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

1.1 Product identifier

Trade name/designation 1,3-Butadiene Art-Nr(n). 2200, 2206, 70220 Substance name 1,3-butadiene **Index No** 601-013-00-X **EC No** 203-450-8

REACH No. 01-2119471988-16

CAS No 106-99-0

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

Process categories [PROC]

PROC1 Use in closed process, no likelihood of exposure PROC2 Use in closed, continuous process with occasional controlled exposure

PROC3 Use in closed batch process (synthesis or formulation)

PROC4 Use in batch and other process (synthesis) where opportunity for exposure arises

PROC5 Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)

PROC6 Calendering operations

PROC8a Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities

PROC8b Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities

PROC9 Transfer of substance or preparation into small containers (dedicated filling line, including weighing)

PROC13 Treatment of articles by dipping and pouring

PROC14 Production of preparations or articles by tabletting, compression, extrusion, pelletisation

PROC15 Use as laboratory reagent

PROC16 Use of fuels

Environmental release categories [ERC]

ERC1 Manufacture of substances

ERC2 Formulation into mixture

ERC4 Industrial use of processing aids in processes and products, not becoming part of articles

ERC6a Industrial use resulting in manufacture of another substance (use of intermediates)

ERC6c Use of monomer in polymerisation processes at industrial site (inclusion or not into/onto article)

ERC6d Use of reactive process regulators in polymerisation processes at industrial site (inclusion or not into/onto article)

ERC7 Use of functional fluid at industrial site

ERC8a Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor)

1.3 Details of the supplier of the safety data sheet

Supplier

GHC Gerling, Holz & Co. Handels GmbH Ruhrstraße 113 D-22761 Hamburg Telephone +49 40 853 123 0 E-mail hamburg@ghc.de Website www.ghc.com

Department responsible for information: GHC Gerling, Holz & Co. Handels GmbH Telephone +49 40 853 123 0

E-mail (competent person): msds@ghc.de

1.4 Emergency telephone number

EN: Poison Information Center Mainz +49 6131 19240

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SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Classification according to Regulation (EC) No 1272/2008

Classification procedure

[CLP]

Flam. Gas 1A, H220 Press. Gas (Liq.), H280

Muta. 1B, H340 Carc. 1A, H350

Hazard statements for physical hazards

H220 Extremely flammable gas.

H280 Contains gas under pressure; may explode if heated.

Hazard statements for health hazards

H340 May cause genetic defects.

H350 May cause cancer.

2.2 Label elements

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

Hazard pictograms





GHS02

GHS08

Signal word

Danger

Hazard statements

H220 Extremely flammable gas.

H280 Contains gas under pressure; may explode if heated.

H340 May cause genetic defects.

H350 May cause cancer.

Precautionary statements

P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

P280 Wear protective gloves/protective clothing/eye protection/face protection.

P308 + P313 IF exposed or concerned: Get medical advice/attention.

P377 Leaking gas fire: Do not extinguish, unless leak can be stopped safely.

P381 In case of leakage, eliminate all ignition sources.

P403 Store in a well-ventilated place.

P405 Store locked up.

Supplemental hazard information

EIGA0357 Asphyxiant in high concentrations.

EIGA0803 Restricted to professional users.

Please return container with residual pressure.

2.3 Other hazards

Adverse human health effects and symptoms

Gas/vapour heavier than air. May accumulate in confined spaces, particularly at or below ground level. Contact with liquid may cause cold burns/frostbite.

Other adverse effects

The substance/mixture does not contain components identified as having endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated Regulation (EU) 2017/2100 or Commission Delegated Regulation (EU) 2018/605 in quantities of 0.1% or more.

Results of PBT and vPvB assessment

The substance/mixture does not contain components meeting the PBT/vPvB criteria of the Reach Regulation, Annex XIII, at levels of 0.1% or higher.

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SECTION 3: Composition / information on ingredients

3.1 Substances

 Substance name
 1,3-butadiene

 Index No
 601-013-00-X

 EC No
 203-450-8

REACH No. 01-2119471988-16

CAS No 106-99-0

ATE ATE(inhalation gas): 128803 ppm

Additional information

Content: >= 99 %

3.2 Mixtures

not applicable

SECTION 4: First aid measures

4.1 Description of first aid measures

General information

Remove contaminated, saturated clothing immediately.

First aider: Pay attention to self-protection!

Call a physician immediately.

Following inhalation

Remove casualty to fresh air and keep warm and at rest.

In case of respiratory standstill give artificial respiration by respiratory bag (Ambu bag) or respirator. Obtain medical assistance.

Following skin contact

In case of skin contact rinse with warm water.

In case of frostbite, wash with plenty of water; do not remove clothing.

In case of frostbite rinse with lukewarm (not hot) water for at least 15 minutes. Do not remove clothing frozen to the skin.

Thaw with lukewarm water. Apply a sterile dressing. Obtain medical assistance.

After eye contact

Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Obtain medical assistance.

Following ingestion

Ingestion is not considered a potential route of exposure.

4.2 Most important symptoms and effects, both acute and delayed

Symptoms

The following symptoms may occur in case of strong exposition:

Unconsciousness

Dizziness

Respiratory tract irritation

Headache

4.3 Indication of any immediate medical attention and special treatment needed

Notes for the doctor

Treat symptomatically.

To supervise the blood circulation.

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SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media

Water spray jet Extinguishing powder

Unsuitable extinguishing media

Carbon dioxide (CO2) Full water jet

5.2 Special hazards arising from the substance or mixture

Hazardous combustion productsIn case of fire formation of dangerous gases possible. Carbon monoxide Carbon dioxide (CO2)

5.3 Advice for firefighters

Special protective equipment for firefighters

Wear a self-contained breathing apparatus and chemical protective clothing.

Additional information

If possible, shut off gas valves and move containers to a safe location.

Use water spray jet to protect personnel and to cool endangered containers.

Exposure to fire may cause rupture / explosion of the containers.

Do not extinguish a leaking gas flame unless absolutely necessary. Spontaneous/explosive re-ignition may occur. Extinguish any other fire.

Dispose of fire residues and contaminated extinguishing water in accordance with local, official regulations.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

For non-emergency personnel Use personal protection equipment.

Leave the danger area.

Keep people away and stay on the upwind side.

For emergency responders

Personal protection by wearing close-fitting protective clothing and breathing apparatus.

Pay attention to extension of gas especially at ground (heavier than air) and in direction of the wind.

Remove persons to safety.

Eliminate all ignition sources if safe to do so.

6.2 Environmental precautions

If possible, stop flow of product.

Do not allow to enter into soil/subsoil.

Do not allow to enter into surface water or drains.

6.3 Methods and material for containment and cleaning up

For containment

If necessary, secure leaky pressure receptacles using a salvage container.

Prevent the liquid from spreading over a wide area (set up barriers, cover sewage systems).

Limit expansion of the gas (water spray jet).

For cleaning up

Leave to vapourize.

Provide adequate ventilation.

6.4 Reference to other sections

Disposal: see section 13

Personal protection equipment: see section 8

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SECTION 7: Handling and storage

7.1 Precautions for safe handling

Protective measures

Use only in well-ventilated areas.

Transfer and handle product only in closed systems.

Usual measures for fire prevention.

Containers' temperature should not be increased above 50 °C.
The working pressure in the receptacle must not exceed the saturation vapour pressure of the pure product resulting at a temperature of 50 °C.

Prevent cylinders from falling over.

Take precautionary measures against static discharges. Ground barrels and installations. Use only antistatically equipped (spark-free) tools.
Use explosion-proof machinery, apparatus, ventilation facilities, tools etc.

Ensure valve protection device is correctly fitted.

Ensure valve outlet cap nut or plug (where provided) is correctly fitted.

Open valve slowly to avoid pressure shock.

Do not allow backflow into the container.

Entering of water into the container must be prevented.

No water to valves, flanges and other fittings.

Purging of pipes and valves with inert gases - to avoid: water, solvents.

Advices on general occupational hygiene When using do not eat, drink, smoke, sniff.

Wash hands before breaks and after work.

Remove contaminated clothing and protective equipment before entering eating areas.

7.2 Conditions for safe storage, including any incompatibilities

Requirements for storage rooms and vessels
All regulations and local requirements for the storage of containers have to be respected.
Keep container tightly closed and in a well-ventilated place.
Containers' temperature should not be increased above 50 °C.

Prevent cylinders from falling over.

Only use containers specifically approved for the substance/product.

Information on suitable materials for receptacles and valves see ISO 11114.

Materials to avoid

Do not store together with explosives.

Do not store together with flammable liquids.

Do not store together with flammable solids.
Do not store together with pyrophoric and self-heating substances.
Do not store together with oxidizing liquids or oxidizing solids.

Do not store together with toxic liquids or toxic solids.

Do not store together with infectious substances.

Do not store together with radioactive material. Do not store together with food or feed.

7.3 Specific end use(s)

Recommendation

Exposure scenarios (ES) see annex to this safety data sheet.

* SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Occupational exposure limit values

CAS No	EC No	Substance name	occupational exposure limit value
106-99-0	203-450-8	1,3-Butadien	1 [ml/m³(ppm)] 2,2 [mg/m³] (IF)

DNEL worker

CAS No	Substance name	DNEL value	DNEL type	Remark
106-99-0	1,3-butadiene	2.21 mg/m³	long-term inhalative (systemic)	Assessment factor 1

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DNEL Consumer

CAS No	Substance name	DNEL value	DNEL type	Remark
106-99-0	1,3-butadiene	0.265 mg/m ³	long-term inhalative (systemic)	Assessment factor 1

8.2 Exposure controls

Appropriate engineering controls

Technical measures to prevent exposure

Transfer and handle only in enclosed systems.

Personal protection equipment

Eye/face protection

Protective goggles according to EN 166, in case of increased risk add protective face shield.

Hand protection

Safety gloves according to EN 374:

Glove material specification [make/type, thickness, permeation time/life]: NBR; 0,4 mm; >= 480 min

Body protection:

Safety shoes with steel toecap.

Body covering work clothing or chemical resistant suit at increased risk.

Respiratory protection Keep self contained breathing apparatus readily available for emergency use.

Respiratory protection necessary at:

high concentrations

Respiratory protection complying with EN 137. Short term: filter apparatus, filter AX

In case of rescue and maintenance activities in storage containers use environment-independent breathing apparatus because of risk of suffocation due to displacement of oxygen.

Thermal hazards

Use cold-resistant protective equipment.

Environmental exposure controls

Remark

Prevent release to the environment.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Physical state

Gaseous / liquefied under pressure.

Colour

colourless

Odour

aromatic

Safety relevant basis data

	Value	Method	Source, Remark
Odour threshold:			not determined
Melting point/freezing point			not applicable
Boiling point or initial boiling point and boiling range	-4.5 °C		
flammability			Extremely flammable gas (H220).
Lower and upper explosion limit	Upper explosion limit 16.3 Vol-%		

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	Value	Method	Source, Remark
Lower and upper explosion limit	Lower explosion limit 1.4 Vol-%		
Flash point			not applicable
Auto-ignition temperature	415 °C		
Decomposition temperature			No decomposition if used as directed.
рН			not applicable
Viscosity			not applicable
Solubility(ies)	Water solubility 454.1 mL/L (20°C)		
Partition coefficient n-octanol/water (log value)	1.99		
Vapour pressure	2400 hPa (20°C)		
Density and/or relative density			not applicable
Relative vapour density	1.92		Air = 1.
particle characteristics			not applicable

9.2 Other information

Information with regard to physical hazard classes

Gases under pressure

Safety characteristics

	Value	Method, Result	Source, Remark
Critical temperature	152 °C		

Other information

Vapours are heavier than air.

SECTION 10: Stability and reactivity

10.1 Reactivity

Formation of explosive gas mixtures in contact with air.

10.2 Chemical stability

The substance is chemically stable under recommended conditions of storage, use and temperature.

10.3 Possibility of hazardous reactions

Reactions with numerous chemical compounds. Must not be mixed with air or oxygen. Danger of polymerisation

10.4 Conditions to avoid

Heat sources / heat - risk of bursting. Ignition sources, open flames, glowing metal surfaces, etc.

10.5 Incompatible materials

Hydrogen bromide (HBr) Boron trifluoride Chlorine Peroxides Sulphur dioxide (SO2)

10.6 Hazardous decomposition products

When handled and stored appropriately, no dangerous decomposition products are known.

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SECTION 11: Toxicological information

11.1 Information on hazard classes as defined in Regulation (EC) No 1272/2008

Acute toxicity

Animal data

	Effective dose	Method,Evaluation	Source, Remark
Acute oral toxicity			Study technically not feasible.
Acute dermal toxicity			Study technically not feasible.
Acute inhalation toxicity	CAS No106-99-0 1,3- butadiene Acute inhalation toxicity (gas) LC50: 128803 ppm Species Rat Exposure time 4 h		

Assessment/classificationBased on available data, the classification criteria are not met.

Skin corrosion/irritation

Other information

Study technically not feasible.

Serious eye damage/irritation

Animal data

Result / Evaluation	Method	Source, Remark	
non-irritant			

Sensitisation to the respiratory tract

Assessment/classification No data available

Species Rabbit

Skin sensitisation

Other information

Study technically not feasible.

Germ cell mutagenicity

	Value	Method	Result / Evaluation	Remark
In vitro mutagenicity/genotox icity		OECD 473	positive	
In vivo mutagenicity/genotox icity		OECD 474	positive	
Assessment/classif				

May cause genetic defects.

Carcinogenicity

Animal data

	Value	Method	Result / Evaluation	Remark
Carcinogenicity	6.25 ppm Species Mouse (male / female) Exposure duration 2	OECD 453	positive	

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Assessment/classification

May cause cancer.

Reproductive toxicity

Animal data

	Value	Method	Result / Evaluation	Remark	
Reproductive toxicity	NOAEC 6000 ppm	OECD 421			

Assessment/classification

Based on available data, the classification criteria are not met.

STOT-single exposure

STOT SE 1 and 2

Assessment/classification

Based on available data, the classification criteria are not met.

STOT-repeated exposure

Animal data

	Effective dose	Method	Specific effects:	Organs affected:	Source, Remark
Inhalative specific target organ toxicity (repeated exposure)	NOAEL(C): 1000 ppm Species Rat Exposure duration 2 a	OECD 453			

Assessment/classificationBased on available data, the classification criteria are not met.

Aspiration hazard

Assessment/classification

Study technically not feasible.

11.2 Information on other hazards

Additional information

Can cause frostbite.

Inhalation causes narcotic effects/intoxication.

SECTION 12: Ecological information

12.1 Toxicity

Aquatic toxicity

	Effective dose	Method,Evaluation	Source, Remark
Acute (short-term) fish toxicity	LL50 34.55 mg/L Species Oncorhynchus mykiss (Rainbow trout) Test duration 72 h	QSAR	
Chronic (long-term) fish toxicity	NOEC 6.62 mg/L Species Oncorhynchus mykiss (Rainbow trout) Test duration 21 d	QSAR	
Acute (short-term) toxicity to crustacea	EC50 64.64 mg/L Species Daphnia magna (Big water flea) Test duration 48 h	QSAR	
Chronic (long-term) toxicity to aquatic invertebrate	NOEC 12.38 mg/L Species Daphnia magna (Big water flea) Test duration 21 d	QSAR	

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	Effective dose	Method, Evaluation	Source, Remark
Acute (short-term) toxicity to algae and cyanobacteria	EC50 35.77 mg/L Species Raphidocelis subcapitata Test duration 72 h	QSAR	
Chronic (long-term) toxicity to aquatic algae and cyanobacteria	not determined		
Toxicity to other aquatic plants/organisms	not determined		
Toxicity to microorganisms	EC50 527.86 mg/L Species activated sludge Test duration 72 h	QSAR	
2.2 Persistence and degradability			
	Value	Method	Source, Remark
Biodegradation		QSAR	Readily biodegradable (according to OECD criteria).
2.3 Bioaccumulative potential			
	Value	Method	Source, Remark
Bioconcentration factor (BCF)	Bioconcentration factor (BCF) 9.8		calculated

Assessment/classificationBased on the n-octanol/water partition coefficient accumulation in organisms is not expected.

12.4 Mobility in soil

No data available

12.5 Results of PBT and vPvB assessment

The substance/mixture does not contain components meeting the PBT/vPvB criteria of the Reach Regulation, Annex XIII, at levels of 0.1% or higher.

12.6 Endocrine disrupting properties

No data available

12.7 Other adverse effects

No data available

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Waste codes/waste designations according to EWC/AVV

Waste code product Waste name gases in pressure containers (including halons) containing hazardous substances 160504 *

Appropriate disposal / ProductWaste disposal according to directive 2008/98/EC, covering waste and dangerous waste. Prevent release to the environment. No disposal via the sewage.

Appropriate disposal / PackageTransportable pressure equipment (empty, residual pressure): Return to supplier / manufacturer.

SECTION 14: Transport information

	Land transport (ADR/RID)	Sea transport (IMDG)	Air transport (ICAO-TI / IATA- DGR)
14.1 UN number or ID number	UN 1010	UN 1010	UN 1010
14.2 UN proper shipping name	BUTADIENES, STABILIZED (1,3- butadiene)	BUTADIENES, STABILIZED (1,3- butadiene)	Butadienes, stabilized (1,3-butadiene)

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	Land transport (ADR/RID)	Sea transport (IMDG)	Air transport (ICAO-TI / IATA- DGR)
14.3 Transport hazard class(es)	2.1	2.1	2.1
14.4 Packing group	-	-	-
14.5 Environmental hazards	No	No	No

14.6 Special precautions for user

The protective measures listed in Sections 6, 7 and 8 of the Safety Data Sheet have to be considered.

14.7 Maritime transport in bulk according to IMO instruments

No carriage in bulk.

Land transport (ADR/RID)

UN number or ID number UN 1010

UN proper shipping name BUTADIENES, STABILIZED (1,3-butadiene)

Transport hazard class(es) 2.1
Hazard label(s) 2.1
Classification code 2F
Packing group Environmental hazards No
Limited quantity (LQ) 0

Special provisions 386, 618, 662, 676

Tunnel restriction code B/D

Sea transport (IMDG)

UN number or ID number UN 1010

UN proper shipping name BUTADIENES, STABILIZED (1,3-butadiene)

Transport hazard class(es) 2.1

Packing group
Environmental hazards No

Limited quantity (LQ) 0

Marine pollutant No

EmS F-D, S-U

Air transport (ICAO-TI / IATA-DGR)

UN number or ID number UN 1010

UN proper shipping name Butadienes, stabilized (1,3-butadiene)

Transport hazard class(es) 2.1
Packing group Environmental hazards No

* SECTION 15: Regulatory information

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

EU legislation

Restrictions of occupation

Observe employment restrictions under the Maternity Protection Directive (92/85/EEC) for expectant or nursing mothers. Observe restrictions to employment for juvenils according to the 'juvenile work protection guideline' (94/33/EC).

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Other regulations (EU)

To follow:

Regulation (EC) No 1907/2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), Annéx XVII No 28 - 30.

Regulation (EC) No 1907/2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), Annex XVII No 40.

Directive 2012/18/EU on the control of major-accident hazards involving dangerous substances.

National and local regulations concerning chemicals shall be observed.

Directive 2010/75/EU on industrial emissions [Industrial Emissions Directive] VOC VOC-value ≥ 99 g/L

15.2 Chemical Safety Assessment

National regulations

For this substance a chemical safety assessment has been carried out.

SECTION 16: Other information

Abbreviations and acronyms

Flam. Gas 1A: Flammable gas, Category 1A Press. Gas (Liq.): Liquefied gas (LG)

Muta. 1B: Germ cell mutagen, Sub-category 1B

Carc. 1A: Carcinogen, Category 1A

Key literature references and sources for data Information from our suppliers and data from the "GESTIS Substances Database" and the "Registered Substances" database of the European Chemicals Agency (ECHA) were used to create this safety data sheet.

Additional information

The information contained herein is based on the state of our knowledge. It characterizes the product with regard to the appropriate safety precautions. It does not represent a guarantee of the properties of the product.

Relevant H- and EUH-phrases (Number and full text)

H220 Extremely flammable gas.

H280 Contains gas under pressure; may explode if heated.

H340 May cause genetic defects.

H350 May cause cancer.

Indication of changes

Data changed compared with the previous version

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Annex: Exposure Scenarios

Index

1. Manufacture of substance

M; ERC1; PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC9, PROC15

2. Formulation

F; ERC2; PROC1, PROC2, PROC3, PROC5, PROC8a, PROC8b, PROC9, PROC14, PROC15

3. Use as laboratory reagent/agent

IS; ERC4; PROC15

4. Polymer production

IS; ERC6c; PROC1, PROC2, PROC3, PROC6, PROC8a, PROC8b, PROC14

5. Use as a Fuel

IS; ERC7; PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC16

6. Polymer processing

IS; ERC6d; PROC1, PROC2, PROC3, PROC6, PROC8a, PROC8b, PROC9, PROC13, PROC14

7. Use of a substance as an intermediate

IS; ERC6a; PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC9, PROC15

8. Use in rubber production and processing

IS: ERC6d: PROC1, PROC2, PROC3, PROC6, PROC8a, PROC8b, PROC9, PROC14, PROC15

9. Polymer processing, (use in professional settings)

PW; ERC8a; PROC1, PROC2, PROC6, PROC8a, PROC8b

* * * * * * * * * * * * * * * *

1. Short title of exposure scenario

Manufacture of substance

M; ERC1; PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC9, PROC15

Control of exposure and risk management measures

Contributing exposure scenario	
Use descriptors covered	ERC1: Manufacture of the substance As no environmental hazard was identified no environmental-related exposure assessment and risk characterization was performed.
Operational conditions	

1,3-Butadiene



Contributing exposure scenario	
Use descriptors covered	PROC1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions. General exposures (closed systems) Use domain: industrial
Operational conditions	
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance during use	268333,1875 Pa
Process temperature	20 °C
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated temperatures
Risk Management Measures	
Drain down and flush system prior to equipment break-in or maintenance. Restrict access to authorised persons. Provide specific employee training to prevent/minimize exposures. Regular inspection and maintenance of equipment and machines. Minimise exposure by partial enclosure of the operation or equipment and provide extract	
ventilation at openings. Disposal - This material and its container must be disposed of in a safe manner.	
In case of potential exposure:, Use suitable chemically resistant gloves., Wear suitable coveralls to prevent exposure to the skin., Wear suitable respiratory protection., Clear spills immediately, Consider the need for risk based health surveillance.	
Avoid frequent and direct contact with substance. Clean up contamination as soon as they occur. Wash off any skin contamination immediately. Provide specific employee training to prevent/minimize exposures. Wear suitable gloves tested to EN	

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ISO 374-1.		
Exposure estimate and reference to its source		
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker	
	Worker - inhalation, long-term - systemic	
Exposure estimate	0,0225 mg/m ³	
Risk Characterization Ratio (RCR)	0,010198	
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker	
Assessment method	Qualitative assessment	
	Worker - dermal	
Additional good practice advice		
Where appropriate, replacement of task by automated and/or closed processes.		
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 General exposures (closed systems) With occasional controlled exposure. Use domain: industrial
Operational conditions	
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance during use	268333,1875 Pa
Process temperature	20 °C
Duration and Frequency of activity	60 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated temperatures
Risk Management Measures	
Local exhaust ventilation	
Provide a good standard of general ventilation (not less than 3 - 5 air changes per hour)	Effectiveness: 30 %
Drain down and flush system prior to equipment break-in or maintenance. Restrict access to authorised persons. Provide specific employee training to prevent/minimize exposures. Regular inspection and maintenance of equipment and machines. Minimise exposure by partial	

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enclosure of the operation or equipment and provide extract ventilation at openings. Disposal -This material and its container must be disposed of in a safe manner. In case of potential exposure:, Use suitable chemically resistant gloves., Wear suitable coveralls to prevent exposure to the skin., Wear suitable respiratory protection., Clear spills immediately, Consider the need for risk based health surveillance. Avoid frequent and direct contact with substance. Clean up contamination as soon as they occur. Wash off any skin contamination immediately. Provide specific employee training to prevent/minimize exposures. Wear suitable gloves tested to EN ISO 374-1. Exposure estimate and reference to its source EASY TRA v6.0, ECETOC TRA v3.0, Worker Assessment method Worker - inhalation, long-term - systemic Exposure estimate 0,7888 mg/m³ Risk Characterization Ratio (RCR) 0,356931 Assessment method EASY TRA v6.0, ECETOC TRA v3.0, Worker Assessment method Qualitative assessment Worker - dermal Additional good practice advice Where appropriate, replacement of task by automated and/or closed processes. 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 General exposures (closed systems) With occasional controlled exposure. Use domain: industrial
Operational conditions	
	1,3-butadiene
Concentration of the substance	Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance	268333,1875 Pa
during use	
Process temperature	20 °C

1,3-Butadiene



Duration and Frequency of activity	60 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated
	temperatures
Risk Management Measures	
Provide a good standard of general	
ventilation (not less than 3 - 5 air	Effectiveness: 30 %
changes per hour)	
Handle substance within a	
predominantly closed system provided	Effectiveness: 90 %
with extract ventilation.	
Drain down and flush system prior to	
equipment break-in or maintenance.	
Restrict access to authorised persons.	
Provide specific employee training to	
prevent/minimize exposures. Regular	
inspection and maintenance of	
equipment and machines.	
Minimise exposure by partial	
enclosure of the operation or	
equipment and provide extract	
ventilation at openings. Disposal - This material and its container must	
be disposed of in a safe manner.	
In case of potential exposure:, Use	
suitable chemically resistant gloves.,	
Wear suitable coveralls to prevent	
exposure to the skin., Wear suitable	
respiratory protection., Clear spills	
immediately, Consider the need for	
risk based health surveillance.	
Avoid frequent and direct contact with	
substance. Clean up contamination as	
soon as they occur. Wash off any skin	
contamination immediately. Provide	
specific employee training to	
prevent/minimize exposures.	
Wear suitable gloves tested to EN	
ISO 374-1.	
Exposure estimate and reference to	
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	0,7888 mg/m ³
Risk Characterization Ratio (RCR)	0,356931
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Assessment method	Qualitative assessment
	Worker - dermal

1,3-Butadiene



Additional good practice advice	
Where appropriate, replacement of task by automated and/or closed processes.	
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 Storage With occasional controlled exposure. Use domain: industrial	
Operational conditions		
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 100 %	
Physical state	liquid	
Vapour pressure of the substance during use	268333,1875 Pa	
Process temperature	20 °C	
Duration and Frequency of activity	60 min 5 days per week	
Indoor/Outdoor	Indoor	
	Operation is carried out at ambient or elevated temperatures	
Risk Management Measures		
Local exhaust ventilation		
Provide a good standard of general ventilation (not less than 3 - 5 air changes per hour)	Effectiveness: 30 %	
Drain down and flush system prior to equipment break-in or maintenance. Restrict access to authorised persons. Provide specific employee training to prevent/minimize exposures. Regular inspection and maintenance of equipment and machines.		
Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings. Disposal - This material and its container must be disposed of in a safe manner. In case of potential exposure:, Use suitable chemically resistant gloves., Wear suitable coveralls to prevent exposure to the skin., Wear suitable respiratory protection., Clear spills		

1,3-Butadiene



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immediately, Consider the need for		
risk based health surveillance.		
Avoid frequent and direct contact with		
substance. Clean up contamination as		
soon as they occur. Wash off any skin		
contamination immediately. Provide		
specific employee training to		
prevent/minimize exposures.		
Wear suitable gloves tested to EN		
ISO 374-1.		
Exposure estimate and reference to it	Exposure estimate and reference to its source	
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker	
	Worker - inhalation, long-term - systemic	
Exposure estimate	0,7888 mg/m ³	
Risk Characterization Ratio (RCR)	0,356931	
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker	
Assessment method	Qualitative assessment	
	Worker - dermal	
Additional good practice advice		
Where appropriate, replacement of task by automated and/or closed processes.		
Guidance to Downstream Users		
For scaling see: http://www.ecetoc.org/t	ra	

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 General exposures (closed systems) Use in contained batch processes Use domain: industrial
Operational conditions	
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance during use	268333,1875 Pa
Process temperature	20 °C
Duration and Frequency of activity	15 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated temperatures
Risk Management Measures	
Local exhaust ventilation	
Provide a good standard of general	Effectiveness: 30 %

1,3-Butadiene



ventilation (not less than 3 - 5 air changes per hour)	
Drain down and flush system prior to	
equipment break-in or maintenance.	
Restrict access to authorised persons.	
Provide specific employee training to	
prevent/minimize exposures. Regular	
inspection and maintenance of	
equipment and machines.	
Minimise exposure by partial	
enclosure of the operation or	
equipment and provide extract	
ventilation at openings. Disposal -	
This material and its container must	
be disposed of in a safe manner.	
In case of potential exposure:, Use	
suitable chemically resistant gloves.,	
Wear suitable coveralls to prevent	
exposure to the skin., Wear suitable	
respiratory protection., Clear spills	
immediately, Consider the need for	
risk based health surveillance.	
Avoid frequent and direct contact with	
substance. Clean up contamination as	
soon as they occur. Wash off any skin	
contamination immediately. Provide	
specific employee training to	
prevent/minimize exposures.	
Wear suitable gloves tested to EN	
ISO 374-1.	
Exposure estimate and reference to	
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Consequence antiquents	Worker - inhalation, long-term - systemic
Exposure estimate	0,7888 mg/m ³
Risk Characterization Ratio (RCR)	0,356931
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Assessment method	Qualitative assessment
Additional good prostice advise	Worker - dermal
Additional good practice advice	hu automated and/or alogad processes
	by automated and/or closed processes.
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/t	ra

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 General exposures (closed systems) Use in contained

1,3-Butadiene



	batch processes Use domain: industrial
Operational conditions	
•	1,3-butadiene
Concentration of the substance	Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance during use	268333,1875 Pa
Process temperature	20 °C
Duration and Frequency of activity	15 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated temperatures
Risk Management Measures	
Provide a good standard of general ventilation (not less than 3 - 5 air changes per hour)	Effectiveness: 30 %
Handle substance within a predominantly closed system provided with extract ventilation.	Effectiveness: 90 %
Drain down and flush system prior to equipment break-in or maintenance. Restrict access to authorised persons. Provide specific employee training to prevent/minimize exposures. Regular inspection and maintenance of equipment and machines.	
Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings. Disposal - This material and its container must be disposed of in a safe manner.	
In case of potential exposure:, Use suitable chemically resistant gloves., Wear suitable coveralls to prevent exposure to the skin., Wear suitable respiratory protection., Clear spills immediately, Consider the need for risk based health surveillance.	
Avoid frequent and direct contact with substance. Clean up contamination as soon as they occur. Wash off any skin contamination immediately. Provide specific employee training to prevent/minimize exposures.	

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Wear suitable gloves tested to EN	
ISO 374-1.	
Exposure estimate and reference to	its source
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	0,7888 mg/m ³
Risk Characterization Ratio (RCR)	0,356931
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Assessment method	Qualitative assessment
	Worker - dermal
Additional good practice advice	
Where appropriate, replacement of task by automated and/or closed processes.	
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 Equipment maintenance Cleaning Use domain: industrial	
Operational conditions		
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 100 %	
Physical state	liquid	
Vapour pressure of the substance during use	268333,1875 Pa	
Process temperature	20 °C	
Duration and Frequency of activity	60 min 5 days per week	
Indoor/Outdoor	Indoor	
	Operation is carried out at ambient or elevated temperatures	
Risk Management Measures		
Local exhaust ventilation		
Wear suitable respiratory protection.	Effectiveness: 90 %	
Provide a good standard of general ventilation (not less than 3 - 5 air changes per hour)	Effectiveness: 30 %	
Drain down and flush system prior to equipment break-in or maintenance. Restrict access to authorised persons. Provide specific employee training to prevent/minimize exposures. Regular inspection and maintenance of equipment and machines. Minimise exposure by partial		

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enclosure of the operation or equipment and provide extract	
ventilation at openings. Disposal -	
This material and its container must	
be disposed of in a safe manner.	
In case of potential exposure:, Use	
suitable chemically resistant gloves.,	
Wear suitable coveralls to prevent	
exposure to the skin., Wear suitable	
respiratory protection., Clear spills	
immediately, Consider the need for	
risk based health surveillance.	
Avoid frequent and direct contact with	
substance. Clean up contamination as	
soon as they occur. Wash off any skin	
contamination immediately. Provide	
specific employee training to	
prevent/minimize exposures.	
Wear suitable gloves tested to EN ISO 374-1.	
Exposure estimate and reference to	ts source
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	0,7888 mg/m ³
Risk Characterization Ratio (RCR)	0,356931
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Assessment method	Qualitative assessment
	Worker - dermal
Additional good practice advice	
Where appropriate, replacement of task by automated and/or closed processes.	
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/t	ra

Contributing exposure scenario	
Use descriptors covered	PROC8a: Transfer of substance or mixture (charging and discharging) at non-dedicated facilities Equipment maintenance Cleaning Use domain: industrial
Operational conditions	
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance during use	268333,1875 Pa
Process temperature	20 °C
Duration and Frequency of activity	60 min 5 days per week

1,3-Butadiene



Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated
	temperatures
Risk Management Measures	
Provide a good standard of general	
ventilation (not less than 3 - 5 air	Effectiveness: 30 %
changes per hour)	
Wear suitable respiratory protection.	Effectiveness: 90 %
Drain down and flush system prior to	
equipment break-in or maintenance.	
Restrict access to authorised persons.	
Provide specific employee training to	
prevent/minimize exposures. Regular	
inspection and maintenance of	
equipment and machines.	
Minimise exposure by partial	
enclosure of the operation or	
equipment and provide extract	
ventilation at openings. Disposal - This material and its container must	
be disposed of in a safe manner.	
In case of potential exposure:, Use suitable chemically resistant gloves.,	
Wear suitable coveralls to prevent	
exposure to the skin., Wear suitable	
respiratory protection., Clear spills	
immediately, Consider the need for	
risk based health surveillance.	
Avoid frequent and direct contact with	
substance. Clean up contamination as	
soon as they occur. Wash off any skin	
contamination immediately. Provide	
specific employee training to	
prevent/minimize exposures.	
Wear suitable gloves tested to EN	
ISO 374-1.	
Exposure estimate and reference to	its source
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	0,7888 mg/m ³
Risk Characterization Ratio (RCR)	0,356931
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Assessment method	Qualitative assessment
	Worker - dermal
Additional good practice advice	
	k by automated and/or closed processes.
Guidance to Downstream Users	·

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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 Bulk transfer Use domain: industrial	
Operational conditions		
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 100 %	
Physical state	liquid	
Vapour pressure of the substance during use	268333,1875 Pa	
Process temperature	20 °C	
Duration and Frequency of activity	60 min 5 days per week	
Indoor/Outdoor	Indoor	
	Operation is carried out at ambient or elevated temperatures	
Risk Management Measures		
Local exhaust ventilation		
Provide a good standard of general or controlled ventilation (5 to 10 air changes per hour)	Effectiveness: 70 %	
Drain down and flush system prior to equipment break-in or maintenance. Restrict access to authorised persons. Provide specific employee training to prevent/minimize exposures. Regular inspection and maintenance of equipment and machines.		
Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings. Disposal - This material and its container must be disposed of in a safe manner.		
In case of potential exposure:, Use suitable chemically resistant gloves., Wear suitable coveralls to prevent exposure to the skin., Wear suitable respiratory protection., Clear spills immediately, Consider the need for risk based health surveillance. Avoid frequent and direct contact with		
substance. Clean up contamination as soon as they occur. Wash off any skin		

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contamination immediately. Provide	
specific employee training to	
prevent/minimize exposures.	
Wear suitable gloves tested to EN	-
ISO 374-1.	
Exposure estimate and reference to	its source
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	1,0142 mg/m ³
Risk Characterization Ratio (RCR)	0,458912
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Assessment method	Qualitative assessment
	Worker - dermal
Additional good practice advice	
Where appropriate, replacement of ta	sk by automated and/or closed processes.
Guidance to Downstream Users	·
For scaling see: http://www.ecetoc.org	ı/tra

Contributing exposure scenario	
Use descriptors covered	PROC8b: Transfer of substance or mixture (charging and discharging) at dedicated facilities Bulk transfer Use domain: industrial
Operational conditions	
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance during use	268333,1875 Pa
Process temperature	20 °C
Duration and Frequency of activity	60 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated temperatures
Risk Management Measures	
Provide a good standard of general or controlled ventilation (5 to 10 air changes per hour)	Effectiveness: 70 %
Use dry break couplings for material transfer	Effectiveness: 95 %
Drain down and flush system prior to equipment break-in or maintenance. Restrict access to authorised persons. Provide specific employee training to prevent/minimize exposures. Regular	

1,3-Butadiene



inspection and maintenance of	
equipment and machines.	
Minimise exposure by partial	
enclosure of the operation or	
equipment and provide extract	
ventilation at openings. Disposal -	
This material and its container must	
be disposed of in a safe manner.	
In case of potential exposure:, Use	
suitable chemically resistant gloves.,	
Wear suitable coveralls to prevent	
exposure to the skin., Wear suitable	
respiratory protection., Clear spills	
immediately, Consider the need for	
risk based health surveillance.	
Avoid frequent and direct contact with	
substance. Clean up contamination as	
soon as they occur. Wash off any skin	
contamination immediately. Provide	
specific employee training to	
prevent/minimize exposures.	
Wear suitable gloves tested to EN	
ISO 374-1.	
Exposure estimate and reference to it	
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	1,0142 mg/m ³
Risk Characterization Ratio (RCR)	0,458912
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Assessment method	Qualitative assessment
	Worker - dermal
Additional good practice advice	
Where appropriate, replacement of task by automated and/or closed processes.	
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/t	ra

Contributing exposure scenario		
Use descriptors covered	PROC8b: Transfer of substance or mixture (charging and discharging) at dedicated facilities Bulk transfer (closed systems) Use domain: industrial	
Operational conditions		
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 100 %	
Physical state	liquid	
Vapour pressure of the substance during use	268333,1875 Pa	

1,3-Butadiene



Process temperature	20 °C
Duration and Frequency of activity	60 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated temperatures
Risk Management Measures	•
Local exhaust ventilation	
Provide a good standard of general or controlled ventilation (5 to 10 air changes per hour)	Effectiveness: 70 %
Drain down and flush system prior to equipment break-in or maintenance. Restrict access to authorised persons. Provide specific employee training to prevent/minimize exposures. Regular inspection and maintenance of equipment and machines.	
Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings. Disposal - This material and its container must be disposed of in a safe manner.	
In case of potential exposure:, Use suitable chemically resistant gloves., Wear suitable coveralls to prevent exposure to the skin., Wear suitable respiratory protection., Clear spills immediately, Consider the need for risk based health surveillance.	
Avoid frequent and direct contact with substance. Clean up contamination as soon as they occur. Wash off any skin contamination immediately. Provide specific employee training to prevent/minimize exposures. Wear suitable gloves tested to EN	
ISO 374-1.	
Exposure estimate and reference to i	
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	1,0142 mg/m ³
Risk Characterization Ratio (RCR)	0,458912
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Assessment method	Qualitative assessment
Additional good practice advice	Worker - dermal

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Where appropriate, replacement of task by automated and/or closed processes.

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 Bulk transfer (closed systems) Use domain: industrial
Operational conditions	
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance during use	268333,1875 Pa
Process temperature	20 °C
Duration and Frequency of activity	60 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated temperatures
Risk Management Measures	
Provide a good standard of general or controlled ventilation (5 to 10 air changes per hour)	Effectiveness: 70 %
Use dry break couplings for material transfer	Effectiveness: 95 %
Drain down and flush system prior to equipment break-in or maintenance. Restrict access to authorised persons. Provide specific employee training to prevent/minimize exposures. Regular inspection and maintenance of equipment and machines.	
Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings. Disposal - This material and its container must be disposed of in a safe manner. In case of potential exposure:, Use suitable chemically resistant gloves., Wear suitable coveralls to prevent exposure to the skin., Wear suitable respiratory protection., Clear spills	
immediately, Consider the need for risk based health surveillance.	

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Avoid frequent and direct contact with		
substance. Clean up contamination as		
soon as they occur. Wash off any skin		
contamination immediately. Provide		
specific employee training to		
prevent/minimize exposures.		
Wear suitable gloves tested to EN		
ISO 374-1.		
Exposure estimate and reference to its source		
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker	
	Worker - inhalation, long-term - systemic	
Exposure estimate	1,0142 mg/m ³	
Risk Characterization Ratio (RCR)	0,458912	
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker	
Assessment method	Qualitative assessment	
	Worker - dermal	
Additional good practice advice		
Where appropriate, replacement of task by automated and/or closed processes.		
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). Process sampling Use domain: industrial
Operational conditions	
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance during use	268333,1875 Pa
Process temperature	20 °C
Duration and Frequency of activity	15 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated temperatures
Risk Management Measures	
Local exhaust ventilation	
Provide a good standard of general or controlled ventilation (5 to 10 air changes per hour)	Effectiveness: 70 %
Drain down and flush system prior to equipment break-in or maintenance. Restrict access to authorised persons.	

1,3-Butadiene



Provide specific employee training to	
prevent/minimize exposures. Regular	
inspection and maintenance of equipment and machines.	
Minimise exposure by partial	
enclosure of the operation or	
equipment and provide extract	
ventilation at openings. Disposal -	
This material and its container must	
be disposed of in a safe manner.	
In case of potential exposure:, Use	
suitable chemically resistant gloves.,	
Wear suitable coveralls to prevent	
exposure to the skin., Wear suitable	
respiratory protection., Clear spills	
immediately, Consider the need for	
risk based health surveillance.	
Avoid frequent and direct contact with	
substance. Clean up contamination as	
soon as they occur. Wash off any skin	
contamination immediately. Provide	
specific employee training to	
prevent/minimize exposures.	
Wear suitable gloves tested to EN	
ISO 374-1.	
Exposure estimate and reference to it	
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	1,3523 mg/m³
Risk Characterization Ratio (RCR)	0,611882
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Assessment method	Qualitative assessment
Additional mand m	Worker - dermal
Additional good practice advice	le a la catada a discala a da
Where appropriate, replacement of task by automated and/or closed processes.	
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/t	ra

Contributing exposure scenario	
Use descriptors covered	PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing). Process sampling Use domain: industrial
Operational conditions	
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 100 %
Physical state	liquid

1,3-Butadiene



Vapour pressure of the substance during use	268333,1875 Pa
Process temperature	20 °C
Duration and Frequency of activity	15 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated
	temperatures
Risk Management Measures	
Provide a good standard of general or	
controlled ventilation (5 to 10 air	Effectiveness: 70 %
changes per hour)	
Sample via a closed loop or other	Effectiveness: 90 %
system to avoid exposure.	LITEGUVETIESS. 30 /0
Drain down and flush system prior to	
equipment break-in or maintenance.	
Restrict access to authorised persons.	
Provide specific employee training to	
prevent/minimize exposures. Regular	
inspection and maintenance of	
equipment and machines.	
Minimise exposure by partial	
enclosure of the operation or	
equipment and provide extract	
ventilation at openings. Disposal -	
This material and its container must	
be disposed of in a safe manner.	
In case of potential exposure:, Use	
suitable chemically resistant gloves.,	
Wear suitable coveralls to prevent exposure to the skin., Wear suitable	
respiratory protection., Clear spills	
immediately, Consider the need for	
risk based health surveillance.	
Avoid frequent and direct contact with	
substance. Clean up contamination as	
soon as they occur. Wash off any skin	
contamination immediately. Provide	
specific employee training to	
prevent/minimize exposures.	
Wear suitable gloves tested to EN	
ISO 374-1.	
Exposure estimate and reference to	its source
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	1,3523 mg/m³
Risk Characterization Ratio (RCR)	0,611882
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker

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Assessment method	Qualitative assessment
	Worker - dermal
Additional good practice advice	
Where appropriate, replacement of task by automated and/or closed processes.	
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/	tra

Contributing exposure scenario	
Use descriptors covered	PROC15: Use a laboratory reagent. Laboratory activities Use domain: industrial
Operational conditions	
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance during use	268333,1875 Pa
Process temperature	20 °C
Duration and Frequency of activity	60 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated temperatures
Risk Management Measures	·
Local exhaust ventilation	
Provide a good standard of general ventilation (not less than 3 - 5 air changes per hour)	Effectiveness: 30 %
Drain down and flush system prior to equipment break-in or maintenance. Restrict access to authorised persons. Provide specific employee training to prevent/minimize exposures. Regular inspection and maintenance of equipment and machines.	
Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings. Disposal - This material and its container must be disposed of in a safe manner. In case of potential exposure:, Use suitable chemically resistant gloves., Wear suitable coveralls to prevent exposure to the skin., Wear suitable respiratory protection., Clear spills	

1,3-Butadiene



immediately, Consider the need for	
risk based health surveillance.	
Avoid frequent and direct contact with	
substance. Clean up contamination as	
soon as they occur. Wash off any skin	
contamination immediately. Provide	
specific employee training to	
prevent/minimize exposures.	
Wear suitable gloves tested to EN	
ISO 374-1.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	1,5776 mg/m³
Risk Characterization Ratio (RCR)	0,713863
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Assessment method	Qualitative assessment
	Worker - dermal
Additional good practice advice	
Where appropriate, replacement of task by automated and/or closed processes.	
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra	

Contributing exposure scenario		
	PROC15: Use a laboratory reagent.	
Use descriptors covered	Laboratory activities Use domain: industrial	
Operational conditions		
	1,3-butadiene	
Concentration of the substance	Content: >= 0 % - <= 100 %	
Physical state	liquid	
Vapour pressure of the substance	268333,1875 Pa	
during use		
Process temperature	20 °C	
1 100000 tomporataro		
Duration and Frequency of activity	60 min 5 days per week	
Indoor/Outdoor	Indoor	
	Operation is carried out at ambient or elevated	
	temperatures	
Risk Management Measures		
Drain down and flush system prior to		
equipment break-in or maintenance.		
Restrict access to authorised persons.		
Provide specific employee training to		
prevent/minimize exposures. Regular		
inspection and maintenance of		

1,3-Butadiene

Print date 19.11.2024
Revision date 19.11.2024
Version 17.0 (en)
replaces version of 15.11.2024 (16.0)



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equipment and machines.		
Minimise exposure by partial		
enclosure of the operation or		
equipment and provide extract		
ventilation at openings. Disposal -		
This material and its container must		
be disposed of in a safe manner.		
In case of potential exposure:, Use		
suitable chemically resistant gloves.,		
Wear suitable coveralls to prevent		
exposure to the skin., Wear suitable		
respiratory protection., Clear spills		
immediately, Consider the need for		
risk based health surveillance.		
Avoid frequent and direct contact with		
substance. Clean up contamination as		
soon as they occur. Wash off any skin		
contamination immediately. Provide		
specific employee training to		
prevent/minimize exposures.		
Wear suitable gloves tested to EN		
ISO 374-1.		
Exposure estimate and reference to it		
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker	
	Worker - inhalation, long-term - systemic	
Exposure estimate	1,1269 mg/m ³	
Risk Characterization Ratio (RCR)	0,509902	
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker	
Assessment method	Qualitative assessment	
	Worker - dermal	
Additional good practice advice		
Where appropriate, replacement of task by automated and/or closed processes.		
Guidance to Downstream Users		
For scaling see: http://www.ecetoc.org/tra		

2. Short title of exposure scenario

Formulation

F; ERC2; PROC1, PROC2, PROC3, PROC5, PROC8a, PROC8b, PROC9, PROC14, PROC15

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Control of exposure and risk management measures

Contributing exposure scenario	
	ERC2: Formulation into mixture
Use descriptors covered	As no environmental hazard was identified no
-	environmental-related exposure assessment and risk

1,3-Butadiene



	characterization was performed.
Operational conditions	

Contributing exposure scenario		
Use descriptors covered	PROC1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions. General exposures (closed systems) Use domain: industrial	
Operational conditions		
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 100 %	
Physical state	liquid	
Vapour pressure of the substance during use	268333,1875 Pa	
Process temperature	20 °C	
Duration and Frequency of activity	480 min 5 days per week	
Indoor/Outdoor	Indoor	
	Operation is carried out at ambient or elevated temperatures	
Risk Management Measures		
Drain down and flush system prior to equipment break-in or maintenance. Restrict access to authorised persons. Provide specific employee training to prevent/minimize exposures. Regular inspection and maintenance of equipment and machines. Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings. Disposal - This material and its container must be disposed of in a safe manner.		
In case of potential exposure:, Use suitable chemically resistant gloves., Wear suitable coveralls to prevent exposure to the skin., Wear suitable respiratory protection., Clear spills immediately, Consider the need for risk based health surveillance. Avoid frequent and direct contact with substance. Clean up contamination as soon as they occur. Wash off any skin		

1,3-Butadiene



contamination immediately. Provide specific employee training to prevent/minimize exposures. Wear suitable gloves tested to EN	
ISO 374-1.	
Exposure estimate and reference to	its source
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	0,0225 mg/m ³
Risk Characterization Ratio (RCR)	0,010198
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Assessment method	Qualitative assessment
	Worker - dermal
Additional good practice advice	
Where appropriate, replacement of task by automated and/or closed processes.	
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 General exposures (closed systems) with sample collection With occasional controlled exposure. Use domain: industrial
Operational conditions	
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance during use	268333,1875 Pa
Process temperature	20 °C
Duration and Frequency of activity	60 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated temperatures
Risk Management Measures	
Local exhaust ventilation	
Provide a good standard of general ventilation (not less than 3 - 5 air changes per hour)	Effectiveness: 30 %
Drain down and flush system prior to equipment break-in or maintenance. Restrict access to authorised persons.	

1,3-Butadiene



prevent/minimize exposures. Regular inspection and maintenance of equipment and machines. Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings. Disposal - This material and its container must be disposed of in a safe manner. In case of potential exposure; Use suitable chemically resistant gloves. Wear suitable chemically resistant gloves. Wear suitable coveralls to prevent exposure to the skin., Wear suitable respiratory protection., Clear spills immediately, Consider the need for risk based health surveillance. Avoid frequent and direct contact with substance. Clean up contamination as soon as they occur. Wash off any skin contamination immediately. Provide specific employee training to prevent/minimize exposures. Wear suitable gloves tested to EN ISO 374-1. Exposure estimate and reference to its source Assessment method EASY TRA v6.0, ECETOC TRA v3.0, Worker Worker - inhalation, long-term - systemic Exposure estimate D,7888 mg/m³ Risk Characterization Ratio (RCR) Assessment method EASY TRA v6.0, ECETOC TRA v3.0, Worker Worker - dermal Additional good practice advice Where appropriate, replacement of task by automated and/or closed processes. Guidance to Downstream Users Exposure gost hits '(timus goots per tra).	Provide specific employee training to		
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roi scaiiig see. http://www.ecetoc.org/tra	For scaling see: http://www.ecetoc.org/t	ra	

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 General exposures (closed systems) with sample collection With occasional controlled exposure. Use domain: industrial
Operational conditions	
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 100 %

1,3-Butadiene



Physical state	liquid
Vapour pressure of the substance	268333,1875 Pa
during use	
	20 °C
Process temperature	
Duration and Frequency of activity	60 min 5 days per week
Indoor/Outdoor	Indoor
indoor/Oddaoor	Operation is carried out at ambient or elevated
	temperatures
Risk Management Measures	temperatures
Provide a good standard of general	
ventilation (not less than 3 - 5 air	Effectiveness: 30 %
changes per hour)	
Sample via a closed loop or other	F##:
system to avoid exposure.	Effectiveness: 90 %
Drain down and flush system prior to	
equipment break-in or maintenance.	
Restrict access to authorised persons.	
Provide specific employee training to	
prevent/minimize exposures. Regular	
inspection and maintenance of	
equipment and machines.	
Minimise exposure by partial	
enclosure of the operation or	
equipment and provide extract	
ventilation at openings. Disposal -	
This material and its container must	
be disposed of in a safe manner.	
In case of potential exposure:, Use suitable chemically resistant gloves.,	
Wear suitable coveralls to prevent	
exposure to the skin., Wear suitable	
respiratory protection., Clear spills	
immediately, Consider the need for	
risk based health surveillance.	
Avoid frequent and direct contact with	
substance. Clean up contamination as	
soon as they occur. Wash off any skin	
contamination immediately. Provide	
specific employee training to	
prevent/minimize exposures.	
Wear suitable gloves tested to EN	
ISO 374-1.	
Exposure estimate and reference to	
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	0,7888 mg/m³

1,3-Butadiene



Risk Characterization Ratio (RCR)	0,356931
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Assessment method	Qualitative assessment
	Worker - dermal
Additional good practice advice	
Where appropriate, replacement of task	by automated and/or closed processes.
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/	ra

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 General exposures (closed systems) with sample collection With occasional controlled exposure. Use domain: industrial
Operational conditions	
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance during use	268333,1875 Pa
Process temperature	20 °C
Duration and Frequency of activity	60 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated temperatures
Risk Management Measures	
Provide a good standard of general ventilation (not less than 3 - 5 air changes per hour)	Effectiveness: 30 %
Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings.	Effectiveness: 90 %
Drain down and flush system prior to equipment break-in or maintenance. Restrict access to authorised persons. Provide specific employee training to prevent/minimize exposures. Regular inspection and maintenance of equipment and machines. Minimise exposure by partial enclosure of the operation or	

1,3-Butadiene



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Assessment method Qualitative assessment Worker - dermal Additional good practice advice Where appropriate, replacement of task by automated and/or closed processes. Guidance to Downstream Users	Risk Characterization Ratio (RCR)	0,356931	
Worker - dermal Additional good practice advice Where appropriate, replacement of task by automated and/or closed processes. Guidance to Downstream Users	Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker	
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Where appropriate, replacement of task by automated and/or closed processes. Guidance to Downstream Users		Worker - dermal	
Guidance to Downstream Users	Additional good practice advice		
For scaling see: http://www.ecetoc.org/tra	Guidance to Downstream Users	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 Storage Use domain: industrial		
Operational conditions	Operational conditions		
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 100 %		
Physical state	liquid		
Vapour pressure of the substance during use	268333,1875 Pa		
Process temperature	20 °C		
Duration and Frequency of activity	240 min 5 days per week		

1,3-Butadiene



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Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated
	temperatures
Risk Management Measures	
Local exhaust ventilation	
Provide a good standard of general or	
controlled ventilation (5 to 10 air	Effectiveness: 70 %
changes per hour)	
Drain down and flush system prior to	
equipment break-in or maintenance.	
Restrict access to authorised persons.	
Provide specific employee training to	
prevent/minimize exposures. Regular	
inspection and maintenance of	
equipment and machines.	
Minimise exposure by partial	
enclosure of the operation or	
equipment and provide extract	
ventilation at openings. Disposal - This material and its container must	
be disposed of in a safe manner.	
In case of potential exposure:, Use	
suitable chemically resistant gloves.,	
Wear suitable coveralls to prevent	
exposure to the skin., Wear suitable	
respiratory protection., Clear spills	
immediately, Consider the need for	
risk based health surveillance.	
Avoid frequent and direct contact with	
substance. Clean up contamination as	
soon as they occur. Wash off any skin	
contamination immediately. Provide	
specific employee training to	
prevent/minimize exposures.	
Wear suitable gloves tested to EN	
ISO 374-1.	
Exposure estimate and reference to it	its source
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	1,0142 mg/m ³
Risk Characterization Ratio (RCR)	0,458912
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Assessment method	Qualitative assessment
	Worker - dermal
Additional good practice advice	
Where appropriate, replacement of task by automated and/or closed processes.	
Guidance to Downstream Users	

1,3-Butadiene

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replaces version of 15.11.2024 (16.0)



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 Storage Use domain: industrial
Operational conditions	
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance during use	268333,1875 Pa
Process temperature	20 °C
Duration and Frequency of activity	240 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated temperatures
Risk Management Measures	
Provide a good standard of general or controlled ventilation (5 to 10 air changes per hour)	Effectiveness: 70 %
Ensure material transfers are under containment or extract ventilation	Effectiveness: 90 %
Drain down and flush system prior to equipment break-in or maintenance. Restrict access to authorised persons. Provide specific employee training to prevent/minimize exposures. Regular inspection and maintenance of equipment and machines.	
Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings. Disposal - This material and its container must be disposed of in a safe manner.	
In case of potential exposure:, Use suitable chemically resistant gloves., Wear suitable coveralls to prevent exposure to the skin., Wear suitable respiratory protection., Clear spills immediately, Consider the need for risk based health surveillance. Avoid frequent and direct contact with	

1,3-Butadiene



substance. Clean up contamination as soon as they occur. Wash off any skin contamination immediately. Provide specific employee training to prevent/minimize exposures. Wear suitable gloves tested to EN ISO 374-1.	
Exposure estimate and reference to it	ts source
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	1,0142 mg/m ³
Risk Characterization Ratio (RCR)	0,458912
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Assessment method	Qualitative assessment
	Worker - dermal
Additional good practice advice	
Where appropriate, replacement of task by automated and/or closed processes.	
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 Batch processes at elevated temperatures Use domain: industrial	
Operational conditions		
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 100 %	
Physical state	liquid	
Vapour pressure of the substance during use	268333,1875 Pa	
Process temperature	20 °C	
Duration and Frequency of activity	240 min 5 days per week	
Indoor/Outdoor	Indoor	
	Operation is carried out at ambient or elevated temperatures	
Risk Management Measures		
Local exhaust ventilation		
Provide a good standard of general or controlled ventilation (5 to 10 air changes per hour)	Effectiveness: 70 %	
Drain down and flush system prior to		

1,3-Butadiene



equipment break-in or maintenance.	
Restrict access to authorised persons.	
Provide specific employee training to	
prevent/minimize exposures. Regular	
inspection and maintenance of	
equipment and machines.	
Minimise exposure by partial	
enclosure of the operation or	
equipment and provide extract	
ventilation at openings. Disposal -	
This material and its container must	
be disposed of in a safe manner.	
In case of potential exposure:, Use	
suitable chemically resistant gloves.,	
Wear suitable coveralls to prevent	
exposure to the skin., Wear suitable	
respiratory protection., Clear spills	
immediately, Consider the need for	
risk based health surveillance.	
Avoid frequent and direct contact with	
substance. Clean up contamination as	
soon as they occur. Wash off any skin	
contamination immediately. Provide	
specific employee training to	
prevent/minimize exposures.	
Wear suitable gloves tested to EN	
ISO 374-1.	
Exposure estimate and reference to it	
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	2,0284 mg/m ³
Risk Characterization Ratio (RCR)	0,917824
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Assessment method	Qualitative assessment
	Worker - dermal
Additional good practice advice	
	by automated and/or closed processes.
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/t	ra

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 Batch processes at elevated temperatures Use domain: industrial
Operational conditions	

1,3-Butadiene



Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 100 %
	35 No. 11 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
Physical state	liquid
Vapour pressure of the substance during use	268333,1875 Pa
Process temperature	20 °C
Duration and Frequency of activity	240 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated temperatures
Risk Management Measures	
Provide a good standard of general or controlled ventilation (5 to 10 air changes per hour)	Effectiveness: 70 %
Handle substance within a predominantly closed system provided with extract ventilation.	Effectiveness: 90 %
Drain down and flush system prior to equipment break-in or maintenance. Restrict access to authorised persons. Provide specific employee training to prevent/minimize exposures. Regular inspection and maintenance of equipment and machines.	
Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings. Disposal - This material and its container must be disposed of in a safe manner.	
In case of potential exposure:, Use suitable chemically resistant gloves., Wear suitable coveralls to prevent exposure to the skin., Wear suitable respiratory protection., Clear spills immediately, Consider the need for risk based health surveillance.	
Avoid frequent and direct contact with substance. Clean up contamination as soon as they occur. Wash off any skin contamination immediately. Provide specific employee training to prevent/minimize exposures.	
Wear suitable gloves tested to EN ISO 374-1. Exposure estimate and reference to it.	its source

1,3-Butadiene



Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker	
	Worker - inhalation, long-term - systemic	
Exposure estimate	2,0284 mg/m ³	
Risk Characterization Ratio (RCR)	0,917824	
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker	
Assessment method	Qualitative assessment	
	Worker - dermal	
Additional good practice advice		
Where appropriate, replacement of task by automated and/or closed processes.		
Guidance to Downstream Users		
For scaling see: http://www.ecetoc.org/tra		

Contributing exposure scenario		
Contributing exposure scenario	DDOCO: Manufacture or former lation in the above	
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 General exposures (closed systems) Use in contained batch processes Use domain: industrial	
Operational conditions		
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 100 %	
Physical state	liquid	
Vapour pressure of the substance during use	268333,1875 Pa	
Process temperature	20 °C	
Duration and Frequency of activity	60 min 5 days per week	
Indoor/Outdoor	Indoor	
	Operation is carried out at ambient or elevated temperatures	
Risk Management Measures		
Local exhaust ventilation		
Provide a good standard of general or controlled ventilation (5 to 10 air changes per hour)	Effectiveness: 70 %	
Drain down and flush system prior to equipment break-in or maintenance. Restrict access to authorised persons. Provide specific employee training to prevent/minimize exposures. Regular inspection and maintenance of equipment and machines.		
Minimise exposure by partial enclosure of the operation or		

1,3-Butadiene



equipment and provide extract	
ventilation at openings. Disposal -	
This material and its container must	
be disposed of in a safe manner.	
In case of potential exposure:, Use	
suitable chemically resistant gloves.,	
Wear suitable coveralls to prevent	
exposure to the skin., Wear suitable	
respiratory protection., Clear spills	
immediately, Consider the need for risk based health surveillance.	
Avoid frequent and direct contact with	
substance. Clean up contamination as	
soon as they occur. Wash off any skin	
contamination immediately. Provide	
specific employee training to	
prevent/minimize exposures.	
Wear suitable gloves tested to EN	
ISO 374-1.	
Exposure estimate and reference to i	
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	0,6761 mg/m ³
Risk Characterization Ratio (RCR)	0,305941
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Assessment method	Qualitative assessment
	Worker - dermal
Additional good practice advice	
Where appropriate, replacement of task by automated and/or closed processes.	
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/t	ra

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 General exposures (closed systems) Use in contained batch processes Use domain: industrial	
Operational conditions		
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 100 %	
Physical state	liquid	
Vapour pressure of the substance during use	268333,1875 Pa	
Process temperature	20 °C	

1,3-Butadiene



Duration and Frequency of activity	60 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated
Risk Management Measures	temperatures
Provide a good standard of general or	
controlled ventilation (5 to 10 air changes per hour)	Effectiveness: 70 %
Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings.	Effectiveness: 90 %
Drain down and flush system prior to equipment break-in or maintenance. Restrict access to authorised persons. Provide specific employee training to prevent/minimize exposures. Regular inspection and maintenance of equipment and machines.	
Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings. Disposal - This material and its container must be disposed of in a safe manner.	
In case of potential exposure:, Use suitable chemically resistant gloves., Wear suitable coveralls to prevent exposure to the skin., Wear suitable respiratory protection., Clear spills immediately, Consider the need for risk based health surveillance.	
Avoid frequent and direct contact with substance. Clean up contamination as soon as they occur. Wash off any skin contamination immediately. Provide specific employee training to prevent/minimize exposures. Wear suitable gloves tested to EN	
ISO 374-1.	
Exposure estimate and reference to it	ts source
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	0,6761 mg/m ³
Risk Characterization Ratio (RCR)	0,305941
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Assessment method	Qualitative assessment

1,3-Butadiene



Worker - dermal	
Additional good practice advice	
Where appropriate, replacement of task by automated and/or closed processes.	
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra	

Contributing exposure scenario		
Use descriptors covered	PROC5: Mixing or blending in batch processes Use domain: industrial	
Operational conditions		
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 100 %	
Physical state	liquid	
Vapour pressure of the substance during use	268333,1875 Pa	
Process temperature	20 °C	
Duration and Frequency of activity	60 min 5 days per week	
Indoor/Outdoor	Indoor	
	Operation is carried out at ambient or elevated temperatures	
Risk Management Measures		
Local exhaust ventilation		
Wear suitable respiratory protection.	Effectiveness: 90 %	
Provide a good standard of general ventilation (not less than 3 - 5 air changes per hour)	Effectiveness: 30 %	
Drain down and flush system prior to equipment break-in or maintenance. Restrict access to authorised persons. Provide specific employee training to prevent/minimize exposures. Regular inspection and maintenance of equipment and machines.		
Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings. Disposal - This material and its container must be disposed of in a safe manner. In case of potential exposure:, Use suitable chemically resistant gloves., Wear suitable coveralls to prevent		
exposure to the skin., Wear suitable respiratory protection., Clear spills		

1,3-Butadiene



Limmodiataly, Canaiday the mond for	l I
immediately, Consider the need for	
risk based health surveillance.	
Avoid frequent and direct contact with	
substance. Clean up contamination as	
soon as they occur. Wash off any skin	
contamination immediately. Provide	
specific employee training to	
prevent/minimize exposures.	
Wear suitable gloves tested to EN	
ISO 374-1.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	0,7888 mg/m ³
Risk Characterization Ratio (RCR)	0,356931
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Assessment method	Qualitative assessment
	Worker - dermal
Additional good practice advice	
Where appropriate, replacement of task by automated and/or closed processes.	
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/t	ra

Contributing exposure scenario	
Use descriptors covered	PROC8a: Transfer of substance or mixture (charging and discharging) at non-dedicated facilities Equipment maintenance Cleaning Use domain: industrial
Operational conditions	
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance during use	268333,1875 Pa
Process temperature	20 °C
Duration and Frequency of activity	240 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated temperatures
Risk Management Measures	
Local exhaust ventilation	
Wear suitable respiratory protection.	Effectiveness: 95 %
Provide a good standard of general ventilation (not less than 3 - 5 air changes per hour)	Effectiveness: 30 %

1,3-Butadiene



Drain days and flush avatem prior to	
Drain down and flush system prior to	
equipment break-in or maintenance. Restrict access to authorised persons.	
Provide specific employee training to	
prevent/minimize exposures. Regular	
inspection and maintenance of	
equipment and machines. Minimise exposure by partial	
enclosure of the operation or	
equipment and provide extract	
ventilation at openings. Disposal -	
This material and its container must	
be disposed of in a safe manner.	
In case of potential exposure:, Use	
suitable chemically resistant gloves.,	
Wear suitable coveralls to prevent	
exposure to the skin., Wear suitable	
respiratory protection., Clear spills	
immediately, Consider the need for	
risk based health surveillance.	
Avoid frequent and direct contact with	
substance. Clean up contamination as	
soon as they occur. Wash off any skin	
contamination immediately. Provide	
specific employee training to	
prevent/minimize exposures.	
Wear suitable gloves tested to EN	
ISO 374-1.	
Exposure estimate and reference to it	
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	1,1832 mg/m³
Risk Characterization Ratio (RCR)	0,535397
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Assessment method	Qualitative assessment
	Worker - dermal
Additional good practice advice	
Where appropriate, replacement of task by automated and/or closed processes.	
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/t	ra

Contributing exposure scenario	
Use descriptors covered	PROC8a: Transfer of substance or mixture (charging and discharging) at non-dedicated facilities Equipment maintenance Cleaning Use domain: industrial
Operational conditions	
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 100 %

1,3-Butadiene



Physical state	liquid
Vapour pressure of the substance	268333,1875 Pa
during use	,
	20 °C
Process temperature	
Duration and Fraguency of activity	240 min 5 days per week
Duration and Frequency of activity	
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated
	temperatures
Risk Management Measures	
Provide a good standard of general	
ventilation (not less than 3 - 5 air	Effectiveness: 30 %
changes per hour)	
Wear suitable respiratory protection.	Effectiveness: 95 %
Drain down and flush system prior to	
equipment break-in or maintenance.	
Provide extract ventilation to points	Effectiveness: 90 %
where emissions occur (LEV).	
Drain down and flush system prior to	
equipment break-in or maintenance.	
Restrict access to authorised persons.	
Provide specific employee training to	
prevent/minimize exposures. Regular	
inspection and maintenance of equipment and machines.	
Minimise exposure by partial	
enclosure of the operation or	
equipment and provide extract	
ventilation at openings. Disposal -	
This material and its container must	
be disposed of in a safe manner.	
In case of potential exposure:, Use	
suitable chemically resistant gloves.,	
Wear suitable coveralls to prevent	
exposure to the skin., Wear suitable	
respiratory protection., Clear spills	
immediately, Consider the need for	
risk based health surveillance.	
Avoid frequent and direct contact with	
substance. Clean up contamination as	
soon as they occur. Wash off any skin	
contamination immediately. Provide	
specific employee training to	
prevent/minimize exposures.	
Wear suitable gloves tested to EN	
ISO 374-1.	
Exposure estimate and reference to	its source

1,3-Butadiene



Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker	
	Worker - inhalation, long-term - systemic	
Exposure estimate	1,1832 mg/m³	
Risk Characterization Ratio (RCR)	0,535397	
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker	
Assessment method	Qualitative assessment	
	Worker - dermal	
Additional good practice advice		
Where appropriate, replacement of task by automated and/or closed processes.		
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 (manual) Transfer from/pouring from containers Use domain: industrial
Operational conditions	
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance during use	268333,1875 Pa
Process temperature	20 °C
Duration and Frequency of activity	60 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated temperatures
Risk Management Measures	
Local exhaust ventilation	
Wear suitable respiratory protection.	Effectiveness: 90 %
Provide a good standard of general ventilation (not less than 3 - 5 air changes per hour)	Effectiveness: 30 %
Drain down and flush system prior to equipment break-in or maintenance. Restrict access to authorised persons. Provide specific employee training to prevent/minimize exposures. Regular inspection and maintenance of equipment and machines.	
Minimise exposure by partial enclosure of the operation or equipment and provide extract	

1,3-Butadiene



ventilation at openings. Disposal - This material and its container must be disposed of in a safe manner. In case of potential exposure:, Use suitable chemically resistant gloves., Wear suitable coveralls to prevent exposure to the skin., Wear suitable respiratory protection., Clear spills immediately, Consider the need for risk based health surveillance. Avoid frequent and direct contact with substance. Clean up contamination as soon as they occur. Wash off any skin contamination immediately. Provide specific employee training to prevent/minimize exposures. Wear suitable gloves tested to EN ISO 374-1. Exposure estimate and reference to its source Assessment method EASY TRA v6.0, ECETOC TRA v3.0, Worker Worker - inhalation, long-term - systemic Exposure estimate 0,7888 mg/m³ Risk Characterization Ratio (RCR) 0,356931 Assessment method EASY TRA v6.0, ECETOC TRA v3.0, Worker Assessment method EASY TRA v6.0, ECETOC TRA v3.0, Worker Usosure estimate 0,7888 mg/m³ Risk Characterization Ratio (RCR) 0,356931 Assessment method Cualitative assessment Worker - dermal Additional good practice advice Where appropriate, replacement of task by automated and/or closed processes. Guidance to Downstream Users For scaling see: http://www.ecetoc.org/tra	La company of the control of the control	I I
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Worker - inhalation, long-term - systemic Exposure estimate 0,7888 mg/m³ Risk Characterization Ratio (RCR) 0,356931 Assessment method EASY TRA v6.0, ECETOC TRA v3.0, Worker Assessment method Qualitative assessment Worker - dermal Additional good practice advice Where appropriate, replacement of task by automated and/or closed processes. Guidance to Downstream Users		
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Assessment method EASY TRA v6.0, ECETOC TRA v3.0, Worker Assessment method Qualitative assessment Worker - dermal Additional good practice advice Where appropriate, replacement of task by automated and/or closed processes. Guidance to Downstream Users	Exposure estimate	0,7888 mg/m ³
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Worker - dermal Additional good practice advice Where appropriate, replacement of task by automated and/or closed processes. Guidance to Downstream Users	Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Additional good practice advice Where appropriate, replacement of task by automated and/or closed processes. Guidance to Downstream Users	Assessment method	Qualitative assessment
Where appropriate, replacement of task by automated and/or closed processes. Guidance to Downstream Users		Worker - dermal
Guidance to Downstream Users	Additional good practice advice	
	Where appropriate, replacement of task by automated and/or closed processes.	
For scaling see: http://www.ecetoc.org/tra	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 (manual) Transfer from/pouring from containers Use domain: industrial
Operational conditions	
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance during use	268333,1875 Pa
Process temperature	20 °C
Duration and Frequency of activity	60 min 5 days per week

1,3-Butadiene



Indoor/Outdoor	Indoor	
	Operation is carried out at ambient or elevated	
	temperatures	
Risk Management Measures		
Provide a good standard of general		
ventilation (not less than 3 - 5 air	Effectiveness: 30 %	
changes per hour)		
Wear suitable respiratory protection.	Effectiveness: 90 %	
Minimise exposure by partial		
enclosure of the operation or	Effectiveness: 90 %	
equipment and provide extract	21100tiv011000.00 /0	
ventilation at openings.		
Drain down and flush system prior to		
equipment break-in or maintenance.		
Restrict access to authorised persons.		
Provide specific employee training to		
prevent/minimize exposures. Regular		
inspection and maintenance of		
equipment and machines.		
Minimise exposure by partial		
enclosure of the operation or		
equipment and provide extract		
ventilation at openings. Disposal - This material and its container must		
be disposed of in a safe manner.		
In case of potential exposure:, Use		
suitable chemically resistant gloves., Wear suitable coveralls to prevent		
exposure to the skin., Wear suitable		
respiratory protection., Clear spills		
immediately, Consider the need for		
risk based health surveillance.		
Avoid frequent and direct contact with		
substance. Clean up contamination as		
soon as they occur. Wash off any skin		
contamination immediately. Provide		
specific employee training to		
prevent/minimize exposures.		
Wear suitable gloves tested to EN		
ISO 374-1.		
Exposure estimate and reference to it	ts source	
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker	
	Worker - inhalation, long-term - systemic	
Exposure estimate	0,7888 mg/m ³	
Risk Characterization Ratio (RCR)	0,356931	
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker	
Assessment method	Qualitative assessment	
	Worker - dermal	
Additional good practice advice		
		

1,3-Butadiene

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Version 17.0 (en)
replaces version of 15.11.2024 (16.0)



Where appropriate, replacement of task by automated and/or closed processes.

Guidance to Downstream Users

For scaling see: http://www.ecetoc.org/tra

Contributing exposure scenario	Contributing exposure scenario	
Use descriptors covered	PROC8b: Transfer of substance or mixture (charging and discharging) at dedicated facilities Bulk transfer Use domain: industrial	
Operational conditions		
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 100 %	
Physical state	liquid	
Vapour pressure of the substance during use	268333,1875 Pa	
Process temperature	20 °C	
Duration and Frequency of activity	60 min 5 days per week	
Indoor/Outdoor	Indoor	
	Operation is carried out at ambient or elevated temperatures	
Risk Management Measures		
Local exhaust ventilation		
Provide a good standard of general or controlled ventilation (5 to 10 air changes per hour)	Effectiveness: 70 %	
Drain down and flush system prior to equipment break-in or maintenance. Restrict access to authorised persons. Provide specific employee training to prevent/minimize exposures. Regular inspection and maintenance of equipment and machines.		
Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings. Disposal - This material and its container must be disposed of in a safe manner. In case of potential exposure:, Use suitable chemically resistant gloves., Wear suitable coveralls to prevent		
exposure to the skin., Wear suitable respiratory protection., Clear spills immediately, Consider the need for risk based health surveillance. Avoid frequent and direct contact with		

1,3-Butadiene



substance. Clean up contamination as soon as they occur. Wash off any skin contamination immediately. Provide specific employee training to	
prevent/minimize exposures.	
Wear suitable gloves tested to EN ISO 374-1.	
Exposure estimate and reference to it	ts source
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	1,0142 mg/m ³
Risk Characterization Ratio (RCR)	0,458912
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Assessment method	Qualitative assessment
	Worker - dermal
Additional good practice advice	
Where appropriate, replacement of task by automated and/or closed processes.	
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 Bulk transfer Use domain: industrial
Operational conditions	
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance during use	268333,1875 Pa
Process temperature	20 °C
Duration and Frequency of activity	60 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated temperatures
Risk Management Measures	
Provide a good standard of general or controlled ventilation (5 to 10 air changes per hour)	Effectiveness: 70 %
Ensure material transfers are under containment or extract ventilation	Effectiveness: 95 %
Drain down and flush system prior to equipment break-in or maintenance. Restrict access to authorised persons.	

1,3-Butadiene



Provide specific employee training to	
prevent/minimize exposures. Regular	
inspection and maintenance of	
equipment and machines.	
Minimise exposure by partial	
enclosure of the operation or	
equipment and provide extract	
ventilation at openings. Disposal -	
This material and its container must	
be disposed of in a safe manner.	
In case of potential exposure:, Use	
suitable chemically resistant gloves.,	
Wear suitable coveralls to prevent	
exposure to the skin., Wear suitable	
respiratory protection., Clear spills	
immediately, Consider the need for	
risk based health surveillance.	
Avoid frequent and direct contact with	
substance. Clean up contamination as	
soon as they occur. Wash off any skin	
contamination immediately. Provide	
specific employee training to	
prevent/minimize exposures.	
Wear suitable gloves tested to EN	
ISO 374-1.	
Exposure estimate and reference to	
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	1,0142 mg/m ³
Risk Characterization Ratio (RCR)	0,458912
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Assessment method	Qualitative assessment
	Worker - dermal
Additional good practice advice	
Where appropriate, replacement of task by automated and/or closed processes.	
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 Drum/Batch transfers Use domain: industrial
Operational conditions	
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 100 %
Physical state	liquid

1,3-Butadiene



Vapour pressure of the substance during use	268333,1875 Pa
Process temperature	20 °C
Duration and Frequency of activity	60 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated temperatures
Risk Management Measures	
Local exhaust ventilation	
Provide a good standard of general or	
controlled ventilation (5 to 10 air	Effectiveness: 70 %
changes per hour)	
Drain down and flush system prior to	
equipment break-in or maintenance.	
Restrict access to authorised persons.	
Provide specific employee training to	
prevent/minimize exposures. Regular	
inspection and maintenance of	
equipment and machines.	
Minimise exposure by partial enclosure of the operation or	
equipment and provide extract	
ventilation at openings. Disposal -	
This material and its container must	
be disposed of in a safe manner.	
In case of potential exposure:, Use	
suitable chemically resistant gloves.,	
Wear suitable coveralls to prevent	
exposure to the skin., Wear suitable	
respiratory protection., Clear spills	
immediately, Consider the need for	
risk based health surveillance.	
Avoid frequent and direct contact with	
substance. Clean up contamination as	
soon as they occur. Wash off any skin	
contamination immediately. Provide	
specific employee training to	
prevent/minimize exposures.	
Wear suitable gloves tested to EN	
ISO 374-1.	ito courso
Assessment method	
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker Worker - inhalation, long-term - systemic
Exposure estimate	1,0142 mg/m ³
Exposure estimate Risk Characterization Ratio (RCR)	0,458912
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Assessment method Assessment method	Qualitative assessment
Assessment method	Qualitative assessifient

1,3-Butadiene

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Worker - dermal

Additional good practice advice

Where appropriate, replacement of task by automated and/or closed processes.

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 Drum/Batch transfers Use domain: industrial
Operational conditions	
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance during use	268333,1875 Pa
Process temperature	20 °C
Duration and Frequency of activity	60 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated temperatures
Risk Management Measures	•
Provide a good standard of general or controlled ventilation (5 to 10 air changes per hour)	Effectiveness: 70 %
Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings.	Effectiveness: 95 %
Drain down and flush system prior to equipment break-in or maintenance. Restrict access to authorised persons. Provide specific employee training to prevent/minimize exposures. Regular inspection and maintenance of equipment and machines.	
Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings. Disposal - This material and its container must be disposed of in a safe manner. In case of potential exposure:, Use suitable chemically resistant gloves., Wear suitable coveralls to prevent	

1,3-Butadiene



exposure to the skin., Wear suitable	
respiratory protection., Clear spills	
immediately, Consider the need for	
risk based health surveillance.	
Avoid frequent and direct contact with	
substance. Clean up contamination as	
soon as they occur. Wash off any skin	
contamination immediately. Provide	
specific employee training to	
prevent/minimize exposures.	
Wear suitable gloves tested to EN	
ISO 374-1.	
Exposure estimate and reference to it	its source
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	1,0142 mg/m ³
Risk Characterization Ratio (RCR)	0,458912
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Assessment method	Qualitative assessment
	Worker - dermal
Additional good practice advice	
Where appropriate, replacement of task	by automated and/or closed processes.
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/t	ra

Contributing exposure scenario	
Use descriptors covered	PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing). Drum and small package filling Use domain: industrial
Operational conditions	
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance during use	268333,1875 Pa
Process temperature	20 °C
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated temperatures
Risk Management Measures	
Local exhaust ventilation	
Provide a good standard of general or controlled ventilation (5 to 10 air	Effectiveness: 70 %

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Contributing exposure scenario

Use descriptors covered



changes per hour)	
Handle substance within closed	
system.	Effectiveness: 90 %
Drain down and flush system prior to	
equipment break-in or maintenance.	
Restrict access to authorised persons.	
Provide specific employee training to	
prevent/minimize exposures. Regular	
inspection and maintenance of	
equipment and machines.	
Minimise exposure by partial	
enclosure of the operation or	
equipment and provide extract	
ventilation at openings. Disposal -	
This material and its container must	
be disposed of in a safe manner.	
In case of potential exposure:, Use	
suitable chemically resistant gloves.,	
Wear suitable coveralls to prevent	
exposure to the skin., Wear suitable	
respiratory protection., Clear spills	
immediately, Consider the need for	
risk based health surveillance.	
Avoid frequent and direct contact with	
substance. Clean up contamination as	
soon as they occur. Wash off any skin	
contamination immediately. Provide	
specific employee training to	
prevent/minimize exposures.	
Wear suitable gloves tested to EN	
ISO 374-1.	ita acuraa
Assessment method	
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Evpoque actimate	Worker - inhalation, long-term - systemic 1,3523 mg/m ³
Exposure estimate Risk Characterization Ratio (RCR)	0,611882
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Assessment method Assessment method	Qualitative assessment
Assessment method	Worker - dermal
Additional good practice advice	WOINER - UCIIIIAI
Additional good practice advice Where appropriate, replacement of task by automated and/or closed processes.	
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra	
1 of scaning see. http://www.ecetoc.org/t	ια

PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing).

Drum and small package filling Use domain: industrial

1,3-Butadiene



Operational conditions	
- p suariar a arrangana	1,3-butadiene
Concentration of the substance	Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance during use	268333,1875 Pa
Process temperature	20 °C
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated temperatures
Risk Management Measures	
Local exhaust ventilation	
Handle substance within closed system.	Effectiveness: 90 %
Transfer via enclosed lines	Effectiveness: 70 %
Drain down and flush system prior to equipment break-in or maintenance.	
Restrict access to authorised persons.	
Provide specific employee training to	
prevent/minimize exposures. Regular	
inspection and maintenance of	
equipment and machines.	
Minimise exposure by partial	
enclosure of the operation or equipment and provide extract	
ventilation at openings. Disposal -	
This material and its container must	
be disposed of in a safe manner.	
In case of potential exposure:, Use	
suitable chemically resistant gloves.,	
Wear suitable coveralls to prevent	
exposure to the skin., Wear suitable	
respiratory protection., Clear spills	
immediately, Consider the need for	
risk based health surveillance.	
Avoid frequent and direct contact with	
substance. Clean up contamination as	
soon as they occur. Wash off any skin	
contamination immediately. Provide	
specific employee training to	
prevent/minimize exposures.	
Wear suitable gloves tested to EN ISO 374-1.	
Exposure estimate and reference to	
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker

1,3-Butadiene



	Worker - inhalation, long-term - systemic	
Exposure estimate	1,3523 mg/m ³	
Risk Characterization Ratio (RCR)	0,611882	
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker	
Assessment method	Qualitative assessment	
	Worker - dermal	
Additional good practice advice		
Where appropriate, replacement of task by automated and/or closed processes.		
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). Process sampling Use domain: industrial
Operational conditions	
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance during use	268333,1875 Pa
Process temperature	20 °C
Duration and Frequency of activity	15 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated temperatures
Risk Management Measures	Lemperatures
Local exhaust ventilation	
Provide a good standard of general or controlled ventilation (5 to 10 air changes per hour)	Effectiveness: 70 %
Drain down and flush system prior to equipment break-in or maintenance. Restrict access to authorised persons. Provide specific employee training to prevent/minimize exposures. Regular inspection and maintenance of equipment and machines. Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings. Disposal - This material and its container must	
be disposed of in a safe manner.	

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In case of potential exposure:, Use suitable chemically resistant gloves., Wear suitable coveralls to prevent exposure to the skin., Wear suitable respiratory protection., Clear spills immediately, Consider the need for risk based health surveillance. Avoid frequent and direct contact with substance. Clean up contamination as soon as they occur. Wash off any skin contamination immediately. Provide specific employee training to prevent/minimize exposures. Wear suitable gloves tested to EN	
ISO 374-1. Exposure estimate and reference to it.	ts source
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	1,3523 mg/m³
Risk Characterization Ratio (RCR)	0,611882
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Assessment method	Qualitative assessment
	Worker - dermal
Additional good practice advice	
Where appropriate, replacement of task by automated and/or closed processes.	
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). Process sampling Use domain: industrial
Operational conditions	
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance during use	268333,1875 Pa
Process temperature	20 °C
Duration and Frequency of activity	15 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated temperatures
Risk Management Measures	

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Contributing exposure scenario

Use descriptors covered



Provide a good standard of general or controlled ventilation (5 to 10 air changes per hour)	Effectiveness: 70 %
Sample via a closed loop or other system to avoid exposure.	Effectiveness: 90 %
Drain down and flush system prior to	
equipment break-in or maintenance.	
Restrict access to authorised persons.	
Provide specific employee training to	
prevent/minimize exposures. Regular	
inspection and maintenance of	
equipment and machines.	
Minimise exposure by partial	
enclosure of the operation or	
equipment and provide extract	
ventilation at openings. Disposal - This material and its container must	
be disposed of in a safe manner.	
In case of potential exposure:, Use	
suitable chemically resistant gloves.,	
Wear suitable coveralls to prevent	
exposure to the skin., Wear suitable	
respiratory protection., Clear spills	
immediately, Consider the need for	
risk based health surveillance.	
Avoid frequent and direct contact with	
substance. Clean up contamination as	
soon as they occur. Wash off any skin	
contamination immediately. Provide	
specific employee training to	
prevent/minimize exposures.	
Wear suitable gloves tested to EN	
ISO 374-1.	
Exposure estimate and reference to i	
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	1,3523 mg/m³
Risk Characterization Ratio (RCR)	0,611882
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Assessment method	Qualitative assessment
	Worker - dermal
Additional good practice advice	
Where appropriate, replacement of task by automated and/or closed processes.	
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra	

PROC9: Transfer of substance or preparation into small

containers (dedicated filling line, including weighing).

1,3-Butadiene



	Process sampling Use domain: industrial
Operational conditions	I
	1,3-butadiene
Concentration of the substance	Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance during use	268333,1875 Pa
Process temperature	20 °C
Duration and Frequency of activity	15 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated temperatures
Risk Management Measures	
Provide a good standard of general or controlled ventilation (5 to 10 air changes per hour)	Effectiveness: 70 %
Wear suitable respiratory protection.	Effectiveness: 90 %
Drain down and flush system prior to equipment break-in or maintenance. Restrict access to authorised persons. Provide specific employee training to prevent/minimize exposures. Regular inspection and maintenance of equipment and machines.	
Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings. Disposal - This material and its container must be disposed of in a safe manner.	
In case of potential exposure:, Use suitable chemically resistant gloves., Wear suitable coveralls to prevent exposure to the skin., Wear suitable respiratory protection., Clear spills immediately, Consider the need for risk based health surveillance.	
Avoid frequent and direct contact with substance. Clean up contamination as soon as they occur. Wash off any skin contamination immediately. Provide specific employee training to prevent/minimize exposures. Wear suitable gloves tested to EN	
ISO 374-1.	

1,3-Butadiene



Exposure estimate and reference to its source	
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	1,3523 mg/m ³
Risk Characterization Ratio (RCR)	0,611882
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Assessment method	Qualitative assessment
	Worker - dermal
Additional good practice advice	
Where appropriate, replacement of task by automated and/or closed processes.	
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra	

Contributing exposure scenario	
Use descriptors covered	PROC14: Tabletting, compression, extrusion, pelletisation, granulation Tabletting, compression, extrusion, pelletisation, granulation Use domain: industrial
Operational conditions	
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 1 %
Physical state	liquid
Vapour pressure of the substance during use	268333,1875 Pa
Process temperature	20 °C
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated temperatures
Risk Management Measures	
Local exhaust ventilation	
Provide a good standard of general or controlled ventilation (5 to 10 air changes per hour)	Effectiveness: 70 %
Drain down and flush system prior to equipment break-in or maintenance. Restrict access to authorised persons. Provide specific employee training to prevent/minimize exposures. Regular inspection and maintenance of equipment and machines.	
Minimise exposure by partial enclosure of the operation or equipment and provide extract	

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	,
ventilation at openings. Disposal -	
This material and its container must	
be disposed of in a safe manner.	
In case of potential exposure:, Use	
suitable chemically resistant gloves.,	
Wear suitable coveralls to prevent	
exposure to the skin., Wear suitable	
respiratory protection., Clear spills	
immediately, Consider the need for	
risk based health surveillance.	
Avoid frequent and direct contact with	
substance. Clean up contamination as	
soon as they occur. Wash off any skin	
contamination immediately. Provide	
specific employee training to	
prevent/minimize exposures.	
Wear suitable gloves tested to EN	
ISO 374-1.	
Exposure estimate and reference to it	its source
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	1,6903 mg/m ³
Risk Characterization Ratio (RCR)	0,764853
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Assessment method	Qualitative assessment
	Worker - dermal
Additional good practice advice	
Where appropriate, replacement of task by automated and/or closed processes.	
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra	

Contributing exposure scenario	
Han danamintana assaul	PROC15: Use a laboratory reagent.
Use descriptors covered	Laboratory activities Use domain: industrial
Operational conditions	
	1,3-butadiene
Concentration of the substance	Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance during use	268333,1875 Pa
Process temperature	20 °C
Duration and Frequency of activity	60 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated

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	temperatures
Risk Management Measures	
Local exhaust ventilation	
Provide a good standard of general	E"
ventilation (not less than 3 - 5 air	Effectiveness: 30 %
changes per hour)	
Drain down and flush system prior to	
equipment break-in or maintenance.	
Restrict access to authorised persons.	
Provide specific employee training to	
prevent/minimize exposures. Regular inspection and maintenance of	
equipment and machines.	
Minimise exposure by partial	
enclosure of the operation or	
equipment and provide extract	
ventilation at openings. Disposal -	
This material and its container must	
be disposed of in a safe manner.	
In case of potential exposure:, Use	
suitable chemically resistant gloves.,	
Wear suitable coveralls to prevent	
exposure to the skin., Wear suitable	
respiratory protection., Clear spills	
immediately, Consider the need for	
risk based health surveillance.	
Avoid frequent and direct contact with	
substance. Clean up contamination as	
soon as they occur. Wash off any skin	
contamination immediately. Provide	
specific employee training to	
prevent/minimize exposures.	
Wear suitable gloves tested to EN ISO 374-1.	
Exposure estimate and reference to i	ts source
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	1,5776 mg/m ³
Risk Characterization Ratio (RCR)	0,713863
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Assessment method	Qualitative assessment
	Worker - dermal
Additional good practice advice	
	by automated and/or closed processes.
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/t	ra

Contributing exposure scenario

1,3-Butadiene



	PROC15: Use a laboratory reagent.
Use descriptors covered	Laboratory activities Use domain: industrial
·	,
Operational conditions	
	1,3-butadiene
Concentration of the substance	Content: >= 0 % - <= 100 %
Di i i i i	
Physical state	liquid
Vapour pressure of the substance during use	268333,1875 Pa
	20 °C
Process temperature	
Duration and Frequency of activity	60 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated
	temperatures
Risk Management Measures	
Drain down and flush system prior to	
equipment break-in or maintenance.	
Restrict access to authorised persons.	
Provide specific employee training to	
prevent/minimize exposures. Regular	
inspection and maintenance of	
equipment and machines.	
Minimise exposure by partial	
enclosure of the operation or	
equipment and provide extract	
ventilation at openings. Disposal -	
This material and its container must	
be disposed of in a safe manner.	
In case of potential exposure:, Use	
suitable chemically resistant gloves.,	
Wear suitable coveralls to prevent	
exposure to the skin., Wear suitable	
respiratory protection., Clear spills immediately, Consider the need for	
risk based health surveillance.	
Avoid frequent and direct contact with	
substance. Clean up contamination as	
soon as they occur. Wash off any skin	
contamination immediately. Provide	
specific employee training to	
prevent/minimize exposures.	
Wear suitable gloves tested to EN	
ISO 374-1.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic

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Exposure estimate	1,1269 mg/m ³	
Risk Characterization Ratio (RCR)	0,509902	
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker	
Assessment method	Qualitative assessment	
	Worker - dermal	
Additional good practice advice		
Where appropriate, replacement of task by automated and/or closed processes.		
Guidance to Downstream Users		
For scaling see: http://www.ecetoc.org/tra		

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3. Short title of exposure scenario

Use as laboratory reagent/agent IS; ERC4; PROC15

Control of exposure and risk management measures

Contributing exposure scenario	
Use descriptors covered	ERC4: Use of non-reactive processing aid at industrial site (no inclusion into or onto article) As no environmental hazard was identified no environmental-related exposure assessment and risk characterization was performed.
Operational conditions	

Contributing exposure scenario	
Use descriptors covered	PROC15: Use a laboratory reagent. Laboratory activities small scale Use domain: industrial
Operational conditions	1
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance during use	268333,1875 Pa
Process temperature	20 °C
Duration and Frequency of activity	60 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated temperatures
Risk Management Measures	
Drain down and flush system prior to	

1,3-Butadiene



equipment break-in or maintenance.	
Restrict access to authorised persons.	
Provide specific employee training to	
prevent/minimize exposures. Regular	
inspection and maintenance of	
equipment and machines.	
Minimise exposure by partial	
enclosure of the operation or	
equipment and provide extract	
ventilation at openings. Disposal -	
This material and its container must	
be disposed of in a safe manner.	
In case of potential exposure:, Use	
suitable chemically resistant gloves.,	
Wear suitable coveralls to prevent	
exposure to the skin., Wear suitable	
respiratory protection., Clear spills	
immediately, Consider the need for	
risk based health surveillance.	
Avoid frequent and direct contact with	
substance. Clean up contamination as	
soon as they occur. Wash off any skin	
contamination immediately. Provide	
specific employee training to	
prevent/minimize exposures.	
Wear suitable gloves tested to EN	
ISO 374-1.	
Exposure estimate and reference to it	
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	1,1269 mg/m ³
Risk Characterization Ratio (RCR)	0,509902
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Assessment method	Qualitative assessment
	Worker - dermal
Additional good practice advice	
Where appropriate, replacement of task by automated and/or closed processes.	
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/t	ra

Contributing exposure scenario	
Use descriptors covered	PROC15: Use a laboratory reagent. Laboratory activities small scale Use domain: industrial
Operational conditions	
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 100 %

1,3-Butadiene



Physical state	liquid
Vapour pressure of the substance	268333,1875 Pa
during use	
Process temperature	20 °C
Duration and Frequency of activity	60 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated temperatures
Risk Management Measures	
Local exhaust ventilation	
Provide a good standard of general ventilation (not less than 3 - 5 air changes per hour)	Effectiveness: 30 %
Drain down and flush system prior to	
equipment break-in or maintenance.	
Restrict access to authorised persons.	
Provide specific employee training to	
prevent/minimize exposures. Regular	
inspection and maintenance of	
equipment and machines.	
Minimise exposure by partial	
enclosure of the operation or equipment and provide extract	
ventilation at openings. Disposal -	
This material and its container must	
be disposed of in a safe manner.	
In case of potential exposure:, Use	
suitable chemically resistant gloves.,	
Wear suitable coveralls to prevent	
exposure to the skin., Wear suitable	
respiratory protection., Clear spills	
immediately, Consider the need for	
risk based health surveillance.	
Avoid frequent and direct contact with	
substance. Clean up contamination as	
soon as they occur. Wash off any skin contamination immediately. Provide	
specific employee training to	
prevent/minimize exposures.	
Wear suitable gloves tested to EN	
ISO 374-1.	
Exposure estimate and reference to i	ts source
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	1,5776 mg/m ³
Risk Characterization Ratio (RCR)	0,713863
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker

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Assessment method	Qualitative assessment	
	Worker - dermal	
Additional good practice advice		
Where appropriate, replacement of task by automated and/or closed processes.		
Guidance to Downstream Users		
For scaling see: http://www.ecetoc.org/tra		

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4. Short title of exposure scenario

Polymer production

IS; ERC6c; PROC1, PROC2, PROC3, PROC6, PROC8a, PROC8b, PROC14

Control of exposure and risk management measures

Contributing exposure scenario	
Use descriptors covered	ERC6c: Use of monomer in polymerisation processes at industrial site (inclusion or not into/onto article) As no environmental hazard was identified no environmental-related exposure assessment and risk characterization was performed.
Operational conditions	

Contributing exposure scenario	
Use descriptors covered	PROC1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions. General exposures (closed systems) Continuous process no sampling Use domain: industrial
Operational conditions	
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance during use	268333,1875 Pa
Process temperature	20 °C
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated
	temperatures
Risk Management Measures	,
Drain down and flush system prior to	

1,3-Butadiene



equipment break-in or maintenance.	
Restrict access to authorised persons.	
Provide specific employee training to	
prevent/minimize exposures. Regular	
inspection and maintenance of	
equipment and machines.	
Minimise exposure by partial	
enclosure of the operation or	
equipment and provide extract	
ventilation at openings. Disposal -	
This material and its container must	
be disposed of in a safe manner.	
In case of potential exposure:, Use	
suitable chemically resistant gloves.,	
Wear suitable coveralls to prevent	
exposure to the skin., Wear suitable	
respiratory protection., Clear spills	
immediately, Consider the need for	
risk based health surveillance.	
Avoid frequent and direct contact with	
substance. Clean up contamination as	
soon as they occur. Wash off any skin	
contamination immediately. Provide	
specific employee training to	
prevent/minimize exposures.	
Wear suitable gloves tested to EN	
ISO 374-1.	
Exposure estimate and reference to i	
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	0,0225 mg/m ³
Risk Characterization Ratio (RCR)	0,010198
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Assessment method	Qualitative assessment
	Worker - dermal
Additional good practice advice	
Where appropriate, replacement of task by automated and/or closed processes.	
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/t	ra

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 Polymerisation (bulk and batch) Continuous process with sample collection Use domain: industrial
Operational conditions	
Concentration of the substance	1,3-butadiene

1,3-Butadiene



	Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance during use	268333,1875 Pa
Process temperature	20 °C
Duration and Frequency of activity	60 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated temperatures
Risk Management Measures	
Local exhaust ventilation	
Provide a good standard of general ventilation (not less than 3 - 5 air changes per hour)	Effectiveness: 30 %
Drain down and flush system prior to equipment break-in or maintenance. Restrict access to authorised persons. Provide specific employee training to prevent/minimize exposures. Regular inspection and maintenance of equipment and machines.	
Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings. Disposal - This material and its container must be disposed of in a safe manner.	
In case of potential exposure:, Use suitable chemically resistant gloves., Wear suitable coveralls to prevent exposure to the skin., Wear suitable respiratory protection., Clear spills immediately, Consider the need for risk based health surveillance.	
Avoid frequent and direct contact with substance. Clean up contamination as soon as they occur. Wash off any skin contamination immediately. Provide specific employee training to prevent/minimize exposures. Wear suitable gloves tested to EN	
ISO 374-1.	
Exposure estimate and reference to i	
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Exposure estimate	Worker - inhalation, long-term - systemic 0,7888 mg/m ³

1,3-Butadiene



Risk Characterization Ratio (RCR)	0,356931	
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker	
Assessment method	Qualitative assessment	
	Worker - dermal	
Additional good practice advice		
Where appropriate, replacement of task by automated and/or closed processes.		
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 Polymerisation (bulk and batch) Continuous process with sample collection Use domain: industrial
Operational conditions	
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance during use	268333,1875 Pa
Process temperature	20 °C
Duration and Frequency of activity	60 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated temperatures
Risk Management Measures	
Provide a good standard of general ventilation (not less than 3 - 5 air changes per hour)	Effectiveness: 30 %
Sample via a closed loop or other system to avoid exposure.	Effectiveness: 90 %
Drain down and flush system prior to equipment break-in or maintenance. Restrict access to authorised persons. Provide specific employee training to prevent/minimize exposures. Regular inspection and maintenance of equipment and machines. Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings. Disposal - This material and its container must	

1,3-Butadiene



be disposed of in a safe manner.	
In case of potential exposure:, Use	
suitable chemically resistant gloves.,	
Wear suitable coveralls to prevent	
exposure to the skin., Wear suitable	
respiratory protection., Clear spills	
immediately, Consider the need for	
risk based health surveillance.	
Avoid frequent and direct contact with	
substance. Clean up contamination as	
soon as they occur. Wash off any skin	
contamination immediately. Provide	
specific employee training to	
prevent/minimize exposures.	
Wear suitable gloves tested to EN	
ISO 374-1.	
Exposure estimate and reference to i	
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	0,7888 mg/m ³
Risk Characterization Ratio (RCR)	0,356931
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Assessment method	Qualitative assessment
	Worker - dermal
Additional good practice advice	
Where appropriate, replacement of task by automated and/or closed processes.	
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/t	ra

Contributing exposure scenario	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 Storage With occasional controlled exposure. Use domain: industrial	
Operational conditions		
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 100 %	
Physical state	liquid	
Vapour pressure of the substance during use	268333,1875 Pa	
Process temperature	20 °C	
Duration and Frequency of activity	60 min 5 days per week	
Indoor/Outdoor	Indoor	

1,3-Butadiene



	Operation is carried out at ambient or elevated
Pick Managament Massures	temperatures
Risk Management Measures Local exhaust ventilation	
Provide a good standard of general	
ventilation (not less than 3 - 5 air	Effectiveness: 30 %
changes per hour)	LifeCliveriess. 50 %
Drain down and flush system prior to	
equipment break-in or maintenance.	
Restrict access to authorised persons.	
Provide specific employee training to	
prevent/minimize exposures. Regular	
inspection and maintenance of	
equipment and machines.	
Minimise exposure by partial	
enclosure of the operation or	
equipment and provide extract	
ventilation at openings. Disposal -	
This material and its container must	
be disposed of in a safe manner.	
In case of potential exposure:, Use	
suitable chemically resistant gloves.,	
Wear suitable coveralls to prevent	
exposure to the skin., Wear suitable	
respiratory protection., Clear spills	
immediately, Consider the need for	
risk based health surveillance.	
Avoid frequent and direct contact with	
substance. Clean up contamination as	
soon as they occur. Wash off any skin	
contamination immediately. Provide	
specific employee training to prevent/minimize exposures.	
Wear suitable gloves tested to EN	
ISO 374-1.	
Exposure estimate and reference to	
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	0,7888 mg/m ³
Risk Characterization Ratio (RCR)	0,356931
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Assessment method	Qualitative assessment
	Worker - dermal
Additional good practice advice	
Where appropriate, replacement of task by automated and/or closed processes.	
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/t	ra

1,3-Butadiene



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 Additivation and stabilisation Use domain: industrial	
Operational conditions		
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 5 %	
Physical state	liquid	
Vapour pressure of the substance during use	268333,1875 Pa	
Process temperature	20 °C	
Duration and Frequency of activity	480 min 5 days per week	
Indoor/Outdoor	Indoor	
	Operation is carried out at ambient or elevated temperatures	
Risk Management Measures		
Local exhaust ventilation		
Provide a good standard of general ventilation (not less than 3 - 5 air changes per hour)	Effectiveness: 30 %	
Drain down and flush system prior to equipment break-in or maintenance. Restrict access to authorised persons. Provide specific employee training to prevent/minimize exposures. Regular inspection and maintenance of equipment and machines. Minimise exposure by partial		
enclosure of the operation or equipment and provide extract ventilation at openings. Disposal - This material and its container must be disposed of in a safe manner. In case of potential exposure:, Use		
suitable chemically resistant gloves., Wear suitable coveralls to prevent exposure to the skin., Wear suitable respiratory protection., Clear spills immediately, Consider the need for risk based health surveillance.		
Avoid frequent and direct contact with substance. Clean up contamination as soon as they occur. Wash off any skin		

1,3-Butadiene



Language of the control of the contr	1	
contamination immediately. Provide		
specific employee training to		
prevent/minimize exposures.		
Wear suitable gloves tested to EN		
ISO 374-1.		
Exposure estimate and reference to its source		
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker	
	Worker - inhalation, long-term - systemic	
Exposure estimate	1,5776 mg/m ³	
Risk Characterization Ratio (RCR)	0,713863	
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker	
Assessment method	Qualitative assessment	
	Worker - dermal	
Additional good practice advice		
Where appropriate, replacement of task by automated and/or closed processes.		
Guidance to Downstream Users		
For scaling see: http://www.ecetoc.org/	ira	

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 Additivation and stabilisation Use domain: industrial	
Operational conditions		
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 5 %	
Physical state	liquid	
Vapour pressure of the substance during use	268333,1875 Pa	
Process temperature	20 °C	
Duration and Frequency of activity	480 min 5 days per week	
Indoor/Outdoor	Indoor	
	Operation is carried out at ambient or elevated temperatures	
Risk Management Measures		
Provide a good standard of general ventilation (not less than 3 - 5 air changes per hour)	Effectiveness: 30 %	
Sample via a closed loop or other system to avoid exposure.	Effectiveness: 90 %	
Drain down and flush system prior to equipment break-in or maintenance. Restrict access to authorised persons.		

1,3-Butadiene



Provide specific employee training to		
prevent/minimize exposures. Regular		
inspection and maintenance of equipment and machines.		
Minimise exposure by partial		
enclosure of the operation or		
equipment and provide extract		
ventilation at openings. Disposal -		
This material and its container must		
be disposed of in a safe manner.		
In case of potential exposure:, Use		
suitable chemically resistant gloves.,		
Wear suitable coveralls to prevent		
exposure to the skin., Wear suitable		
respiratory protection., Clear spills		
immediately, Consider the need for		
risk based health surveillance.		
Avoid frequent and direct contact with		
substance. Clean up contamination as		
soon as they occur. Wash off any skin		
contamination immediately. Provide		
specific employee training to		
prevent/minimize exposures.		
Wear suitable gloves tested to EN ISO 374-1.		
Exposure estimate and reference to	its source	
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker	
7.65556	Worker - inhalation, long-term - systemic	
Exposure estimate	1,5776 mg/m ³	
Risk Characterization Ratio (RCR)	0,713863	
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker	
Assessment method	Qualitative assessment	
	Worker - dermal	
Additional good practice advice	Additional good practice advice	
Where appropriate, replacement of task by automated and/or closed processes.		
Guidance to Downstream Users		
For scaling see: http://www.ecetoc.org/t	ra	

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 Bulk transfer Continuous process with sample collection Use domain: industrial
Operational conditions	
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 100 %

1,3-Butadiene



Physical state	liquid
Vapour pressure of the substance	268333,1875 Pa
during use	
Process temperature	20 °C
	00 1 5 1
Duration and Frequency of activity	60 min 5 days per week
Indoor/Outdoor	Indoor
indoor/ Catagor	Operation is carried out at ambient or elevated
	temperatures
Risk Management Measures	10 P 100 1
Local exhaust ventilation	
Provide a good standard of general	
ventilation (not less than 3 - 5 air	Effectiveness: 30 %
changes per hour)	
Drain down and flush system prior to	
equipment break-in or maintenance.	
Restrict access to authorised persons.	
Provide specific employee training to	
prevent/minimize exposures. Regular	
inspection and maintenance of equipment and machines.	
Minimise exposure by partial	
enclosure of the operation or	
equipment and provide extract	
ventilation at openings. Disposal -	
This material and its container must	
be disposed of in a safe manner.	
In case of potential exposure:, Use	
suitable chemically resistant gloves.,	
Wear suitable coveralls to prevent	
exposure to the skin., Wear suitable	
respiratory protection., Clear spills	
immediately, Consider the need for	
risk based health surveillance.	
Avoid frequent and direct contact with	
substance. Clean up contamination as soon as they occur. Wash off any skin	
contamination immediately. Provide	
specific employee training to	
prevent/minimize exposures.	
Wear suitable gloves tested to EN	
ISO 374-1.	
Exposure estimate and reference to	ts source
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	1,5776 mg/m³
Risk Characterization Ratio (RCR)	0,713863

1,3-Butadiene



Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker	
Assessment method	Qualitative assessment	
	Worker - dermal	
Additional good practice advice		
Where appropriate, replacement of task by automated and/or closed processes.		
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 Bulk transfer Continuous process with sample collection Use domain: industrial
Operational conditions	
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance during use	268333,1875 Pa
Process temperature	20 °C
Duration and Frequency of activity	60 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated temperatures
Risk Management Measures	
Provide a good standard of general ventilation (not less than 3 - 5 air changes per hour)	Effectiveness: 30 %
Sample via a closed loop or other system to avoid exposure.	Effectiveness: 90 %
Drain down and flush system prior to equipment break-in or maintenance. Restrict access to authorised persons. Provide specific employee training to prevent/minimize exposures. Regular inspection and maintenance of equipment and machines. Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings. Disposal - This material and its container must	

1,3-Butadiene



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be disposed of in a safe manner.	
In case of potential exposure:, Use	
suitable chemically resistant gloves.,	
Wear suitable coveralls to prevent	
exposure to the skin., Wear suitable	
respiratory protection., Clear spills	
immediately, Consider the need for	
risk based health surveillance.	
Avoid frequent and direct contact with	
substance. Clean up contamination as	
soon as they occur. Wash off any skin contamination immediately. Provide	
specific employee training to prevent/minimize exposures.	
Wear suitable gloves tested to EN	
ISO 374-1.	
Exposure estimate and reference to	its source
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Assessment method	Worker - inhalation, long-term - systemic
Exposure estimate	1,5776 mg/m ³
Risk Characterization Ratio (RCR)	0,713863
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
	Qualitative assessment
Assessment method	Worker - dermal
Additional wood prosting advice	Worker - dermai
Additional good practice advice	
Where appropriate, replacement of task by automated and/or closed processes.	
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/t	ra

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 Finishing operations Batch process with sample collection Use domain: industrial
Operational conditions	
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 5 %
Physical state	liquid
Vapour pressure of the substance during use	268333,1875 Pa
Process temperature	20 °C
Duration and Frequency of activity	480 min 5 days per week

1,3-Butadiene



Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated
	temperatures
Risk Management Measures	
Local exhaust ventilation	
Provide a good standard of general	
ventilation (not less than 3 - 5 air	Effectiveness: 30 %
changes per hour)	
Drain down and flush system prior to	
equipment break-in or maintenance.	
Restrict access to authorised persons.	
Provide specific employee training to	
prevent/minimize exposures. Regular	
inspection and maintenance of	
equipment and machines.	
Minimise exposure by partial	
enclosure of the operation or equipment and provide extract	
ventilation at openings. Disposal -	
This material and its container must	
be disposed of in a safe manner.	
In case of potential exposure:, Use	
suitable chemically resistant gloves.,	
Wear suitable coveralls to prevent	
exposure to the skin., Wear suitable	
respiratory protection., Clear spills	
immediately, Consider the need for	
risk based health surveillance.	
Avoid frequent and direct contact with	
substance. Clean up contamination as	
soon as they occur. Wash off any skin	
contamination immediately. Provide	
specific employee training to	
prevent/minimize exposures.	
Wear suitable gloves tested to EN	
ISO 374-1.	
Exposure estimate and reference to i	
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
<u> </u>	Worker - inhalation, long-term - systemic
Exposure estimate	1,5776 mg/m³
Risk Characterization Ratio (RCR)	0,713863
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Assessment method	Qualitative assessment
Additional modern des	Worker - dermal
Additional good practice advice	
Where appropriate, replacement of task by automated and/or closed processes.	
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/t	ra

1,3-Butadiene



Contributing expecure secretic	
Contributing exposure scenario	PROC3: Manufacture or formulation in the chemical
Use descriptors covered	industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition Finishing operations Batch process with sample collection Use domain: industrial
Operational conditions	
	1,3-butadiene
Concentration of the substance	Content: >= 0 % - <= 5 %
Physical state	liquid
Vapour pressure of the substance during use	268333,1875 Pa
Process temperature	20 °C
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated temperatures
Risk Management Measures	
Provide a good standard of general ventilation (not less than 3 - 5 air changes per hour)	Effectiveness: 30 %
Sample via a closed loop or other system to avoid exposure.	Effectiveness: 90 %
Drain down and flush system prior to equipment break-in or maintenance. Restrict access to authorised persons. Provide specific employee training to prevent/minimize exposures. Regular inspection and maintenance of equipment and machines.	
Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings. Disposal - This material and its container must be disposed of in a safe manner.	
In case of potential exposure:, Use suitable chemically resistant gloves., Wear suitable coveralls to prevent exposure to the skin., Wear suitable respiratory protection., Clear spills immediately, Consider the need for risk based health surveillance. Avoid frequent and direct contact with	

1,3-Butadiene



substance. Clean up contamination as soon as they occur. Wash off any skin contamination immediately. Provide specific employee training to prevent/minimize exposures. Wear suitable gloves tested to EN	
ISO 374-1.	4
Exposure estimate and reference to it	
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	1,5776 mg/m³
Risk Characterization Ratio (RCR)	0,713863
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Assessment method	Qualitative assessment
	Worker - dermal
Additional good practice advice	
Where appropriate, replacement of task by automated and/or closed processes.	
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/t	ra

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 Polymerisation (bulk and batch) Batch process with sample collection Use domain: industrial
Operational conditions	
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 25 %
Physical state	liquid
Vapour pressure of the substance during use	268333,1875 Pa
Process temperature	20 °C
Duration and Frequency of activity	60 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated temperatures
Risk Management Measures	
Local exhaust ventilation	
Provide a good standard of general ventilation (not less than 3 - 5 air changes per hour)	Effectiveness: 30 %
Drain down and flush system prior to	

1,3-Butadiene



equipment break-in or maintenance.	
Restrict access to authorised persons.	
Provide specific employee training to	
prevent/minimize exposures. Regular	
inspection and maintenance of	
equipment and machines.	
Minimise exposure by partial	
enclosure of the operation or	
equipment and provide extract	
ventilation at openings. Disposal -	
This material and its container must	
be disposed of in a safe manner.	
In case of potential exposure:, Use	
suitable chemically resistant gloves.,	
Wear suitable coveralls to prevent	
exposure to the skin., Wear suitable	
respiratory protection., Clear spills	
immediately, Consider the need for	
risk based health surveillance.	
Avoid frequent and direct contact with	
substance. Clean up contamination as	
soon as they occur. Wash off any skin	
contamination immediately. Provide	
specific employee training to	
prevent/minimize exposures.	
Wear suitable gloves tested to EN	
ISO 374-1.	
Exposure estimate and reference to it	
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	0,9466 mg/m ³
Risk Characterization Ratio (RCR)	0,428318
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Assessment method	Qualitative assessment
	Worker - dermal
Additional good practice advice	
Where appropriate, replacement of task by automated and/or closed processes.	
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/t	ra

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 Polymerisation (bulk and batch) Batch process with sample collection Use domain: industrial
Operational conditions	

1,3-Butadiene



	1,3-butadiene
Concentration of the substance	Content: >= 0 % - <= 25 %
Physical state	liquid
Vapour pressure of the substance	268333,1875 Pa
during use	, and the second
Process temperature	20 °C
Process temperature	
Duration and Frequency of activity	60 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated
	temperatures
Risk Management Measures	
Provide a good standard of general	
ventilation (not less than 3 - 5 air	Effectiveness: 30 %
changes per hour)	
Sample via a closed loop or other	Effectiveness: 90 %
system to avoid exposure.	Effectiveness. 30 70
Drain down and flush system prior to	
equipment break-in or maintenance.	
Restrict access to authorised persons.	
Provide specific employee training to	
prevent/minimize exposures. Regular	
inspection and maintenance of	
equipment and machines.	
Minimise exposure by partial	
enclosure of the operation or	
equipment and provide extract	
ventilation at openings. Disposal - This material and its container must	
be disposed of in a safe manner.	
In case of potential exposure:, Use	
suitable chemically resistant gloves.,	
Wear suitable coveralls to prevent	
exposure to the skin., Wear suitable	
respiratory protection., Clear spills	
immediately, Consider the need for	
risk based health surveillance.	
Avoid frequent and direct contact with	
substance. Clean up contamination as	
soon as they occur. Wash off any skin	
contamination immediately. Provide	
specific employee training to	
prevent/minimize exposures.	
Wear suitable gloves tested to EN	
ISO 374-1.	
Exposure estimate and reference to	
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker

1,3-Butadiene



	Worker - inhalation, long-term - systemic	
Exposure estimate	0,9466 mg/m ³	
Risk Characterization Ratio (RCR)	0,428318	
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker	
Assessment method	Qualitative assessment	
	Worker - dermal	
Additional good practice advice		
Where appropriate, replacement of task by automated and/or closed processes.		
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 Polymerisation (bulk and batch) Batch process with sample collection Use domain: industrial
Operational conditions	<u> </u>
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance during use	268333,1875 Pa
Process temperature	20 °C
Duration and Frequency of activity	60 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated temperatures
Risk Management Measures	
Local exhaust ventilation	
Provide a good standard of general ventilation (not less than 3 - 5 air changes per hour)	Effectiveness: 30 %
Drain down and flush system prior to equipment break-in or maintenance. Restrict access to authorised persons. Provide specific employee training to prevent/minimize exposures. Regular inspection and maintenance of equipment and machines. Minimise exposure by partial enclosure of the operation or	
equipment and provide extract	

1,3-Butadiene



l man e e e	l I
ventilation at openings. Disposal -	
This material and its container must	
be disposed of in a safe manner.	
In case of potential exposure:, Use	
suitable chemically resistant gloves.,	
Wear suitable coveralls to prevent	
exposure to the skin., Wear suitable	
respiratory protection., Clear spills	
immediately, Consider the need for	
risk based health surveillance.	
Avoid frequent and direct contact with	
substance. Clean up contamination as	
soon as they occur. Wash off any skin	
contamination immediately. Provide	
specific employee training to	
prevent/minimize exposures.	
Wear suitable gloves tested to EN	
ISO 374-1.	
Exposure estimate and reference to i	
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	1,5776 mg/m ³
Risk Characterization Ratio (RCR)	0,713863
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Assessment method	Qualitative assessment
	Worker - dermal
Additional good practice advice	
Where appropriate, replacement of task by automated and/or closed processes.	
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra	
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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 Polymerisation (bulk and batch) Batch process with sample collection Use domain: industrial
Operational conditions	
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance during use	268333,1875 Pa
Process temperature	20 °C

1,3-Butadiene



Duration and Frequency of activity	60 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated
	temperatures
Risk Management Measures	·
Provide a good standard of general	
ventilation (not less than 3 - 5 air	Effectiveness: 30 %
changes per hour)	
Sample via a closed loop or other	F((1)
system to avoid exposure.	Effectiveness: 90 %
Drain down and flush system prior to	
equipment break-in or maintenance.	
Restrict access to authorised persons.	
Provide specific employee training to	
prevent/minimize exposures. Regular	
inspection and maintenance of	
equipment and machines.	
Minimise exposure by partial	
enclosure of the operation or	
equipment and provide extract	
ventilation at openings. Disposal -	
This material and its container must	
be disposed of in a safe manner.	
In case of potential exposure:, Use	
suitable chemically resistant gloves.,	
Wear suitable coveralls to prevent	
exposure to the skin., Wear suitable	
respiratory protection., Clear spills	
immediately, Consider the need for	
risk based health surveillance.	
Avoid frequent and direct contact with	
substance. Clean up contamination as	
soon as they occur. Wash off any skin	
contamination immediately. Provide	
specific employee training to	
prevent/minimize exposures.	
Wear suitable gloves tested to EN	
ISO 374-1.	
Exposure estimate and reference to it	ts source
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	1,5776 mg/m ³
Risk Characterization Ratio (RCR)	0,713863
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
	Qualitative assessment
Assessment method	
Additional good practice advice	Worker - dermal
Additional good practice advice	by systemated and/or algood processes
where appropriate, replacement of task	by automated and/or closed processes.

1,3-Butadiene



Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra	

Contributing exposure scenario	
	PROC6: Calendering operations
Use descriptors covered	Pelletizing Extrusion and masterbatching Use domain: industrial
Operational conditions	
	1,3-butadiene
Concentration of the substance	Content: >= 0 % - <= 1 %
Physical state	liquid
Vapour pressure of the substance during use	268333,1875 Pa
Process temperature	20 °C
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated temperatures
Risk Management Measures	
Local exhaust ventilation	
Provide a good standard of general or	
controlled ventilation (5 to 10 air	Effectiveness: 70 %
changes per hour)	
Drain down and flush system prior to	
equipment break-in or maintenance.	
Restrict access to authorised persons. Provide specific employee training to	
prevent/minimize exposures. Regular	
inspection and maintenance of	
equipment and machines.	
Minimise exposure by partial	
enclosure of the operation or	
equipment and provide extract	
ventilation at openings. Disposal -	
This material and its container must	
be disposed of in a safe manner.	
In case of potential exposure:, Use	
suitable chemically resistant gloves.,	
Wear suitable coveralls to prevent	
exposure to the skin., Wear suitable	
respiratory protection., Clear spills	
immediately, Consider the need for	
risk based health surveillance.	
Avoid frequent and direct contact with	
substance. Clean up contamination as	

1,3-Butadiene



1	
soon as they occur. Wash off any skin	i
contamination immediately. Provide	
specific employee training to	
prevent/minimize exposures.	
Wear suitable gloves tested to EN	
ISO 374-1.	
Exposure estimate and reference to	its source
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	1,6903 mg/m ³
Risk Characterization Ratio (RCR)	0,764853
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Assessment method	Qualitative assessment
	Worker - dermal
Additional good practice advice	
Where appropriate, replacement of task by automated and/or closed processes.	
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra	

Contributing exposure scenario	
Use descriptors covered	PROC6: Calendering operations Pelletizing Extrusion and masterbatching Use domain: industrial
Operational conditions	
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 1 %
Physical state	liquid
Vapour pressure of the substance during use	268333,1875 Pa
Process temperature	20 °C
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated temperatures
Risk Management Measures	
Provide a good standard of general or controlled ventilation (5 to 10 air changes per hour)	Effectiveness: 70 %
Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings.	Effectiveness: 90 %
Drain down and flush system prior to equipment break-in or maintenance.	

1,3-Butadiene

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Contributing exposure scenario

Use descriptors covered

Operational conditions

Concentration of the substance



Restrict access to authorised persons.	
Provide specific employee training to prevent/minimize exposures. Regular	
inspection and maintenance of	
equipment and machines.	
Minimise exposure by partial	
enclosure of the operation or	
equipment and provide extract	
ventilation at openings. Disposal -	
This material and its container must	
be disposed of in a safe manner.	
In case of potential exposure:, Use	
suitable chemically resistant gloves.,	
Wear suitable coveralls to prevent	
exposure to the skin., Wear suitable	
respiratory protection., Clear spills	
immediately, Consider the need for	
risk based health surveillance.	
Avoid frequent and direct contact with	
substance. Clean up contamination as	
soon as they occur. Wash off any skin	
contamination immediately. Provide	
specific employee training to	
prevent/minimize exposures.	
Wear suitable gloves tested to EN	
ISO 374-1.	
Exposure estimate and reference to	
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	1,6903 mg/m ³
Risk Characterization Ratio (RCR)	0,764853
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Assessment method	Qualitative assessment
	Worker - dermal
Additional good practice advice	
Where appropriate, replacement of task by automated and/or closed processes.	
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra	

PROC8a: Transfer of substance or mixture (charging and

discharging) at non-dedicated facilities

1,3-butadiene

Content: >= 0 % - <= 100 %

Equipment maintenance Use domain: industrial

1,3-Butadiene



Physical state	liquid
Vapour pressure of the substance	268333,1875 Pa
during use	
Process temperature	20 °C
Duration and Frequency of activity	240 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated temperatures
Risk Management Measures	
Local exhaust ventilation	
Wear suitable respiratory protection.	Effectiveness: 90 %
Provide a good standard of general or	
controlled ventilation (5 to 10 air changes per hour)	Effectiveness: 70 %
Drain down and flush system prior to	
equipment break-in or maintenance.	
Restrict access to authorised persons.	
Provide specific employee training to	
prevent/minimize exposures. Regular	
inspection and maintenance of	
equipment and machines.	
Minimise exposure by partial	
enclosure of the operation or	
equipment and provide extract	
ventilation at openings. Disposal -	
This material and its container must	
be disposed of in a safe manner.	
In case of potential exposure:, Use	
suitable chemically resistant gloves.,	
Wear suitable coveralls to prevent	
exposure to the skin., Wear suitable	
respiratory protection., Clear spills	
immediately, Consider the need for	
risk based health surveillance.	
Avoid frequent and direct contact with	
substance. Clean up contamination as	
soon as they occur. Wash off any skin	
contamination immediately. Provide	
specific employee training to	
prevent/minimize exposures.	
Wear suitable gloves tested to EN ISO 374-1.	
Exposure estimate and reference to it	its source
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	1,0142 mg/m ³
Risk Characterization Ratio (RCR)	0,458912

1,3-Butadiene



Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker	
Assessment method	Qualitative assessment	
	Worker - dermal	
Additional good practice advice		
Where appropriate, replacement of task by automated and/or closed processes.		
Guidance to Downstream Users		
For scaling see: http://www.ecetoc.org/tra		

Contributing exposure scenario	
PROC8a: Transfer of substance or mixture (charging and discharging) at non-dedicated facilities Equipment maintenance Use domain: industrial	
1,3-butadiene Content: >= 0 % - <= 100 %	
liquid	
268333,1875 Pa	
20 °C	
240 min 5 days per week	
Indoor	
Operation is carried out at ambient or elevated temperatures	
Effectiveness: 70 %	
Effectiveness: 90 %	

1,3-Butadiene



exposure to the skin., Wear suitable respiratory protection., Clear spills immediately, Consider the need for risk based health surveillance. Avoid frequent and direct contact with substance. Clean up contamination as soon as they occur. Wash off any skin contamination immediately. Provide specific employee training to	
prevent/minimize exposures. Wear suitable gloves tested to EN	
ISO 374-1. Exposure estimate and reference to i	te cource
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
7.03033ITCH ITCHIOG	Worker - inhalation, long-term - systemic
Exposure estimate	1,0142 mg/m³
Risk Characterization Ratio (RCR)	0,458912
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Assessment method	Qualitative assessment
	Worker - dermal
Additional good practice advice	
Where appropriate, replacement of task by automated and/or closed processes.	
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/t	ra

Contributing exposure scenario	
Use descriptors covered	PROC8b: Transfer of substance or mixture (charging and discharging) at dedicated facilities Bulk transfer transport with sample collection Use domain: industrial
Operational conditions	
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance during use	268333,1875 Pa
Process temperature	20 °C
Duration and Frequency of activity	60 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated temperatures
Risk Management Measures	
Local exhaust ventilation	
Provide a good standard of general or	Effectiveness: 70 %

1,3-Butadiene

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Contributing exposure scenario

Use descriptors covered



controlled ventilation (5 to 10 air	
changes per hour)	
Drain down and flush system prior to	
equipment break-in or maintenance.	
Restrict access to authorised persons.	
Provide specific employee training to	
prevent/minimize exposures. Regular	
inspection and maintenance of	
equipment and machines.	
Minimise exposure by partial	
enclosure of the operation or	
equipment and provide extract	
ventilation at openings. Disposal -	
This material and its container must	
be disposed of in a safe manner.	
In case of potential exposure:, Use	
suitable chemically resistant gloves.,	
Wear suitable coveralls to prevent	
exposure to the skin., Wear suitable	
respiratory protection., Clear spills	
immediately, Consider the need for	
risk based health surveillance.	
Avoid frequent and direct contact with	
substance. Clean up contamination as	
soon as they occur. Wash off any skin	
contamination immediately. Provide	
specific employee training to	
prevent/minimize exposures.	
Wear suitable gloves tested to EN	
ISO 374-1.	
Exposure estimate and reference to it	its source
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	1,0142 mg/m ³
Risk Characterization Ratio (RCR)	0,458912
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Assessment method	Qualitative assessment
	Worker - dermal
Additional good practice advice	
Where appropriate, replacement of task by automated and/or closed processes.	
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/t	ra

PROC8b: Transfer of substance or mixture (charging and

Bulk transfer transport with sample collection Use domain:

discharging) at dedicated facilities

industrial

1,3-Butadiene



Operational conditions	
	1,3-butadiene
Concentration of the substance	Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance during use	268333,1875 Pa
Process temperature	20 °C
Duration and Frequency of activity	60 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated temperatures
Risk Management Measures	
Provide a good standard of general or	
controlled ventilation (5 to 10 air changes per hour)	Effectiveness: 70 %
Sample via a closed loop or other system to avoid exposure.	Effectiveness: 95 %
Drain down and flush system prior to equipment break-in or maintenance. Restrict access to authorised persons. Provide specific employee training to prevent/minimize exposures. Regular inspection and maintenance of equipment and machines. Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings. Disposal - This material and its container must be disposed of in a safe manner. In case of potential exposure:, Use suitable chemically resistant gloves., Wear suitable coveralls to prevent exposure to the skin., Wear suitable	
respiratory protection., Clear spills immediately, Consider the need for risk based health surveillance.	
Avoid frequent and direct contact with substance. Clean up contamination as soon as they occur. Wash off any skin contamination immediately. Provide specific employee training to prevent/minimize exposures.	
Wear suitable gloves tested to EN ISO 374-1.	
Exposure estimate and reference to i	ts source

1,3-Butadiene



Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker	
	Worker - inhalation, long-term - systemic	
Exposure estimate	1,0142 mg/m ³	
Risk Characterization Ratio (RCR)	0,458912	
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker	
Assessment method	Qualitative assessment	
	Worker - dermal	
Additional good practice advice		
Where appropriate, replacement of task by automated and/or closed processes.		
Guidance to Downstream Users		
For scaling see: http://www.ecetoc.org	/tra	

Contributing expecting coopering	
Contributing exposure scenario	
Use descriptors covered	PROC8b: Transfer of substance or mixture (charging and discharging) at dedicated facilities Bulk transfer transport with sample collection Use domain: industrial
Operational conditions	
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance during use	268333,1875 Pa
Process temperature	20 °C
Duration and Frequency of activity	60 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated temperatures
Risk Management Measures	
Sample via a closed loop or other system to avoid exposure.	Effectiveness: 95 %
Transfer via enclosed lines	Effectiveness: 70 %
Drain down and flush system prior to equipment break-in or maintenance. Restrict access to authorised persons. Provide specific employee training to prevent/minimize exposures. Regular inspection and maintenance of equipment and machines.	
Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings. Disposal - This material and its container must	

1,3-Butadiene



be disposed of in a safe manner.	
In case of potential exposure:, Use	
suitable chemically resistant gloves.,	
Wear suitable coveralls to prevent	
exposure to the skin., Wear suitable	
respiratory protection., Clear spills	
immediately, Consider the need for	
risk based health surveillance.	
Avoid frequent and direct contact with	
substance. Clean up contamination as	
soon as they occur. Wash off any skin	
contamination immediately. Provide	
specific employee training to	
prevent/minimize exposures.	
Wear suitable gloves tested to EN	
ISO 374-1.	
Exposure estimate and reference to i	
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	1,0142 mg/m ³
Risk Characterization Ratio (RCR)	0,458912
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Assessment method	Qualitative assessment
	Worker - dermal
Additional good practice advice	
Where appropriate, replacement of task by automated and/or closed processes.	
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 Bulk transfer transport with sample collection Use domain: industrial
Operational conditions	
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance during use	268333,1875 Pa
Process temperature	20 °C
Duration and Frequency of activity	60 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated

1,3-Butadiene



	temperatures
Risk Management Measures	
Local exhaust ventilation	
Transfer via enclosed lines	Effectiveness: 70 %
Drain down and flush system prior to	
equipment break-in or maintenance.	
Restrict access to authorised persons.	
Provide specific employee training to	
prevent/minimize exposures. Regular	
inspection and maintenance of	
equipment and machines.	
Minimise exposure by partial	
enclosure of the operation or	
equipment and provide extract	
ventilation at openings. Disposal -	
This material and its container must	
be disposed of in a safe manner.	
In case of potential exposure:, Use	
suitable chemically resistant gloves.,	
Wear suitable coveralls to prevent	
exposure to the skin., Wear suitable	
respiratory protection., Clear spills	
immediately, Consider the need for	
risk based health surveillance.	
Avoid frequent and direct contact with	
substance. Clean up contamination as	
soon as they occur. Wash off any skin	
contamination immediately. Provide	
specific employee training to	
prevent/minimize exposures.	
Wear suitable gloves tested to EN	
ISO 374-1.	
Exposure estimate and reference to i	
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	1,0142 mg/m³
Risk Characterization Ratio (RCR)	0,458912
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Assessment method	Qualitative assessment
	Worker - dermal
Additional good practice advice	
	by automated and/or closed processes.
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/t	ra

Contributing exposure scenario	
	PROC8b: Transfer of substance or mixture (charging and
	discharging) at dedicated facilities

1,3-Butadiene



	Pelletisation and pellet screening (open systems) Use domain: industrial
Operational conditions	ı
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 1 %
Physical state	liquid
Vapour pressure of the substance during use	268333,1875 Pa
Process temperature	20 °C
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated temperatures
Risk Management Measures	
Local exhaust ventilation	
Drain down and flush system prior to	
equipment break-in or maintenance.	
Restrict access to authorised persons.	
Provide specific employee training to	
prevent/minimize exposures. Regular	
inspection and maintenance of	
equipment and machines.	
Minimise exposure by partial	
enclosure of the operation or	
equipment and provide extract	
ventilation at openings. Disposal -	
This material and its container must	
be disposed of in a safe manner.	
In case of potential exposure:, Use	
suitable chemically resistant gloves.,	
Wear suitable coveralls to prevent	
exposure to the skin., Wear suitable	
respiratory protection., Clear spills	
immediately, Consider the need for risk based health surveillance.	
Avoid frequent and direct contact with	
substance. Clean up contamination as	
soon as they occur. Wash off any skin	
contamination immediately. Provide	
specific employee training to	
prevent/minimize exposures.	
Wear suitable gloves tested to EN	
ISO 374-1.	
Exposure estimate and reference to	its source
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
ccccomone mounda	

1,3-Butadiene



	Worker - inhalation, long-term - systemic	
Exposure estimate	1,6903 mg/m ³	
Risk Characterization Ratio (RCR)	0,764853	
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker	
Assessment method	Qualitative assessment	
	Worker - dermal	
Additional good practice advice		
Where appropriate, replacement of task by automated and/or closed processes.		
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 Pelletisation and pellet screening (open systems) Use domain: industrial
Operational conditions	
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 1 %
Physical state	liquid
Vapour pressure of the substance during use	268333,1875 Pa
Process temperature	20 °C
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated temperatures
Risk Management Measures	
Ensure material transfers are under containment or extract ventilation	Effectiveness: 95 %
Drain down and flush system prior to equipment break-in or maintenance. Restrict access to authorised persons. Provide specific employee training to prevent/minimize exposures. Regular inspection and maintenance of equipment and machines. Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings. Disposal -	
This material and its container must be disposed of in a safe manner.	
In case of potential exposure:, Use	

1,3-Butadiene



quitable abomically registent aloves	
suitable chemically resistant gloves., Wear suitable coveralls to prevent	
exposure to the skin., Wear suitable	
respiratory protection., Clear spills	
immediately, Consider the need for	
risk based health surveillance.	
Avoid frequent and direct contact with	
substance. Clean up contamination as	
soon as they occur. Wash off any skin	
contamination immediately. Provide	
specific employee training to	
prevent/minimize exposures.	
Wear suitable gloves tested to EN	
ISO 374-1.	
Exposure estimate and reference to it	
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	1,6903 mg/m³
Risk Characterization Ratio (RCR)	0,764853
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Assessment method	Qualitative assessment
	Worker - dermal
Additional good practice advice	
Where appropriate, replacement of task by automated and/or closed processes.	
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/t	ra

Contributing exposure scenario	
Use descriptors covered	PROC8b: Transfer of substance or mixture (charging and discharging) at dedicated facilities transport with sample collection Use domain: industrial
Operational conditions	
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance during use	268333,1875 Pa
Process temperature	20 °C
Duration and Frequency of activity	60 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated temperatures
Risk Management Measures	
Local exhaust ventilation	

1,3-Butadiene



Provide a good standard of general or controlled ventilation (5 to 10 air changes per hour)	Effectiveness: 70 %
Drain down and flush system prior to	
equipment break-in or maintenance.	
Restrict access to authorised persons.	
Provide specific employee training to	
prevent/minimize exposures. Regular	
inspection and maintenance of	
equipment and machines.	
Minimise exposure by partial	
enclosure of the operation or	
equipment and provide extract	
ventilation at openings. Disposal -	
This material and its container must	
be disposed of in a safe manner.	
In case of potential exposure:, Use	
suitable chemically resistant gloves.,	
Wear suitable coveralls to prevent	
exposure to the skin., Wear suitable	
respiratory protection., Clear spills	
immediately, Consider the need for	
risk based health surveillance.	
Avoid frequent and direct contact with	
substance. Clean up contamination as	
soon as they occur. Wash off any skin	
contamination immediately. Provide	
specific employee training to	
prevent/minimize exposures.	
Wear suitable gloves tested to EN	
ISO 374-1.	
Exposure estimate and reference to	
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	1,0142 mg/m ³
Risk Characterization Ratio (RCR)	0,458912
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Assessment method	Qualitative assessment
	Worker - dermal
Additional good practice advice	
Where appropriate, replacement of task by automated and/or closed processes.	
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/t	ra

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

1,3-Butadiene



Operational conditions	
	1,3-butadiene
Concentration of the substance	Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance during use	268333,1875 Pa
Process temperature	20 °C
Duration and Frequency of activity	60 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated temperatures
Risk Management Measures	
Provide a good standard of general or	
controlled ventilation (5 to 10 air changes per hour)	Effectiveness: 70 %
Ensure material transfers are under containment or extract ventilation	Effectiveness: 95 %
Drain down and flush system prior to equipment break-in or maintenance. Restrict access to authorised persons. Provide specific employee training to prevent/minimize exposures. Regular inspection and maintenance of equipment and machines. Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings. Disposal - This material and its container must be disposed of in a safe manner. In case of potential exposure:, Use suitable chemically resistant gloves., Wear suitable coveralls to prevent	
exposure to the skin., Wear suitable respiratory protection., Clear spills immediately, Consider the need for risk based health surveillance.	
Avoid frequent and direct contact with substance. Clean up contamination as soon as they occur. Wash off any skin contamination immediately. Provide specific employee training to prevent/minimize exposures.	
Wear suitable gloves tested to EN ISO 374-1.	
Exposure estimate and reference to i	ts source

1,3-Butadiene



Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker	
	Worker - inhalation, long-term - systemic	
Exposure estimate	1,0142 mg/m ³	
Risk Characterization Ratio (RCR)	0,458912	
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker	
Assessment method	Qualitative assessment	
	Worker - dermal	
Additional good practice advice		
Where appropriate, replacement of task by automated and/or closed processes.		
Guidance to Downstream Users		
For scaling see: http://www.ecetoc.org/tra		

Contributing exposure scenario	
Use descriptors covered	PROC14: Tabletting, compression, extrusion, pelletisation, granulation Pelletizing Use domain: industrial
Operational conditions	
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 1 %
Physical state	liquid
Vapour pressure of the substance during use	268333,1875 Pa
Process temperature	20 °C
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated temperatures
Risk Management Measures	
Local exhaust ventilation	
Provide a good standard of general or controlled ventilation (5 to 10 air changes per hour)	Effectiveness: 70 %
Drain down and flush system prior to equipment break-in or maintenance. Restrict access to authorised persons. Provide specific employee training to prevent/minimize exposures. Regular inspection and maintenance of equipment and machines.	
Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings. Disposal - This material and its container must	

1,3-Butadiene



be disposed of in a safe manner.	
In case of potential exposure:, Use	
suitable chemically resistant gloves.,	
Wear suitable coveralls to prevent	
exposure to the skin., Wear suitable	
respiratory protection., Clear spills	
immediately, Consider the need for	
risk based health surveillance.	
Avoid frequent and direct contact with	
substance. Clean up contamination as	
soon as they occur. Wash off any skin	
contamination immediately. Provide	
specific employee training to	
prevent/minimize exposures.	
Wear suitable gloves tested to EN	
ISO 374-1.	
Exposure estimate and reference to it	
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	1,6903 mg/m ³
Risk Characterization Ratio (RCR)	0,764853
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Assessment method	Qualitative assessment
	Worker - dermal
Additional good practice advice	
Where appropriate, replacement of task by automated and/or closed processes.	
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/t	ra

Contributing exposure scenario	
Use descriptors covered	PROC14: Tabletting, compression, extrusion, pelletisation, granulation Pelletizing Use domain: industrial
Operational conditions	
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 1 %
Physical state	liquid
Vapour pressure of the substance during use	268333,1875 Pa
Process temperature	20 °C
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated temperatures

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Risk Management Measures	
Provide a good standard of general or	
controlled ventilation (5 to 10 air	Effectiveness: 70 %
changes per hour)	Effectiveness. 70 70
Minimise exposure by partial	
enclosure of the operation or	
equipment and provide extract	Effectiveness: 90 %
ventilation at openings.	
Drain down and flush system prior to	
equipment break-in or maintenance.	
Restrict access to authorised persons.	
Provide specific employee training to	
prevent/minimize exposures. Regular	
inspection and maintenance of	
equipment and machines.	
Minimise exposure by partial	
enclosure of the operation or	
equipment and provide extract	
ventilation at openings. Disposal -	
This material and its container must	
be disposed of in a safe manner.	
In case of potential exposure:, Use	
suitable chemically resistant gloves.,	
Wear suitable coveralls to prevent	
exposure to the skin., Wear suitable	
respiratory protection., Clear spills	
immediately, Consider the need for	
risk based health surveillance.	
Avoid frequent and direct contact with	
substance. Clean up contamination as	
soon as they occur. Wash off any skin	
contamination immediately. Provide	
specific employee training to	
prevent/minimize exposures.	
Wear suitable gloves tested to EN	
ISO 374-1.	
Exposure estimate and reference to it	ts source
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	1,6903 mg/m ³
Risk Characterization Ratio (RCR)	0,764853
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Assessment method	Qualitative assessment
7.00000mont mothed	Worker - dermal
Additional good practice advice	Worker definal
Where appropriate, replacement of task by automated and/or closed processes.	
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra	
For scaling see. http://www.ecetoc.org/t	Id

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5. Short title of exposure scenario

Use as a Fuel

IS; ERC7; PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC16

Control of exposure and risk management measures

Contributing exposure scenario	
Use descriptors covered	ERC7: Use of functional fluid at industrial site As no environmental hazard was identified no environmental-related exposure assessment and risk characterization was performed.
Operational conditions	

Contributing exposure scenario		
Use descriptors covered	PROC1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions. General exposures (closed systems) Use domain: industrial	
Operational conditions		
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 100 %	
Physical state	liquid	
Vapour pressure of the substance during use	268333,1875 Pa	
Process temperature	20 °C	
Duration and Frequency of activity	480 min 5 days per week	
Indoor/Outdoor	Indoor	
	Operation is carried out at ambient or elevated temperatures	
Risk Management Measures		
Drain down and flush system prior to equipment break-in or maintenance. Restrict access to authorised persons. Provide specific employee training to prevent/minimize exposures. Regular inspection and maintenance of equipment and machines.		
Minimise exposure by partial enclosure of the operation or		

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equipment and provide extract	
ventilation at openings. Disposal -	
This material and its container must	
be disposed of in a safe manner.	
In case of potential exposure:, Use	
suitable chemically resistant gloves.,	
Wear suitable coveralls to prevent	
exposure to the skin., Wear suitable	
respiratory protection., Clear spills	
immediately, Consider the need for	
risk based health surveillance.	
Avoid frequent and direct contact with	
substance. Clean up contamination as	
soon as they occur. Wash off any skin	
contamination immediately. Provide	
specific employee training to	
prevent/minimize exposures.	
Wear suitable gloves tested to EN	
ISO 374-1.	
Exposure estimate and reference to i	
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	0,0225 mg/m ³
Risk Characterization Ratio (RCR)	0,010198
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Assessment method	Qualitative assessment
	Worker - dermal
Additional good practice advice	
Where appropriate, replacement of task by automated and/or closed processes.	
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/t	ra

Contributing exposure scenario	
Use descriptors covered	PROC1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions. Storage Use domain: industrial
Operational conditions	
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance during use	268333,1875 Pa
Process temperature	20 °C
Duration and Frequency of activity	480 min 5 days per week

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Indoor/Outdoor Indoor Operation is carried out at ambient or elevated temperatures Risk Management Measures Drain down and flush system prior to equipment break-in or maintenance. Restrict access to authorised persons. Provide specific employee training to prevent/minimize exposures. Regular inspection and maintenance of equipment and machines. Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings. Disposal -This material and its container must be disposed of in a safe manner. In case of potential exposure:. Use suitable chemically resistant gloves., Wear suitable coveralls to prevent exposure to the skin., Wear suitable respiratory protection., Clear spills immediately, Consider the need for risk based health surveillance. Avoid frequent and direct contact with substance. Clean up contamination as soon as they occur. Wash off any skin contamination immediately. Provide specific employee training to prevent/minimize exposures. Wear suitable gloves tested to EN ISO 374-1. Exposure estimate and reference to its source EASY TRA v6.0, ECETOC TRA v3.0, Worker Assessment method Worker - inhalation, long-term - systemic Exposure estimate 0.0225 mg/m^3 Risk Characterization Ratio (RCR) 0,010198 Assessment method EASY TRA v6.0, ECETOC TRA v3.0, Worker Assessment method Qualitative assessment Worker - dermal Additional good practice advice Where appropriate, replacement of task by automated and/or closed processes. 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

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	continuous process with occasional controlled exposure or processes with equivalent containment conditions General exposures (closed systems) With occasional controlled exposure. Use domain: industrial
Operational conditions	
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance	268333,1875 Pa
during use	, and the second
Process temperature	20 °C
Duration and Frequency of activity	240 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated temperatures
Risk Management Measures	
Local exhaust ventilation	
Provide a good standard of general or controlled ventilation (5 to 10 air changes per hour)	Effectiveness: 70 %
Drain down and flush system prior to equipment break-in or maintenance. Restrict access to authorised persons. Provide specific employee training to prevent/minimize exposures. Regular inspection and maintenance of equipment and machines.	
Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings. Disposal - This material and its container must be disposed of in a safe manner.	
In case of potential exposure:, Use suitable chemically resistant gloves., Wear suitable coveralls to prevent exposure to the skin., Wear suitable respiratory protection., Clear spills immediately, Consider the need for risk based health surveillance. Avoid frequent and direct contact with substance. Clean up contamination as soon as they occur. Wash off any skin	
contamination immediately. Provide specific employee training to	

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prevent/minimize exposures.	
Wear suitable gloves tested to EN	
ISO 374-1.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	1,0142 mg/m ³
Risk Characterization Ratio (RCR)	0,458912
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Assessment method	Qualitative assessment
	Worker - dermal
Additional good practice advice	
Where appropriate, replacement of task by automated and/or closed processes.	
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 General exposures (closed systems) With occasional controlled exposure. Use domain: industrial
Operational conditions	
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance during use	268333,1875 Pa
Process temperature	20 °C
Duration and Frequency of activity	240 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated temperatures
Risk Management Measures	
Provide a good standard of general or controlled ventilation (5 to 10 air changes per hour)	Effectiveness: 70 %
Handle substance within closed system.	Effectiveness: 90 %
Drain down and flush system prior to equipment break-in or maintenance. Restrict access to authorised persons. Provide specific employee training to prevent/minimize exposures. Regular	

1,3-Butadiene



inspection and maintenance of		
equipment and machines.		
Minimise exposure by partial		
enclosure of the operation or		
equipment and provide extract		
ventilation at openings. Disposal -		
This material and its container must		
be disposed of in a safe manner.		
In case of potential exposure:, Use		
suitable chemically resistant gloves.,		
Wear suitable coveralls to prevent		
exposure to the skin., Wear suitable		
respiratory protection., Clear spills		
immediately, Consider the need for		
risk based health surveillance.		
Avoid frequent and direct contact with		
substance. Clean up contamination as		
soon as they occur. Wash off any skin		
contamination immediately. Provide		
specific employee training to		
prevent/minimize exposures.		
Wear suitable gloves tested to EN		
ISO 374-1.	#	
Exposure estimate and reference to i		
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker	
	Worker - inhalation, long-term - systemic	
Exposure estimate	1,0142 mg/m ³	
Risk Characterization Ratio (RCR)	0,458912	
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker	
Assessment method	Qualitative assessment	
	Worker - dermal	
	Additional good practice advice	
Where appropriate, replacement of task by automated and/or closed processes.		
Guidance to Downstream Users		
For scaling see: http://www.ecetoc.org/t	ra	

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 Storage With occasional controlled exposure. Use domain: industrial	
Operational conditions		
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 100 %	
Physical state	liquid	

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Vapour pressure of the substance during use	268333,1875 Pa
Process temperature	20 °C
Duration and Frequency of activity	240 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated temperatures
Risk Management Measures	•
Local exhaust ventilation	
Provide a good standard of general or	
controlled ventilation (5 to 10 air	Effectiveness: 70 %
changes per hour)	
Drain down and flush system prior to	
equipment break-in or maintenance.	
Restrict access to authorised persons.	
Provide specific employee training to	
prevent/minimize exposures. Regular	
inspection and maintenance of	
equipment and machines.	
Minimise exposure by partial	
enclosure of the operation or	
equipment and provide extract	
ventilation at openings. Disposal -	
This material and its container must	
be disposed of in a safe manner.	
In case of potential exposure:, Use	
suitable chemically resistant gloves.,	
Wear suitable coveralls to prevent	
exposure to the skin., Wear suitable	
respiratory protection., Clear spills	
immediately, Consider the need for risk based health surveillance.	
Avoid frequent and direct contact with	
substance. Clean up contamination as	
soon as they occur. Wash off any skin	
contamination immediately. Provide	
specific employee training to	
prevent/minimize exposures.	
Wear suitable gloves tested to EN	
ISO 374-1.	
Exposure estimate and reference to it	its source
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	1,0142 mg/m ³
Risk Characterization Ratio (RCR)	0,458912
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Assessment method	Qualitative assessment

1,3-Butadiene



Worker - dermal	
Additional good practice advice	
Where appropriate, replacement of task by automated and/or closed processes.	
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 Storage With occasional controlled exposure. Use domain: industrial
Operational conditions	
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance during use	268333,1875 Pa
Process temperature	20 °C
Duration and Frequency of activity	240 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated temperatures
Risk Management Measures	
Provide a good standard of general or controlled ventilation (5 to 10 air changes per hour)	Effectiveness: 70 %
Handle substance within a predominantly closed system provided with extract ventilation.	Effectiveness: 90 %
Drain down and flush system prior to equipment break-in or maintenance. Restrict access to authorised persons. Provide specific employee training to prevent/minimize exposures. Regular inspection and maintenance of equipment and machines. Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings. Disposal - This material and its container must be disposed of in a safe manner.	
In case of potential exposure:, Use	
suitable chemically resistant gloves.,	

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Table 1	ı
Wear suitable coveralls to prevent	
exposure to the skin., Wear suitable	
respiratory protection., Clear spills	
immediately, Consider the need for	
risk based health surveillance.	
Avoid frequent and direct contact with	
substance. Clean up contamination as	
soon as they occur. Wash off any skin	
contamination immediately. Provide	
specific employee training to	
prevent/minimize exposures.	
Wear suitable gloves tested to EN	
ISO 374-1.	
Exposure estimate and reference to i	ts source
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	1,0142 mg/m³
Risk Characterization Ratio (RCR)	0,458912
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Assessment method	Qualitative assessment
	Worker - dermal
Additional good practice advice	
Where appropriate, replacement of task by automated and/or closed processes.	
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/t	ra

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 General exposures (closed systems) Batch process Use domain: industrial
Operational conditions	
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance during use	268333,1875 Pa
Process temperature	20 °C
Duration and Frequency of activity	60 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated temperatures

1,3-Butadiene

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Contributing exposure scenario

Use descriptors covered



Risk Management Measures	
Local exhaust ventilation	
Provide a good standard of general or controlled ventilation (5 to 10 air	Effectiveness: 70 %
changes per hour)	
Drain down and flush system prior to	
equipment break-in or maintenance.	
Restrict access to authorised persons.	
Provide specific employee training to	
prevent/minimize exposures. Regular	
inspection and maintenance of	
equipment and machines.	
Minimise exposure by partial	
enclosure of the operation or	
equipment and provide extract	
ventilation at openings. Disposal -	
This material and its container must	
be disposed of in a safe manner.	
In case of potential exposure:, Use	
suitable chemically resistant gloves.,	
Wear suitable coveralls to prevent exposure to the skin., Wear suitable	
respiratory protection., Clear spills	
immediately, Consider the need for	
risk based health surveillance.	
Avoid frequent and direct contact with	
substance. Clean up contamination as	
soon as they occur. Wash off any skin	
contamination immediately. Provide	
specific employee training to	
prevent/minimize exposures.	
Wear suitable gloves tested to EN	
ISO 374-1.	
Exposure estimate and reference to i	
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	0,6761 mg/m ³
Risk Characterization Ratio (RCR)	0,305941
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Assessment method	Qualitative assessment
A LIVE	Worker - dermal
Additional good practice advice	
Where appropriate, replacement of task by automated and/or closed processes.	
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra	

PROC3: Manufacture or formulation in the chemical

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	industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition General exposures (closed systems) Batch process Use domain: industrial
Operational conditions	
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance during use	268333,1875 Pa
Process temperature	20 °C
Duration and Frequency of activity	60 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated temperatures
Risk Management Measures	
Provide a good standard of general or controlled ventilation (5 to 10 air changes per hour)	Effectiveness: 70 %
Handle substance within closed system.	Effectiveness: 90 %
Drain down and flush system prior to equipment break-in or maintenance. Restrict access to authorised persons. Provide specific employee training to prevent/minimize exposures. Regular inspection and maintenance of equipment and machines.	
Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings. Disposal - This material and its container must be disposed of in a safe manner.	
In case of potential exposure:, Use suitable chemically resistant gloves., Wear suitable coveralls to prevent exposure to the skin., Wear suitable respiratory protection., Clear spills immediately, Consider the need for risk based health surveillance.	
Avoid frequent and direct contact with substance. Clean up contamination as soon as they occur. Wash off any skin	

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contamination immediately. Provide	
specific employee training to	
prevent/minimize exposures.	
Wear suitable gloves tested to EN	
ISO 374-1.	
Exposure estimate and reference to	o its source
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	0,6761 mg/m ³
Risk Characterization Ratio (RCR)	0,305941
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Assessment method	Qualitative assessment
	Worker - dermal
Additional good practice advice	
Where appropriate, replacement of task by automated and/or closed processes.	
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org	g/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 General exposures (open systems) (closed systems) Batch process Use domain: industrial
Operational conditions	
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 25 %
Physical state	liquid
Vapour pressure of the substance during use	268333,1875 Pa
Process temperature	20 °C
Duration and Frequency of activity	60 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated temperatures
Risk Management Measures	
Local exhaust ventilation	
Provide a good standard of general or controlled ventilation (5 to 10 air changes per hour)	Effectiveness: 70 %
Drain down and flush system prior to equipment break-in or maintenance. Restrict access to authorised persons.	

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Provide specific employee training to	
prevent/minimize exposures. Regular	
inspection and maintenance of equipment and machines.	
Minimise exposure by partial	
enclosure of the operation or	
equipment and provide extract	
ventilation at openings. Disposal -	
This material and its container must	
be disposed of in a safe manner.	
In case of potential exposure:, Use	
suitable chemically resistant gloves.,	
Wear suitable coveralls to prevent	
exposure to the skin., Wear suitable	
respiratory protection., Clear spills	
immediately, Consider the need for	
risk based health surveillance.	
Avoid frequent and direct contact with	
substance. Clean up contamination as	
soon as they occur. Wash off any skin	
contamination immediately. Provide	
specific employee training to prevent/minimize exposures.	
Wear suitable gloves tested to EN	
ISO 374-1.	
Exposure estimate and reference to	its source
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	0,4057 mg/m ³
Risk Characterization Ratio (RCR)	0,183565
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Assessment method	Qualitative assessment
	Worker - dermal
Additional good practice advice	
Where appropriate, replacement of task by automated and/or closed processes.	
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/t	ra

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 General exposures (open systems) (closed systems) Batch process Use domain: industrial
Operational conditions	
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 25 %

1,3-Butadiene



I	
Physical state	liquid
Vapour pressure of the substance	268333,1875 Pa
during use	255555,107514
	20 °C
Process temperature	
Duration and Frequency of activity	60 min 5 days per week
, , ,	
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated
	temperatures
Risk Management Measures	
Provide a good standard of general or	E" " 70 0'
controlled ventilation (5 to 10 air	Effectiveness: 70 %
changes per hour)	
Handle substance within a	Effectiveness 00 0/
predominantly closed system provided	Effectiveness: 90 %
with extract ventilation.	
Drain down and flush system prior to	
equipment break-in or maintenance.	
Restrict access to authorised persons.	
Provide specific employee training to	
prevent/minimize exposures. Regular inspection and maintenance of	
equipment and machines.	
Minimise exposure by partial	
enclosure of the operation or	
equipment and provide extract	
ventilation at openings. Disposal -	
This material and its container must	
be disposed of in a safe manner.	
In case of potential exposure:, Use	
suitable chemically resistant gloves.,	
Wear suitable coveralls to prevent	
exposure to the skin., Wear suitable	
respiratory protection., Clear spills	
immediately, Consider the need for	
risk based health surveillance.	
Avoid frequent and direct contact with	
substance. Clean up contamination as	
soon as they occur. Wash off any skin	
contamination immediately. Provide	
specific employee training to	
prevent/minimize exposures.	
Wear suitable gloves tested to EN	
ISO 374-1.	
Exposure estimate and reference to i	ts source
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic

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Exposure estimate	0,4057 mg/m ³	
Risk Characterization Ratio (RCR)	0,183565	
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker	
Assessment method	Qualitative assessment	
	Worker - dermal	
Additional good practice advice		
Where appropriate, replacement of task by automated and/or closed processes.		
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 Bulk transfer Use domain: industrial	
Operational conditions		
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 25 %	
Physical state	liquid	
Vapour pressure of the substance during use	268333,1875 Pa	
Process temperature	20 °C	
Duration and Frequency of activity	60 min 5 days per week	
Indoor/Outdoor	Indoor	
	Operation is carried out at ambient or elevated temperatures	
Risk Management Measures		
Local exhaust ventilation		
Provide a good standard of general or controlled ventilation (5 to 10 air changes per hour)	Effectiveness: 70 %	
Drain down and flush system prior to equipment break-in or maintenance. Restrict access to authorised persons. Provide specific employee training to prevent/minimize exposures. Regular inspection and maintenance of		
equipment and machines. Minimise exposure by partial		
enclosure of the operation or equipment and provide extract ventilation at openings. Disposal - This material and its container must be disposed of in a safe manner.		
In case of potential exposure:, Use		

1,3-Butadiene



La granda de la Califfe de Calabrata de la cal	
suitable chemically resistant gloves.,	
Wear suitable coveralls to prevent	
exposure to the skin., Wear suitable respiratory protection., Clear spills	
immediately, Consider the need for	
risk based health surveillance.	
Avoid frequent and direct contact with	
substance. Clean up contamination as	
soon as they occur. Wash off any skin	
contamination immediately. Provide	
specific employee training to	
prevent/minimize exposures.	
Wear suitable gloves tested to EN	
ISO 374-1.	
Exposure estimate and reference to it	ts source
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	0,8114 mg/m³
Risk Characterization Ratio (RCR)	0,367129
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Assessment method	Qualitative assessment
	Worker - dermal
Additional good practice advice	
Where appropriate, replacement of task by automated and/or closed processes.	
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 Bulk transfer Use domain: industrial
Operational conditions	
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 25 %
Physical state	liquid
Vapour pressure of the substance during use	268333,1875 Pa
Process temperature	20 °C
Duration and Frequency of activity	60 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated temperatures
Risk Management Measures	
Local exhaust ventilation	

1,3-Butadiene



Transfer via enclosed lines	Effectiveness: 70 %
Drain down and flush system prior to	
equipment break-in or maintenance.	
Restrict access to authorised persons.	
Provide specific employee training to	
prevent/minimize exposures. Regular	
inspection and maintenance of	
equipment and machines.	
Minimise exposure by partial	
enclosure of the operation or	
equipment and provide extract	
ventilation at openings. Disposal -	
This material and its container must	
be disposed of in a safe manner.	
In case of potential exposure:, Use	
suitable chemically resistant gloves.,	
Wear suitable coveralls to prevent	
exposure to the skin., Wear suitable	
respiratory protection., Clear spills	
immediately, Consider the need for	
risk based health surveillance.	
Avoid frequent and direct contact with	
substance. Clean up contamination as	
soon as they occur. Wash off any skin	
contamination immediately. Provide	
specific employee training to	
prevent/minimize exposures.	
Wear suitable gloves tested to EN	
ISO 374-1.	
Exposure estimate and reference to it	
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
For a source askins at a	Worker - inhalation, long-term - systemic
Exposure estimate	0,8114 mg/m ³
Risk Characterization Ratio (RCR)	0,367129
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Assessment method	Qualitative assessment
Additional model of	Worker - dermal
Additional good practice advice	
Where appropriate, replacement of task by automated and/or closed processes. Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/t	ıa

Contributing exposure scenario	
Use descriptors covered	PROC8a: Transfer of substance or mixture (charging and discharging) at non-dedicated facilities Disposal of wastes (Disposal/transfer) Use domain: industrial
Operational conditions	

1,3-Butadiene



	1,3-butadiene
Concentration of the substance	Content: >= 0 % - <= 25 %
Physical state	liquid
Vapour pressure of the substance	268333,1875 Pa
during use	
	20 °C
Process temperature	
Duration and Frequency of activity	60 min 5 days per week
Duration and Frequency of activity	
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated
	temperatures
Risk Management Measures	
Provide a good standard of general or	
controlled ventilation (5 to 10 air	Effectiveness: 70 %
changes per hour)	
Wear suitable respiratory protection.	Effectiveness: 90 %
Drain down and flush system prior to	
equipment break-in or maintenance.	
Restrict access to authorised persons.	
Provide specific employee training to	
prevent/minimize exposures. Regular	
inspection and maintenance of	
equipment and machines.	
Minimise exposure by partial	
enclosure of the operation or	
equipment and provide extract	
ventilation at openings. Disposal -	
This material and its container must	
be disposed of in a safe manner.	
In case of potential exposure:, Use	
suitable chemically resistant gloves.,	
Wear suitable coveralls to prevent	
exposure to the skin., Wear suitable	
respiratory protection., Clear spills	
immediately, Consider the need for	
risk based health surveillance.	
Avoid frequent and direct contact with	
substance. Clean up contamination as	
soon as they occur. Wash off any skin	
contamination immediately. Provide	
specific employee training to	
prevent/minimize exposures.	
Wear suitable gloves tested to EN ISO 374-1.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
7.00030HIGHEHIOU	Worker - inhalation, long-term - systemic
	Tronco initialation, long term - systemic

1,3-Butadiene



Exposure estimate	2,0284 mg/m ³	
Risk Characterization Ratio (RCR)	0,917824	
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker	
Assessment method	Qualitative assessment	
	Worker - dermal	
Additional good practice advice		
Where appropriate, replacement of task by automated and/or closed processes.		
Guidance to Downstream Users		
For scaling see: http://www.ecetoc.org/tra		

Contributing exposure scenario	Contributing exposure scenario		
Use descriptors covered	PROC8a: Transfer of substance or mixture (charging and discharging) at non-dedicated facilities Disposal of wastes (Disposal/transfer) Use domain: industrial		
Operational conditions			
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 25 %		
Physical state	liquid		
Vapour pressure of the substance during use	268333,1875 Pa		
Process temperature	20 °C		
Duration and Frequency of activity	60 min 5 days per week		
Indoor/Outdoor	Indoor		
	Operation is carried out at ambient or elevated temperatures		
Risk Management Measures			
Wear suitable respiratory protection.	Effectiveness: 90 %		
Transfer via enclosed lines	Effectiveness: 70 %		
Drain down and flush system prior to equipment break-in or maintenance. Restrict access to authorised persons. Provide specific employee training to prevent/minimize exposures. Regular inspection and maintenance of equipment and machines.			
Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings. Disposal - This material and its container must be disposed of in a safe manner. In case of potential exposure:, Use suitable chemically resistant gloves.,			

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Wear suitable coveralls to prevent	
exposure to the skin., Wear suitable	
respiratory protection., Clear spills	
immediately, Consider the need for	
risk based health surveillance.	
Avoid frequent and direct contact with	
substance. Clean up contamination as	
soon as they occur. Wash off any skin	
contamination immediately. Provide	
specific employee training to	
prevent/minimize exposures.	
Wear suitable gloves tested to EN	
ISO 374-1.	
Exposure estimate and reference to i	ts source
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	2,0284 mg/m³
Risk Characterization Ratio (RCR)	0,917824
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Assessment method	Qualitative assessment
	Worker - dermal
Additional good practice advice	
Where appropriate, replacement of task by automated and/or closed processes.	
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/t	ra

Contributing exposure scenario	
Use descriptors covered	PROC8a: Transfer of substance or mixture (charging and discharging) at non-dedicated facilities Equipment maintenance Use domain: industrial
Operational conditions	•
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 25 %
Physical state	liquid
Vapour pressure of the substance during use	268333,1875 Pa
Process temperature	20 °C
Duration and Frequency of activity	60 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated temperatures
Risk Management Measures	
Local exhaust ventilation	
Wear suitable respiratory protection.	Effectiveness: 90 %

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Drain down and flush system prior to		
equipment break-in or maintenance.		
Restrict access to authorised persons.		
Provide specific employee training to		
prevent/minimize exposures. Regular		
inspection and maintenance of		
equipment and machines.		
Minimise exposure by partial		
enclosure of the operation or		
equipment and provide extract		
ventilation at openings. Disposal -		
This material and its container must		
be disposed of in a safe manner.		
In case of potential exposure:, Use		
suitable chemically resistant gloves.,		
Wear suitable coveralls to prevent		
exposure to the skin., Wear suitable		
respiratory protection., Clear spills		
immediately, Consider the need for		
risk based health surveillance.		
Avoid frequent and direct contact with		
substance. Clean up contamination as		
soon as they occur. Wash off any skin		
contamination immediately. Provide		
specific employee training to		
prevent/minimize exposures.		
Wear suitable gloves tested to EN		
ISO 374-1.		
Exposure estimate and reference to it		
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker	
	Worker - inhalation, long-term - systemic	
Exposure estimate	0,6761 mg/m ³	
Risk Characterization Ratio (RCR)	0,305941	
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker	
Assessment method	Qualitative assessment	
	Worker - dermal	
Additional good practice advice		
Where appropriate, replacement of task by automated and/or closed processes.		
Guidance to Downstream Users		
For scaling see: http://www.ecetoc.org/t	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 Equipment maintenance Use domain: industrial	
Operational conditions		
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 25 %	

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I	I
Physical state	liquid
Vapour pressure of the substance	268333,1875 Pa
during use	
Process temperature	20 °C
1 rocess temperature	
Duration and Frequency of activity	60 min 5 days per week
	lade e
Indoor/Outdoor	Indoor Operation is carried out at ambient or elevated
	temperatures
Risk Management Measures	temperatures
Wear suitable respiratory protection.	Effectiveness: 90 %
Drain down and flush system prior to	Emodivoriode. 00 70
equipment break-in or maintenance.	
Restrict access to authorised persons.	
Provide specific employee training to	
prevent/minimize exposures. Regular	
inspection and maintenance of	
equipment and machines.	
Minimise exposure by partial	
enclosure of the operation or	
equipment and provide extract	
ventilation at openings. Disposal -	
This material and its container must	
be disposed of in a safe manner.	
In case of potential exposure:, Use suitable chemically resistant gloves.,	
Wear suitable coveralls to prevent	
exposure to the skin., Wear suitable	
respiratory protection., Clear spills	
immediately, Consider the need for	
risk based health surveillance.	
Avoid frequent and direct contact with	
substance. Clean up contamination as	
soon as they occur. Wash off any skin	
contamination immediately. Provide	
specific employee training to	
prevent/minimize exposures.	
Wear suitable gloves tested to EN	
ISO 374-1. Exposure estimate and reference to it.	ite source
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
A35633HIGHT HIGHIOU	Worker - inhalation, long-term - systemic
Exposure estimate	0,6761 mg/m ³
Risk Characterization Ratio (RCR)	0,305941
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Assessment method	Qualitative assessment
	Worker - dermal

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Additional good practice advice	
Where appropriate, replacement of task by automated and/or closed processes.	
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 Drum/Batch transfers Use domain: industrial	
Operational conditions		
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 25 %	
Physical state	liquid	
Vapour pressure of the substance during use	268333,1875 Pa	
Process temperature	20 °C	
Duration and Frequency of activity	240 min 5 days per week	
Indoor/Outdoor	Indoor Operation is carried out at ambient or elevated temperatures	
Risk Management Measures		
Local exhaust ventilation		
Provide a good standard of general or controlled ventilation (5 to 10 air changes per hour)	Effectiveness: 70 %	
Drain down and flush system prior to equipment break-in or maintenance. Restrict access to authorised persons. Provide specific employee training to prevent/minimize exposures. Regular inspection and maintenance of equipment and machines.		
Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings. Disposal - This material and its container must be disposed of in a safe manner. In case of potential exposure:, Use		
suitable chemically resistant gloves., Wear suitable coveralls to prevent exposure to the skin., Wear suitable respiratory protection., Clear spills immediately, Consider the need for risk based health surveillance.		

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Avoid frequent and direct contact with	
substance. Clean up contamination as	
soon as they occur. Wash off any skin	
contamination immediately. Provide	
specific employee training to	
prevent/minimize exposures.	
Wear suitable gloves tested to EN	
ISO 374-1.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	1,8256 mg/m ³
Risk Characterization Ratio (RCR)	0,826041
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Assessment method	Qualitative assessment
	Worker - dermal
Additional good practice advice	
Where appropriate, replacement of task by automated and/or closed processes.	
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 Drum/Batch transfers Use domain: industrial	
Operational conditions		
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 25 %	
Physical state	liquid	
Vapour pressure of the substance during use	268333,1875 Pa	
Process temperature	20 °C	
Duration and Frequency of activity	240 min 5 days per week	
Indoor/Outdoor	Indoor	
	Operation is carried out at ambient or elevated temperatures	
Risk Management Measures		
Local exhaust ventilation		
Transfer via enclosed lines	Effectiveness: 70 %	
Drain down and flush system prior to equipment break-in or maintenance. Restrict access to authorised persons.		
Provide specific employee training to prevent/minimize exposures. Regular		

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inspection and maintenance of			
equipment and machines.			
Minimise exposure by partial			
enclosure of the operation or			
equipment and provide extract			
ventilation at openings. Disposal -			
This material and its container must			
be disposed of in a safe manner.			
In case of potential exposure:, Use			
suitable chemically resistant gloves.,			
Wear suitable coveralls to prevent			
exposure to the skin., Wear suitable			
respiratory protection., Clear spills			
immediately, Consider the need for			
risk based health surveillance.			
Avoid frequent and direct contact with			
substance. Clean up contamination as			
soon as they occur. Wash off any skin			
contamination immediately. Provide			
specific employee training to			
prevent/minimize exposures.			
Wear suitable gloves tested to EN			
ISO 374-1.			
Exposure estimate and reference to it			
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker		
	Worker - inhalation, long-term - systemic		
Exposure estimate	1,8256 mg/m ³		
Risk Characterization Ratio (RCR)	0,826041		
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker		
Assessment method	Qualitative assessment		
	Worker - dermal		
Additional good practice advice			
Where appropriate, replacement of task by automated and/or closed processes.			
Guidance to Downstream Users			
For scaling see: http://www.ecetoc.org/t	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 Drum/Batch transfers Use domain: industrial	
Operational conditions		
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 25 %	
Physical state	liquid	
Vapour pressure of the substance during use	268333,1875 Pa	

1,3-Butadiene



Process temperature	20 °C
Duration and Frequency of activity	240 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated temperatures
Risk Management Measures	·
Provide a good standard of general or controlled ventilation (5 to 10 air changes per hour)	Effectiveness: 70 %
Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings.	Effectiveness: 95 %
Drain down and flush system prior to equipment break-in or maintenance. Restrict access to authorised persons. Provide specific employee training to prevent/minimize exposures. Regular inspection and maintenance of equipment and machines.	
Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings. Disposal - This material and its container must be disposed of in a safe manner.	
In case of potential exposure:, Use suitable chemically resistant gloves., Wear suitable coveralls to prevent exposure to the skin., Wear suitable respiratory protection., Clear spills immediately, Consider the need for risk based health surveillance.	
Avoid frequent and direct contact with substance. Clean up contamination as soon as they occur. Wash off any skin contamination immediately. Provide specific employee training to	
prevent/minimize exposures. Wear suitable gloves tested to EN ISO 374-1.	
Exposure estimate and reference to it	ts source
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	1,8256 mg/m ³
Risk Characterization Ratio (RCR)	0,826041
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker

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Assessment method	Qualitative assessment	
	Worker - dermal	
Additional good practice advice	ce	
Where appropriate, replacement of task by automated and/or closed processes.		
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 Drum/Batch transfers Use domain: industrial	
Operational conditions		
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 25 %	
Physical state	liquid	
Vapour pressure of the substance during use	268333,1875 Pa	
Process temperature	20 °C	
Duration and Frequency of activity	240 min 5 days per week	
Indoor/Outdoor	Indoor	
	Operation is carried out at ambient or elevated temperatures	
Risk Management Measures		
Transfer via enclosed lines	Effectiveness: 70 %	
Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings.	Effectiveness: 95 %	
Drain down and flush system prior to equipment break-in or maintenance. Restrict access to authorised persons. Provide specific employee training to prevent/minimize exposures. Regular inspection and maintenance of equipment and machines.		
Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings. Disposal - This material and its container must be disposed of in a safe manner. In case of potential exposure:, Use suitable chemically resistant gloves., Wear suitable coveralls to prevent		

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exposure to the skin., Wear suitable respiratory protection., Clear spills immediately, Consider the need for risk based health surveillance. Avoid frequent and direct contact with substance. Clean up contamination as soon as they occur. Wash off any skin contamination immediately. Provide specific employee training to prevent/minimize exposures. Wear suitable gloves tested to EN ISO 374-1.	
Exposure estimate and reference to i	te eource
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
7.03033ITCH ITCHIOG	Worker - inhalation, long-term - systemic
Exposure estimate	1,8256 mg/m ³
Risk Characterization Ratio (RCR)	0,826041
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Assessment method	Qualitative assessment
	Worker - dermal
Additional good practice advice	
Where appropriate, replacement of task by automated and/or closed processes.	
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/t	ra

Contributing exposure scenario	
Use descriptors covered	PROC16: Use of fuels General exposures (open systems) (closed systems) Use domain: industrial
Operational conditions	
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 25 %
Physical state	liquid
Vapour pressure of the substance during use	268333,1875 Pa
Process temperature	20 °C
Duration and Frequency of activity	60 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated temperatures
Risk Management Measures	
Local exhaust ventilation	
Provide a good standard of general ventilation (not less than 3 - 5 air	Effectiveness: 30 %

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Drain down and flush system prior to equipment break-in or maintenance. Restrict access to authorised persons. Provide specific employee training to prevent/minimize exposures. Regular inspection and maintenance of equipment and machines. Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings. Disposal - This material and its container must be disposed of in a safe manner. In case of potential exposure; Use suitable chemically resistant gloves., Wear suitable coveralls to prevent exposure to the skin., Wear suitable respiratory protection., Clear spills immediately, Consider the need for risk based health surveillance. Avoid frequent and direct contact with substance. Clean up contamination as soon as they occur. Wash off any skin contamination immediately. Provide specific employee training to prevent/minimize exposures. Wear suitable gloves tested to EN ISO 374-1. Exposure estimate and reference to its source Assessment method EASY TRA v6.0, ECETOC TRA v3.0, Worker Worker - inhalation, long-term - systemic 0.4733 mg/m³ Risk Characterization Ratio (RCR) 0.214159 Assessment method EASY TRA v6.0, ECETOC TRA v3.0, Worker Oualitative assessment Worker - dermal Additional good practice advice Where appropriate, replacement of task by automated and/or closed processes. Guidance to Downstream Users For scaling see: http://www.ecetoc.org/tra	changes per hour)	
Restrict access to authorised persons. Provide specific employee training to prevent/minimize exposures. Regular inspection and maintenance of equipment and machines. Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings. Disposal - This material and its container must be disposed of in a safe manner. In case of potential exposure:, Use suitable chemically resistant gloves., Wear suitable coveralls to prevent exposure to the skin., Wear suitable respiratory protection., Clear spills immediately, Consider the need for risk based health surveillance. Avoid frequent and direct contact with substance. Clean up contamination as soon as they occur. Wash off any skin contamination immediately. Provide specific employee training to prevent/minimize exposures. Wear suitable gloves tested to EN ISO 374-1. Exposure estimate and reference to its source Assessment method EASY TRA v6.0, ECETOC TRA v3.0, Worker Worker - inhalation, long-term - systemic Exposure estimate 0,4733 mg/m³ Risk Characterization Ratio (RCR) 0,214159 Assessment method Qualitative assessment worker appropriate, replacement of task by automated and/or closed processes. Guidance to Downstream Users		
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equipment and machines. Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings. Disposal - This material and its container must be disposed of in a safe manner. In case of potential exposure:, Use suitable chemically resistant gloves., Wear suitable coveralls to prevent exposure to the skin., Wear suitable respiratory protection., Clear spills immediately, Consider the need for risk based health surveillance. Avoid frequent and direct contact with substance. Clean up contamination as soon as they occur. Wash off any skin contamination immediately. Provide specific employee training to prevent/minimize exposures. Wear suitable gloves tested to EN ISO 374-1. Exposure estimate and reference to its source Assessment method EASY TRA v6.0, ECETOC TRA v3.0, Worker Worker - inhalation, long-term - systemic Exposure estimate 0,4733 mg/m³ Risk Characterization Ratio (RCR) Assessment method EASY TRA v6.0, ECETOC TRA v3.0, Worker Qualitative assessment Worker - dermal Additional good practice advice Where appropriate, replacement of task by automated and/or closed processes. Guidance to Downstream Users		
Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings. Disposal - This material and its container must be disposed of in a safe manner. In case of potential exposure:, Use suitable chemically resistant gloves., Wear suitable coveralls to prevent exposure to the skin., Wear suitable respiratory protection., Clear spills immediately, Consider the need for risk based health surveillance. Avoid frequent and direct contact with substance. Clean up contamination as soon as they occur. Wash off any skin contamination immediately. Provide specific employee training to prevent/minimize exposures. Wear suitable gloves tested to EN ISO 374-1. Exposure estimate and reference to its source Assessment method EASY TRA v6.0, ECETOC TRA v3.0, Worker Worker - inhalation, long-term - systemic Exposure estimate Exposure estimate EASY TRA v6.0, ECETOC TRA v3.0, Worker Exposure estimate EASY TRA v6.0, ECETOC TRA v3.0, Worker Exposure estimate EASY TRA v6.0, ECETOC TRA v3.0, Worker EXPOSURE estimate EASY TRA v6.0, ECETOC TRA v3.0, Worker EASY TRA v6.0, ECETOC TRA v3.0, Worker Assessment method EASY TRA v6.0, ECETOC TRA v3.0, Worker Assessment method Qualitative assessment Worker - dermal Additional good practice advice Where appropriate, replacement of task by automated and/or closed processes. Guidance to Downstream Users	inspection and maintenance of	
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Worker - inhalation, long-term - systemic Exposure estimate 0,4733 mg/m³ Risk Characterization Ratio (RCR) 0,214159 Assessment method EASY TRA v6.0, ECETOC TRA v3.0, Worker Assessment method Qualitative assessment Worker - dermal Additional good practice advice Where appropriate, replacement of task by automated and/or closed processes. Guidance to Downstream Users		
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Where appropriate, replacement of task by automated and/or closed processes. Guidance to Downstream Users		Worker - dermal
Guidance to Downstream Users	Additional good practice advice	
		by automated and/or closed processes.
For scaling see: http://www.ecetoc.org/tra		
	For scaling see: http://www.ecetoc.org/t	ra

6. Short title of exposure scenario

Polymer processing

IS; ERC6d; PROC1, PROC2, PROC3, PROC6, PROC8a, PROC8b, PROC9, PROC13, PROC14

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1,3-Butadiene

Print date 19.11.2024
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Version 17.0 (en)
replaces version of 15.11.2024 (16.0)



Control of exposure and risk management measures

Contributing exposure scenario	
Use descriptors covered	ERC6d: Use of reactive process regulators in polymerisation processes at industrial site (inclusion or not into/onto article) As no environmental hazard was identified no environmental-related exposure assessment and risk characterization was performed.
Operational conditions	·

Contributing exposure scenario	
Use descriptors covered	PROC1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions. Bulk transfer (closed systems) Use domain: industrial
Operational conditions	
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance during use	268333,1875 Pa
Process temperature	20 °C
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated temperatures
Risk Management Measures	
Drain down and flush system prior to equipment break-in or maintenance. Restrict access to authorised persons. Provide specific employee training to prevent/minimize exposures. Regular inspection and maintenance of equipment and machines.	
Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings. Disposal - This material and its container must be disposed of in a safe manner. In case of potential exposure:, Use suitable chemically resistant gloves., Wear suitable coveralls to prevent	

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exposure to the skin., Wear suitable	
respiratory protection., Clear spills	
immediately, Consider the need for	
risk based health surveillance.	
Avoid frequent and direct contact with	
substance. Clean up contamination as	
soon as they occur. Wash off any skin	
contamination immediately. Provide	
specific employee training to	
prevent/minimize exposures.	
Wear suitable gloves tested to EN	
ISO 374-1.	
Exposure estimate and reference to it	ts source
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	0,0225 mg/m ³
Risk Characterization Ratio (RCR)	0,010198
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Assessment method	Qualitative assessment
	Worker - dermal
Additional good practice advice	
Where appropriate, replacement of task by automated and/or closed processes.	
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/t	ra

Contributing exposure scenario	
Use descriptors covered	PROC1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions. Bulk weighing (closed systems) Use domain: industrial
Operational conditions	
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance during use	268333,1875 Pa
Process temperature	20 °C
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated temperatures
Risk Management Measures	
Drain down and flush system prior to equipment break-in or maintenance.	

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Restrict access to authorised persons. Provide specific employee training to	
prevent/minimize exposures. Regular	
inspection and maintenance of	
equipment and machines.	
Minimise exposure by partial	
enclosure of the operation or	
equipment and provide extract	
ventilation at openings. Disposal -	
This material and its container must	
be disposed of in a safe manner.	
In case of potential exposure:, Use	
suitable chemically resistant gloves.,	
Wear suitable coveralls to prevent	
exposure to the skin., Wear suitable	
respiratory protection., Clear spills	
immediately, Consider the need for	
risk based health surveillance.	
Avoid frequent and direct contact with	
substance. Clean up contamination as	
soon as they occur. Wash off any skin	
contamination immediately. Provide	
specific employee training to	
prevent/minimize exposures.	
Wear suitable gloves tested to EN	
ISO 374-1.	
Exposure estimate and reference to	
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	0,0225 mg/m ³
Risk Characterization Ratio (RCR)	0,010198
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Assessment method	Qualitative assessment
	Worker - dermal
Additional good practice advice	
Where appropriate, replacement of task by automated and/or closed processes.	
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 Bulk transfer (closed systems) With occasional controlled exposure. Use domain: industrial
Operational conditions	
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 1 %

1,3-Butadiene



Physical state	liquid
Vapour pressure of the substance	268333,1875 Pa
during use	
	20 °C
Process temperature	
Duration and Frequency of activity	480 min 5 days per week
	Indeau
Indoor/Outdoor	Indoor Operation is carried out at ambient or elevated
	temperatures
Risk Management Measures	temperatures
Local exhaust ventilation	
Drain down and flush system prior to	
equipment break-in or maintenance.	
Restrict access to authorised persons.	
Provide specific employee training to	
prevent/minimize exposures. Regular	
inspection and maintenance of	
equipment and machines.	
Minimise exposure by partial	
enclosure of the operation or	
equipment and provide extract	
ventilation at openings. Disposal -	
This material and its container must	
be disposed of in a safe manner.	
In case of potential exposure:, Use	
suitable chemically resistant gloves.,	
Wear suitable coveralls to prevent	
exposure to the skin., Wear suitable	
respiratory protection., Clear spills immediately, Consider the need for	
risk based health surveillance.	
Avoid frequent and direct contact with	
substance. Clean up contamination as	
soon as they occur. Wash off any skin	
contamination immediately. Provide	
specific employee training to	
prevent/minimize exposures.	
Wear suitable gloves tested to EN	
ISO 374-1.	
Exposure estimate and reference to	
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	0,5634 mg/m ³
Risk Characterization Ratio (RCR)	0,254951
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Assessment method	Qualitative assessment
	Worker - dermal

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Additional good practice advice	
Where appropriate, replacement of task by automated and/or closed processes.	
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 Bulk transfer (closed systems) With occasional controlled exposure. Use domain: industrial
Operational conditions	
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 1 %
Physical state	liquid
Vapour pressure of the substance during use	268333,1875 Pa
Process temperature	20 °C
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated temperatures
Risk Management Measures	
Handle substance within closed system.	Effectiveness: 90 %
Drain down and flush system prior to equipment break-in or maintenance. Restrict access to authorised persons. Provide specific employee training to prevent/minimize exposures. Regular inspection and maintenance of equipment and machines.	
Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings. Disposal - This material and its container must be disposed of in a safe manner. In case of potential exposure:, Use suitable chemically resistant gloves., Wear suitable coveralls to prevent exposure to the skin., Wear suitable respiratory protection., Clear spills immediately, Consider the need for risk based health surveillance.	

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Avoid frequent and direct contact with	
substance. Clean up contamination as	
soon as they occur. Wash off any skin	
contamination immediately. Provide	
specific employee training to	
prevent/minimize exposures.	
Wear suitable gloves tested to EN	
ISO 374-1.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	0,5634 mg/m ³
Risk Characterization Ratio (RCR)	0,254951
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Assessment method	Qualitative assessment
	Worker - dermal
Additional good practice advice	
Where appropriate, replacement of task by automated and/or closed processes.	
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 Bulk weighing With occasional controlled exposure. Use domain: industrial
Operational conditions	
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 1 %
Physical state	liquid
Vapour pressure of the substance during use	268333,1875 Pa
Process temperature	20 °C
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated temperatures
Risk Management Measures	
Local exhaust ventilation	
Provide a good standard of general ventilation (not less than 3 - 5 air changes per hour)	Effectiveness: 30 %
Drain down and flush system prior to	

1,3-Butadiene



equipment break-in or maintenance.	
Restrict access to authorised persons.	
Provide specific employee training to	
prevent/minimize exposures. Regular	
inspection and maintenance of	
equipment and machines.	
Minimise exposure by partial	
enclosure of the operation or	
equipment and provide extract	
ventilation at openings. Disposal -	
This material and its container must	
be disposed of in a safe manner.	
In case of potential exposure:, Use	
suitable chemically resistant gloves.,	
Wear suitable coveralls to prevent	
exposure to the skin., Wear suitable	
respiratory protection., Clear spills	
immediately, Consider the need for	
risk based health surveillance.	
Avoid frequent and direct contact with	
substance. Clean up contamination as	
soon as they occur. Wash off any skin	
contamination immediately. Provide	
specific employee training to	
prevent/minimize exposures.	
Wear suitable gloves tested to EN	
ISO 374-1.	
Exposure estimate and reference to it	
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	0,3944 mg/m³
Risk Characterization Ratio (RCR)	0,178466
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Assessment method	Qualitative assessment
	Worker - dermal
Additional good practice advice	
Where appropriate, replacement of task by automated and/or closed processes.	
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/t	ra

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 Bulk weighing With occasional controlled exposure. Use domain: industrial
Operational conditions	
Concentration of the substance	1,3-butadiene

1,3-Butadiene



	Content: >= 0 % - <= 1 %
Physical state	liquid
Vapour pressure of the substance during use	268333,1875 Pa
Process temperature	20 °C
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated temperatures
Risk Management Measures	
Provide a good standard of general ventilation (not less than 3 - 5 air changes per hour)	Effectiveness: 30 %
Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings.	Effectiveness: 90 %
Drain down and flush system prior to equipment break-in or maintenance. Restrict access to authorised persons. Provide specific employee training to prevent/minimize exposures. Regular inspection and maintenance of equipment and machines.	
Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings. Disposal - This material and its container must be disposed of in a safe manner.	
In case of potential exposure:, Use suitable chemically resistant gloves., Wear suitable coveralls to prevent exposure to the skin., Wear suitable respiratory protection., Clear spills immediately, Consider the need for risk based health surveillance.	
Avoid frequent and direct contact with substance. Clean up contamination as soon as they occur. Wash off any skin contamination immediately. Provide specific employee training to prevent/minimize exposures.	
Wear suitable gloves tested to EN ISO 374-1. Exposure estimate and reference to it.	its source

1,3-Butadiene



Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker	
	Worker - inhalation, long-term - systemic	
Exposure estimate	0,3944 mg/m ³	
Risk Characterization Ratio (RCR)	0,178466	
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker	
Assessment method	Qualitative assessment	
	Worker - dermal	
Additional good practice advice		
Where appropriate, replacement of task by automated and/or closed processes.		
Guidance to Downstream Users		
For scaling see: http://www.ecetoc.org/t	ra	

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 Storage With occasional controlled exposure. Use domain: industrial
Operational conditions	
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 1 %
Physical state	liquid
Vapour pressure of the substance during use	268333,1875 Pa
Process temperature	20 °C
Duration and Frequency of activity	60 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated temperatures
Risk Management Measures	
Provide a good standard of general ventilation (not less than 3 - 5 air changes per hour)	Effectiveness: 30 %
Drain down and flush system prior to equipment break-in or maintenance. Restrict access to authorised persons. Provide specific employee training to prevent/minimize exposures. Regular	
inspection and maintenance of equipment and machines.	
Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings. Disposal -	

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This material and its container must	1
be disposed of in a safe manner.	
In case of potential exposure:, Use	
suitable chemically resistant gloves., Wear suitable coveralls to prevent	
exposure to the skin., Wear suitable	
respiratory protection., Clear spills	
immediately, Consider the need for	
risk based health surveillance.	
Avoid frequent and direct contact with	
substance. Clean up contamination as	
soon as they occur. Wash off any skin	
contamination immediately. Provide	
specific employee training to	
prevent/minimize exposures.	
Wear suitable gloves tested to EN	
ISO 374-1.	
Exposure estimate and reference to it	ts source
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	0,7888 mg/m ³
Risk Characterization Ratio (RCR)	0,356931
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Assessment method	Qualitative assessment
	Worker - dermal
Additional good practice advice	
	by automated and/or closed processes.
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/t	ra

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 Additive premixing (closed systems) Use domain: industrial
Operational conditions	
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 1 %
Physical state	liquid
Vapour pressure of the substance during use	268333,1875 Pa
Process temperature	20 °C
Duration and Frequency of activity	480 min 5 days per week

For scaling see: http://www.ecetoc.org/tra

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Print date Revision date Version replaces version of 19.11.2024 19.11.2024 17.0 (en) 15.11.2024 (16.0)



Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated
	temperatures
Risk Management Measures	
Local exhaust ventilation	
Provide a good standard of general	E(()) 00 0/
ventilation (not less than 3 - 5 air	Effectiveness: 30 %
changes per hour)	
Drain down and flush system prior to	
equipment break-in or maintenance.	
Restrict access to authorised persons.	
Provide specific employee training to	
prevent/minimize exposures. Regular	
inspection and maintenance of equipment and machines.	
Minimise exposure by partial	
enclosure of the operation or	
equipment and provide extract	
ventilation at openings. Disposal -	
This material and its container must	
be disposed of in a safe manner.	
In case of potential exposure:, Use	
suitable chemically resistant gloves.,	
Wear suitable coveralls to prevent	
exposure to the skin., Wear suitable	
respiratory protection., Clear spills	
immediately, Consider the need for	
risk based health surveillance.	
Avoid frequent and direct contact with	
substance. Clean up contamination as	
soon as they occur. Wash off any skin	
contamination immediately. Provide	
specific employee training to	
prevent/minimize exposures.	
Wear suitable gloves tested to EN	
ISO 374-1.	ita agurag
Exposure estimate and reference to a Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
ASSESSINGIL INCLINU	Worker - inhalation, long-term - systemic
Exposure estimate	0,7888 mg/m ³
Risk Characterization Ratio (RCR)	0,356931
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Assessment method Assessment method	Qualitative assessment
Assessment method	Worker - dermal
Additional good practice advice	Tronor domina
	by automated and/or closed processes.
Guidance to Downstream Users	. ag automatou androi oloood proodoodi
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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 Additive premixing (closed systems) Use domain: industrial
Operational conditions	
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 1 %
Physical state	liquid
Vapour pressure of the substance during use	268333,1875 Pa
Process temperature	20 °C
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated temperatures
Risk Management Measures	
Provide a good standard of general ventilation (not less than 3 - 5 air changes per hour)	Effectiveness: 30 %
Ensure material transfers are under containment or extract ventilation	Effectiveness: 90 %
Drain down and flush system prior to equipment break-in or maintenance. Restrict access to authorised persons. Provide specific employee training to prevent/minimize exposures. Regular inspection and maintenance of equipment and machines.	
Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings. Disposal - This material and its container must be disposed of in a safe manner.	
In case of potential exposure:, Use suitable chemically resistant gloves., Wear suitable coveralls to prevent exposure to the skin., Wear suitable respiratory protection., Clear spills immediately, Consider the need for risk based health surveillance. Avoid frequent and direct contact with	
substance. Clean up contamination as	

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Lancaca than an an AMarila off an all the	1
soon as they occur. Wash off any skin	
contamination immediately. Provide	
specific employee training to	
prevent/minimize exposures.	
Wear suitable gloves tested to EN	
ISO 374-1.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	0,7888 mg/m ³
Risk Characterization Ratio (RCR)	0,356931
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Assessment method	Qualitative assessment
	Worker - dermal
Additional good practice advice	•
Where appropriate, replacement of tas	k by automated and/or closed processes.
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/	/tra

Contributing exposure scenario	
	PROC6: Calendering operations
Use descriptors covered	Calendering (including Banburys) Use domain: industrial
Operational conditions	
	1,3-butadiene
Concentration of the substance	Content: >= 0 % - <= 1 %
Physical state	liquid
Vapour pressure of the substance during use	268333,1875 Pa
Process temperature	20 °C
Duration and Frequency of activity	240 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated temperatures
Risk Management Measures	
Local exhaust ventilation	
Provide a good standard of general or controlled ventilation (5 to 10 air changes per hour)	Effectiveness: 70 %
Drain down and flush system prior to	
equipment break-in or maintenance.	
Restrict access to authorised persons.	
Provide specific employee training to	
prevent/minimize exposures. Regular inspection and maintenance of	

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equipment and machines.	
Minimise exposure by partial	
enclosure of the operation or	
equipment and provide extract	
ventilation at openings. Disposal -	
This material and its container must	
be disposed of in a safe manner.	
In case of potential exposure:, Use	
suitable chemically resistant gloves.,	
Wear suitable coveralls to prevent	
exposure to the skin., Wear suitable	
respiratory protection., Clear spills	
immediately, Consider the need for	
risk based health surveillance.	
Avoid frequent and direct contact with	
substance. Clean up contamination as	
soon as they occur. Wash off any skin	
contamination immediately. Provide	
specific employee training to	
prevent/minimize exposures.	
Wear suitable gloves tested to EN	
ISO 374-1.	
Exposure estimate and reference to i	
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	1,0142 mg/m ³
Risk Characterization Ratio (RCR)	0,458912
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Assessment method	Qualitative assessment
	Worker - dermal
Additional good practice advice	
	by automated and/or closed processes.
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/t	ra

Contributing exposure scenario	
Use descriptors covered	PROC6: Calendering operations Calendering (including Banburys) Use domain: industrial
Operational conditions	
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 1 %
Physical state	liquid
Vapour pressure of the substance during use	268333,1875 Pa
Process temperature	20 °C

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Duration and Frequency of activity	240 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated temperatures
Risk Management Measures	
Provide a good standard of general or	
controlled ventilation (5 to 10 air	Effectiveness: 70 %
changes per hour)	
Minimise exposure by partial	
enclosure of the operation or	Effectiveness: 90 %
equipment and provide extract	Effectiveness. 30 %
ventilation at openings.	
Drain down and flush system prior to	
equipment break-in or maintenance.	
Restrict access to authorised persons.	
Provide specific employee training to	
prevent/minimize exposures. Regular	
inspection and maintenance of	
equipment and machines.	
Minimise exposure by partial	
enclosure of the operation or	
equipment and provide extract	
ventilation at openings. Disposal - This material and its container must	
be disposed of in a safe manner. In case of potential exposure:, Use	
suitable chemically resistant gloves.,	
Wear suitable coveralls to prevent	
exposure to the skin., Wear suitable	
respiratory protection., Clear spills	
immediately, Consider the need for	
risk based health surveillance.	
Avoid frequent and direct contact with	
substance. Clean up contamination as	
soon as they occur. Wash off any skin	
contamination immediately. Provide	
specific employee training to	
prevent/minimize exposures.	
Wear suitable gloves tested to EN	
ISO 374-1.	
Exposure estimate and reference to it	
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	1,0142 mg/m ³
Risk Characterization Ratio (RCR)	0,458912
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Assessment method	Qualitative assessment
	Worker - dermal

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Additional good practice advice	
Where appropriate, replacement of task by automated and/or closed processes.	
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 Equipment maintenance Use domain: industrial
Operational conditions	
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 1 %
Physical state	liquid
Vapour pressure of the substance during use	268333,1875 Pa
Process temperature	20 °C
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor Operation is carried out at ambient or elevated temperatures
Risk Management Measures	
Local exhaust ventilation	
Provide a good standard of general or controlled ventilation (5 to 10 air changes per hour)	Effectiveness: 70 %
Drain down and flush system prior to equipment break-in or maintenance. Restrict access to authorised persons. Provide specific employee training to prevent/minimize exposures. Regular inspection and maintenance of equipment and machines.	
Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings. Disposal - This material and its container must be disposed of in a safe manner. In case of potential exposure:, Use	
suitable chemically resistant gloves., Wear suitable coveralls to prevent exposure to the skin., Wear suitable respiratory protection., Clear spills immediately, Consider the need for risk based health surveillance.	

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Avoid frequent and direct contact with	
substance. Clean up contamination as	
soon as they occur. Wash off any skin	
contamination immediately. Provide	
specific employee training to	
prevent/minimize exposures.	
Wear suitable gloves tested to EN	
ISO 374-1.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	1,6903 mg/m ³
Risk Characterization Ratio (RCR)	0,764853
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Assessment method	Qualitative assessment
	Worker - dermal
Additional good practice advice	
Where appropriate, replacement of task by automated and/or closed processes.	
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/t	ra

Contributing exposure scenario	
Use descriptors covered	PROC8a: Transfer of substance or mixture (charging and discharging) at non-dedicated facilities Equipment maintenance Use domain: industrial
Operational conditions	
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 1 %
Physical state	liquid
Vapour pressure of the substance during use	268333,1875 Pa
Process temperature	20 °C
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated temperatures
Risk Management Measures	
Provide a good standard of general or controlled ventilation (5 to 10 air changes per hour)	Effectiveness: 70 %
Drain down and flush system prior to equipment break-in or maintenance. Restrict access to authorised persons. Provide specific employee training to	

1,3-Butadiene



prevent/minimize exposures. Regular	
inspection and maintenance of	
equipment and machines.	
Minimise exposure by partial	
enclosure of the operation or	
equipment and provide extract	
ventilation at openings. Disposal -	
This material and its container must	
be disposed of in a safe manner.	
In case of potential exposure:, Use	
suitable chemically resistant gloves.,	
Wear suitable coveralls to prevent	
exposure to the skin., Wear suitable	
respiratory protection., Clear spills	
immediately, Consider the need for	
risk based health surveillance.	
Avoid frequent and direct contact with	
substance. Clean up contamination as	
soon as they occur. Wash off any skin	
contamination immediately. Provide	
specific employee training to	
prevent/minimize exposures.	
Wear suitable gloves tested to EN	
ISO 374-1.	
Exposure estimate and reference to i	
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	1,6903 mg/m ³
Risk Characterization Ratio (RCR)	0,764853
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Assessment method	Qualitative assessment
	Worker - dermal
Additional good practice advice	
	by automated and/or closed processes.
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/t	ra

Contributing exposure scenario	
Use descriptors covered	PROC8b: Transfer of substance or mixture (charging and discharging) at dedicated facilities Bulk transfer Dedicated facility Use domain: industrial
Operational conditions	
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 1 %
Physical state	liquid
Vapour pressure of the substance	268333,1875 Pa

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during use	
Process temperature	20 °C
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated temperatures
Risk Management Measures	temperatures
Local exhaust ventilation	
Drain down and flush system prior to	
equipment break-in or maintenance.	
Restrict access to authorised persons.	
Provide specific employee training to	
prevent/minimize exposures. Regular	
inspection and maintenance of	
equipment and machines.	
Minimise exposure by partial	
enclosure of the operation or	
equipment and provide extract	
ventilation at openings. Disposal -	
This material and its container must	
be disposed of in a safe manner.	
In case of potential exposure:, Use	
suitable chemically resistant gloves.,	
Wear suitable coveralls to prevent	
exposure to the skin., Wear suitable	
respiratory protection., Clear spills	
immediately, Consider the need for	
risk based health surveillance.	
Avoid frequent and direct contact with	
substance. Clean up contamination as	
soon as they occur. Wash off any skin	
contamination immediately. Provide	
specific employee training to	
prevent/minimize exposures.	
Wear suitable gloves tested to EN	
ISO 374-1.	
Exposure estimate and reference to	its source
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
7.00000mont motilod	Worker - inhalation, long-term - systemic
Exposure estimate	1,6903 mg/m ³
Risk Characterization Ratio (RCR)	0,764853
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Assessment method	Qualitative assessment
ASSESSITELL HIGHIOU	Worker - dermal
Additional good practice advice	WOINEL - UEIIIIAL
Additional good practice advice	by automated and/or alogad processes
writere appropriate, replacement of task	by automated and/or closed processes.

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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 Bulk transfer Dedicated facility Use domain: industrial
Operational conditions	
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 1 %
Physical state	liquid
Vapour pressure of the substance during use	268333,1875 Pa
Process temperature	20 °C
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated temperatures
Risk Management Measures	
Ensure material transfers are under containment or extract ventilation Drain down and flush system prior to	Effectiveness: 95 %
equipment break-in or maintenance. Restrict access to authorised persons. Provide specific employee training to prevent/minimize exposures. Regular inspection and maintenance of equipment and machines.	
Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings. Disposal - This material and its container must be disposed of in a safe manner.	
In case of potential exposure:, Use suitable chemically resistant gloves., Wear suitable coveralls to prevent exposure to the skin., Wear suitable respiratory protection., Clear spills immediately, Consider the need for risk based health surveillance. Avoid frequent and direct contact with	
substance. Clean up contamination as soon as they occur. Wash off any skin contamination immediately. Provide	

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specific employee training to	
prevent/minimize exposures.	
Wear suitable gloves tested to EN	
ISO 374-1.	
Exposure estimate and reference to	o its source
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	1,6903 mg/m ³
Risk Characterization Ratio (RCR)	0,764853
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Assessment method	Qualitative assessment
	Worker - dermal
Additional good practice advice	
Where appropriate, replacement of task by automated and/or closed processes.	
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org	g/tra

Contributing exposure coordin	
Contributing exposure scenario	
	PROC8b: Transfer of substance or mixture (charging and
Use descriptors covered	discharging) at dedicated facilities
·	Bulk transfer Drum/Batch transfers Use domain: industrial
Operational conditions	
	1,3-butadiene
Concentration of the substance	Content: >= 0 % - <= 1 %
Physical state	liquid
Vapour pressure of the substance	268333,1875 Pa
during use	
Process temperature	20 °C
1 100000 tomporataro	
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated
	temperatures
Risk Management Measures	
Local exhaust ventilation	
Provide a good standard of general	
ventilation (not less than 3 - 5 air	Effectiveness: 30 %
changes per hour)	
Drain down and flush system prior to	
equipment break-in or maintenance.	
Restrict access to authorised persons.	
Provide specific employee training to	
prevent/minimize exposures. Regular	
inspection and maintenance of	
equipment and machines.	

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Minimise exposure by partial	
enclosure of the operation or	
equipment and provide extract	
ventilation at openings. Disposal -	
This material and its container must	
be disposed of in a safe manner.	
In case of potential exposure:, Use	
suitable chemically resistant gloves.,	
Wear suitable coveralls to prevent	
exposure to the skin., Wear suitable	
respiratory protection., Clear spills	
immediately, Consider the need for	
risk based health surveillance.	
Avoid frequent and direct contact with	
substance. Clean up contamination as	
soon as they occur. Wash off any skin	
contamination immediately. Provide	
specific employee training to	
prevent/minimize exposures.	
Wear suitable gloves tested to EN	
ISO 374-1.	
Exposure estimate and reference to it	
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	1,1832 mg/m³
Risk Characterization Ratio (RCR)	0,535397
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Assessment method	Qualitative assessment
	Worker - dermal
Additional good practice advice	
Where appropriate, replacement of task by automated and/or closed processes.	
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/t	ra

Contributing exposure scenario	
Use descriptors covered	PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing). Bulk transfer Small package filling Use domain: industrial
Operational conditions	
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 1 %
Physical state	liquid
Vapour pressure of the substance during use	268333,1875 Pa
Process temperature	20 °C

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Duration and Frequency of activity	240 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated
	temperatures
Risk Management Measures	
Local exhaust ventilation	
Provide a good standard of general	
ventilation (not less than 3 - 5 air	Effectiveness: 30 %
changes per hour)	
Drain down and flush system prior to	
equipment break-in or maintenance.	
Restrict access to authorised persons.	
Provide specific employee training to	
prevent/minimize exposures. Regular	
inspection and maintenance of	
equipment and machines. Minimise exposure by partial	
enclosure of the operation or	
equipment and provide extract	
ventilation at openings. Disposal -	
This material and its container must	
be disposed of in a safe manner.	
In case of potential exposure:, Use	
suitable chemically resistant gloves.,	
Wear suitable coveralls to prevent	
exposure to the skin., Wear suitable	
respiratory protection., Clear spills	
immediately, Consider the need for	
risk based health surveillance.	
Avoid frequent and direct contact with	
substance. Clean up contamination as	
soon as they occur. Wash off any skin	
contamination immediately. Provide	
specific employee training to	
prevent/minimize exposures.	
Wear suitable gloves tested to EN	
ISO 374-1.	to accuracy
Exposure estimate and reference to i	
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Evangura antimata	Worker - inhalation, long-term - systemic
Exposure estimate	1,8932 mg/m ³
Risk Characterization Ratio (RCR)	0,856635
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Assessment method	Qualitative assessment Worker - dermal
Additional good practice advice	vvorker - defilial
Additional good practice advice	by automated and/or closed processes
Guidance to Downstream Users	by automated and/or closed processes.
Guidance to Downstream Users	

1,3-Butadiene

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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). Bulk transfer Small package filling Use domain: industrial
Operational conditions	
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 1 %
Physical state	liquid
Vapour pressure of the substance during use	268333,1875 Pa
Process temperature	20 °C
Duration and Frequency of activity	240 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated temperatures
Risk Management Measures	
Provide a good standard of general ventilation (not less than 3 - 5 air changes per hour)	Effectiveness: 30 %
Ensure material transfers are under containment or extract ventilation	Effectiveness: 90 %
Drain down and flush system prior to equipment break-in or maintenance. Restrict access to authorised persons. Provide specific employee training to prevent/minimize exposures. Regular inspection and maintenance of equipment and machines.	
Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings. Disposal - This material and its container must be disposed of in a safe manner.	
In case of potential exposure:, Use suitable chemically resistant gloves., Wear suitable coveralls to prevent exposure to the skin., Wear suitable respiratory protection., Clear spills immediately, Consider the need for risk based health surveillance. Avoid frequent and direct contact with	
substance. Clean up contamination as	

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soon as they occur. Wash off any skin	
contamination immediately. Provide	
specific employee training to	
prevent/minimize exposures.	
Wear suitable gloves tested to EN	
ISO 374-1.	
Exposure estimate and reference to	its source
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	1,8932 mg/m ³
Risk Characterization Ratio (RCR)	0,856635
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Assessment method	Qualitative assessment
	Worker - dermal
Additional good practice advice	
Where appropriate, replacement of task by automated and/or closed processes.	
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). Small scale weighing Use domain: industrial	
Operational conditions		
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 1 %	
Physical state	liquid	
Vapour pressure of the substance during use	268333,1875 Pa	
Process temperature	20 °C	
Duration and Frequency of activity	480 min 5 days per week	
Indoor/Outdoor	Indoor	
	Operation is carried out at ambient or elevated temperatures	
Risk Management Measures		
Local exhaust ventilation		
Provide a good standard of general or controlled ventilation (5 to 10 air changes per hour)	Effectiveness: 70 %	
Drain down and flush system prior to equipment break-in or maintenance. Restrict access to authorised persons. Provide specific employee training to prevent/minimize exposures. Regular		

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inspection and maintenance of	
equipment and machines.	
Minimise exposure by partial	
enclosure of the operation or	
equipment and provide extract	
ventilation at openings. Disposal -	
This material and its container must	
be disposed of in a safe manner.	
In case of potential exposure:, Use	
suitable chemically resistant gloves.,	
Wear suitable coveralls to prevent	
exposure to the skin., Wear suitable	
respiratory protection., Clear spills	
immediately, Consider the need for	
risk based health surveillance.	
Avoid frequent and direct contact with	
substance. Clean up contamination as	
soon as they occur. Wash off any skin	
contamination immediately. Provide	
specific employee training to	
prevent/minimize exposures.	
Wear suitable gloves tested to EN	
ISO 374-1.	
Exposure estimate and reference to	
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	1,3523 mg/m³
Risk Characterization Ratio (RCR)	0,611882
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Assessment method	Qualitative assessment
	Worker - dermal
Additional good practice advice	
Where appropriate, replacement of task by automated and/or closed processes.	
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/t	ra

Contributing exposure scenario		
Use descriptors covered	PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing). Small scale weighing Use domain: industrial	
Operational conditions		
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 1 %	
Physical state	liquid	
Vapour pressure of the substance during use	268333,1875 Pa	

1,3-Butadiene



Process temperature	20 °C
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated temperatures
Risk Management Measures	
Provide a good standard of general or controlled ventilation (5 to 10 air changes per hour)	Effectiveness: 70 %
Ensure material transfers are under containment or extract ventilation	Effectiveness: 90 %
Drain down and flush system prior to equipment break-in or maintenance. Restrict access to authorised persons. Provide specific employee training to prevent/minimize exposures. Regular inspection and maintenance of equipment and machines.	
Minimise exposure by partial	
enclosure of the operation or	
equipment and provide extract	
ventilation at openings. Disposal -	
This material and its container must	
be disposed of in a safe manner.	
In case of potential exposure:, Use	
suitable chemically resistant gloves.,	
Wear suitable coveralls to prevent	
exposure to the skin., Wear suitable	
respiratory protection., Clear spills	
immediately, Consider the need for	
risk based health surveillance.	
Avoid frequent and direct contact with	
substance. Clean up contamination as	
soon as they occur. Wash off any skin	
contamination immediately. Provide	
specific employee training to	
prevent/minimize exposures.	
Wear suitable gloves tested to EN ISO 374-1.	
Exposure estimate and reference to i	
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	1,3523 mg/m ³
Risk Characterization Ratio (RCR)	0,611882
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Assessment method	Qualitative assessment
	Worker - dermal

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Additional good practice advice	
Where appropriate, replacement of task by automated and/or closed processes.	
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra	

Contributing exposure scenario	
Contributing Oxposure Sociatio	PROC13: Treatment of articles by dipping and pouring.
Use descriptors covered	Production of articles by dipping and pouring Use domain:
,	industrial
Operational conditions	
	1,3-butadiene
Concentration of the substance	Content: >= 0 % - <= 1 %
Physical state	liquid
Vapour pressure of the substance	268333,1875 Pa
during use	
Process temperature	20 °C
. 100000 tomporatoro	
Duration and Frequency of activity	240 min 5 days per week
Indoor/Outdoor	Indoor
indoor/Outdoor	Operation is carried out at ambient or elevated
	temperatures
Risk Management Measures	temperatures
Local exhaust ventilation	
Provide a good standard of general or	
controlled ventilation (5 to 10 air	Effectiveness: 70 %
changes per hour)	
Drain down and flush system prior to	
equipment break-in or maintenance.	
Restrict access to authorised persons.	
Provide specific employee training to	
prevent/minimize exposures. Regular	
inspection and maintenance of equipment and machines.	
Minimise exposure by partial	
enclosure of the operation or	
equipment and provide extract	
ventilation at openings. Disposal -	
This material and its container must	
be disposed of in a safe manner.	
In case of potential exposure:, Use	
suitable chemically resistant gloves.,	
Wear suitable coveralls to prevent	
exposure to the skin., Wear suitable	
respiratory protection., Clear spills	
immediately, Consider the need for	
risk based health surveillance.	

1,3-Butadiene



Avoid frequent and direct contact with	
substance. Clean up contamination as	
soon as they occur. Wash off any skin	
contamination immediately. Provide	
specific employee training to	
prevent/minimize exposures.	
Wear suitable gloves tested to EN	
ISO 374-1.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	1,0142 mg/m ³
Risk Characterization Ratio (RCR)	0,458912
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Assessment method	Qualitative assessment
	Worker - dermal
Additional good practice advice	
Where appropriate, replacement of task by automated and/or closed processes.	
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra	

Contributing exposure scenario	
Use descriptors covered	PROC13: Treatment of articles by dipping and pouring. Production of articles by dipping and pouring Use domain: industrial
Operational conditions	
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 1 %
Physical state	liquid
Vapour pressure of the substance during use	268333,1875 Pa
Process temperature	20 °C
Duration and Frequency of activity	240 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated temperatures
Risk Management Measures	
Provide a good standard of general or controlled ventilation (5 to 10 air changes per hour)	Effectiveness: 70 %
Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings.	Effectiveness: 90 %

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Drain down and flush system prior to equipment break-in or maintenance. Restrict access to authorised persons. Provide specific employee training to prevent/minimize exposures. Regular inspection and maintenance of equipment and machines. Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings. Disposal - This material and its container must	
be disposed of in a safe manner.	
In case of potential exposure:, Use suitable chemically resistant gloves., Wear suitable coveralls to prevent exposure to the skin., Wear suitable respiratory protection., Clear spills immediately, Consider the need for risk based health surveillance.	
Avoid frequent and direct contact with substance. Clean up contamination as soon as they occur. Wash off any skin contamination immediately. Provide specific employee training to prevent/minimize exposures.	
Wear suitable gloves tested to EN	
ISO 374-1.	
Exposure estimate and reference to	
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	1,0142 mg/m³
Risk Characterization Ratio (RCR)	0,458912
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Assessment method	Qualitative assessment
	Worker - dermal
Additional good practice advice	
Where appropriate, replacement of task by automated and/or closed processes.	
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/t	ra

Contributing exposure scenario	
Use descriptors covered	PROC14: Tabletting, compression, extrusion, pelletisation, granulation Extrusion and masterbatching Use domain: industrial
Operational conditions	
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 1 %

1,3-Butadiene



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Physical state	liquid
Vapour pressure of the substance	268333,1875 Pa
during use	
	20 °C
Process temperature	
Duration and Frequency of activity	240 min 5 days per week
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Indoor/Outdoor	Indoor Operation is carried out at ambient or elevated
	temperatures
Risk Management Measures	Temperatures
Local exhaust ventilation	
Provide a good standard of general or	
controlled ventilation (5 to 10 air	Effectiveness: 70 %
changes per hour)	
Drain down and flush system prior to	
equipment break-in or maintenance.	
Restrict access to authorised persons.	
Provide specific employee training to	
prevent/minimize exposures. Regular	
inspection and maintenance of	
equipment and machines.	
Minimise exposure by partial	
enclosure of the operation or equipment and provide extract	
ventilation at openings. Disposal -	
This material and its container must	
be disposed of in a safe manner.	
In case of potential exposure:, Use	
suitable chemically resistant gloves.,	
Wear suitable coveralls to prevent	
exposure to the skin., Wear suitable	
respiratory protection., Clear spills	
immediately, Consider the need for	
risk based health surveillance.	
Avoid frequent and direct contact with	
substance. Clean up contamination as	
soon as they occur. Wash off any skin contamination immediately. Provide	
specific employee training to	
prevent/minimize exposures.	
Wear suitable gloves tested to EN	
ISO 374-1.	
Exposure estimate and reference to	its source
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	1,0142 mg/m³
Risk Characterization Ratio (RCR)	0,458912

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Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker	
Assessment method	Qualitative assessment	
	Worker - dermal	
Additional good practice advice		
Where appropriate, replacement of task by automated and/or closed processes.		
Guidance to Downstream Users		
For scaling see: http://www.ecetoc.org/tra		

Contributing exposure scenario		
Use descriptors covered	PROC14: Tabletting, compression, extrusion, pelletisation, granulation Extrusion and masterbatching Use domain: industrial	
Operational conditions		
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 1 %	
Physical state	liquid	
Vapour pressure of the substance during use	268333,1875 Pa	
Process temperature	20 °C	
Duration and Frequency of activity	240 min 5 days per week	
Indoor/Outdoor	Indoor	
	Operation is carried out at ambient or elevated temperatures	
Risk Management Measures		
Provide a good standard of general or controlled ventilation (5 to 10 air changes per hour)	Effectiveness: 70 %	
Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings.	Effectiveness: 90 %	
Drain down and flush system prior to equipment break-in or maintenance. Restrict access to authorised persons. Provide specific employee training to prevent/minimize exposures. Regular inspection and maintenance of equipment and machines. Minimise exposure by partial		
enclosure of the operation or equipment and provide extract ventilation at openings. Disposal - This material and its container must be disposed of in a safe manner.		

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In case of potential exposure:, Use suitable chemically resistant gloves., Wear suitable coveralls to prevent exposure to the skin., Wear suitable respiratory protection., Clear spills	
immediately, Consider the need for risk based health surveillance.	
Avoid frequent and direct contact with substance. Clean up contamination as	
soon as they occur. Wash off any skin contamination immediately. Provide	
specific employee training to	
prevent/minimize exposures.	
Wear suitable gloves tested to EN	
ISO 374-1.	
Exposure estimate and reference to it	ts source
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	1,0142 mg/m ³
Risk Characterization Ratio (RCR)	0,458912
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Assessment method	Qualitative assessment
	Worker - dermal
Additional good practice advice	
Where appropriate, replacement of task by automated and/or closed processes.	
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra	

Contributing exposure scenario	
Use descriptors covered	PROC14: Tabletting, compression, extrusion, pelletisation, granulation Injection moulding (of articles) Use domain: industrial
Operational conditions	
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 1 %
Physical state	liquid
Vapour pressure of the substance during use	268333,1875 Pa
Process temperature	20 °C
Duration and Frequency of activity	240 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated temperatures
Risk Management Measures	

1,3-Butadiene



Local exhaust ventilation	
Provide a good standard of general or	
controlled ventilation (5 to 10 air	Effectiveness: 70 %
changes per hour)	
Drain down and flush system prior to	
equipment break-in or maintenance.	
Restrict access to authorised persons.	
Provide specific employee training to	
prevent/minimize exposures. Regular	
inspection and maintenance of	
equipment and machines.	
Minimise exposure by partial	
enclosure of the operation or	
equipment and provide extract	
ventilation at openings. Disposal -	
This material and its container must	
be disposed of in a safe manner.	
In case of potential exposure:, Use	
suitable chemically resistant gloves.,	
Wear suitable coveralls to prevent	
exposure to the skin., Wear suitable	
respiratory protection., Clear spills	
immediately, Consider the need for	
risk based health surveillance.	
Avoid frequent and direct contact with	
substance. Clean up contamination as	
soon as they occur. Wash off any skin	
contamination immediately. Provide	
specific employee training to	
prevent/minimize exposures.	
Wear suitable gloves tested to EN	
ISO 374-1. Exposure estimate and reference to a	ite courag
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Assessment method	Worker - inhalation, long-term - systemic
Exposure estimate	1,0142 mg/m ³
Risk Characterization Ratio (RCR)	0,458912
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Assessment method	·
Assessifietti illettion	Qualitative assessment Worker - dermal
Additional good practice advice	T VVOINEI - UCIIIIAI
	by automated and/or closed processes.
Guidance to Downstream Users	t by automated analor closed processes.
For scaling see: http://www.ecetoc.org/t	ra
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Contributing exposure scenario	
Use descriptors covered	PROC14: Tabletting, compression, extrusion, pelletisation, granulation
	Injection moulding (of articles) Use domain: industrial

1,3-Butadiene



Operational conditions	
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 1 %
Physical state	liquid
Vapour pressure of the substance during use	268333,1875 Pa
Process temperature	20 °C
Duration and Frequency of activity	240 min 5 days per week
Indoor/Outdoor	Indoor Operation is carried out at ambient or elevated temperatures
Risk Management Measures	
Provide a good standard of general or controlled ventilation (5 to 10 air changes per hour)	Effectiveness: 70 %
Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings.	Effectiveness: 90 %
Drain down and flush system prior to equipment break-in or maintenance. Restrict access to authorised persons. Provide specific employee training to prevent/minimize exposures. Regular inspection and maintenance of equipment and machines.	
Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings. Disposal - This material and its container must be disposed of in a safe manner.	
In case of potential exposure:, Use suitable chemically resistant gloves., Wear suitable coveralls to prevent exposure to the skin., Wear suitable respiratory protection., Clear spills immediately, Consider the need for risk based health surveillance. Avoid frequent and direct contact with	
substance. Clean up contamination as soon as they occur. Wash off any skin contamination immediately. Provide specific employee training to prevent/minimize exposures.	

1,3-Butadiene

Print date 19.11.2024
Revision date 19.11.2024
Version 17.0 (en)
replaces version of 15.11.2024 (16.0)



Wear suitable gloves tested to EN ISO 374-1.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	1,0142 mg/m³
Risk Characterization Ratio (RCR)	0,458912
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Assessment method	Qualitative assessment
	Worker - dermal
Additional good practice advice	
Where appropriate, replacement of task by automated and/or closed processes.	
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra	

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7. Short title of exposure scenario

Use of a substance as an intermediate IS; ERC6a; PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC9, PROC15

Control of exposure and risk management measures

Contributing exposure scenario	
Use descriptors covered	ERC6a: Use of intermediate As no environmental hazard was identified no environmental-related exposure assessment and risk characterization was performed.
Operational conditions	

Contributing exposure scenario		
Use descriptors covered	PROC1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions. General exposures (closed systems) Use domain: industrial	
Operational conditions		
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 100 %	
Physical state	liquid	
Vapour pressure of the substance during use	268333,1875 Pa	
Process temperature	20 °C	

1,3-Butadiene

Print date 19.11.2024
Revision date 19.11.2024
Version 17.0 (en)
replaces version of 15.11.2024 (16.0)



Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated
	temperatures
Risk Management Measures	
Drain down and flush system prior to	
equipment break-in or maintenance.	
Restrict access to authorised persons.	
Provide specific employee training to	
prevent/minimize exposures. Regular inspection and maintenance of	
equipment and machines.	
Minimise exposure by partial	
enclosure of the operation or	
equipment and provide extract	
ventilation at openings. Disposal -	
This material and its container must	
be disposed of in a safe manner.	
In case of potential exposure:, Use	
suitable chemically resistant gloves.,	
Wear suitable coveralls to prevent	
exposure to the skin., Wear suitable	
respiratory protection., Clear spills	
immediately, Consider the need for risk based health surveillance.	
Avoid frequent and direct contact with	
substance. Clean up contamination as	
soon as they occur. Wash off any skin	
contamination immediately. Provide	
specific employee training to	
prevent/minimize exposures.	
Wear suitable gloves tested to EN	
ISO 374-1.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	0,0225 mg/m ³
Risk Characterization Ratio (RCR)	0,010198
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Assessment method	Qualitative assessment
Additional good proctice advice	Worker - dermal
Additional good practice advice Where appropriate, replacement of task by automated and/or closed processes.	
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra	
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Contributing exposure scenario

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Use descriptors covered	PROC2: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions General exposures (closed systems) With occasional controlled exposure. Use domain: industrial
Operational conditions	
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance during use	268333,1875 Pa
Process temperature	20 °C
Duration and Frequency of activity	60 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated temperatures
Risk Management Measures	
Local exhaust ventilation	
Provide a good standard of general	
ventilation (not less than 3 - 5 air	Effectiveness: 30 %
changes per hour)	
Drain down and flush system prior to	
equipment break-in or maintenance.	
Restrict access to authorised persons.	
Provide specific employee training to	
prevent/minimize exposures. Regular	
inspection and maintenance of	
equipment and machines.	
Minimise exposure by partial	
enclosure of the operation or	
equipment and provide extract	
ventilation at openings. Disposal - This material and its container must	
be disposed of in a safe manner.	
In case of potential exposure:, Use	
suitable chemically resistant gloves.,	
Wear suitable coveralls to prevent	
exposure to the skin., Wear suitable	
respiratory protection., Clear spills	
immediately, Consider the need for	
risk based health surveillance.	
Avoid frequent and direct contact with	
substance. Clean up contamination as	
soon as they occur. Wash off any skin	
contamination immediately. Provide	

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specific employee training to	
prevent/minimize exposures.	
Wear suitable gloves tested to EN	
ISO 374-1.	
Exposure estimate and reference to	its source
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	0,7888 mg/m³
Risk Characterization Ratio (RCR)	0,356931
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Assessment method	Qualitative assessment
	Worker - dermal
Additional good practice advice	
Where appropriate, replacement of task by automated and/or closed processes.	
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 General exposures (closed systems) With occasional controlled exposure. Use domain: industrial	
Operational conditions		
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 100 %	
Physical state	liquid	
Vapour pressure of the substance during use	268333,1875 Pa	
Process temperature	20 °C	
Duration and Frequency of activity	60 min 5 days per week	
Indoor/Outdoor	Indoor	
	Operation is carried out at ambient or elevated temperatures	
Risk Management Measures		
Provide a good standard of general ventilation (not less than 3 - 5 air changes per hour)	Effectiveness: 30 %	
Handle substance within a predominantly closed system provided with extract ventilation.	Effectiveness: 90 %	
Drain down and flush system prior to equipment break-in or maintenance. Restrict access to authorised persons.		

1,3-Butadiene



prevent/minimize exposures. Regular inspection and maintenance of equipment and machines. Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings. Disposal - This material and its container must be disposed of in a safe manner. In case of potential exposure; Use suitable chemically resistant gloves, Wear suitable coveralls to prevent exposure to the skin., Wear suitable respiratory protection, Clear spills immediately, Consider the need for risk based health surveillance. Avoid frequent and direct contact with substance. Clean up contamination as soon as they occur. Wash off any skin contamination immediately. Provide specific employee training to prevent/minimize exposures. Wear suitable gloves tested to EN ISO 374-1. Exposure estimate and reference to its source Assessment method EASY TRA v6.0, ECETOC TRA v3.0, Worker Worker - inhalation, long-term - systemic Exposure estimate	Provide specific employee training to	
equipment and machines. Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings. Disposal - This material and its container must be disposed of in a safe manner. In case of potential exposures; Use suitable chemically resistant gloves., Wear suitable coveralls to prevent exposure to the skin., Wear suitable respiratory protection., Clear spills immediately, Consider the need for risk based health surveillance. Avoid frequent and direct contact with substance. Clean up contamination as soon as they occur. Wash off any skin contamination immediately. Provide specific employee training to prevent/minimize exposures. Wear suitable gloves tested to EN ISO 374-1. Exposure estimate and reference to its source Assessment method EASY TRA v6.0, ECETOC TRA v3.0, Worker Worker - inhalation, long-term - systemic Exposure estimate 5,7888 mg/m³ Risk Characterization Ratio (RCR) Assessment method Qualitative assessment Worker - dermal Additional good practice advice Where appropriate, replacement of task by automated and/or closed processes.		
Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings. Disposal - This material and its container must be disposed of in a safe manner. In case of potential exposure:, Use suitable chemically resistant gloves., Wear suitable coveralls to prevent exposure to the skin., Wear suitable respiratory protection., Clear spills immediately, Consider the need for risk based health surveillance. Avoid frequent and direct contact with substance. Clean up contamination as soon as they occur. Wash off any skin contamination immediately. Provide specific employee training to prevent/minimize exposures. Wear suitable gloves tested to EN ISO 374-1. Exposure estimate and reference to its source Assessment method EASY TRA v6.0, ECETOC TRA v3.0, Worker Worker - inhalation, long-term - systemic Exposure estimate 5,788 mg/m³ Risk Characterization Ratio (RCR) Assessment method PASY TRA v6.0, ECETOC TRA v3.0, Worker EASY TRA v6.0, ECETOC TRA v3.0, Worker Worker - inhalation, long-term - systemic 2,7888 mg/m³ Risk Characterization Ratio (RCR) Assessment method Qualitative assessment Worker - dermal Additional good practice advice Where appropriate, replacement of task by automated and/or closed processes.		
enclosure of the operation or equipment and provide extract ventilation at openings. Disposal - This material and its container must be disposed of in a safe manner. In case of potential exposure:, Use suitable chemically resistant gloves., Wear suitable coveralls to prevent exposure to the skin., Wear suitable respiratory protection., Clear spills immediately, Consider the need for risk based health surveillance. Avoid frequent and direct contact with substance. Clean up contamination as soon as they occur. Wash off any skin contamination immediately. Provide specific employee training to prevent/minimize exposures. Wear suitable gloves tested to EN ISO 374-1. Exposure estimate and reference to its source Assessment method EASY TRA v6.0, ECETOC TRA v3.0, Worker Worker - inhalation, long-term - systemic Exposure estimate 0,7888 mg/m³ Risk Characterization Ratio (RCR) 0,356931 Assessment method EASY TRA v6.0, ECETOC TRA v3.0, Worker Additional good practice advice Where appropriate, replacement of task by automated and/or closed processes. Guidance to Downstream Users		
equipment and provide extract ventilation at openings. Disposal - This material and its container must be disposed of in a safe manner. In case of potential exposure:, Use suitable chemically resistant gloves., Wear suitable coveralls to prevent exposure to the skin., Wear suitable respiratory protection., Clear spills immediately, Consider the need for risk based health surveillance. Avoid frequent and direct contact with substance. Clean up contamination as soon as they occur. Wash off any skin contamination immediately. Provide specific employee training to prevent/minimize exposures. Wear suitable gloves tested to EN ISO 374-1. Exposure estimate and reference to its source Assessment method EASY TRA v6.0, ECETOC TRA v3.0, Worker Worker - inhalation, long-term - systemic Exposure estimate D,7888 mg/m³ Risk Characterization Ratio (RCR) Assessment method EASY TRA v6.0, ECETOC TRA v3.0, Worker Worker - dermal Additional good practice advice Where appropriate, replacement of task by automated and/or closed processes. Guidance to Downstream Users	, , , , , , , , , , , , , , , , , , , ,	
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Worker - dermal Additional good practice advice Where appropriate, replacement of task by automated and/or closed processes. Guidance to Downstream Users		, , ,
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Where appropriate, replacement of task by automated and/or closed processes. Guidance to Downstream Users		Worker - dermal
Guidance to Downstream Users		
For scaling see: http://www.ecetoc.org/tra		
	For scaling see: http://www.ecetoc.org/t	ra

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 Storage With occasional controlled exposure. Use domain: industrial
Operational conditions	
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 100 %

1,3-Butadiene



Physical state	liquid
Vapour pressure of the substance	268333,1875 Pa
during use	
Process temperature	20 °C
Duration and Frequency of activity	60 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated temperatures
Risk Management Measures	
Local exhaust ventilation	
Provide a good standard of general ventilation (not less than 3 - 5 air changes per hour)	Effectiveness: 30 %
Drain down and flush system prior to	
equipment break-in or maintenance.	
Restrict access to authorised persons.	
Provide specific employee training to	
prevent/minimize exposures. Regular	
inspection and maintenance of equipment and machines.	
Minimise exposure by partial	
enclosure of the operation or	
equipment and provide extract	
ventilation at openings. Disposal -	
This material and its container must	
be disposed of in a safe manner.	
In case of potential exposure:, Use	
suitable chemically resistant gloves.,	
Wear suitable coveralls to prevent	
exposure to the skin., Wear suitable	
respiratory protection., Clear spills immediately, Consider the need for	
risk based health surveillance.	
Avoid frequent and direct contact with	
substance. Clean up contamination as	
soon as they occur. Wash off any skin	
contamination immediately. Provide	
specific employee training to	
prevent/minimize exposures.	
Wear suitable gloves tested to EN ISO 374-1.	
Exposure estimate and reference to	
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	0,7888 mg/m³
Risk Characterization Ratio (RCR)	0,356931
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker

1,3-Butadiene



Assessment method	Qualitative assessment
	Worker - dermal
Additional good practice advice	
Where appropriate, replacement of task by automated and/or closed processes.	
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 General exposures (closed systems) Use in contained batch processes Use domain: industrial
Operational conditions	
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance during use	268333,1875 Pa
Process temperature	20 °C
Duration and Frequency of activity	15 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated temperatures
Risk Management Measures	
Local exhaust ventilation	
Provide a good standard of general ventilation (not less than 3 - 5 air changes per hour)	Effectiveness: 30 %
Drain down and flush system prior to equipment break-in or maintenance. Restrict access to authorised persons. Provide specific employee training to prevent/minimize exposures. Regular inspection and maintenance of equipment and machines. Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings. Disposal - This material and its container must be disposed of in a safe manner.	
In case of potential exposure:, Use	

1,3-Butadiene



suitable chemically resistant gloves.,	
Wear suitable coveralls to prevent	
exposure to the skin., Wear suitable respiratory protection., Clear spills	
immediately, Consider the need for	
risk based health surveillance.	
Avoid frequent and direct contact with substance. Clean up contamination as	
soon as they occur. Wash off any skin	
contamination immediately. Provide	
specific employee training to	
prevent/minimize exposures.	
Wear suitable gloves tested to EN	
ISO 374-1.	
Exposure estimate and reference to it	ts source
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
7.03033ment method	Worker - inhalation, long-term - systemic
Exposure estimate	0,7888 mg/m ³
Risk Characterization Ratio (RCR)	0,356931
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Assessment method Assessment method	Qualitative assessment
Assessment method	
Additional good prosting advis-	Worker - dermal
Additional good practice advice	
Where appropriate, replacement of task by automated and/or closed processes.	
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/t	ra

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 General exposures (closed systems) Use in contained batch processes Use domain: industrial
Operational conditions	
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance during use	268333,1875 Pa
Process temperature	20 °C
Duration and Frequency of activity	15 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated

1,3-Butadiene



	temperatures
Risk Management Measures	tomporaturos
Provide a good standard of general	
ventilation (not less than 3 - 5 air	Effectiveness: 30 %
changes per hour)	
Handle substance within a	
predominantly closed system provided	Effectiveness: 90 %
with extract ventilation.	
Drain down and flush system prior to	
equipment break-in or maintenance.	
Restrict access to authorised persons.	
Provide specific employee training to	
prevent/minimize exposures. Regular	
inspection and maintenance of	
equipment and machines.	
Minimise exposure by partial	
enclosure of the operation or	
equipment and provide extract	
ventilation at openings. Disposal -	
This material and its container must	
be disposed of in a safe manner.	
In case of potential exposure:, Use	
suitable chemically resistant gloves.,	
Wear suitable coveralls to prevent	
exposure to the skin., Wear suitable	
respiratory protection., Clear spills	
immediately, Consider the need for	
risk based health surveillance.	
Avoid frequent and direct contact with	
substance. Clean up contamination as	
soon as they occur. Wash off any skin	
contamination immediately. Provide	
specific employee training to	
prevent/minimize exposures.	
Wear suitable gloves tested to EN	
ISO 374-1.	
Exposure estimate and reference to i	
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	0,7888 mg/m ³
Risk Characterization Ratio (RCR)	0,356931
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Assessment method	Qualitative assessment
	Worker - dermal
Additional good practice advice	
Where appropriate, replacement of task by automated and/or closed processes.	
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra	

1,3-Butadiene



Contributing exposure scenario	
Community exposure sociation	PROC8a: Transfer of substance or mixture (charging and
	discharging) at non-dedicated facilities
Use descriptors covered	Equipment maintenance Cleaning Use domain: industrial
	4.1
Operational conditions	
	1,3-butadiene
Concentration of the substance	Content: >= 0 % - <= 100 %
Di i i i i	
Physical state	liquid
Vapour pressure of the substance during use	268333,1875 Pa
Process temperature	20 °C
Duration and Frequency of activity	60 min 5 days per week
Indoor/Outdoor	Indoor
massi, satassi	Operation is carried out at ambient or elevated
	temperatures
Risk Management Measures	
Local exhaust ventilation	
Wear suitable respiratory protection.	Effectiveness: 90 %
Provide a good standard of general	
ventilation (not less than 3 - 5 air	Effectiveness: 30 %
changes per hour)	
Drain down and flush system prior to	
equipment break-in or maintenance.	
Restrict access to authorised persons.	
Provide specific employee training to	
prevent/minimize exposures. Regular	
inspection and maintenance of	
equipment and machines.	
Minimise exposure by partial	
enclosure of the operation or equipment and provide extract	
ventilation at openings. Disposal -	
This material and its container must	
be disposed of in a safe manner.	
In case of potential exposure:, Use	
suitable chemically resistant gloves.,	
Wear suitable coveralls to prevent	
exposure to the skin., Wear suitable	
respiratory protection., Clear spills	
immediately, Consider the need for	
risk based health surveillance.	
Avoid frequent and direct contact with	
substance. Clean up contamination as	
soon as they occur. Wash off any skin	
contamination immediately. Provide	

1,3-Butadiene



specific employee training to	
prevent/minimize exposures.	
Wear suitable gloves tested to EN	
ISO 374-1.	
Exposure estimate and reference to	its source
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	0,7888 mg/m³
Risk Characterization Ratio (RCR)	0,356931
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Assessment method	Qualitative assessment
	Worker - dermal
Additional good practice advice	
Where appropriate, replacement of tas	k by automated and/or closed processes.
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 Equipment maintenance Cleaning Use domain: industrial
Operational conditions	
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance during use	268333,1875 Pa
Process temperature	20 °C
Duration and Frequency of activity	60 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated temperatures
Risk Management Measures	
Local exhaust ventilation	
Wear suitable respiratory protection.	Effectiveness: 90 %
Provide a good standard of general ventilation (not less than 3 - 5 air changes per hour)	Effectiveness: 30 %
Drain down and flush system prior to equipment break-in or maintenance. Restrict access to authorised persons. Provide specific employee training to prevent/minimize exposures. Regular inspection and maintenance of	

1,3-Butadiene



equipment and machines.	
Minimise exposure by partial	
enclosure of the operation or	
equipment and provide extract	
ventilation at openings. Disposal -	
This material and its container must	
be disposed of in a safe manner.	
In case of potential exposure:, Use	
suitable chemically resistant gloves.,	
Wear suitable coveralls to prevent	
exposure to the skin., Wear suitable	
respiratory protection., Clear spills	
immediately, Consider the need for	
risk based health surveillance.	
Avoid frequent and direct contact with	
substance. Clean up contamination as	
soon as they occur. Wash off any skin	
contamination immediately. Provide	
specific employee training to	
prevent/minimize exposures.	
Wear suitable gloves tested to EN	
ISO 374-1.	
Exposure estimate and reference to	
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	0,7888 mg/m ³
Risk Characterization Ratio (RCR)	0,356931
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Assessment method	Qualitative assessment
	Worker - dermal
Additional good practice advice	
	by automated and/or closed processes.
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/	ra

Contributing exposure scenario	
Use descriptors covered	PROC8a: Transfer of substance or mixture (charging and discharging) at non-dedicated facilities Equipment maintenance Cleaning Use domain: industrial
Operational conditions	
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance during use	268333,1875 Pa
Process temperature	20 °C

1,3-Butadiene



Duration and Frequency of activity	60 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated
	temperatures
Risk Management Measures	
Provide a good standard of general	
ventilation (not less than 3 - 5 air	Effectiveness: 30 %
changes per hour)	
Wear suitable respiratory protection.	Effectiveness: 90 %
Drain down and flush system prior to	
equipment break-in or maintenance.	
Restrict access to authorised persons.	
Provide specific employee training to	
prevent/minimize exposures. Regular	
inspection and maintenance of	
equipment and machines.	
Minimise exposure by partial	
enclosure of the operation or	
equipment and provide extract	
ventilation at openings. Disposal - This material and its container must	
be disposed of in a safe manner.	
In case of potential exposure:, Use suitable chemically resistant gloves.,	
Wear suitable coveralls to prevent	
exposure to the skin., Wear suitable	
respiratory protection., Clear spills	
immediately, Consider the need for	
risk based health surveillance.	
Avoid frequent and direct contact with	
substance. Clean up contamination as	
soon as they occur. Wash off any skin	
contamination immediately. Provide	
specific employee training to	
prevent/minimize exposures.	
Wear suitable gloves tested to EN	
ISO 374-1.	
Exposure estimate and reference to	its source
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	0,7888 mg/m ³
Risk Characterization Ratio (RCR)	0,356931
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Assessment method	Qualitative assessment
	Worker - dermal
Additional good practice advice	
	by automated and/or closed processes.
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1,3-Butadiene



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 Equipment maintenance Cleaning Use domain: industrial
Operational conditions	
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance during use	268333,1875 Pa
Process temperature	20 °C
Duration and Frequency of activity	60 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated temperatures
Risk Management Measures	
Provide a good standard of general ventilation (not less than 3 - 5 air changes per hour)	Effectiveness: 30 %
Wear suitable respiratory protection.	Effectiveness: 90 %
Drain down and flush system prior to equipment break-in or maintenance. Restrict access to authorised persons. Provide specific employee training to prevent/minimize exposures. Regular inspection and maintenance of equipment and machines.	
Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings. Disposal - This material and its container must be disposed of in a safe manner. In case of potential exposure:, Use suitable chemically resistant gloves.,	
Wear suitable coveralls to prevent exposure to the skin., Wear suitable respiratory protection., Clear spills immediately, Consider the need for risk based health surveillance. Avoid frequent and direct contact with substance. Clean up contamination as	

1,3-Butadiene



Lancard the control March off and all the	
soon as they occur. Wash off any skin	
contamination immediately. Provide	
specific employee training to	
prevent/minimize exposures.	
Wear suitable gloves tested to EN	
ISO 374-1.	
Exposure estimate and reference to	its source
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	0,7888 mg/m ³
Risk Characterization Ratio (RCR)	0,356931
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Assessment method	Qualitative assessment
	Worker - dermal
Additional good practice advice	
Where appropriate, replacement of tas	k by automated and/or closed processes.
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 Bulk transfer Use domain: industrial
Operational conditions	
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance during use	268333,1875 Pa
Process temperature	20 °C
Duration and Frequency of activity	60 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated temperatures
Risk Management Measures	
Local exhaust ventilation	
Provide a good standard of general or controlled ventilation (5 to 10 air changes per hour)	Effectiveness: 70 %
Drain down and flush system prior to equipment break-in or maintenance. Restrict access to authorised persons. Provide specific employee training to prevent/minimize exposures. Regular	

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inspection and maintenance of equipment and machines. Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings. Disposal -This material and its container must be disposed of in a safe manner. In case of potential exposure:, Use suitable chemically resistant gloves., Wear suitable coveralls to prevent exposure to the skin., Wear suitable respiratory protection., Clear spills immediately. Consider the need for risk based health surveillance. Avoid frequent and direct contact with substance. Clean up contamination as soon as they occur. Wash off any skin contamination immediately. Provide specific employee training to prevent/minimize exposures. Wear suitable gloves tested to EN ISO 374-1. Exposure estimate and reference to its source Assessment method EASY TRA v6.0, ECETOC TRA v3.0, Worker Worker - inhalation, long-term - systemic 1,0142 mg/m³ Exposure estimate 0,458912 Risk Characterization Ratio (RCR) EASY TRA v6.0, ECETOC TRA v3.0, Worker Assessment method Assessment method Qualitative assessment Worker - dermal Additional good practice advice Where appropriate, replacement of task by automated and/or closed processes. 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 Bulk transfer Use domain: industrial
Operational conditions	
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance during use	268333,1875 Pa

1,3-Butadiene



Process temperature	20 °C
Duration and Frequency of activity	60 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated temperatures
Risk Management Measures	
Provide a good standard of general or controlled ventilation (5 to 10 air changes per hour)	Effectiveness: 70 %
Use dry break couplings for material transfer	Effectiveness: 95 %
Drain down and flush system prior to equipment break-in or maintenance. Restrict access to authorised persons. Provide specific employee training to prevent/minimize exposures. Regular inspection and maintenance of equipment and machines.	
Minimise exposure by partial	
enclosure of the operation or	
equipment and provide extract	
ventilation at openings. Disposal -	
This material and its container must	
be disposed of in a safe manner.	
In case of potential exposure:, Use	
suitable chemically resistant gloves.,	
Wear suitable coveralls to prevent	
exposure to the skin., Wear suitable	
respiratory protection., Clear spills	
immediately, Consider the need for	
risk based health surveillance.	
Avoid frequent and direct contact with	
substance. Clean up contamination as	
soon as they occur. Wash off any skin	
contamination immediately. Provide	
specific employee training to	
prevent/minimize exposures.	
Wear suitable gloves tested to EN ISO 374-1.	
Exposure estimate and reference to	
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	1,0142 mg/m³
Risk Characterization Ratio (RCR)	0,458912
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Assessment method	Qualitative assessment
	Worker - dermal

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Additional good practice advice
Where appropriate, replacement of task by automated and/or closed processes.
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 Bulk transfer (closed systems) Use domain: industrial
Operational conditions	
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance during use	268333,1875 Pa
Process temperature	20 °C
Duration and Frequency of activity	60 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated temperatures
Risk Management Measures	
Local exhaust ventilation	
Provide a good standard of general or controlled ventilation (5 to 10 air changes per hour)	Effectiveness: 70 %
Drain down and flush system prior to equipment break-in or maintenance. Restrict access to authorised persons. Provide specific employee training to prevent/minimize exposures. Regular inspection and maintenance of equipment and machines.	
Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings. Disposal - This material and its container must be disposed of in a safe manner. In case of potential exposure:, Use suitable chemically resistant gloves., Wear suitable coveralls to prevent exposure to the skin., Wear suitable respiratory protection., Clear spills immediately, Consider the need for risk based health surveillance.	

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Avoid frequent and direct contact with	
substance. Clean up contamination as	
soon as they occur. Wash off any skin	
contamination immediately. Provide	
specific employee training to	
prevent/minimize exposures.	
Wear suitable gloves tested to EN	
ISO 374-1.	
Exposure estimate and reference to it	ts source
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	1,0142 mg/m ³
Risk Characterization Ratio (RCR)	0,458912
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Assessment method	Qualitative assessment
	Worker - dermal
Additional good practice advice	
Where appropriate, replacement of task by automated and/or closed processes.	
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/t	ra

Contributing exposure scenario	
Use descriptors covered	PROC8b: Transfer of substance or mixture (charging and discharging) at dedicated facilities Bulk transfer (closed systems) Use domain: industrial
Operational conditions	
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance during use	268333,1875 Pa
Process temperature	20 °C
Duration and Frequency of activity	60 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated temperatures
Risk Management Measures	
Provide a good standard of general or controlled ventilation (5 to 10 air changes per hour)	Effectiveness: 70 %
Use dry break couplings for material transfer	Effectiveness: 95 %
Drain down and flush system prior to equipment break-in or maintenance.	

1,3-Butadiene



Restrict access to authorised persons.	
Provide specific employee training to	
prevent/minimize exposures. Regular inspection and maintenance of	
equipment and machines.	
Minimise exposure by partial	
enclosure of the operation or	
equipment and provide extract	
ventilation at openings. Disposal -	
This material and its container must	
be disposed of in a safe manner.	
In case of potential exposure:, Use	
suitable chemically resistant gloves.,	
Wear suitable coveralls to prevent	
exposure to the skin., Wear suitable	
respiratory protection., Clear spills	
immediately, Consider the need for	
risk based health surveillance.	
Avoid frequent and direct contact with	
substance. Clean up contamination as	
soon as they occur. Wash off any skin	
contamination immediately. Provide	
specific employee training to	
prevent/minimize exposures.	
Wear suitable gloves tested to EN	
ISO 374-1.	
Exposure estimate and reference to	
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	1,0142 mg/m ³
Risk Characterization Ratio (RCR)	0,458912
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Assessment method	Qualitative assessment
	Worker - dermal
Additional good practice advice	
	k by automated and/or closed processes.
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). Process sampling Use domain: industrial	
Operational conditions		
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 100 %	

1,3-Butadiene



Physical state	liquid
Vapour pressure of the substance	268333,1875 Pa
during use	
Process temperature	20 °C
Duration and Frequency of activity	15 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated
	temperatures
Risk Management Measures	
Local exhaust ventilation	
Provide a good standard of general or	
controlled ventilation (5 to 10 air	Effectiveness: 70 %
changes per hour)	
Drain down and flush system prior to	
equipment break-in or maintenance.	
Restrict access to authorised persons.	
Provide specific employee training to	
prevent/minimize exposures. Regular	
inspection and maintenance of	
equipment and machines.	
Minimise exposure by partial	
enclosure of the operation or	
equipment and provide extract	
ventilation at openings. Disposal -	
This material and its container must	
be disposed of in a safe manner.	
In case of potential exposure:, Use	
suitable chemically resistant gloves.,	
Wear suitable coveralls to prevent	
exposure to the skin., Wear suitable	
respiratory protection., Clear spills immediately, Consider the need for	
risk based health surveillance.	
Avoid frequent and direct contact with	
substance. Clean up contamination as	
soon as they occur. Wash off any skin	
contamination immediately. Provide	
specific employee training to	
prevent/minimize exposures.	
Wear suitable gloves tested to EN	
ISO 374-1.	
Exposure estimate and reference to it	ts source
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	1,3523 mg/m ³
Risk Characterization Ratio (RCR)	0,611882
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker

1,3-Butadiene



Assessment method	Qualitative assessment	
	Worker - dermal	
Additional good practice advice		
Where appropriate, replacement of task by automated and/or closed processes.		
Guidance to Downstream Users		
For scaling see: http://www.eceto	oc.org/tra	

Contributing exposure scenario		
Use descriptors covered	PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing). Process sampling Use domain: industrial	
Operational conditions		
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 100 %	
Physical state	liquid	
Vapour pressure of the substance during use	268333,1875 Pa	
Process temperature	20 °C	
Duration and Frequency of activity	15 min 5 days per week	
Indoor/Outdoor	Indoor	
	Operation is carried out at ambient or elevated temperatures	
Risk Management Measures		
Provide a good standard of general or controlled ventilation (5 to 10 air changes per hour)	Effectiveness: 70 %	
Sample via a closed loop or other system to avoid exposure.	Effectiveness: 90 %	
Drain down and flush system prior to equipment break-in or maintenance. Restrict access to authorised persons. Provide specific employee training to prevent/minimize exposures. Regular inspection and maintenance of equipment and machines.		
Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings. Disposal - This material and its container must be disposed of in a safe manner. In case of potential exposure:, Use		
suitable chemically resistant gloves., Wear suitable coveralls to prevent		

1,3-Butadiene



exposure to the skin., Wear suitable	
respiratory protection., Clear spills	
immediately, Consider the need for	
risk based health surveillance.	
Avoid frequent and direct contact with	
substance. Clean up contamination as	
soon as they occur. Wash off any skin	
contamination immediately. Provide	
specific employee training to	
prevent/minimize exposures.	
Wear suitable gloves tested to EN	
ISO 374-1.	
Exposure estimate and reference to it	ts source
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	1,3523 mg/m³
Risk Characterization Ratio (RCR)	0,611882
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Assessment method	Qualitative assessment
	Worker - dermal
Additional good practice advice	
Where appropriate, replacement of task	by automated and/or closed processes.
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/t	ra

T
PROC15: Use a laboratory reagent.
Laboratory activities Use domain: industrial
1,3-butadiene
Content: >= 0 % - <= 100 %
liquid
268333,1875 Pa
20 °C
60 min 5 days per week
oo min o dayo por moon
Indoor
Operation is carried out at ambient or elevated
temperatures
Effectiveness: 30 %

1,3-Butadiene



In case of potential exposure:, Use suitable chemically resistant gloves., Wear suitable coveralls to prevent exposure to the skin., Wear suitable respiratory protection., Clear spills immediately, Consider the need for risk based health surveillance. Avoid frequent and direct contact with substance. Clean up contamination as soon as they occur. Wash off any skin contamination immediately. Provide specific employee training to prevent/minimize exposures. Wear suitable gloves tested to EN ISO 374-1. Exposure estimate and reference to its source Assessment method EASY TRA v6.0, ECETOC TRA v3.0, Worker Worker - inhalation, long-term - systemic Exposure estimate 1,5776 mg/m³ Risk Characterization Ratio (RCR) 0,713863 Assessment method EASY TRA v6.0, ECETOC TRA v3.0, Worker Assessment method Qualitative assessment Worker - dermal	Drain down and flush system prior to equipment break-in or maintenance. Restrict access to authorised persons. Provide specific employee training to prevent/minimize exposures. Regular inspection and maintenance of equipment and machines. Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings. Disposal - This material and its container must be disposed of in a safe manner.	
Wear suitable coveralls to prevent exposure to the skin., Wear suitable respiratory protection., Clear spills immediately, Consider the need for risk based health surveillance. Avoid frequent and direct contact with substance. Clean up contamination as soon as they occur. Wash off any skin contamination immediately. Provide specific employee training to prevent/minimize exposures. Wear suitable gloves tested to EN ISO 374-1. Exposure estimate and reference to its source Assessment method EASY TRA v6.0, ECETOC TRA v3.0, Worker Worker - inhalation, long-term - systemic Exposure estimate 1,5776 mg/m³ Risk Characterization Ratio (RCR) 0,713863 Assessment method EASY TRA v6.0, ECETOC TRA v3.0, Worker Qualitative assessment Worker - dermal	In case of potential exposure:, Use	
respiratory protection., Clear spills immediately, Consider the need for risk based health surveillance. Avoid frequent and direct contact with substance. Clean up contamination as soon as they occur. Wash off any skin contamination immediately. Provide specific employee training to prevent/minimize exposures. Wear suitable gloves tested to EN ISO 374-1. Exposure estimate and reference to its source Assessment method EASY TRA v6.0, ECETOC TRA v3.0, Worker Worker - inhalation, long-term - systemic Exposure estimate 1,5776 mg/m³ Risk Characterization Ratio (RCR) 0,713863 Assessment method EASY TRA v6.0, ECETOC TRA v3.0, Worker Qualitative assessment Worker - dermal	Wear suitable coveralls to prevent	
immediately, Consider the need for risk based health surveillance. Avoid frequent and direct contact with substance. Clean up contamination as soon as they occur. Wash off any skin contamination immediately. Provide specific employee training to prevent/minimize exposures. Wear suitable gloves tested to EN ISO 374-1. Exposure estimate and reference to its source Assessment method EASY TRA v6.0, ECETOC TRA v3.0, Worker Worker - inhalation, long-term - systemic Exposure estimate 1,5776 mg/m³ Risk Characterization Ratio (RCR) 0,713863 Assessment method EASY TRA v6.0, ECETOC TRA v3.0, Worker Assessment method Qualitative assessment Worker - dermal		
risk based health surveillance. Avoid frequent and direct contact with substance. Clean up contamination as soon as they occur. Wash off any skin contamination immediately. Provide specific employee training to prevent/minimize exposures. Wear suitable gloves tested to EN ISO 374-1. Exposure estimate and reference to its source Assessment method EASY TRA v6.0, ECETOC TRA v3.0, Worker Worker - inhalation, long-term - systemic Exposure estimate 1,5776 mg/m³ Risk Characterization Ratio (RCR) 0,713863 Assessment method EASY TRA v6.0, ECETOC TRA v3.0, Worker Assessment method Qualitative assessment Worker - dermal		
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contamination immediately. Provide specific employee training to prevent/minimize exposures. Wear suitable gloves tested to EN ISO 374-1. Exposure estimate and reference to its source Assessment method EASY TRA v6.0, ECETOC TRA v3.0, Worker Worker - inhalation, long-term - systemic Exposure estimate 1,5776 mg/m³ Risk Characterization Ratio (RCR) 0,713863 Assessment method EASY TRA v6.0, ECETOC TRA v3.0, Worker Qualitative assessment Worker - dermal		
specific employee training to prevent/minimize exposures. Wear suitable gloves tested to EN ISO 374-1. Exposure estimate and reference to its source Assessment method EASY TRA v6.0, ECETOC TRA v3.0, Worker Worker - inhalation, long-term - systemic Exposure estimate 1,5776 mg/m³ Risk Characterization Ratio (RCR) 0,713863 Assessment method EASY TRA v6.0, ECETOC TRA v3.0, Worker Qualitative assessment Worker - dermal		
prevent/minimize exposures. Wear suitable gloves tested to EN ISO 374-1. Exposure estimate and reference to its source Assessment method EASY TRA v6.0, ECETOC TRA v3.0, Worker Worker - inhalation, long-term - systemic Exposure estimate 1,5776 mg/m³ Risk Characterization Ratio (RCR) 0,713863 Assessment method EASY TRA v6.0, ECETOC TRA v3.0, Worker Qualitative assessment Worker - dermal	1	
Wear suitable gloves tested to EN ISO 374-1. Exposure estimate and reference to its source Assessment method EASY TRA v6.0, ECETOC TRA v3.0, Worker Worker - inhalation, long-term - systemic Exposure estimate 1,5776 mg/m³ Risk Characterization Ratio (RCR) 0,713863 Assessment method EASY TRA v6.0, ECETOC TRA v3.0, Worker Assessment method Qualitative assessment Worker - dermal		
ISO 374-1. Exposure estimate and reference to its source Assessment method EASY TRA v6.0, ECETOC TRA v3.0, Worker Worker - inhalation, long-term - systemic Exposure estimate 1,5776 mg/m³ Risk Characterization Ratio (RCR) 0,713863 Assessment method EASY TRA v6.0, ECETOC TRA v3.0, Worker Assessment method Qualitative assessment Worker - dermal		
Exposure estimate and reference to its source Assessment method EASY TRA v6.0, ECETOC TRA v3.0, Worker Worker - inhalation, long-term - systemic Exposure estimate 1,5776 mg/m³ Risk Characterization Ratio (RCR) 0,713863 Assessment method EASY TRA v6.0, ECETOC TRA v3.0, Worker Assessment method Qualitative assessment Worker - dermal		
Assessment method EASY TRA v6.0, ECETOC TRA v3.0, Worker Worker - inhalation, long-term - systemic 1,5776 mg/m³ Risk Characterization Ratio (RCR) Assessment method EASY TRA v6.0, ECETOC TRA v3.0, Worker Qualitative assessment Worker - dermal		its source
Worker - inhalation, long-term - systemic Exposure estimate 1,5776 mg/m³ Risk Characterization Ratio (RCR) 0,713863 Assessment method EASY TRA v6.0, ECETOC TRA v3.0, Worker Assessment method Qualitative assessment Worker - dermal		
Exposure estimate 1,5776 mg/m³ Risk Characterization Ratio (RCR) 0,713863 Assessment method EASY TRA v6.0, ECETOC TRA v3.0, Worker Assessment method Qualitative assessment Worker - dermal	7.00000ITCHT ITCHTOO	
Risk Characterization Ratio (RCR) 0,713863 Assessment method EASY TRA v6.0, ECETOC TRA v3.0, Worker Assessment method Qualitative assessment Worker - dermal	Exposure estimate	
Assessment method EASY TRA v6.0, ECETOC TRA v3.0, Worker Assessment method Qualitative assessment Worker - dermal		
Assessment method Qualitative assessment Worker - dermal		,
	Assessment method	
Additional good practice advice		Worker - dermal
Additional good practice advice		
Where appropriate, replacement of task by automated and/or closed processes.		
Guidance to Downstream Users		
For scaling see: http://www.ecetoc.org/tra		

Contributing exposure scenario	
Use descriptors covered	PROC15: Use a laboratory reagent. Laboratory activities Use domain: industrial
Operational conditions	
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 100 %

1,3-Butadiene



Physical state	liquid
Vapour pressure of the substance	268333,1875 Pa
during use	
Process temperature	20 °C
Duration and Frequency of activity	60 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated temperatures
Risk Management Measures	
Drain down and flush system prior to	
equipment break-in or maintenance.	
Restrict access to authorised persons.	
Provide specific employee training to	
prevent/minimize exposures. Regular	
inspection and maintenance of	
equipment and machines.	
Minimise exposure by partial	
enclosure of the operation or	
equipment and provide extract	
ventilation at openings. Disposal -	
This material and its container must	
be disposed of in a safe manner.	
In case of potential exposure:, Use	
suitable chemically resistant gloves.,	
Wear suitable coveralls to prevent	
exposure to the skin., Wear suitable respiratory protection., Clear spills	
immediately, Consider the need for	
risk based health surveillance.	
Avoid frequent and direct contact with	
substance. Clean up contamination as	
soon as they occur. Wash off any skin	
contamination immediately. Provide	
specific employee training to	
prevent/minimize exposures.	
Wear suitable gloves tested to EN	
ISO 374-1.	
Exposure estimate and reference to	ts source
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	1,1269 mg/m ³
Risk Characterization Ratio (RCR)	0,509902
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Assessment method	Qualitative assessment
	Worker - dermal
Additional good practice advice	
Where appropriate, replacement of task by automated and/or closed processes.	

1,3-Butadiene

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Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra	

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8. Short title of exposure scenario

Use in rubber production and processing IS; ERC6d; PROC1, PROC2, PROC3, PROC6, PROC8a, PROC8b, PROC9, PROC14, PROC15

Control of exposure and risk management measures

Contributing exposure scenario	
Use descriptors covered	ERC6d: Use of reactive process regulators in polymerisation processes at industrial site (inclusion or not into/onto article) As no environmental hazard was identified no environmental-related exposure assessment and risk characterization was performed.
Operational conditions	

Contributing exposure scenario	
Use descriptors covered	PROC1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions. Bulk weighing (closed systems) Use domain: industrial
Operational conditions	
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance during use	268333,1875 Pa
Process temperature	20 °C
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated temperatures
Risk Management Measures	
Provide a good standard of general ventilation (not less than 3 - 5 air changes per hour)	Effectiveness: 30 %
Drain down and flush system prior to equipment break-in or maintenance.	

1,3-Butadiene



Provide specific employee training to	
number of the indicate and a sum of the contract of the contra	
prevent/minimize exposures. Regular	
inspection and maintenance of	
equipment and machines.	
Minimise exposure by partial	
enclosure of the operation or	
equipment and provide extract	
ventilation at openings. Disposal - This material and its container must	
be disposed of in a safe manner.	
In case of potential exposure:, Use	
suitable chemically resistant gloves.,	
Wear suitable coveralls to prevent	
exposure to the skin., Wear suitable	
respiratory protection., Clear spills	
immediately, Consider the need for	
risk based health surveillance.	
Avoid frequent and direct contact with	
substance. Clean up contamination as	
soon as they occur. Wash off any skin	
contamination immediately. Provide	
specific employee training to	
prevent/minimize exposures.	
Wear suitable gloves tested to EN	
ISO 374-1.	
Exposure estimate and reference to	its source
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	0,0158 mg/m ³
Risk Characterization Ratio (RCR)	0,007139
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Assessment method	Qualitative assessment
	Worker - dermal
Additional good practice advice	
	by automated and/or closed processes.
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/t	tra

Contributing exposure scenario	
Use descriptors covered	PROC1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions. Material transfers Use domain: industrial
Operational conditions	
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 100 %

1,3-Butadiene



Physical state	liquid
Vapour pressure of the substance	268333,1875 Pa
during use	
Process temperature	20 °C
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated temperatures
Risk Management Measures	
Drain down and flush system prior to	
equipment break-in or maintenance.	
Restrict access to authorised persons.	
Provide specific employee training to	
prevent/minimize exposures. Regular	
inspection and maintenance of	
equipment and machines.	
Minimise exposure by partial	
enclosure of the operation or	
equipment and provide extract	
ventilation at openings. Disposal -	
This material and its container must	
be disposed of in a safe manner.	
In case of potential exposure:, Use	
suitable chemically resistant gloves.,	
Wear suitable coveralls to prevent	
exposure to the skin., Wear suitable	
respiratory protection., Clear spills	
immediately, Consider the need for	
risk based health surveillance.	
Avoid frequent and direct contact with	
substance. Clean up contamination as soon as they occur. Wash off any skin	
contamination immediately. Provide	
specific employee training to	
prevent/minimize exposures.	
Wear suitable gloves tested to EN	
ISO 374-1.	
Exposure estimate and reference to	its source
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	0,0225 mg/m ³
Risk Characterization Ratio (RCR)	0,010198
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Assessment method	Qualitative assessment
	Worker - dermal
Additional good practice advice	
	by automated and/or closed processes.
TTHE S appropriate, replacement of task	as a standard and or order processes.

1,3-Butadiene



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 Bulk weighing With occasional controlled exposure. Use domain: industrial
Operational conditions	
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance during use	268333,1875 Pa
Process temperature	20 °C
Duration and Frequency of activity	240 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated temperatures
Risk Management Measures	
Local exhaust ventilation	
Provide a good standard of general or controlled ventilation (5 to 10 air changes per hour)	Effectiveness: 70 %
Drain down and flush system prior to equipment break-in or maintenance. Restrict access to authorised persons. Provide specific employee training to prevent/minimize exposures. Regular inspection and maintenance of equipment and machines.	
Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings. Disposal - This material and its container must be disposed of in a safe manner. In case of potential exposure:, Use suitable chemically resistant gloves., Wear suitable coveralls to prevent exposure to the skin., Wear suitable respiratory protection., Clear spills immediately, Consider the need for	
risk based health surveillance.	

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Avoid frequent and direct contact with		
substance. Clean up contamination as		
soon as they occur. Wash off any skin		
contamination immediately. Provide		
specific employee training to		
prevent/minimize exposures.		
Wear suitable gloves tested to EN		
ISO 374-1.		
Exposure estimate and reference to it	Exposure estimate and reference to its source	
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker	
	Worker - inhalation, long-term - systemic	
Exposure estimate	1,0142 mg/m ³	
Risk Characterization Ratio (RCR)	0,458912	
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker	
Assessment method	Qualitative assessment	
	Worker - dermal	
Additional good practice advice		
Where appropriate, replacement of task by automated and/or closed processes.		
Guidance to Downstream Users		
For scaling see: http://www.ecetoc.org/t	ra	

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 Bulk weighing With occasional controlled exposure. Use domain: industrial
Operational conditions	
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance during use	268333,1875 Pa
Process temperature	20 °C
Duration and Frequency of activity	240 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated temperatures
Risk Management Measures	
Provide a good standard of general or controlled ventilation (5 to 10 air changes per hour)	Effectiveness: 70 %
Ensure material transfers are under containment or extract ventilation	Effectiveness: 90 %

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Drain down and flush system prior to		
equipment break-in or maintenance.		
Restrict access to authorised persons.		
Provide specific employee training to		
prevent/minimize exposures. Regular		
inspection and maintenance of		
equipment and machines.		
Minimise exposure by partial		
enclosure of the operation or		
equipment and provide extract		
ventilation at openings. Disposal -		
This material and its container must		
be disposed of in a safe manner.		
In case of potential exposure:, Use		
suitable chemically resistant gloves.,		
Wear suitable coveralls to prevent		
exposure to the skin., Wear suitable		
respiratory protection., Clear spills		
immediately, Consider the need for		
risk based health surveillance.		
Avoid frequent and direct contact with		
substance. Clean up contamination as		
soon as they occur. Wash off any skin		
contamination immediately. Provide		
specific employee training to		
prevent/minimize exposures.		
Wear suitable gloves tested to EN		
ISO 374-1.		
Exposure estimate and reference to it		
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker	
	Worker - inhalation, long-term - systemic	
Exposure estimate	1,0142 mg/m ³	
Risk Characterization Ratio (RCR)	0,458912	
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker	
Assessment method	Qualitative assessment	
	Worker - dermal	
Additional good practice advice		
Where appropriate, replacement of task by automated and/or closed processes.		
Guidance to Downstream Users		
For scaling see: http://www.ecetoc.org/t	ra	

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 Material transfers With occasional controlled exposure. Use domain: industrial
Operational conditions	

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	1,3-butadiene
Concentration of the substance	Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance	268333,1875 Pa
during use	
Process temperature	20 °C
'	040 min E dava manusali
Duration and Frequency of activity	240 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated
	temperatures
Risk Management Measures	•
Local exhaust ventilation	
Provide a good standard of general or	
controlled ventilation (5 to 10 air	Effectiveness: 70 %
changes per hour)	
Drain down and flush system prior to	
equipment break-in or maintenance.	
Restrict access to authorised persons.	
Provide specific employee training to	
prevent/minimize exposures. Regular	
inspection and maintenance of	
equipment and machines.	
Minimise exposure by partial	
enclosure of the operation or equipment and provide extract	
ventilation at openings. Disposal -	
This material and its container must	
be disposed of in a safe manner.	
In case of potential exposure:, Use	
suitable chemically resistant gloves.,	
Wear suitable coveralls to prevent	
exposure to the skin., Wear suitable	
respiratory protection., Clear spills	
immediately, Consider the need for	
risk based health surveillance.	
Avoid frequent and direct contact with	
substance. Clean up contamination as	
soon as they occur. Wash off any skin	
contamination immediately. Provide	
specific employee training to	
prevent/minimize exposures.	
Wear suitable gloves tested to EN	
ISO 374-1.	ite course
Assessment method	
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic

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Exposure estimate	1,0142 mg/m ³	
Risk Characterization Ratio (RCR)	0,458912	
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker	
Assessment method	Qualitative assessment	
	Worker - dermal	
Additional good practice advice		
Where appropriate, replacement of task by automated and/or closed processes.		
Guidance to Downstream Users		
For scaling see: http://www.ecetoc.org/tra		

Contributing exposure scenario	
Continuum exposure scendilo	PROC2: Chemical production or refinery in closed
Use descriptors covered	continuous process with occasional controlled exposure or processes with equivalent containment conditions Material transfers With occasional controlled exposure. Use domain: industrial
Operational conditions	
	1,3-butadiene
Concentration of the substance	Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance during use	268333,1875 Pa
Process temperature	20 °C
Duration and Frequency of activity	240 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated temperatures
Risk Management Measures	
Local exhaust ventilation	
Transfer via enclosed lines	Effectiveness: 70 %
Drain down and flush system prior to	
equipment break-in or maintenance.	
Restrict access to authorised persons.	
Provide specific employee training to	
prevent/minimize exposures. Regular	
inspection and maintenance of equipment and machines.	
Minimise exposure by partial	
enclosure of the operation or	
equipment and provide extract	
ventilation at openings. Disposal -	
This material and its container must	
be disposed of in a safe manner.	
In case of potential exposure:, Use	

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Lauthala alaunia di unatata di una	1
suitable chemically resistant gloves.,	
Wear suitable coveralls to prevent exposure to the skin., Wear suitable	
respiratory protection., Clear spills	
immediately, Consider the need for	
risk based health surveillance.	
Avoid frequent and direct contact with substance. Clean up contamination as	
soon as they occur. Wash off any skin	
contamination immediately. Provide	
specific employee training to	
prevent/minimize exposures.	
Wear suitable gloves tested to EN	
ISO 374-1.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	1,0142 mg/m ³
Risk Characterization Ratio (RCR)	0,458912
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Assessment method	Qualitative assessment
	Worker - dermal
Additional good practice advice	
Where appropriate, replacement of task by automated and/or closed processes.	
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/t	ra

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 Additive premixing Batch process (closed systems) Use domain: industrial
Operational conditions	
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance during use	268333,1875 Pa
Process temperature	20 °C
Duration and Frequency of activity	60 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated

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replaces version of 15.11.2024 (16.0)



	temperatures	
Risk Management Measures		
Local exhaust ventilation		
Provide a good standard of general or		
controlled ventilation (5 to 10 air	Effectiveness: 70 %	
changes per hour)		
Drain down and flush system prior to		
equipment break-in or maintenance.		
Restrict access to authorised persons.		
Provide specific employee training to		
prevent/minimize exposures. Regular		
inspection and maintenance of		
equipment and machines.		
Minimise exposure by partial		
enclosure of the operation or		
equipment and provide extract		
ventilation at openings. Disposal -		
This material and its container must		
be disposed of in a safe manner.		
In case of potential exposure:, Use		
suitable chemically resistant gloves.,		
Wear suitable coveralls to prevent		
exposure to the skin., Wear suitable		
respiratory protection., Clear spills		
immediately, Consider the need for		
risk based health surveillance.		
Avoid frequent and direct contact with		
substance. Clean up contamination as		
soon as they occur. Wash off any skin contamination immediately. Provide		
specific employee training to		
prevent/minimize exposures.		
Wear suitable gloves tested to EN		
ISO 374-1.		
Exposure estimate and reference to its source		
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker	
	Worker - inhalation, long-term - systemic	
Exposure estimate	0,6761 mg/m ³	
Risk Characterization Ratio (RCR)	0,305941	
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker	
Assessment method	Qualitative assessment	
	Worker - dermal	
Additional good practice advice		
	by automated and/or closed processes.	
Guidance to Downstream Users		
For scaling see: http://www.ecetoc.org/tra		

Contributing exposure scenario

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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 Additive premixing Batch process (closed systems) Use domain: industrial
Operational conditions	
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance during use	268333,1875 Pa
Process temperature	20 °C
Duration and Frequency of activity	60 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated temperatures
Risk Management Measures	
Provide a good standard of general or controlled ventilation (5 to 10 air changes per hour)	Effectiveness: 70 %
Ensure material transfers are under containment or extract ventilation	Effectiveness: 90 %
Drain down and flush system prior to equipment break-in or maintenance. Restrict access to authorised persons. Provide specific employee training to prevent/minimize exposures. Regular inspection and maintenance of equipment and machines.	
Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings. Disposal - This material and its container must be disposed of in a safe manner. In case of potential exposure:, Use	
suitable chemically resistant gloves., Wear suitable coveralls to prevent exposure to the skin., Wear suitable respiratory protection., Clear spills immediately, Consider the need for risk based health surveillance. Avoid frequent and direct contact with	
substance. Clean up contamination as	

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soon as they occur. Wash off any skin	
contamination immediately. Provide	
specific employee training to	
prevent/minimize exposures.	
Wear suitable gloves tested to EN	
ISO 374-1.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	0,6761 mg/m ³
Risk Characterization Ratio (RCR)	0,305941
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Assessment method	Qualitative assessment
	Worker - dermal
Additional good practice advice	
Where appropriate, replacement of task by automated and/or closed processes.	
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org	/tra

Contributing exposure scenario	
	PROC6: Calendering operations
Use descriptors covered	Calendering (including Banburys) Use domain: industrial
Operational conditions	
	1,3-butadiene
Concentration of the substance	Content: >= 0 % - <= 1 %
Physical state	liquid
Vapour pressure of the substance during use	268333,1875 Pa
Process temperature	20 °C
Duration and Frequency of activity	240 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated temperatures
Risk Management Measures	
Local exhaust ventilation	
Provide a good standard of general or controlled ventilation (5 to 10 air	Effectiveness: 70 %
changes per hour)	
Drain down and flush system prior to	
equipment break-in or maintenance.	
Restrict access to authorised persons. Provide specific employee training to	
prevent/minimize exposures. Regular	
inspection and maintenance of	

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equipment and machines.	
Minimise exposure by partial	
enclosure of the operation or	
equipment and provide extract	
ventilation at openings. Disposal -	
This material and its container must	
be disposed of in a safe manner.	
In case of potential exposure:, Use	
suitable chemically resistant gloves.,	
Wear suitable coveralls to prevent	
exposure to the skin., Wear suitable	
respiratory protection., Clear spills	
immediately, Consider the need for	
risk based health surveillance.	
Avoid frequent and direct contact with	
substance. Clean up contamination as	
soon as they occur. Wash off any skin	
contamination immediately. Provide	
specific employee training to	
prevent/minimize exposures.	
Wear suitable gloves tested to EN	
ISO 374-1. Exposure estimate and reference to it.	ita aayyaa
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Evenes une petimente	Worker - inhalation, long-term - systemic
Exposure estimate	1,0142 mg/m ³
Risk Characterization Ratio (RCR)	0,458912
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Assessment method	Qualitative assessment
Additional wood prosting advice	Worker - dermal
Additional good practice advice	les este de
Where appropriate, replacement of task by automated and/or closed processes.	
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/t	га

Contributing exposure scenario	
Use descriptors covered	PROC6: Calendering operations Calendering (including Banburys) Use domain: industrial
Operational conditions	
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 1 %
Physical state	liquid
Vapour pressure of the substance during use	268333,1875 Pa
Process temperature	20 °C

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Duration and Frequency of activity	240 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated temperatures
Risk Management Measures	
Provide a good standard of general or	
controlled ventilation (5 to 10 air	Effectiveness: 70 %
changes per hour)	
Minimise exposure by partial	
enclosure of the operation or	Effectiveness: 90 %
equipment and provide extract	Effectiveness. 30 %
ventilation at openings.	
Drain down and flush system prior to	
equipment break-in or maintenance.	
Restrict access to authorised persons.	
Provide specific employee training to	
prevent/minimize exposures. Regular	
inspection and maintenance of	
equipment and machines.	
Minimise exposure by partial	
enclosure of the operation or	
equipment and provide extract	
ventilation at openings. Disposal - This material and its container must	
be disposed of in a safe manner. In case of potential exposure:, Use	
suitable chemically resistant gloves.,	
Wear suitable coveralls to prevent	
exposure to the skin., Wear suitable	
respiratory protection., Clear spills	
immediately, Consider the need for	
risk based health surveillance.	
Avoid frequent and direct contact with	
substance. Clean up contamination as	
soon as they occur. Wash off any skin	
contamination immediately. Provide	
specific employee training to	
prevent/minimize exposures.	
Wear suitable gloves tested to EN	
ISO 374-1.	
Exposure estimate and reference to it	
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	1,0142 mg/m ³
Risk Characterization Ratio (RCR)	0,458912
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Assessment method	Qualitative assessment
	Worker - dermal

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Additional good practice advice	
Where appropriate, replacement of task by automated and/or closed processes.	
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra	

Contributing exposure scenario	
	PROC6: Calendering operations
Use descriptors covered	Cooling cured articles Use domain: industrial
Operational conditions	
	1,3-butadiene
Concentration of the substance	Content: >= 0 % - <= 1 %
Physical state	liquid
Vapour pressure of the substance during use	268333,1875 Pa
Process temperature	20 °C
Duration and Frequency of activity	240 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated
	temperatures
Risk Management Measures	
Local exhaust ventilation	
Provide a good standard of general or	
controlled ventilation (5 to 10 air	Effectiveness: 70 %
changes per hour)	
Drain down and flush system prior to	
equipment break-in or maintenance.	
Restrict access to authorised persons.	
Provide specific employee training to	
prevent/minimize exposures. Regular	
inspection and maintenance of	
equipment and machines.	
Minimise exposure by partial	
enclosure of the operation or	
equipment and provide extract	
ventilation at openings. Disposal - This material and its container must	
be disposed of in a safe manner. In case of potential exposure:, Use	
suitable chemically resistant gloves.,	
Wear suitable coveralls to prevent	
exposure to the skin., Wear suitable	
respiratory protection., Clear spills	
immediately, Consider the need for	
risk based health surveillance.	
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1	ı I
Avoid frequent and direct contact with	
substance. Clean up contamination as	
soon as they occur. Wash off any skin	
contamination immediately. Provide	
specific employee training to	
prevent/minimize exposures.	
Wear suitable gloves tested to EN	
ISO 374-1.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	1,0142 mg/m ³
Risk Characterization Ratio (RCR)	0,458912
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Assessment method	Qualitative assessment
	Worker - dermal
Additional good practice advice	
Where appropriate, replacement of task by automated and/or closed processes.	
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra	

Contributing exposure scenario	Contributing exposure scenario	
Use descriptors covered	PROC6: Calendering operations Cooling cured articles Use domain: industrial	
Operational conditions		
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 1 %	
Physical state	liquid	
Vapour pressure of the substance during use	268333,1875 Pa	
Process temperature	20 °C	
Duration and Frequency of activity	240 min 5 days per week	
Indoor/Outdoor	Indoor	
	Operation is carried out at ambient or elevated temperatures	
Risk Management Measures		
Provide a good standard of general or controlled ventilation (5 to 10 air changes per hour)	Effectiveness: 70 %	
Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings.	Effectiveness: 90 %	
Drain down and flush system prior to		

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equipment break-in or maintenance.	
Restrict access to authorised persons.	
Provide specific employee training to	
prevent/minimize exposures. Regular	
inspection and maintenance of	
equipment and machines.	
Minimise exposure by partial	
enclosure of the operation or	
equipment and provide extract	
ventilation at openings. Disposal -	
This material and its container must	
be disposed of in a safe manner.	
In case of potential exposure:, Use	
suitable chemically resistant gloves.,	
Wear suitable coveralls to prevent	
exposure to the skin., Wear suitable	
respiratory protection., Clear spills	
immediately, Consider the need for	
risk based health surveillance.	
Avoid frequent and direct contact with	
substance. Clean up contamination as	
soon as they occur. Wash off any skin	
contamination immediately. Provide	
specific employee training to	
prevent/minimize exposures.	
Wear suitable gloves tested to EN	
ISO 374-1.	
Exposure estimate and reference to	
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	1,0142 mg/m³
Risk Characterization Ratio (RCR)	0,458912
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Assessment method	Qualitative assessment
	Worker - dermal
Additional good practice advice	
Where appropriate, replacement of task by automated and/or closed processes.	
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/t	ra

Contributing exposure scenario	
Use descriptors covered	PROC6: Calendering operations Vulcanisation Use domain: industrial
Operational conditions	
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 1 %

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Physical state	liquid
Vapour pressure of the substance	268333,1875 Pa
during use	
Process temperature	20 °C
Duration and Frequency of activity	240 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated temperatures
Risk Management Measures	
Local exhaust ventilation	
Provide a good standard of general or controlled ventilation (5 to 10 air changes per hour)	Effectiveness: 70 %
Drain down and flush system prior to	
equipment break-in or maintenance.	
Restrict access to authorised persons.	
Provide specific employee training to	
prevent/minimize exposures. Regular inspection and maintenance of	
equipment and machines.	
Minimise exposure by partial	
enclosure of the operation or	
equipment and provide extract	
ventilation at openings. Disposal -	
This material and its container must	
be disposed of in a safe manner.	
In case of potential exposure:, Use	
suitable chemically resistant gloves.,	
Wear suitable coveralls to prevent	
exposure to the skin., Wear suitable	
respiratory protection., Clear spills	
immediately, Consider the need for	
risk based health surveillance.	
Avoid frequent and direct contact with substance. Clean up contamination as	
soon as they occur. Wash off any skin	
contamination immediately. Provide	
specific employee training to	
prevent/minimize exposures.	
Wear suitable gloves tested to EN ISO 374-1.	
Exposure estimate and reference to it	ts source
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	1,0142 mg/m³
Risk Characterization Ratio (RCR)	0,458912
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker

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Assessment method	Qualitative assessment
	Worker - dermal
Additional good practice advice	
Where appropriate, replacement of task by automated and/or closed processes.	
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/	tra

Contributing exposure scenario	
Contributing exposure scenario	PROC6: Calendering operations
Use descriptors covered	Vulcanisation Use domain: industrial
	Valoamoadon 666 domain madotha
Operational conditions	
	1,3-butadiene
Concentration of the substance	Content: >= 0 % - <= 1 %
Physical state	liquid
Vapour pressure of the substance	268333,1875 Pa
during use	
Process temperature	20 °C
Duration and Frequency of activity	240 min 5 days per week
, , ,	Later
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated
Diek Management Managemen	temperatures
Risk Management Measures	
Provide a good standard of general or	Effectiveness: 70 %
controlled ventilation (5 to 10 air changes per hour)	Effectiveness. 70 %
Minimise exposure by partial	
enclosure of the operation or	
equipment and provide extract	Effectiveness: 90 %
ventilation at openings.	
Drain down and flush system prior to	
equipment break-in or maintenance.	
Restrict access to authorised persons.	
Provide specific employee training to	
prevent/minimize exposures. Regular	
inspection and maintenance of	
equipment and machines.	
Minimise exposure by partial	
enclosure of the operation or	
equipment and provide extract	
ventilation at openings. Disposal -	
This material and its container must	
be disposed of in a safe manner.	
In case of potential exposure:, Use	
suitable chemically resistant gloves.,	

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Wear suitable coveralls to prevent	
exposure to the skin., Wear suitable	
respiratory protection., Clear spills	
immediately, Consider the need for	
risk based health surveillance.	
Avoid frequent and direct contact with	
substance. Clean up contamination as	
soon as they occur. Wash off any skin	
contamination immediately. Provide	
specific employee training to	
prevent/minimize exposures.	
Wear suitable gloves tested to EN	
ISO 374-1.	
Exposure estimate and reference to it	ts source
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	1,0142 mg/m³
Risk Characterization Ratio (RCR)	0,458912
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Assessment method	Qualitative assessment
	Worker - dermal
Additional good practice advice	
Where appropriate, replacement of task by automated and/or closed processes.	
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/t	ra

Contributing exposure scenario	
Use descriptors covered	PROC8a: Transfer of substance or mixture (charging and discharging) at non-dedicated facilities Equipment maintenance Use domain: industrial
Operational conditions	
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance during use	268333,1875 Pa
Process temperature	20 °C
Duration and Frequency of activity	240 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated temperatures
Risk Management Measures	
Local exhaust ventilation	
Wear suitable respiratory protection.	Effectiveness: 90 %

1,3-Butadiene

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Version 17.0 (en)
replaces version of 15.11.2024 (16.0)

Contributing exposure scenario

Use descriptors covered



Provide a good standard of general or controlled ventilation (5 to 10 air changes per hour)	Effectiveness: 70 %
Drain down and flush system prior to	
equipment break-in or maintenance.	
Restrict access to authorised persons.	
Provide specific employee training to	
prevent/minimize exposures. Regular	
inspection and maintenance of	
equipment and machines.	
Minimise exposure by partial	
enclosure of the operation or	
equipment and provide extract	
ventilation at openings. Disposal - This material and its container must	
be disposed of in a safe manner.	
In case of potential exposure:, Use suitable chemically resistant gloves.,	
Wear suitable coveralls to prevent	
exposure to the skin., Wear suitable	
respiratory protection., Clear spills	
immediately, Consider the need for	
risk based health surveillance.	
Avoid frequent and direct contact with	
substance. Clean up contamination as	
soon as they occur. Wash off any skin	
contamination immediately. Provide	
specific employee training to	
prevent/minimize exposures.	
Wear suitable gloves tested to EN	
ISO 374-1.	
Exposure estimate and reference to	
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	1,0142 mg/m³
Risk Characterization Ratio (RCR)	0,458912
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Assessment method	Qualitative assessment
	Worker - dermal
Additional good practice advice	
Where appropriate, replacement of task by automated and/or closed processes.	
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/t	ra

PROC8a: Transfer of substance or mixture (charging and

discharging) at non-dedicated facilities

Equipment maintenance Use domain: industrial

1,3-Butadiene



Operational conditions	
-	1,3-butadiene
Concentration of the substance	Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance	268333,1875 Pa
during use	
Process temperature	20 °C
Duration and Frequency of activity	240 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated
	temperatures
Risk Management Measures	
Provide a good standard of general or	
controlled ventilation (5 to 10 air	Effectiveness: 70 %
changes per hour)	
Wear suitable respiratory protection.	Effectiveness: 90 %
Drain down and flush system prior to	
equipment break-in or maintenance.	
Restrict access to authorised persons.	
Provide specific employee training to	
prevent/minimize exposures. Regular	
inspection and maintenance of	
equipment and machines.	
Minimise exposure by partial	
enclosure of the operation or	
equipment and provide extract	
ventilation at openings. Disposal -	
This material and its container must	
be disposed of in a safe manner.	
In case of potential exposure:, Use	
suitable chemically resistant gloves.,	
Wear suitable coveralls to prevent	
exposure to the skin., Wear suitable	
respiratory protection., Clear spills	
immediately, Consider the need for	
risk based health surveillance.	
Avoid frequent and direct contact with	
substance. Clean up contamination as	
soon as they occur. Wash off any skin	
contamination immediately. Provide	
specific employee training to	
prevent/minimize exposures.	
Wear suitable gloves tested to EN	
ISO 374-1.	
Exposure estimate and reference to	
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker

1,3-Butadiene



	Worker - inhalation, long-term - systemic	
Exposure estimate	1,0142 mg/m ³	
Risk Characterization Ratio (RCR)	0,458912	
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker	
Assessment method	Qualitative assessment	
	Worker - dermal	
Additional good practice advice		
Where appropriate, replacement of task by automated and/or closed processes.		
Guidance to Downstream Users		
For scaling see: http://www.ecetoc.org/tra		

Contributing exposure scenario	Contributing exposure scenario		
Use descriptors covered	PROC8b: Transfer of substance or mixture (charging and discharging) at dedicated facilities Material transfers Dedicated facility Use domain: industrial		
Operational conditions			
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 100 %		
Physical state	liquid		
Vapour pressure of the substance during use	268333,1875 Pa		
Process temperature	20 °C		
Duration and Frequency of activity	60 min 5 days per week		
Indoor/Outdoor	Indoor		
	Operation is carried out at ambient or elevated		
Diek Menegement Messures	temperatures		
Risk Management Measures Local exhaust ventilation			
Provide a good standard of general or controlled ventilation (5 to 10 air changes per hour)	Effectiveness: 70 %		
Drain down and flush system prior to equipment break-in or maintenance. Restrict access to authorised persons. Provide specific employee training to prevent/minimize exposures. Regular inspection and maintenance of equipment and machines. Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings. Disposal - This material and its container must be disposed of in a safe manner.			

1,3-Butadiene



I	l I
In case of potential exposure:, Use	
suitable chemically resistant gloves.,	
Wear suitable coveralls to prevent	
exposure to the skin., Wear suitable	
respiratory protection., Clear spills	
immediately, Consider the need for	
risk based health surveillance.	
Avoid frequent and direct contact with	
substance. Clean up contamination as	
soon as they occur. Wash off any skin	
contamination immediately. Provide	
specific employee training to	
prevent/minimize exposures.	
Wear suitable gloves tested to EN	
ISO 374-1.	
Exposure estimate and reference to it	ts source
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	1,0142 mg/m³
Risk Characterization Ratio (RCR)	0,458912
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Assessment method	Qualitative assessment
	Worker - dermal
Additional good practice advice	
Where appropriate, replacement of task by automated and/or closed processes.	
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 Material transfers Dedicated facility Use domain: industrial
Operational conditions	·
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance during use	268333,1875 Pa
Process temperature	20 °C
Duration and Frequency of activity	60 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated temperatures
Risk Management Measures	

1,3-Butadiene



Local exhaust ventilation	
Provide a good standard of general or	
controlled ventilation (5 to 10 air	Effectiveness: 70 %
changes per hour)	
Drain down and flush system prior to	
equipment break-in or maintenance.	
Restrict access to authorised persons.	
Provide specific employee training to	
prevent/minimize exposures. Regular	
inspection and maintenance of	
equipment and machines.	
Minimise exposure by partial	
enclosure of the operation or	
equipment and provide extract	
ventilation at openings. Disposal -	
This material and its container must	
be disposed of in a safe manner.	
In case of potential exposure:, Use	
suitable chemically resistant gloves.,	
Wear suitable coveralls to prevent	
exposure to the skin., Wear suitable	
respiratory protection., Clear spills	
immediately, Consider the need for	
risk based health surveillance.	
Avoid frequent and direct contact with	
substance. Clean up contamination as	
soon as they occur. Wash off any skin	
contamination immediately. Provide	
specific employee training to	
prevent/minimize exposures.	
Wear suitable gloves tested to EN	
ISO 374-1.	
Exposure estimate and reference to i	
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	1,0142 mg/m ³
Risk Characterization Ratio (RCR)	0,458912
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Assessment method	Qualitative assessment
Additional mand was the sadely	Worker - dermal
Additional good practice advice	less as the grant and less also and grant and
	by automated and/or closed processes.
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/t	ra

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

Operational conditions	
Operational conditions	1,3-butadiene
Concentration of the substance	Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance during use	268333,1875 Pa
Process temperature	20 °C
Duration and Frequency of activity	60 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated temperatures
Risk Management Measures	
Local exhaust ventilation	
Transfer via enclosed lines	Effectiveness: 70 %
Drain down and flush system prior to	
equipment break-in or maintenance.	
Restrict access to authorised persons.	
Provide specific employee training to	
prevent/minimize exposures. Regular	
inspection and maintenance of	
equipment and machines.	
Minimise exposure by partial	
enclosure of the operation or	
equipment and provide extract	
ventilation at openings. Disposal -	
This material and its container must	
be disposed of in a safe manner.	
In case of potential exposure:, Use	
suitable chemically resistant gloves.,	
Wear suitable coveralls to prevent	
exposure to the skin., Wear suitable	
respiratory protection., Clear spills	
immediately, Consider the need for	
risk based health surveillance.	
Avoid frequent and direct contact with	
substance. Clean up contamination as	
soon as they occur. Wash off any skin	
contamination immediately. Provide	
specific employee training to	
prevent/minimize exposures.	
Wear suitable gloves tested to EN	
ISO 374-1.	
Exposure estimate and reference to it	its source
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker

1,3-Butadiene



Exposure estimate	1,0142 mg/m ³	
Risk Characterization Ratio (RCR)	0,458912	
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker	
Assessment method	Qualitative assessment	
	Worker - dermal	
Additional good practice advice		
Where appropriate, replacement of task by automated and/or closed processes.		
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 Material transfers Dedicated facility Use domain: industrial
Operational conditions	
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance during use	268333,1875 Pa
Process temperature	20 °C
Duration and Frequency of activity	60 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated temperatures
Risk Management Measures	
Local exhaust ventilation	
Transfer via enclosed lines	Effectiveness: 70 %
Drain down and flush system prior to equipment break-in or maintenance. Restrict access to authorised persons. Provide specific employee training to prevent/minimize exposures. Regular inspection and maintenance of equipment and machines.	
Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings. Disposal - This material and its container must be disposed of in a safe manner. In case of potential exposure:, Use suitable chemically resistant gloves., Wear suitable coveralls to prevent	

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exposure to the skin., Wear suitable		
respiratory protection., Clear spills		
immediately, Consider the need for		
risk based health surveillance.		
Avoid frequent and direct contact with		
substance. Clean up contamination as		
soon as they occur. Wash off any skin		
contamination immediately. Provide		
specific employee training to		
prevent/minimize exposures.		
Wear suitable gloves tested to EN		
ISO 374-1.		
Exposure estimate and reference to it	Exposure estimate and reference to its source	
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker	
	Worker - inhalation, long-term - systemic	
Exposure estimate	1,0142 mg/m³	
Risk Characterization Ratio (RCR)	0,458912	
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker	
Assessment method	Qualitative assessment	
	Worker - dermal	
Additional good practice advice		
Where appropriate, replacement of task	by automated and/or closed processes.	
Guidance to Downstream Users		
For scaling see: http://www.ecetoc.org/t	ra	

Contributing exposure scenario		
Use descriptors covered	PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing). Material transfers Use domain: industrial	
Operational conditions		
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 1 %	
Physical state	liquid	
Vapour pressure of the substance during use	268333,1875 Pa	
Process temperature	20 °C	
Duration and Frequency of activity	240 min 5 days per week	
Indoor/Outdoor	Indoor	
	Operation is carried out at ambient or elevated temperatures	
Risk Management Measures		
Local exhaust ventilation		
Provide a good standard of general or controlled ventilation (5 to 10 air	Effectiveness: 70 %	

1,3-Butadiene



changes per hour)	
Drain down and flush system prior to	
equipment break-in or maintenance.	
Restrict access to authorised persons.	
Provide specific employee training to	
prevent/minimize exposures. Regular	
inspection and maintenance of	
equipment and machines.	
Minimise exposure by partial	
enclosure of the operation or	
equipment and provide extract	
ventilation at openings. Disposal -	
This material and its container must	
be disposed of in a safe manner.	
In case of potential exposure:, Use	
suitable chemically resistant gloves.,	
Wear suitable coveralls to prevent	
exposure to the skin., Wear suitable	
respiratory protection., Clear spills	
immediately, Consider the need for	
risk based health surveillance.	
Avoid frequent and direct contact with	
substance. Clean up contamination as	
soon as they occur. Wash off any skin	
contamination immediately. Provide	
specific employee training to	
prevent/minimize exposures.	
Wear suitable gloves tested to EN	
ISO 374-1.	
Exposure estimate and reference to i	
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	0,8114 mg/m ³
Risk Characterization Ratio (RCR)	0,367129
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Assessment method	Qualitative assessment
	Worker - dermal
Additional good practice advice	
Where appropriate, replacement of task	by automated and/or closed processes.
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/ti	ra

Contributing exposure scenario	
Use descriptors covered	PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing). Material transfers Use domain: industrial
Operational conditions	

1,3-Butadiene



1	1,3-butadiene
Concentration of the substance	Content: >= 0 % - <= 1 %
Concontration of the capetance	
Physical state	liquid
Vapour pressure of the substance	268333,1875 Pa
during use	,
Process temperature	20 °C
1 locess temperature	
Duration and Frequency of activity	240 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated
	temperatures
Risk Management Measures	
Local exhaust ventilation	
Transfer via enclosed lines	Effectiveness: 70 %
Drain down and flush system prior to	
equipment break-in or maintenance.	
Restrict access to authorised persons.	
Provide specific employee training to	
prevent/minimize exposures. Regular	
inspection and maintenance of equipment and machines.	
Minimise exposure by partial	
enclosure of the operation or	
equipment and provide extract	
ventilation at openings. Disposal -	
This material and its container must	
be disposed of in a safe manner.	
In case of potential exposure:, Use	
suitable chemically resistant gloves.,	
Wear suitable coveralls to prevent	
exposure to the skin., Wear suitable	
respiratory protection., Clear spills	
immediately, Consider the need for	
risk based health surveillance.	
Avoid frequent and direct contact with	
substance. Clean up contamination as	
soon as they occur. Wash off any skin	
contamination immediately. Provide	
specific employee training to	
prevent/minimize exposures.	
Wear suitable gloves tested to EN ISO 374-1.	
Exposure estimate and reference to it	its source
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
, isossonioni motnou	Worker - inhalation, long-term - systemic
Exposure estimate	0,8114 mg/m³
Risk Characterization Ratio (RCR)	0,367129
Thor onaracionzation Hatio (HOH)	0,007120

1,3-Butadiene



Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker	
Assessment method	Qualitative assessment	
	Worker - dermal	
Additional good practice advice		
Where appropriate, replacement of task by automated and/or closed processes.		
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). Small scale weighing Dedicated facility Use domain: industrial
Operational conditions	
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 5 %
Physical state	liquid
Vapour pressure of the substance during use	268333,1875 Pa
Process temperature	20 °C
Duration and Frequency of activity	240 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated temperatures
Risk Management Measures	
Local exhaust ventilation	
Provide a good standard of general or controlled ventilation (5 to 10 air changes per hour)	Effectiveness: 70 %
Drain down and flush system prior to equipment break-in or maintenance. Restrict access to authorised persons. Provide specific employee training to prevent/minimize exposures. Regular inspection and maintenance of equipment and machines.	
Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings. Disposal - This material and its container must be disposed of in a safe manner. In case of potential exposure:, Use suitable chemically resistant gloves.,	

1,3-Butadiene



	i i
Wear suitable coveralls to prevent	
exposure to the skin., Wear suitable	
respiratory protection., Clear spills	
immediately, Consider the need for	
risk based health surveillance.	
Avoid frequent and direct contact with	
substance. Clean up contamination as	
soon as they occur. Wash off any skin	
contamination immediately. Provide	
specific employee training to	
prevent/minimize exposures.	
Wear suitable gloves tested to EN	
ISO 374-1.	
Exposure estimate and reference to it	ts source
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	1,6227 mg/m ³
Risk Characterization Ratio (RCR)	0,734259
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Assessment method	Qualitative assessment
	Worker - dermal
Additional good practice advice	
Where appropriate, replacement of task	by automated and/or closed processes.
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/t	ra

Contributing exposure scenario	
Use descriptors covered	PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing). Small scale weighing Dedicated facility Use domain: industrial
Operational conditions	
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 5 %
Physical state	liquid
Vapour pressure of the substance during use	268333,1875 Pa
Process temperature	20 °C
Duration and Frequency of activity	240 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated
	temperatures
Risk Management Measures	
Provide a good standard of general or	Effectiveness: 70 %

controlled ventilation (5 to 10 air	
changes per hour)	
Ensure material transfers are under	Effection and OO O/
containment or extract ventilation	Effectiveness: 90 %
Drain down and flush system prior to	
equipment break-in or maintenance.	
Restrict access to authorised persons.	
Provide specific employee training to	
prevent/minimize exposures. Regular	
inspection and maintenance of	
equipment and machines.	
Minimise exposure by partial	
enclosure of the operation or	
equipment and provide extract	
ventilation at openings. Disposal -	
This material and its container must	
be disposed of in a safe manner.	
In case of potential exposure:, Use	
suitable chemically resistant gloves.,	
Wear suitable coveralls to prevent	
exposure to the skin., Wear suitable	
respiratory protection., Clear spills	
immediately, Consider the need for	
risk based health surveillance.	
Avoid frequent and direct contact with	
substance. Clean up contamination as	
soon as they occur. Wash off any skin	
contamination immediately. Provide	
specific employee training to	
prevent/minimize exposures.	
Wear suitable gloves tested to EN	
ISO 374-1.	
Exposure estimate and reference to	
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	1,6227 mg/m ³
Risk Characterization Ratio (RCR)	0,734259
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Assessment method	Qualitative assessment
	Worker - dermal
Additional good practice advice	
	by automated and/or closed processes.
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/	ira

Contributing exposure scenario	
	PROC14: Tabletting, compression, extrusion, pelletisation,
Use descriptors covered	granulation
	Pressing uncured rubber blanks Use domain: industrial

1,3-Butadiene



Operational conditions	
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 1 %
Physical state	liquid
Vapour pressure of the substance during use	268333,1875 Pa
Process temperature	20 °C
Duration and Frequency of activity	240 min 5 days per week
Indoor/Outdoor	Indoor Operation is carried out at ambient or elevated temperatures
Risk Management Measures	To
Local exhaust ventilation	
Provide a good standard of general or controlled ventilation (5 to 10 air changes per hour)	Effectiveness: 70 %
Drain down and flush system prior to equipment break-in or maintenance. Restrict access to authorised persons. Provide specific employee training to prevent/minimize exposures. Regular inspection and maintenance of equipment and machines.	
Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings. Disposal - This material and its container must be disposed of in a safe manner.	
In case of potential exposure:, Use suitable chemically resistant gloves., Wear suitable coveralls to prevent exposure to the skin., Wear suitable respiratory protection., Clear spills immediately, Consider the need for risk based health surveillance.	
Avoid frequent and direct contact with substance. Clean up contamination as soon as they occur. Wash off any skin contamination immediately. Provide specific employee training to prevent/minimize exposures.	
Wear suitable gloves tested to EN ISO 374-1. Exposure estimate and reference to i	ts source

1,3-Butadiene



Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker	
	Worker - inhalation, long-term - systemic	
Exposure estimate	1,0142 mg/m ³	
Risk Characterization Ratio (RCR)	0,458912	
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker	
Assessment method	Qualitative assessment	
	Worker - dermal	
Additional good practice advice		
Where appropriate, replacement of task by automated and/or closed processes.		
Guidance to Downstream Users		
For scaling see: http://www.ecetoc.org/tra		

Contributing exposure scenario	
Use descriptors covered	PROC14: Tabletting, compression, extrusion, pelletisation, granulation Pressing uncured rubber blanks Use domain: industrial
Operational conditions	
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 1 %
Physical state	liquid
Vapour pressure of the substance during use	268333,1875 Pa
Process temperature	20 °C
Duration and Frequency of activity	240 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated temperatures
Risk Management Measures	
Provide a good standard of general or controlled ventilation (5 to 10 air changes per hour)	Effectiveness: 70 %
Ensure material transfers are under containment or extract ventilation	Effectiveness: 90 %
Drain down and flush system prior to equipment break-in or maintenance. Restrict access to authorised persons. Provide specific employee training to prevent/minimize exposures. Regular inspection and maintenance of equipment and machines. Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings. Disposal -	

1,3-Butadiene



1	
This material and its container must	
be disposed of in a safe manner.	
In case of potential exposure:, Use	
suitable chemically resistant gloves.,	
Wear suitable coveralls to prevent	
exposure to the skin., Wear suitable	
respiratory protection., Clear spills	
immediately, Consider the need for	
risk based health surveillance.	
Avoid frequent and direct contact with	
substance. Clean up contamination as	
soon as they occur. Wash off any skin	
contamination immediately. Provide	
specific employee training to	
prevent/minimize exposures.	
Wear suitable gloves tested to EN	
ISO 374-1.	
Exposure estimate and reference to it	ts source
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	1,0142 mg/m³
Risk Characterization Ratio (RCR)	0,458912
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Assessment method	Qualitative assessment
	Worker - dermal
Additional good practice advice	
Where appropriate, replacement of task	by automated and/or closed processes.
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/t	ra

Contributing exposure scenario	
	PROC15: Use a laboratory reagent.
Use descriptors covered	Laboratory activities Use domain: industrial
Operational conditions	
	1,3-butadiene
Concentration of the substance	Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance	268333,1875 Pa
during use	
Process temperature	20 °C
1 locess temperature	
Duration and Frequency of activity	60 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated
	temperatures

1,3-Butadiene



Risk Management Measures	
Local exhaust ventilation	
Provide a good standard of general	
ventilation (not less than 3 - 5 air	Effectiveness: 30 %
changes per hour)	
Drain down and flush system prior to	
equipment break-in or maintenance.	
Restrict access to authorised persons.	
Provide specific employee training to	
prevent/minimize exposures. Regular	
inspection and maintenance of	
equipment and machines.	
Minimise exposure by partial	
enclosure of the operation or	
equipment and provide extract	
ventilation at openings. Disposal - This material and its container must	
be disposed of in a safe manner.	
In case of potential exposure:, Use	
suitable chemically resistant gloves.,	
Wear suitable coveralls to prevent	
exposure to the skin., Wear suitable	
respiratory protection., Clear spills	
immediately, Consider the need for	
risk based health surveillance.	
Avoid frequent and direct contact with	
substance. Clean up contamination as	
soon as they occur. Wash off any skin	
contamination immediately. Provide	
specific employee training to	
prevent/minimize exposures.	
Wear suitable gloves tested to EN	
ISO 374-1.	
Exposure estimate and reference to i	
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	1,5776 mg/m ³
Risk Characterization Ratio (RCR)	0,713863
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Assessment method	Qualitative assessment
Additional good prostice of the	Worker - dermal
Additional good practice advice	by automated and/or aloned processes
	by automated and/or closed processes.
Guidance to Downstream Users	ro
For scaling see: http://www.ecetoc.org/t	la e

Contributing exposure scenario	
Use descriptors covered	PROC15: Use a laboratory reagent.

	Laboratory activities Use domain: industrial
Operational conditions	L
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance during use	268333,1875 Pa
Process temperature	20 °C
Duration and Frequency of activity	60 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated temperatures
Risk Management Measures	
Drain down and flush system prior to equipment break-in or maintenance. Restrict access to authorised persons. Provide specific employee training to prevent/minimize exposures. Regular inspection and maintenance of equipment and machines.	
Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings. Disposal - This material and its container must be disposed of in a safe manner.	
In case of potential exposure:, Use suitable chemically resistant gloves., Wear suitable coveralls to prevent exposure to the skin., Wear suitable respiratory protection., Clear spills immediately, Consider the need for risk based health surveillance.	
Avoid frequent and direct contact with substance. Clean up contamination as soon as they occur. Wash off any skin contamination immediately. Provide specific employee training to prevent/minimize exposures.	
Wear suitable gloves tested to EN ISO 374-1.	
Exposure estimate and reference to	
Assessment method	
Assessment method Exposure estimate Exposure estimate	EASY TRA v6.0, ECETOC TRA v3.0, Worker Worker - inhalation, long-term - systemic 1,1269 mg/m ³

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Risk Characterization Ratio (RCR)	0,509902
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Assessment method	Qualitative assessment
	Worker - dermal
Additional good practice advice	
Where appropriate, replacement of task	by automated and/or closed processes.
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/t	ra

* * * * * * * * * * * * * * * *

9. Short title of exposure scenario

Polymer processing, (use in professional settings) PW; ERC8a; PROC1, PROC2, PROC6, PROC8a, PROC8b

Control of exposure and risk management measures

Contributing exposure scenario	
Use descriptors covered	ERC8a: Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor) As no environmental hazard was identified no environmental-related exposure assessment and risk characterization was performed.
Operational conditions	•

Contributing exposure scenario	
Use descriptors covered	PROC1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions. Bulk transfer (closed systems) Use domain: professional
Operational conditions	
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance during use	268333,1875 Pa
Process temperature	20 °C
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated
	temperatures
Risk Management Measures	

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Print date 19.11.2024
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Drain down and flush system prior to equipment break-in or maintenance. Restrict access to authorised persons. Provide specific employee training to prevent/minimize exposures. Regular inspection and maintenance of equipment and machines. Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings. Disposal -This material and its container must be disposed of in a safe manner. In case of potential exposure:, Use suitable chemically resistant gloves... Wear suitable coveralls to prevent exposure to the skin., Wear suitable respiratory protection., Clear spills immediately, Consider the need for risk based health surveillance. Avoid frequent and direct contact with substance. Clean up contamination as soon as they occur. Wash off any skin contamination immediately. Provide specific employee training to prevent/minimize exposures. Wear suitable gloves tested to EN ISO 374-1. Exposure estimate and reference to its source Assessment method EASY TRA v6.0, ECETOC TRA v3.0, Worker Worker - inhalation, long-term - systemic Exposure estimate 0,2254 mg/m³ Risk Characterization Ratio (RCR) 0.10198 Assessment method EASY TRA v6.0, ECETOC TRA v3.0, Worker Assessment method Qualitative assessment Worker - dermal Additional good practice advice Where appropriate, replacement of task by automated and/or closed processes. Guidance to Downstream Users For scaling see: http://www.ecetoc.org/tra

Contributing exposure scenario	
Use descriptors covered	PROC1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions. Storage Use domain: professional
Operational conditions	
Concentration of the substance	1,3-butadiene

1,3-Butadiene



	Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance during use	268333,1875 Pa
Process temperature	20 °C
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated temperatures
Risk Management Measures	
Drain down and flush system prior to equipment break-in or maintenance. Restrict access to authorised persons. Provide specific employee training to prevent/minimize exposures. Regular inspection and maintenance of equipment and machines.	
Minimise exposure by partial	
enclosure of the operation or equipment and provide extract ventilation at openings. Disposal - This material and its container must be disposed of in a safe manner. In case of potential exposure:, Use	
suitable chemically resistant gloves., Wear suitable coveralls to prevent exposure to the skin., Wear suitable respiratory protection., Clear spills immediately, Consider the need for risk based health surveillance.	
Avoid frequent and direct contact with substance. Clean up contamination as soon as they occur. Wash off any skin contamination immediately. Provide specific employee training to prevent/minimize exposures. Wear suitable gloves tested to EN	
ISO 374-1.	
Exposure estimate and reference to	
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	0,2254 mg/m ³
Risk Characterization Ratio (RCR)	0,10198
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Assessment method	Qualitative assessment
	Worker - dermal

1,3-Butadiene



Additional good practice advice
Where appropriate, replacement of task by automated and/or closed processes.
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 Bulk transfer (closed systems) With occasional controlled exposure. Use domain: professional
Operational conditions	
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 1 %
Physical state	liquid
Vapour pressure of the substance during use	268333,1875 Pa
Process temperature	20 °C
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor Operation is carried out at ambient or elevated temperatures
Risk Management Measures	
Local exhaust ventilation	
Provide a good standard of general ventilation (not less than 3 - 5 air changes per hour)	Effectiveness: 30 %
Drain down and flush system prior to equipment break-in or maintenance. Restrict access to authorised persons. Provide specific employee training to prevent/minimize exposures. Regular inspection and maintenance of equipment and machines.	
Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings. Disposal - This material and its container must be disposed of in a safe manner. In case of potential exposure:, Use suitable chemically resistant gloves.,	
Wear suitable coveralls to prevent exposure to the skin., Wear suitable respiratory protection., Clear spills	

1,3-Butadiene



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immediately, Consider the need for	
risk based health surveillance.	
Avoid frequent and direct contact with	
substance. Clean up contamination as	
soon as they occur. Wash off any skin	
contamination immediately. Provide	
specific employee training to	
prevent/minimize exposures.	
Wear suitable gloves tested to EN	
ISO 374-1.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	1,5776 mg/m³
Risk Characterization Ratio (RCR)	0,713863
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Assessment method	Qualitative assessment
	Worker - dermal
Additional good practice advice	
Where appropriate, replacement of task by automated and/or closed processes.	
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/t	ra

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 Bulk transfer (closed systems) With occasional controlled exposure. Use domain: professional
Operational conditions	
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 1 %
Physical state	liquid
Vapour pressure of the substance during use	268333,1875 Pa
Process temperature	20 °C
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated temperatures
Risk Management Measures	
Provide a good standard of general ventilation (not less than 3 - 5 air changes per hour)	Effectiveness: 30 %

1,3-Butadiene



Ensure material transfers are under	Effectiveness: 80 %
containment or extract ventilation	Lifective fiess. 00 76
Drain down and flush system prior to	
equipment break-in or maintenance.	
Restrict access to authorised persons.	
Provide specific employee training to	
prevent/minimize exposures. Regular	
inspection and maintenance of	
equipment and machines.	
Minimise exposure by partial	
enclosure of the operation or	
equipment and provide extract	
ventilation at openings. Disposal -	
This material and its container must	
be disposed of in a safe manner.	
In case of potential exposure:, Use	
suitable chemically resistant gloves.,	
Wear suitable coveralls to prevent	
exposure to the skin., Wear suitable	
respiratory protection., Clear spills	
immediately, Consider the need for	
risk based health surveillance.	
Avoid frequent and direct contact with	
substance. Clean up contamination as	
soon as they occur. Wash off any skin	
contamination immediately. Provide	
specific employee training to	
prevent/minimize exposures.	
Wear suitable gloves tested to EN	
ISO 374-1.	
Exposure estimate and reference to	
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	1,5776 mg/m ³
Risk Characterization Ratio (RCR)	0,713863
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Assessment method	Qualitative assessment
	Worker - dermal
Additional good practice advice	
	by automated and/or closed processes.
Guidance to Downstream Users	·
For scaling see: http://www.ecetoc.org/	ira

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 Storage With occasional controlled exposure. Use domain: professional

1,3-Butadiene



Operational conditions Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 1 %
•	
Concentration of the substance	Content: >= 0 % - <= 1 %
Physical state	liquid
Vapour pressure of the substance during use	268333,1875 Pa
Process temperature	20 °C
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated temperatures
Risk Management Measures	100000000000000000000000000000000000000
Local exhaust ventilation	
Provide a good standard of general ventilation (not less than 3 - 5 air changes per hour)	Effectiveness: 30 %
Drain down and flush system prior to equipment break-in or maintenance. Restrict access to authorised persons. Provide specific employee training to prevent/minimize exposures. Regular inspection and maintenance of equipment and machines.	
Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings. Disposal - This material and its container must be disposed of in a safe manner.	
In case of potential exposure:, Use suitable chemically resistant gloves., Wear suitable coveralls to prevent exposure to the skin., Wear suitable respiratory protection., Clear spills immediately, Consider the need for risk based health surveillance.	
Avoid frequent and direct contact with substance. Clean up contamination as soon as they occur. Wash off any skin contamination immediately. Provide specific employee training to prevent/minimize exposures.	
Wear suitable gloves tested to EN ISO 374-1. Exposure estimate and reference to it.	ts source

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Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker	
	Worker - inhalation, long-term - systemic	
Exposure estimate	1,5776 mg/m ³	
Risk Characterization Ratio (RCR)	0,713863	
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker	
Assessment method	Qualitative assessment	
	Worker - dermal	
Additional good practice advice		
Where appropriate, replacement of task by automated and/or closed processes.		
Guidance to Downstream Users		
For scaling see: http://www.ecetoc.org/t	ra	

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 Storage With occasional controlled exposure. Use domain: professional
Operational conditions	
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 1 %
Physical state	liquid
Vapour pressure of the substance during use	268333,1875 Pa
Process temperature	20 °C
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated temperatures
Risk Management Measures	
Provide a good standard of general ventilation (not less than 3 - 5 air changes per hour)	Effectiveness: 30 %
Handle substance within closed system.	Effectiveness: 80 %
Drain down and flush system prior to equipment break-in or maintenance. Restrict access to authorised persons. Provide specific employee training to prevent/minimize exposures. Regular inspection and maintenance of equipment and machines. Minimize exposure by portial	
Minimise exposure by partial enclosure of the operation or	

1,3-Butadiene



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equipment and provide extract	
ventilation at openings. Disposal -	
This material and its container must	
be disposed of in a safe manner.	
In case of potential exposure:, Use	
suitable chemically resistant gloves.,	
Wear suitable coveralls to prevent	
exposure to the skin., Wear suitable	
respiratory protection., Clear spills	
immediately, Consider the need for	
risk based health surveillance.	
Avoid frequent and direct contact with	
substance. Clean up contamination as	
soon as they occur. Wash off any skin	
contamination immediately. Provide	
specific employee training to	
prevent/minimize exposures.	
Wear suitable gloves tested to EN	
ISO 374-1.	
Exposure estimate and reference to i	
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	1,5776 mg/m ³
Risk Characterization Ratio (RCR)	0,713863
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Assessment method	Qualitative assessment
	Worker - dermal
Additional good practice advice	
	by automated and/or closed processes.
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra	

Contributing exposure scenario	
Use descriptors covered	PROC6: Calendering operations Injection moulding (of articles) Use domain: professional
Operational conditions	
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 1 %
Physical state	liquid
Vapour pressure of the substance during use	268333,1875 Pa
Process temperature	20 °C
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor

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	Operation is carried out at ambient or elevated temperatures
Risk Management Measures	
Local exhaust ventilation	
Provide a good standard of general	
ventilation (not less than 3 - 5 air	Effectiveness: 30 %
changes per hour)	
Minimise exposure by partial	
enclosure of the operation or	Effectiveness: 95 %
equipment and provide extract	Effectiveness. 95 %
ventilation at openings.	
Drain down and flush system prior to	
equipment break-in or maintenance.	
Restrict access to authorised persons.	
Provide specific employee training to	
prevent/minimize exposures. Regular	
inspection and maintenance of	
equipment and machines.	
Minimise exposure by partial	
enclosure of the operation or	
equipment and provide extract	
ventilation at openings. Disposal -	
This material and its container must	
be disposed of in a safe manner.	
In case of potential exposure:, Use	
suitable chemically resistant gloves.,	
Wear suitable coveralls to prevent	
exposure to the skin., Wear suitable	
respiratory protection., Clear spills	
immediately, Consider the need for	
risk based health surveillance.	
Avoid frequent and direct contact with	
substance. Clean up contamination as	
soon as they occur. Wash off any skin	
contamination immediately. Provide	
specific employee training to	
prevent/minimize exposures.	
Wear suitable gloves tested to EN	
ISO 374-1.	
Exposure estimate and reference to it	its source
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
ASSESSITION THE HIGH INC.	Worker - inhalation, long-term - systemic
Evnocuro estimato	0,7888 mg/m ³
Exposure estimate	
Risk Characterization Ratio (RCR)	0,356931
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Assessment method	Qualitative assessment
	Worker - dermal
Additional good practice advice	
Where appropriate, replacement of task	by automated and/or closed processes.

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Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra	

Contributing exposure scenario	Contributing exposure scenario	
PROC6: Calendering operations		
Use descriptors covered	Injection moulding (of articles) Use domain: professional	
Operational conditions		
	1,3-butadiene	
Concentration of the substance	Content: >= 0 % - <= 1 %	
Physical state	liquid	
Vapour pressure of the substance during use	268333,1875 Pa	
Process temperature	20 °C	
Duration and Frequency of activity	480 min 5 days per week	
Indoor/Outdoor	Indoor	
	Operation is carried out at ambient or elevated temperatures	
Risk Management Measures		
Provide a good standard of general		
ventilation (not less than 3 - 5 air	Effectiveness: 30 %	
changes per hour)		
Minimise exposure by partial		
enclosure of the operation or	Effectiveness: 95 %	
equipment and provide extract	2110011010011000100070	
ventilation at openings.		
Handle substance within a	F((-)) 00 0/	
predominantly closed system provided	Effectiveness: 80 %	
with extract ventilation.		
Drain down and flush system prior to equipment break-in or maintenance.		
Restrict access to authorised persons.		
Provide specific employee training to		
prevent/minimize exposures. Regular		
inspection and maintenance of		
equipment and machines.		
Minimise exposure by partial		
enclosure of the operation or		
equipment and provide extract		
ventilation at openings. Disposal -		
This material and its container must		
be disposed of in a safe manner.		
In case of potential exposure:, Use		
suitable chemically resistant gloves.,		
Wear suitable coveralls to prevent		
exposure to the skin., Wear suitable		

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respiratory protection., Clear spills immediately, Consider the need for risk based health surveillance. Avoid frequent and direct contact with substance. Clean up contamination as soon as they occur. Wash off any skin contamination immediately. Provide specific employee training to prevent/minimize exposures. Wear suitable gloves tested to EN ISO 374-1.		
Exposure estimate and reference to it	Exposure estimate and reference to its source	
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker	
	Worker - inhalation, long-term - systemic	
Exposure estimate	0,7888 mg/m ³	
Risk Characterization Ratio (RCR)	0,356931	
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker	
Assessment method	Qualitative assessment	
	Worker - dermal	
Additional good practice advice		
Where appropriate, replacement of task by automated and/or closed processes.		
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 Equipment maintenance Use domain: professional
Operational conditions	•
	1,3-butadiene
Concentration of the substance	Content: >= 0 % - <= 1 %
Physical state	liquid
Vapour pressure of the substance during use	268333,1875 Pa
Process temperature	20 °C
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated
	temperatures
Risk Management Measures	
Local exhaust ventilation	
Wear suitable respiratory protection.	Effectiveness: 90 %
Provide a good standard of general ventilation (not less than 3 - 5 air	Effectiveness: 30 %

1,3-Butadiene



Laboration manifesture	1
changes per hour)	
Drain down and flush system prior to	
equipment break-in or maintenance.	
Restrict access to authorised persons.	
Provide specific employee training to	
prevent/minimize exposures. Regular	
inspection and maintenance of	
equipment and machines.	
Minimise exposure by partial	
enclosure of the operation or	
equipment and provide extract	
ventilation at openings. Disposal -	
This material and its container must	
be disposed of in a safe manner.	
In case of potential exposure:, Use	
suitable chemically resistant gloves.,	
Wear suitable coveralls to prevent	
exposure to the skin., Wear suitable	
respiratory protection., Clear spills	
immediately, Consider the need for	
risk based health surveillance.	
Avoid frequent and direct contact with	
substance. Clean up contamination as	
soon as they occur. Wash off any skin	
contamination immediately. Provide	
specific employee training to	
prevent/minimize exposures.	
Wear suitable gloves tested to EN	
ISO 374-1.	
Exposure estimate and reference to it	
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	1,5776 mg/m ³
Risk Characterization Ratio (RCR)	0,713863
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Assessment method	Qualitative assessment
	Worker - dermal
Additional good practice advice	
	by automated and/or closed processes.
Guidance to Downstream Users	·
For scaling see: http://www.ecetoc.org/t	ra

Contributing exposure scenario	
Use descriptors covered	PROC8a: Transfer of substance or mixture (charging and discharging) at non-dedicated facilities Equipment maintenance Use domain: professional
Operational conditions	

1,3-Butadiene



	1,3-butadiene
Concentration of the substance	Content: >= 0 % - <= 1 %
Physical state	liquid
Vapour pressure of the substance	268333,1875 Pa
during use	, ,
Dua a a a tamana watu wa	20 °C
Process temperature	
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated
	temperatures
Risk Management Measures	
Provide a good standard of general	
ventilation (not less than 3 - 5 air	Effectiveness: 30 %
changes per hour)	
Wear suitable respiratory protection.	Effectiveness: 90 %
Drain down and flush system prior to	
equipment break-in or maintenance.	
Restrict access to authorised persons.	
Provide specific employee training to	
prevent/minimize exposures. Regular	
inspection and maintenance of	
equipment and machines.	
Minimise exposure by partial	
enclosure of the operation or	
equipment and provide extract	
ventilation at openings. Disposal -	
This material and its container must	
be disposed of in a safe manner. In case of potential exposure:, Use	
suitable chemically resistant gloves.,	
Wear suitable coveralls to prevent	
exposure to the skin., Wear suitable	
respiratory protection., Clear spills	
immediately, Consider the need for	
risk based health surveillance.	
Avoid frequent and direct contact with	
substance. Clean up contamination as	
soon as they occur. Wash off any skin	
contamination immediately. Provide	
specific employee training to	
prevent/minimize exposures.	
Wear suitable gloves tested to EN	
ISO 374-1.	
Exposure estimate and reference to	
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic

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Exposure estimate	1,5776 mg/m³
Risk Characterization Ratio (RCR)	0,713863
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Assessment method	Qualitative assessment
	Worker - dermal
Additional good practice advice	
Where appropriate, replacement of task by automated and/or closed processes.	
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 Material transfers Use domain: professional
Operational conditions	
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 1 %
Physical state	liquid
Vapour pressure of the substance during use	268333,1875 Pa
Process temperature	20 °C
Duration and Frequency of activity	60 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated temperatures
Risk Management Measures	
Local exhaust ventilation	
Provide a good standard of general ventilation (not less than 3 - 5 air changes per hour)	Effectiveness: 30 %
Drain down and flush system prior to equipment break-in or maintenance. Restrict access to authorised persons. Provide specific employee training to prevent/minimize exposures. Regular inspection and maintenance of equipment and machines.	
Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings. Disposal - This material and its container must be disposed of in a safe manner. In case of potential exposure:, Use	

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suitable chemically resistant gloves.,	
Wear suitable coveralls to prevent exposure to the skin., Wear suitable	
respiratory protection., Clear spills	
immediately, Consider the need for	
risk based health surveillance.	
Avoid frequent and direct contact with	
substance. Clean up contamination as	
soon as they occur. Wash off any skin	
contamination immediately. Provide	
specific employee training to	
prevent/minimize exposures.	
Wear suitable gloves tested to EN	
ISO 374-1.	
Exposure estimate and reference to it	its source
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	0,7888 mg/m ³
Risk Characterization Ratio (RCR)	0,356931
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Assessment method	Qualitative assessment
	Worker - dermal
Additional good practice advice	
	by automated and/or closed processes.
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/t	ra

Contributing exposure scenario	
Use descriptors covered	PROC8b: Transfer of substance or mixture (charging and discharging) at dedicated facilities Material transfers Use domain: professional
Operational conditions	•
Concentration of the substance	1,3-butadiene Content: >= 0 % - <= 1 %
Physical state	liquid
Vapour pressure of the substance during use	268333,1875 Pa
Process temperature	20 °C
Duration and Frequency of activity	60 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated temperatures
Risk Management Measures	
Provide a good standard of general	Effectiveness: 30 %

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ventilation (not less than 3 - 5 air	
changes per hour)	
Ensure material transfers are under	Effectiveness: 90 %
containment or extract ventilation	
Drain down and flush system prior to	
equipment break-in or maintenance.	
Restrict access to authorised persons.	
Provide specific employee training to	
prevent/minimize exposures. Regular	
inspection and maintenance of	
equipment and machines.	
Minimise exposure by partial	
enclosure of the operation or	
equipment and provide extract	
ventilation at openings. Disposal -	
This material and its container must	
be disposed of in a safe manner.	
In case of potential exposure:, Use	
suitable chemically resistant gloves.,	
Wear suitable coveralls to prevent	
exposure to the skin., Wear suitable	
respiratory protection., Clear spills	
immediately, Consider the need for	
risk based health surveillance.	
Avoid frequent and direct contact with	
substance. Clean up contamination as	
soon as they occur. Wash off any skin	
contamination immediately. Provide	
specific employee training to	
prevent/minimize exposures.	
Wear suitable gloves tested to EN	
ISO 374-1.	
Exposure estimate and reference to it Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Assessment method	Worker - inhalation, long-term - systemic
Exposure estimate	0,7888 mg/m ³
Risk Characterization Ratio (RCR)	0,356931
Assessment method	EASY TRA v6.0, ECETOC TRA v3.0, Worker
Assessment method	Qualitative assessment
<u> </u>	Worker - dermal
Additional good practice advice	T VVOINGE - UCITIAL
	by automated and/or closed processes.
Guidance to Downstream Users	by automated and/or closed processes.
For scaling see: http://www.ecetoc.org/t	ra
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