposure scenario	
Use descriptors covered	PROC2: Chemical production or refinery in closed continuous process with occasional controlled exposure or

	processes with equivalent containment conditions Use domain: industrial
Operational conditions	
Concentration of the substance	ethylbenzene Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance during use	10001 Pa
Process temperature	70 °C
	Corresponds to a vapour pressure > 100.0 hPa
Duration and Frequency of activity	60 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Provide extract ventilation to points where emissions occur (LEV).	
Reduce duration of activity to less than 60 min, Alternatively:, Wear a respirator conforming to EN140 with Type A/P2 filter or better, In case of potential exposure:, Use suitable chemically resistant gloves., Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	0.2743 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.001524
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	22.1177 mg/m³
Risk Characterization Ratio (RCR)	0.287243
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra	

Contributing exposure scenario	
Use descriptors covered	PROC3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition Use domain: industrial
Operational conditions	
Concentration of the substance	ethylbenzene Content: >= 0 % - <= 100 %
Physical state	liquid

Vapour pressure of the substance during use	10001 Pa
Process temperature	70 °C
	Corresponds to a vapour pressure > 100.0 hPa
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 90 %
Handle substance within closed system. Provide extract ventilation to points where emissions occur (LEV). Ensure samples are obtained under containment or extract ventilation.	
In case of potential exposure:, Use suitable chemically resistant gloves., Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker, Reduction factor for local exhaust ventilation (LEV) has been used for the calculation of dermal exposure estimates.
	Worker - dermal, long-term - systemic
Exposure estimate	0.0686 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.000381
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	22.1177 mg/m³
Risk Characterization Ratio (RCR)	0.287243
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra	

Contributing exposure scenario	
Use descriptors covered	PROC4: Chemical production where opportunity for exposure arises Use domain: industrial
Operational conditions	
Concentration of the substance	ethylbenzene Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance during use	10001 Pa
Process temperature	70 °C
	Corresponds to a vapour pressure > 100.0 hPa
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor

Risk Management Measures	
Local exhaust ventilation	Effectiveness: 90 %
Provide extract ventilation to points where emissions occur (LEV). Ensure samples are obtained under containment or extract ventilation. Ensure material transfers are under containment or extract ventilation	
Use suitable chemically resistant gloves., Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker, Reduction factor for local exhaust ventilation (LEV) has been used for the calculation of dermal exposure estimates.
	Worker - dermal, long-term - systemic
Exposure estimate	0.6857 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.00381
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	44.2354 mg/m³
Risk Characterization Ratio (RCR)	0.574486
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra	

Contributing exposure scenario	
Use descriptors covered	PROC8a: Transfer of substance or mixture (charging and discharging) at non-dedicated facilities Use domain: industrial
Operational conditions	
Concentration of the substance	ethylbenzene Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance during use	10001 Pa
Process temperature	70 °C
	Corresponds to a vapour pressure > 100.0 hPa
Duration and Frequency of activity	60 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Drain down and flush system prior to equipment break-in or maintenance.	
Transfer via enclosed lines Clear transfer lines prior to de-coupling Retain drain downs in sealed storage pending disposal or for subsequent recycle.	

Use suitable chemically resistant gloves., Use suitable eye protection., Reduce duration of activity to less than 60 min, Alternatively:, Wear a respirator conforming to EN140 with Type A/P2 filter or better	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	2.7429 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.015238
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, worker, modified version
	Worker - inhalation, long-term - systemic
Exposure estimate	44.2354 mg/m³
Risk Characterization Ratio (RCR)	0.574486
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

Contributing exposure scenario	
Use descriptors covered	PROC8b: Transfer of substance or mixture (charging and discharging) at dedicated facilities Use domain: industrial
Operational conditions	
Concentration of the substance	ethylbenzene Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance during use	952 Pa
Process temperature	20 °C
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 95 %
Provide basic employee training to prevent/minimize exposures.	
Provide extract ventilation to points where emissions occur (LEV). Use bulk or semi-bulk handling systems.	
In case of potential exposure:, Use suitable chemically resistant gloves., Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic

Exposure estimate	1.3714 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.007619
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	5.5294 mg/m³
Risk Characterization Ratio (RCR)	0.071811
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra	

Contributing exposure scenario	
Use descriptors covered	PROC8b: Transfer of substance or mixture (charging and discharging) at dedicated facilities Use domain: industrial
Operational conditions	
Concentration of the substance	ethylbenzene Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance during use	952 Pa
Process temperature	20 °C
Duration and Frequency of activity	60 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Use bulk or semi-bulk handling systems.	
Reduce duration of activity to less than 60 min, Alternatively:, Wear a respirator conforming to EN140 with Type A/P2 filter or better, In case of potential exposure:, Use suitable chemically resistant gloves., Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	2.7429 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.015238
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	22.1177 mg/m³
Risk Characterization Ratio (RCR)	0.287243
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra	

Contributing exposure scenario	
Use descriptors covered	PROC8b: Transfer of substance or mixture (charging and

	discharging) at dedicated facilities Use domain: industrial
Operational conditions	
Concentration of the substance	ethylbenzene Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance during use	952 Pa
Process temperature	20 °C
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Provide basic employee training to prevent/minimize exposures.	
Use bulk or semi-bulk handling systems. Use dry break couplings for material transfer Ensure material transfers are under containment or extract ventilation	
In case of potential exposure:, Use suitable chemically resistant gloves., Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	13.7143 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.07619
Assessment method	EASY TRA v4.1, Workplace measurements
	Worker - inhalation, long-term - systemic
Exposure estimate	36 mg/m³
Risk Characterization Ratio (RCR)	0.467532
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra	

Contributing exposure scenario	
Use descriptors covered	PROC15: Use a laboratory reagent. Use domain: industrial
Operational conditions	
Concentration of the substance	ethylbenzene Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance during use	952 Pa
Process temperature	20 °C

Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Handle in a fume cupboard or under extract ventilation	
In case of potential exposure:, Use suitable chemically resistant gloves., Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	0.3429 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.001905
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	44.2354 mg/m³
Risk Characterization Ratio (RCR)	0.574486
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra	

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2. Short title of exposure scenario

Formulation
IS; ERC2; PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC9, PROC15

Control of exposure and risk management measures

Contributing exposure scenario	
Use descriptors covered	ESVOC SpERC 2.2.v1: ESVOC SpERC 2.2.v1
Operational conditions	
Annual amount used in the EU	840,000 kg
Minimum emission days per year	300
Emission factor air	1 %
Emission factor water	0.2 %
Emission factor soil	0.01 %
Receive Surf. Water (Flow Rate).	18,000 m3/d
Dilution factor river	10
Dilution factor coast	100

Risk Management Measures	
Air treatment measures considered suitable are, e.g.	Wet scrubber - for dusts, Filtration, Waste gas treatment by thermal oxidation, Adsorption
Wastewater treatment measures considered suitable are, e.g.	Acclimated biological treatment, Distillation
Type of STP	Municipal STP
Assumed sewage treatment plant flow (m3/d)	2,000 m3/d
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Environment
Risk Characterization Ratio (RCR)	0.028473
	Risk from environmental exposure is driven by soil.
Maximum amount of safe use	9,833.8 kg/d
Risk from environmental exposure is driven by soil.	

Contributing exposure scenario	
Use descriptors covered	PROC1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions. Use domain: industrial
Operational conditions	
Concentration of the substance	ethylbenzene Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance during use	952 Pa
Process temperature	20 °C
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Ensure doors and windows are opened (general ventilation).	
In case of potential exposure:, Use suitable eye protection., Use suitable chemically resistant gloves.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	0.0343 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.00019
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	0.0442 mg/m³

Risk Characterization Ratio (RCR)	0.000574
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra	

Contributing exposure scenario	
Use descriptors covered	PROC2: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions Use domain: industrial
Operational conditions	
Concentration of the substance	ethylbenzene Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance during use	952 Pa
Process temperature	20 °C
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Use dry break couplings for material transfer	
In case of potential exposure:, Use suitable chemically resistant gloves., Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	1.3714 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.007619
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	22.1177 mg/m³
Risk Characterization Ratio (RCR)	0.287243
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra	

Contributing exposure scenario	
Use descriptors covered	PROC3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition Use domain: industrial
Operational conditions	
Concentration of the substance	ethylbenzene Content: >= 0 % - <= 100 %

Physical state	liquid
Vapour pressure of the substance during use	952 Pa
Process temperature	20 °C
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 90 %
Handle substance within closed system. Provide extract ventilation to points where emissions occur (LEV). Ensure samples are obtained under containment or extract ventilation.	
In case of potential exposure:, Use suitable chemically resistant gloves., Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker, Reduction factor for local exhaust ventilation (LEV) has been used for the calculation of dermal exposure estimates.
	Worker - dermal, long-term - systemic
Exposure estimate	0.0686 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.000381
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	4.4235 mg/m³
Risk Characterization Ratio (RCR)	0.057449
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra	

Contributing exposure scenario	
Use descriptors covered	PROC4: Chemical production where opportunity for exposure arises Use domain: industrial
Operational conditions	
Concentration of the substance	ethylbenzene Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance during use	952 Pa
Process temperature	20 °C
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor

Risk Management Measures	
Local exhaust ventilation	Effectiveness: 90 %
Handle substance within a predominantly closed system provided with extract ventilation. Provide extract ventilation to points where emissions occur (LEV). Ensure samples are obtained under containment or extract ventilation.	
Use suitable chemically resistant gloves., Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker, Reduction factor for local exhaust ventilation (LEV) has been used for the calculation of dermal exposure estimates.
	Worker - dermal, long-term - systemic
Exposure estimate	0.6857 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.00381
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	8.8471 mg/m³
Risk Characterization Ratio (RCR)	0.114897
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra	

Contributing exposure scenario	
Use descriptors covered	PROC8a: Transfer of substance or mixture (charging and discharging) at non-dedicated facilities Use domain: industrial
Operational conditions	
Concentration of the substance	ethylbenzene Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance during use	952 Pa
Process temperature	20 °C
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 90 %
Handle substance within closed system. Ensure samples are obtained under containment or extract ventilation.	
Use suitable chemically resistant gloves., Use suitable eye protection.	

Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	0.1371 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.000762
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	22.1177 mg/m³
Risk Characterization Ratio (RCR)	0.287243
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra	

Contributing exposure scenario	
Use descriptors covered	PROC8a: Transfer of substance or mixture (charging and discharging) at non-dedicated facilities Use domain: industrial
Operational conditions	
Concentration of the substance	ethylbenzene Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance during use	952 Pa
Process temperature	20 °C
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Drain down and flush system prior to equipment break-in or maintenance.	
Transfer via enclosed lines Clear transfer lines prior to de-coupling Retain drain downs in sealed storage pending disposal or for subsequent recycle.	
Use suitable chemically resistant gloves., Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	13.7143 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.07619
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, worker, modified version
	Worker - inhalation, long-term - systemic
Exposure estimate	44.2354 mg/m³
Risk Characterization Ratio (RCR)	0.574486
Guidance to Downstream Users	

For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)

Contributing exposure scenario	
Use descriptors covered	PROC8b: Transfer of substance or mixture (charging and discharging) at dedicated facilities Use domain: industrial
Operational conditions	
Concentration of the substance	ethylbenzene Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance during use	952 Pa
Process temperature	20 °C
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Provide basic employee training to prevent/minimize exposures.	
Provide extract ventilation to points where emissions occur (LEV). Use bulk or semi-bulk handling systems. Use dry break couplings for material transfer	
In case of potential exposure:, Use suitable chemically resistant gloves., Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	1.3714 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.007619
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, worker, modified version
	Worker - inhalation, long-term - systemic
Exposure estimate	11.0589 mg/m³
Risk Characterization Ratio (RCR)	0.143621
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

Contributing exposure scenario	
Use descriptors covered	PROC8b: Transfer of substance or mixture (charging and discharging) at dedicated facilities Use domain: industrial

Operational conditions	
Concentration of the substance	ethylbenzene Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance during use	952 Pa
Process temperature	20 °C
Duration and Frequency of activity	60 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Use bulk or semi-bulk handling systems. Use dry break couplings for material transfer	
In case of potential exposure:, Use suitable chemically resistant gloves., Use suitable eye protection., Reduce duration of activity to less than 60 min, Alternatively:, Wear a respirator conforming to EN140 with Type A/P2 filter or better	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	2.7429 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.015238
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	22.1177 mg/m³
Risk Characterization Ratio (RCR)	0.287243
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra	

Contributing exposure scenario	
Use descriptors covered	PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing). Use domain: industrial
Operational conditions	
Concentration of the substance	ethylbenzene Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance during use	952 Pa
Process temperature	20 °C
Duration and Frequency of activity	480 min 5 days per week

Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 90 %
Transfer via enclosed lines Ensure that task is semi-automated or automated. Provide extract ventilation to material transfer points and other openings.	
In case of potential exposure:, Use suitable chemically resistant gloves., Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker, Reduction factor for local exhaust ventilation (LEV) has been used for the calculation of dermal exposure estimates.
	Worker - dermal, long-term - systemic
Exposure estimate	0.6857 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.00381
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	22.1177 mg/m³
Risk Characterization Ratio (RCR)	0.287243
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra	

Contributing exposure scenario	
Use descriptors covered	PROC15: Use a laboratory reagent. Use domain: industrial
Operational conditions	
Concentration of the substance	ethylbenzene Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance during use	952 Pa
Process temperature	20 °C
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Handle in a fume cupboard or under extract ventilation	
In case of potential exposure:, Use suitable chemically resistant gloves., Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker

	Worker - dermal, long-term - systemic
Exposure estimate	0.3429 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.001905
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	44.2354 mg/m³
Risk Characterization Ratio (RCR)	0.574486
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra	

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3. Short title of exposure scenario

Use as an intermediate
IS; ERC6a; PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC15

Control of exposure and risk management measures

Contributing exposure scenario		
Use descriptors covered	ESVOC SpERC 6.1a.v1: ESVOC SpERC 6.1a.v1	
Operational conditions		
Annual amount per site	1,220 kt	
Minimum emission days per year	350	
Emission factor air	0.02 %	
Emission factor water	0.002 %	
Emission factor soil	0.1 %	
Receive Surf. Water (Flow Rate).	18,000 m3/d	
Dilution factor river	10	
Dilution factor coast	100	
Risk Management Measures		
Air treatment measures considered suitable are, e.g.		Wet scrubber - for dusts, Adsorption
Wastewater treatment measures considered suitable are, e.g.		Acclimated biological treatment
Soil treatment measures considered suitable are, e.g.		No application of sludge to soil
Type of STP		Municipal STP
Assumed sewage treatment plant flow (m3/d)		2,000 m3/d
Exposure estimate and reference to its source		
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Environment	
Risk Characterization Ratio (RCR)	0.234104	
	Risk from environmental exposure is driven by freshwater.	

Maximum amount of safe use	1,489 t/d
Risk from environmental exposure is driven by freshwater.	

Contributing exposure scenario	
Use descriptors covered	PROC1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions. Use domain: industrial
Operational conditions	
Concentration of the substance	ethylbenzene Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance during use	10001 Pa
Process temperature	70 °C
	Corresponds to a vapour pressure > 100.0 hPa
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Ensure doors and windows are opened (general ventilation).	
Handle substance within closed system.	
In case of potential exposure:, Use suitable chemically resistant gloves., Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	0.0343 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.00019
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	0.0442 mg/m³
Risk Characterization Ratio (RCR)	0.000574
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra	

Contributing exposure scenario	
Use descriptors covered	PROC2: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions Use domain: industrial

Operational conditions	
Concentration of the substance	ethylbenzene Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance during use	10001 Pa
Process temperature	70 °C
	Corresponds to a vapour pressure > 100.0 hPa
Duration and Frequency of activity	60 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Handle substance within closed system. Provide extract ventilation to points where emissions occur (LEV). Ensure samples are obtained under containment or extract ventilation.	
Reduce duration of activity to less than 60 min, Alternatively:, Wear a respirator conforming to EN140 with Type A/P2 filter or better, In case of potential exposure:, Use suitable chemically resistant gloves., Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	0.2743 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.001524
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	22.1177 mg/m³
Risk Characterization Ratio (RCR)	0.287243
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra	

Contributing exposure scenario	
Use descriptors covered	PROC3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition Use domain: industrial
Operational conditions	
Concentration of the substance	ethylbenzene Content: >= 0 % - <= 100 %
Physical state	liquid

Vapour pressure of the substance during use	10001 Pa
Process temperature	70 °C
	Corresponds to a vapour pressure > 100.0 hPa
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 90 %
Handle substance within closed system. Provide extract ventilation to points where emissions occur (LEV). Ensure samples are obtained under containment or extract ventilation.	
In case of potential exposure:, Use suitable chemically resistant gloves., Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker, Reduction factor for local exhaust ventilation (LEV) has been used for the calculation of dermal exposure estimates.
	Worker - dermal, long-term - systemic
Exposure estimate	0.0686 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.000381
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	22.1177 mg/m³
Risk Characterization Ratio (RCR)	0.287243
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra	

Contributing exposure scenario	
Use descriptors covered	PROC4: Chemical production where opportunity for exposure arises Use domain: industrial
Operational conditions	
Concentration of the substance	ethylbenzene Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance during use	10001 Pa
Process temperature	70 °C
	Corresponds to a vapour pressure > 100.0 hPa
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor

Risk Management Measures	
Local exhaust ventilation	Effectiveness: 90 %
Provide extract ventilation to points where emissions occur (LEV). Ensure samples are obtained under containment or extract ventilation. Ensure material transfers are under containment or extract ventilation	
Use suitable chemically resistant gloves., Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker, Reduction factor for local exhaust ventilation (LEV) has been used for the calculation of dermal exposure estimates.
	Worker - dermal, long-term - systemic
Exposure estimate	0.6857 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.00381
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	44.2354 mg/m³
Risk Characterization Ratio (RCR)	0.574486
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra	

Contributing exposure scenario	
Use descriptors covered	PROC8a: Transfer of substance or mixture (charging and discharging) at non-dedicated facilities Use domain: industrial
Operational conditions	
Concentration of the substance	ethylbenzene Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance during use	10001 Pa
Process temperature	70 °C
	Corresponds to a vapour pressure > 100.0 hPa
Duration and Frequency of activity	60 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Drain down and flush system prior to equipment break-in or maintenance.	
Transfer via enclosed lines Clear transfer lines prior to de-coupling Retain drain downs in sealed storage pending disposal or for subsequent recycle.	

Use suitable chemically resistant gloves., Use suitable eye protection., Reduce duration of activity to less than 60 min, Alternatively:, Wear a respirator conforming to EN140 with Type A/P2 filter or better	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	2.7429 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.015238
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, worker, modified version
	Worker - inhalation, long-term - systemic
Exposure estimate	44.2354 mg/m³
Risk Characterization Ratio (RCR)	0.574486
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

Contributing exposure scenario	
Use descriptors covered	PROC8b: Transfer of substance or mixture (charging and discharging) at dedicated facilities Use domain: industrial
Operational conditions	
Concentration of the substance	ethylbenzene Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance during use	952 Pa
Process temperature	20 °C
Duration and Frequency of activity	60 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Use bulk or semi-bulk handling systems. Use dry break couplings for material transfer	
Reduce duration of activity to less than 60 min, Alternatively:, Wear a respirator conforming to EN140 with Type A/P2 filter or better, In case of potential exposure:, Use suitable chemically resistant gloves., Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker

	Worker - dermal, long-term - systemic
Exposure estimate	2.7429 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.015238
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	22.1177 mg/m³
Risk Characterization Ratio (RCR)	0.287243
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra	

Contributing exposure scenario	
Use descriptors covered	PROC8b: Transfer of substance or mixture (charging and discharging) at dedicated facilities Use domain: industrial
Operational conditions	
Concentration of the substance	ethylbenzene Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance during use	952 Pa
Process temperature	20 °C
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Provide basic employee training to prevent/minimize exposures.	
Ensure material transfers are under containment or extract ventilation Use dry break couplings for material transfer	
In case of potential exposure:, Use suitable chemically resistant gloves., Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	13.7143 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.07619
Assessment method	EASY TRA v4.1, Workplace measurements
	Worker - inhalation, long-term - systemic
Exposure estimate	36 mg/m³
Risk Characterization Ratio (RCR)	0.467532
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra	

Contributing exposure scenario

Use descriptors covered	PROC8b: Transfer of substance or mixture (charging and discharging) at dedicated facilities Use domain: industrial
Operational conditions	
Concentration of the substance	ethylbenzene Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance during use	10001 Pa
Process temperature	70 °C
	Corresponds to a vapour pressure > 100.0 hPa
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Wear suitable respiratory protection.	Effectiveness: 90 %
Transfer via enclosed lines Provide extract ventilation to points where emissions occur (LEV). Clear transfer lines prior to de-coupling Ensure material transfers are under containment or extract ventilation	
In case of potential exposure:, Use suitable chemically resistant gloves., Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	13.7143 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.07619
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, worker, modified version
	Worker - inhalation, long-term - systemic
Exposure estimate	13.2706 mg/m³
Risk Characterization Ratio (RCR)	0.172346
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

Contributing exposure scenario	
Use descriptors covered	PROC15: Use a laboratory reagent. Use domain: industrial
Operational conditions	
Concentration of the substance	ethylbenzene Content: >= 0 % - <= 100 %

Physical state	liquid
Vapour pressure of the substance during use	952 Pa
Process temperature	20 °C
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Provide extract ventilation to points where emissions occur (LEV). Carry out in a vented booth.	
Alternatively:, In case of potential exposure:, Use suitable chemically resistant gloves., Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	0.3429 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.001905
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	44.2354 mg/m³
Risk Characterization Ratio (RCR)	0.574486
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra	

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4. Short title of exposure scenario

Use as solvent
IS; ERC4; PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC15

Control of exposure and risk management measures

Contributing exposure scenario	
Use descriptors covered	ESVOC SpERC 4.3a.v1: ESVOC SpERC 4.3a.v1
Operational conditions	
Annual amount used in the EU	840,000 kg
Minimum emission days per year	300
Emission factor air	98 %
Emission factor water	0.7 %
Emission factor soil	0 %

Receive Surf. Water (Flow Rate).	18,000 m3/d
Dilution factor river	10
Dilution factor coast	100
Risk Management Measures	
Air treatment measures considered suitable are, e.g.	Wet scrubber - for dusts, Filtration, Waste gas treatment by thermal oxidation, Adsorption
Wastewater treatment measures considered suitable are, e.g.	Acclimated biological treatment, Distillation
Type of STP	Municipal STP
Assumed sewage treatment plant flow (m3/d)	2,000 m3/d
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Environment
Risk Characterization Ratio (RCR)	0.102015
	Risk from environmental exposure is driven by soil.
Maximum amount of safe use	2,744.7 kg/d
Risk from environmental exposure is driven by soil.	

Contributing exposure scenario	
Use descriptors covered	PROC1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions. Use domain: industrial
Operational conditions	
Concentration of the substance	ethylbenzene Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance during use	10001 Pa
Process temperature	70 °C
	Corresponds to a vapour pressure > 100.0 hPa
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Ensure doors and windows are opened (general ventilation).	
Handle substance within closed system.	
In case of potential exposure:, Use suitable chemically resistant gloves.,	

Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	0.0343 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.00019
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	0.0442 mg/m³
Risk Characterization Ratio (RCR)	0.000574
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra	

Contributing exposure scenario	
Use descriptors covered	PROC2: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions Use domain: industrial
Operational conditions	
Concentration of the substance	ethylbenzene Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance during use	10001 Pa
Process temperature	70 °C
	Corresponds to a vapour pressure > 100.0 hPa
Duration and Frequency of activity	60 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Ensure doors and windows are opened (general ventilation).	
Reduce duration of activity to less than 60 min, Alternatively:, Wear a respirator conforming to EN140 with Type A/P2 filter or better, In case of potential exposure:, Use suitable chemically resistant gloves., Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	0.2743 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.001524
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	22.1177 mg/m³

Risk Characterization Ratio (RCR)	0.287243
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra	

Contributing exposure scenario	
Use descriptors covered	PROC3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition Use domain: industrial
Operational conditions	
Concentration of the substance	ethylbenzene Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance during use	10001 Pa
Process temperature	70 °C
	Corresponds to a vapour pressure > 100.0 hPa
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 90 %
Handle substance within closed system. Ensure samples are obtained under containment or extract ventilation.	
In case of potential exposure:, Use suitable chemically resistant gloves., Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker, Reduction factor for local exhaust ventilation (LEV) has been used for the calculation of dermal exposure estimates.
	Worker - dermal, long-term - systemic
Exposure estimate	0.0686 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.000381
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	22.1177 mg/m³
Risk Characterization Ratio (RCR)	0.287243
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra	

Contributing exposure scenario	
Use descriptors covered	PROC4: Chemical production where opportunity for exposure arises

	Use domain: industrial
Operational conditions	
Concentration of the substance	ethylbenzene Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance during use	10001 Pa
Process temperature	70 °C
	Corresponds to a vapour pressure > 100.0 hPa
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 90 %
Provide extract ventilation to points where emissions occur (LEV). Ensure samples are obtained under containment or extract ventilation. Ensure material transfers are under containment or extract ventilation	
Use suitable chemically resistant gloves., Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker, Reduction factor for local exhaust ventilation (LEV) has been used for the calculation of dermal exposure estimates.
	Worker - dermal, long-term - systemic
Exposure estimate	0.6857 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.00381
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	44.2354 mg/m³
Risk Characterization Ratio (RCR)	0.574486
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra	

Contributing exposure scenario	
Use descriptors covered	PROC8a: Transfer of substance or mixture (charging and discharging) at non-dedicated facilities Use domain: industrial
Operational conditions	
Concentration of the substance	ethylbenzene Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance	10001 Pa

during use	
Process temperature	70 °C
	Corresponds to a vapour pressure > 100.0 hPa
Duration and Frequency of activity	60 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Drain down and flush system prior to equipment break-in or maintenance.	
Transfer via enclosed lines Clear transfer lines prior to de-coupling Retain drain downs in sealed storage pending disposal or for subsequent recycle.	
Use suitable chemically resistant gloves., Use suitable eye protection., Reduce duration of activity to less than 60 min, Alternatively:, Wear a respirator conforming to EN140 with Type A/P2 filter or better	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	2.7429 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.015238
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, worker, modified version
	Worker - inhalation, long-term - systemic
Exposure estimate	44.2354 mg/m³
Risk Characterization Ratio (RCR)	0.574486
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

Contributing exposure scenario	
Use descriptors covered	PROC8b: Transfer of substance or mixture (charging and discharging) at dedicated facilities Use domain: industrial
Operational conditions	
Concentration of the substance	ethylbenzene Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance during use	10001 Pa
Process temperature	70 °C
	Corresponds to a vapour pressure > 100.0 hPa

Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Drain down and flush system prior to equipment break-in or maintenance.	
Transfer via enclosed lines Clear transfer lines prior to de-coupling Provide extract ventilation to material transfer points and other openings.	
In case of potential exposure:, Use suitable chemically resistant gloves., Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	1.3714 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.007619
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, worker, modified version
	Worker - inhalation, long-term - systemic
Exposure estimate	66.3531 mg/m³
Risk Characterization Ratio (RCR)	0.861729
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

Contributing exposure scenario	
Use descriptors covered	PROC15: Use a laboratory reagent. Use domain: industrial
Operational conditions	
Concentration of the substance	ethylbenzene Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance during use	952 Pa
Process temperature	20 °C
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Handle in a fume cupboard or under extract ventilation	
In case of potential exposure:, Use suitable chemically resistant gloves., Use suitable eye protection.	
Exposure estimate and reference to its source	

Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	0.3429 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.001905
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, worker, modified version
	Worker - inhalation, long-term - systemic
Exposure estimate	4.4235 mg/m³
Risk Characterization Ratio (RCR)	0.057449
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

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