

SECTION 1: Identification of the substance/mixture and of the company/undertaking**1.1. Product identifier**

Product Name	BEPD		
Chemical Name	CAS No	EC No	REACH registration number
2-Butyl-2-ethylpropanediol	115-84-4	204-111-7	01-2119450133-52-0000
Pure substance/mixture	Substance		

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

Industrial	Manufacture of substances. Industrial manufacturing of polymers and of oligomers. Formulation and (re)packing of substances and mixtures. Distribution and storage. Use as laboratory reagent.
Application	Raw material: Coatings.
Uses advised against	Not identified.

1.3. Details of the supplier of the safety data sheet

Manufacturer	
Perstorp Oxo Belgium AB	
Durmakker 33	
Havennummer 8768A	
BE-9940 Evergem, Belgium	
Tel. +32 9 257 17 17	
Fax +32 9 253 26 78	
www.perstorp.com	
E-mail address	productinfo@perstorp.com

1.4. Emergency telephone number

Europe	(+1 760 476 3961 (contract no: 334101)
United Kingdom	(+44 8 08 189 0979 (contract no: 334101)

SECTION 2: Hazards identification**Hazards description**

Eye contact: Causes severe eye irritation. Risk of burns (in case the product is delivered in molten form).

2.1. Classification of the substance or mixture

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

Serious eye damage/eye irritation

Category 2 - (H319)

Classification according to Directive 67/548/EEC or 1999/45/EC

Full text of R-phrases: see section 16

Hazard symbols

The substance is not classified as hazardous to health or the environment according to the substance directive.

2.2. Label elements

Symbols/Pictograms

**Signal word**

Warning

Hazard statements

H319 - Causes serious eye irritation

Precautionary Statements

P280 - Wear protective gloves and eye/face protection

P264 - Wash hands thoroughly after handling

P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing

P337 + P313 - If eye irritation persists: Get medical advice/attention

Contains: 2-Butyl-2-ethylpropanediol

2.3. Other hazards

May be harmful if swallowed.

SECTION 3: Composition/information on ingredients**3.1 Substances**

Chemical Name	EC No	CAS No	REACH registration number	Weight-%	Classification according to Directive 67/548/EEC or 1999/45/EC	Classification according to Regulation (EC) No. 1272/2008 [CLP]
2-Butyl-2-ethylpropane diol	204-111-7	115-84-4	01-2119450133-52-0000	90-100	Not classified	Eye Irrit. 2 (H319)

*Full text of R-phrases: see section 16**Full text of H- and EUH-phrases: see section 16***Additional information**

No information available

SECTION 4: First aid measures**4.1. Description of first aid measures**

General advice	Emergency eyewash facilities must be located in the vicinity of where the product is handled.
Inhalation	Remove to fresh air. Rinse mouth with water. If irritation persists get medical advice/attention.
Skin contact	In contact with molten product immediately flush with cold water for at least 10 minutes. Do not pull solidified product off the skin. In case of burn injury immediately get medical attention.
Eye contact	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Use lukewarm water if possible. Keep eye wide open while rinsing. If eye irritation persists: Get medical advice/attention. After contact with the molten/hot product, cool rapidly with cold water. Seek immediate medical attention/advice.
Ingestion	Clean mouth with water and drink afterwards plenty of water. If a large quantity has been ingested or you feel unwell, get medical advice/attention.

Self-protection of the first aider

Avoid contact with skin, eyes or clothing.

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

Eye contact: Causes severe irritation (tears, blurred vision and redness). Risk of burns (in case the product is delivered in molten form).

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

Treat symptomatically.

SECTION 5: Firefighting measures**5.1. Extinguishing media****Suitable extinguishing media**

All types of extinguishing media are suitable. Use fire extinguishing methods suitable to surrounding conditions.

Unsuitable extinguishing media

High volume water jet.

5.2. Special hazards arising from the substance or mixture

Thermal decomposition can lead to release of irritating and toxic gases and vapours.

Hazardous combustion products

Carbon monoxide (CO), Carbon dioxide (CO₂).

5.3. Advice for firefighters

Wear self-contained breathing apparatus and protective suit.

Additional information

Prevent fire extinguishing water from contaminating surface water or the ground water system.

SECTION 6: Accidental release measures**6.1. Personal precautions, protective equipment and emergency procedures**

Keep unprotected persons away from molten/hot product if released. Wear protective gloves and protective clothing, Tight sealing safety goggles, Rubber boots.

6.2. Environmental precautions

Minimize the area spreading and cover the drains. Do not allow into any sewer, on the ground or into any body of water. Local authorities should be advised if significant spillages cannot be contained. See Section 12 for additional ecological information.

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

If molten/hot product is released, pick up mechanically when cooled.

Methods for cleaning up

Clean contaminated surface thoroughly. Use: Water (with cleaning agent).

6.4. Reference to other sections

See Section 7,8,13 for more information.

SECTION 7: Handling and storage**7.1. Precautions for safe handling**

Use personal protection recommended in Section 8.

General Hygiene Considerations

Handle in accordance with good industrial hygiene and safety practice.

7.2. Conditions for safe storage, including any incompatibilities

No special measures are necessary.

7.3. Specific end use(s)

For details, see the separate exposure scenario(s).

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Exposure Limits

Keep personal exposure levels below Derived No Effect Level (DNEL) and national exposure limit values (if existing).

Derived No Effect Level (DNEL) - worker

2-Butyl-2-ethylpropanediol (115-84-4)

Type	Exposure route	DNEL	Remarks
Chronic effects, systemic	Inhalation	5.3	mg/m ³
Chronic effects, systemic	Dermal	1.5	mg/kg bw/d

Derived No Effect Level (DNEL) - Consumer

2-Butyl-2-ethylpropanediol (115-84-4)

Type	Exposure route	DNEL	Remarks
Chronic effects, systemic	Oral	0.75	mg/kg bw/d
Chronic effects, systemic	Inhalation	1.3	mg/m ³
Chronic effects, systemic	Dermal	0.75	mg/kg bw/d

Predicted No Effect Concentration (PNEC)

2-Butyl-2-ethylpropanediol (115-84-4)

Environmental compartment	Predicted No Effect Concentration (PNEC)	Remarks
Freshwater	0.1	mg/l
Intermittent	1	mg/l
Marine water	0.01	mg/l
Impact on Sewage Treatment	6.5	mg/l

8.2. Exposure controls

Appropriate engineering controls

Eyewash stations.

Individual protection measures, such as personal protective equipment

Eye/face protection	Tight sealing safety goggles.
Hand Protection	Wear protective gloves. Butyl rubber. Ensure that the breakthrough time of the glove material is not exceeded. Refer to glove supplier for information on breakthrough time for specific gloves.
Skin and body protection	Normal work clothes for the chemical industry (long legs and sleeves). If any risk of getting in contact with hot product - use heat-resistant protective clothing.
Respiratory protection	None under normal use conditions. In case of insufficient ventilation, wear suitable respiratory equipment.

Environmental exposure controls

No information available.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Appearance

Solid or Melt
white

Odour

Mild

Odour threshold

No information available

Property

Value

Remarks • Method

pH

Not applicable

Melting point / freezing point

41 °C / 106 °F

OECD 102

Boiling point / boiling range

264 °C / 507 °F

OECD Test No. 103: Boiling Point

Flash point

136 °C / 277 °F

CC (closed cup) Regulation (EC) No. 440/2008, Annex, A.9

Evaporation rate

No information available

Flammability (solid, gas)	Not flammable	EU Method A.10
Explosive limits		
Upper explosive limits		Not applicable
Lower explosive limits		Not applicable
Vapour pressure	0.08 Pa	Calculation method SPARC, MPBPWIN (v1.43) @25°C
Vapour density		No information available
Relative density	0.97	ISO 1183-1 @20 °C
Water solubility	8.8 g/L	OECD Test No. 105: Water Solubility @20°C
Solubility(ies)		No information available
Partition coefficient	2.2	log Pow @25°C OECD Test No. 117: Partition Coefficient (n-octanol/water), HPLC Method
Autoignition temperature		Not applicable
Decomposition temperature		Not determined
Kinematic viscosity		No information available
Dynamic viscosity		Not determined
Explosive properties	Not explosive.	
Oxidising properties	Not oxidizing.	
Density		No information available
Bulk density		No information available

9.2. Other information

No information available.

SECTION 10: Stability and reactivity

10.1. Reactivity

There exists no specific test data for this product. For further information, see the subsequent subsections of this chapter.

10.2. Chemical stability

Stable under normal conditions.

10.3. Possibility of hazardous reactions

None under normal use conditions. Reacts with: Strong oxidising agents.

10.4. Conditions to avoid

None under normal use conditions.

10.5. Incompatible materials

Incompatible with oxidising agents.

10.6. Hazardous decomposition products

Thermal decomposition can lead to release of irritating and toxic gases and vapours.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Information on likely routes of exposure

Dermal. Inhalation.

Symptoms related to the physical, chemical and toxicological characteristics

See Section 4 for more information.

Numerical measures of toxicity

Acute toxicity

May be harmful if swallowed.

2-Butyl-2-ethylpropanediol (115-84-4)				
Method	Species	Exposure route	Effective dose	Remarks
Regulation (EC) No. 440/2008, Annex, B.1 bis	Rat	Oral	2900	mg/kg LD50 (lethal dose)

OECD Test No. 402: Acute Dermal Toxicity	Rat	Dermal	2000	mg/kg LD0
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Skin corrosion/irritation

Non-irritating to the skin.

2-Butyl-2-ethylpropanediol (115-84-4)			
Method	Species	Exposure route	Results
Regulation (EC) No. 440/2008, Annex, B.4	Rabbit	Dermal	Non-irritant
OECD Test No. 404: Acute Dermal Irritation/Corrosion	Rabbit	Dermal	Non-irritant

Serious eye damage/eye irritation

Causes serious eye irritation.

2-Butyl-2-ethylpropanediol (115-84-4)			
Method	Species	Exposure route	Results
Regulation (EC) No. 440/2008, Annex, B.5	Rabbit	Eye	Irritating to eyes

Respiratory or skin sensitisation

No sensitising effects known.

2-Butyl-2-ethylpropanediol (115-84-4)			
Method	Species	Exposure route	Results
Regulation (EC) No. 440/2008, Annex, B.6	Guinea pig	Skin	Not a skin sensitiser

Germ cell mutagenicity

Not mutagenic.

2-Butyl-2-ethylpropanediol (115-84-4)			
Method	Species	Exposure route	Results
OECD Test No. 476: In vitro Mammalian Cell Gene Mutation Test	in vitro		Negative
OECD Test No. 471: Bacterial Reverse Mutation Test	in vitro		Negative
OECD Test No. 474: Mammalian Erythrocyte Micronucleus Test	Mouse		Negative

Carcinogenicity

Since all in vitro and in vivo mutagenicity studies are negative, there is no hint for any carcinogenic potential.

Reproductive toxicity

This product does not contain any known or suspected reproductive hazards.

2-Butyl-2-ethylpropanediol (115-84-4)				
Method	Species	Exposure route	Effective dose	Remarks
OECD Test No. 414: Pre-natal Development Toxicity Study	Rat	Oral	1000	mg/kg bw/d NOAEL

STOT - single exposure

No information available

STOT - repeated exposure

2-Butyl-2-ethylpropanediol (115-84-4)				
Method	Species	Exposure route	Effective dose	Remarks
OECD Test No. 408: Repeated Dose 90-Day Oral Toxicity Study in Rodents	Rat female	Oral	150	mg/kg bw/d NOAEL
OECD Test No. 408: Repeated Dose 90-Day Oral Toxicity Study in Rodents	Rat male	Oral	15	mg/kg bw/d NOAEL

OECD Test No. 407: Repeated Dose 28-day Oral Toxicity Study in Rodents	Rat	Oral	1000	mg/kg bw/d NOAEL
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Aspiration hazard

No information available.

SECTION 12: Ecological information**12.1. Toxicity**

Low toxicity to aquatic organisms.

2-Butyl-2-ethylpropanediol (115-84-4)					
Method	Species	Exposure route	Effective dose	Exposure time	Remarks
OECD Test No. 203: Fish, Acute Toxicity Test	Oncorhynchus mykiss (rainbow trout)	Freshwater	>100	96h	mg/l LC50 (lethal concentration)
OECD Test No. 202: Daphnia sp. Acute Immobilization Test	Daphnia magna	Freshwater	>100	48h	mg/l EC50 (effective concentration)
OECD Test No. 201: Freshwater Algae and Cyanobacteria, Growth Inhibition Test	Selenastrum capricornutum	Freshwater	>100	72h	mg/l ErC50
OECD Test No. 209: Activated Sludge, Respiration Inhibition Test (Carbon and Ammonium Oxidation)	Bacteria toxicity	Freshwater	650	3h	mg/l EC50 (effective concentration)
OECD Test No. 201: Freshwater Algae and Cyanobacteria, Growth Inhibition Test	Selenastrum capricornutum	Freshwater	45	72h	mg/l NOEC

12.2. Persistence and degradability

Not readily biodegradable. The substance is inherently biodegradable and therefore has no potential to persist.

2-Butyl-2-ethylpropanediol (115-84-4)			
Method	Value	Exposure time	Results
OECD Test No. 301F: Ready Biodegradability: Manometric Respirometry Test (TG 301 F)	<7%	28d	Not readily biodegradable
OECD Test No. 302B: Inherent Biodegradability: Zahn-Wellens/ EVPA Test	79%	28d	The substance is inherently biodegradable and therefore has no potential to persist.
OECD Test No. 111: Hydrolysis as a Function of pH	>365 days		Hydrolysis , t1/2

12.3. Bioaccumulative potential

Based on the partition coefficients of the ingredients the product is not expected to bioaccumulate in organisms.

Chemical Name	Partition coefficient	Bioconcentration factor (BCF)
2-Butyl-2-ethylpropanediol	2.2	

12.4. Mobility in soil

The substance is not expected to adsorb to a high degree to suspended solids and sediment based upon the log Pow.

12.5. Results of PBT and vPvB assessment

This substance does not meet the criteria for classification as PBT or vPvB.

12.6. Other adverse effects

No information available.

SECTION 13: Disposal considerations

13.1. Waste treatment methods**Waste from residues/unused products**

This material and its container must be disposed of as hazardous waste. Incinerate at a licensed installation.

Contaminated packaging

Contaminated packaging materials must be disposed of in the same manner as the product. Thoroughly emptied and clean packaging may be recycled.

Waste codes / waste designations according to EWC / AVV

Waste from residues/unused products: 16 03 05*.

Other Information

Waste codes should be assigned by the user based on the application for which the product was used.

SECTION 14: Transport information**ADR Road transport**

14.1 UN number	Not regulated
14.2 UN proper shipping name	Not regulated
14.3 Transport hazard class(es)	Not regulated
14.4 Packing Group	Not regulated
14.5 Environmental hazard	Not applicable
14.6 Special precautions for user	None

RID Rail transport

14.1 UN number	Not regulated
14.2 UN proper shipping name	Not regulated
14.3 Transport hazard class(es)	Not regulated
14.4 Packing Group	Not regulated
14.5 Environmental hazard	Not applicable
14.6 Special precautions for user	None

IMDG Sea transport

14.1 UN number	Not regulated
14.2 UN proper shipping name	Not regulated
14.3 Transport hazard class(es)	Not regulated
14.4 Packing Group	Not regulated
14.5 Environmental hazards	Not applicable
14.6 Special precautions for user	None
14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code	No information available

IATA Air transport

14.1 UN number	Not regulated
14.2 UN proper shipping name	Not regulated
14.3 Transport hazard class(es)	Not regulated
14.4 Packing Group	Not regulated
14.5 Environmental hazard	Not applicable
14.6 Special precautions for user	None

SECTION 15: Regulatory information**15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture****International Regulations**

Not applicable.

European Union

Take note of Directive 98/24/EC on the protection of the health and safety of workers from the risks related to chemical agents at work

Germany

Water hazard class (WGK)

slightly hazardous to water (WGK 1)

15.2. Chemical safety assessment

A Chemical Safety Assessment has been carried out for this substance.

SECTION 16: Other information

Key or legend to abbreviations and acronyms used in the safety data sheet

Full text of R-phrases referred to under sections 2 and 3

Not applicable

Full text of H-Statements referred to under section 3

H319 - Causes serious eye irritation

Issue Date 20-Aug-2015

Revision Date 10-Jul-2015

Revision Note Not applicable.

This safety data sheet complies with the requirements of: Regulation (EC) No. 1907/2006, COMMISSION REGULATION (EU) No. 453/2010 of 20 May 2010.

Disclaimer

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

End of Safety Data Sheet

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

Product Name	BEPD
Chemical Name	2-butyl-2-ethylpropanediol
CAS No	115-84-4
EC No	204-111-7
REACH registration number	01-2119450133-52-0000
Pure substance/mixture	Substance

Exposure scenario

Section 1 - Title

Title	ES1 - Manufacture of substances.
Version	2
Product Name	BEPD
Revision Date	20-Aug-2015

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) ERC1 - Manufacture of substances

Remarks

Not relevant since not classified as dangerous for the environment.

Section 2.2 - Control of worker exposure

Control of worker exposure

Title	Contributing Scenario [CS] 1
Process category(ies)	PROC1 - Use in closed process, no likelihood of exposure
Covers concentrations up to	100%
Physical form of product	Solid, low dustiness
Vapour pressure	0.08 Pa @ 25°C (SPARC, MPBPWIN v1.43)
Exposure duration	Avoid carrying out operation for more than 8h
Technical conditions and measures to control dispersion from source towards the worker	Minimisation of manual phases/work tasks Provide a basic standard of general ventilation (1 to 3 air changes per hour)
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Tight sealing safety goggles Avoid splashing Avoid contact with contaminated tools and objects Clean contaminated surface thoroughly
Organisational measures to prevent/limit releases, dispersion and exposure	Supervision in place to check that the RMMs in place are being used correctly and OCs followed Assumes a good basic standard of occupational hygiene is implemented Ensure operatives are trained to minimise exposures
Covers skin contact area up to	240 cm ²
Remarks	Palm of one hand
Indoor/Outdoor use	Indoor
Operational conditions	Assumes activities are at ambient temperature (unless stated differently)

Title	Contributing Scenario [CS] 2
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Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	100%
Physical form of product	Solid, low dustiness
Vapour pressure	0.08 Pa @ 25°C (SPARC, MPBPWIN v1.43)
Exposure duration	Avoid carrying out operation for more than 8h
Technical conditions and measures to control dispersion from source towards the worker	Minimisation of manual phases/work tasks Provide a basic standard of general ventilation (1 to 3 air changes per hour)
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection and gloves Tight sealing safety goggles Wear chemically resistant gloves (tested to EN374) in combination with specific activity training Avoid splashing Avoid contact with contaminated tools and objects Clean contaminated surface thoroughly
Organisational measures to prevent /limit releases, dispersion and exposure	Supervision in place to check that the RMMs in place are being used correctly and OCs followed Assumes a good basic standard of occupational hygiene is implemented Ensure operatives are trained to minimise exposures
Covers skin contact area up to	480 cm ²
Remarks	Palm of both hands
Indoor/Outdoor use	Indoor
Operational conditions	Assumes activities are at ambient temperature (unless stated differently)

Title	Contributing Scenario [CS] 3
Process category(ies)	PROC3 - Use in closed batch process (synthesis or formulation)
Covers concentrations up to	100%
Physical form of product	Solid, low dustiness
Vapour pressure	0.08 Pa @ 25°C (SPARC, MPBPWIN v1.43)
Exposure duration	Avoid carrying out operation for more than 8h
Technical conditions and measures to control dispersion from source towards the worker	Minimisation of manual phases/work tasks Provide a basic standard of general ventilation (1 to 3 air changes per hour)
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Tight sealing safety goggles Avoid splashing Avoid contact with contaminated tools and objects Clean contaminated surface thoroughly
Organisational measures to prevent /limit releases, dispersion and exposure	Supervision in place to check that the RMMs in place are being used correctly and OCs followed Assumes a good basic standard of occupational hygiene is implemented Ensure operatives are trained to minimise exposures
Covers skin contact area up to	240 cm ²
Remarks	Palm of one hand
Indoor/Outdoor use	Indoor
Operational conditions	Assumes activities are at ambient temperature (unless stated differently)

Title	Contributing Scenario [CS] 4
Process category(ies)	PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises
Covers concentrations up to	100%
Physical form of product	Solid, low dustiness
Vapour pressure	0.08 Pa @ 25°C (SPARC, MPBPWIN v1.43)
Exposure duration	Avoid carrying out operation for more than 8h
Technical conditions and measures to control dispersion from source towards the worker	Minimisation of manual phases/work tasks Provide a basic standard of general ventilation (1 to 3 air changes per hour)
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection and gloves Tight sealing safety goggles Wear chemically resistant gloves (tested to EN374) in combination with specific activity training

	Avoid splashing Avoid contact with contaminated tools and objects Clean contaminated surface thoroughly
Organisational measures to prevent/limit releases, dispersion and exposure	Supervision in place to check that the RMMs in place are being used correctly and OCs followed Assumes a good basic standard of occupational hygiene is implemented Ensure operatives are trained to minimise exposures
Covers skin contact area up to	480 cm ²
Remarks	Palm of both hands
Indoor/Outdoor use	Indoor
Operational conditions	Assumes activities are at ambient temperature (unless stated differently)

Title	Contributing Scenario [CS] 5
Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
Covers concentrations up to	100%
Physical form of product	Solid, low dustiness
Vapour pressure	0.08 Pa @ 25°C (SPARC, MPBPWIN v1.43)
Exposure duration	Avoid carrying out operation for more than 8h
Technical conditions and measures to control dispersion from source towards the worker	Minimisation of manual phases/work tasks Provide a basic standard of general ventilation (1 to 3 air changes per hour)
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection and gloves Tight sealing safety goggles Wear chemically resistant gloves (tested to EN374) in combination with specific activity training Avoid splashing Avoid contact with contaminated tools and objects Clean contaminated surface thoroughly
Organisational measures to prevent/limit releases, dispersion and exposure	Supervision in place to check that the RMMs in place are being used correctly and OCs followed Assumes a good basic standard of occupational hygiene is implemented Ensure operatives are trained to minimise exposures
Covers skin contact area up to	960 cm ²
Remarks	Both hands
Indoor/Outdoor use	Indoor
Operational conditions	Assumes activities are at ambient temperature (unless stated differently)

Title	Contributing Scenario [CS] 6
Process category(ies)	PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Covers concentrations up to	100%
Physical form of product	Solid, low dustiness
Vapour pressure	0.08 Pa @ 25°C (SPARC, MPBPWIN v1.43)
Exposure duration	Avoid carrying out operation for more than 8h
Technical conditions and measures to control dispersion from source towards the worker	Minimisation of manual phases/work tasks Provide a basic standard of general ventilation (1 to 3 air changes per hour)
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection and gloves Tight sealing safety goggles Wear chemically resistant gloves (tested to EN374) in combination with specific activity training Avoid splashing Avoid contact with contaminated tools and objects Clean contaminated surface thoroughly
Organisational measures to prevent/limit releases, dispersion and exposure	Supervision in place to check that the RMMs in place are being used correctly and OCs followed Assumes a good basic standard of occupational hygiene is implemented Ensure operatives are trained to minimise exposures
Covers skin contact area up to	960 cm ²
Remarks	Both hands
Indoor/Outdoor use	Indoor

Operational conditions	Assumes activities are at ambient temperature (unless stated differently)
Title	Contributing Scenario [CS] 7
Process category(ies)	PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
Covers concentrations up to	100%
Physical form of product	Solid, low dustiness
Vapour pressure	0.08 Pa @ 25°C (SPARC, MPBPWIN v1.43)
Exposure duration	Avoid carrying out operation for more than 8h
Technical conditions and measures to control dispersion from source towards the worker	Minimisation of manual phases/work tasks Provide a basic standard of general ventilation (1 to 3 air changes per hour)
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection and gloves Tight sealing safety goggles Wear chemically resistant gloves (tested to EN374) in combination with specific activity training Avoid splashing Avoid contact with contaminated tools and objects Clean contaminated surface thoroughly
Organisational measures to prevent /limit releases, dispersion and exposure	Supervision in place to check that the RMMs in place are being used correctly and OCs followed Assumes a good basic standard of occupational hygiene is implemented Ensure operatives are trained to minimise exposures
Covers skin contact area up to	480 cm ²
Remarks	Palm of both hands
Indoor/Outdoor use	Indoor
Operational conditions	Assumes activities are at ambient temperature (unless stated differently)
Title	Contributing Scenario [CS] 8
Process category(ies)	PROC15 - Use as laboratory reagent
Covers concentrations up to	100%
Physical form of product	Solid, low dustiness
Vapour pressure	0.08 Pa @ 25°C (SPARC, MPBPWIN v1.43)
Exposure duration	Avoid carrying out operation for more than 8h
Technical conditions and measures to control dispersion from source towards the worker	Minimisation of manual phases/work tasks Provide a basic standard of general ventilation (1 to 3 air changes per hour)
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Tight sealing safety goggles Avoid splashing Avoid contact with contaminated tools and objects Clean contaminated surface thoroughly
Organisational measures to prevent /limit releases, dispersion and exposure	Supervision in place to check that the RMMs in place are being used correctly and OCs followed Assumes a good basic standard of occupational hygiene is implemented Ensure operatives are trained to minimise exposures
Covers skin contact area up to	240 cm ²
Remarks	Palm of one hand
Indoor/Outdoor use	Indoor
Operational conditions	Assumes activities are at ambient temperature (unless stated differently)

Section 3 - Exposure estimation

Environmental exposure

Environmental release category(ies)

ERC1 - Manufacture of substances

Remarks

Not relevant since not classified as dangerous for the environment.

worker**Control of worker exposure****Calculation method**

Risk management measures are based on qualitative risk characterization
Used ECETOC TRA model

Title	Exposure route	Calculation method	predicted exposure level	Risk characterisation ratio (RCR)
Contributing Scenario [CS] 1	Worker - inhalative, long-term - systemic	Used ECETOC TRA model	0.01 mg/m ³	<0.1
Contributing Scenario [CS] 1	Worker - dermal, long-term - systemic	Used ECETOC TRA model	0.034 mg/kg bw/day	0.023
Contributing Scenario [CS] 1	Worker - combined, long-term - systemic			0.025
Contributing Scenario [CS] 2	Worker - inhalative, long-term - systemic	Used ECETOC TRA model	0.01 mg/m ³	<0.01
Contributing Scenario [CS] 2	Worker - dermal, long-term - systemic	Used ECETOC TRA model	0.068 mg/kg bw/day	0.046
Contributing Scenario [CS] 2	Worker - combined, long-term - systemic			0.048
Contributing Scenario [CS] 3	Worker - inhalative, long-term - systemic	Used ECETOC TRA model	0.1 mg/m ³	0.019
Contributing Scenario [CS] 3	Worker - dermal, long-term - systemic	Used ECETOC TRA model	0.69 mg/kg bw/day	0.46
Contributing Scenario [CS] 3	Worker - combined, long-term - systemic			0.479
Contributing Scenario [CS] 4	Worker - inhalative, long-term - systemic	Used ECETOC TRA model	0.5 mg/m ³	0.094
Contributing Scenario [CS] 4	Worker - dermal, long-term - systemic	Used ECETOC TRA model	0.343 mg/kg bw/day	0.229
Contributing Scenario [CS] 4	Worker - combined, long-term - systemic			0.323
Contributing Scenario [CS] 5	Worker - inhalative, long-term - systemic	Used ECETOC TRA model	0.5 mg/m ³	0.094
Contributing Scenario [CS] 5	Worker - dermal, long-term - systemic	Used ECETOC TRA model	0.686 mg/kg bw/day	0.457
Contributing Scenario [CS] 5	Worker - combined, long-term - systemic			0.551
Contributing Scenario [CS] 6	Worker - inhalative, long-term - systemic	Used ECETOC TRA model	0.1 mg/m ³	0.019
Contributing Scenario [CS] 6	Worker - dermal, long-term - systemic	Used ECETOC TRA model	0.686 mg/kg bw/day	0.457
Contributing Scenario [CS] 6	Worker - combined, long-term - systemic			0.476
Contributing Scenario [CS] 7	Worker - inhalative, long-term - systemic	Used ECETOC TRA model	0.1 mg/m ³	0.019
Contributing Scenario [CS] 7	Worker - dermal, long-term - systemic	Used ECETOC TRA model	0.343 mg/kg bw/day	0.229
Contributing Scenario [CS] 7	Worker - combined, long-term - systemic			0.248
Contributing Scenario [CS] 8	Worker - inhalative, long-term - systemic	Used ECETOC TRA model	0.1 mg/m ³	0.019
Contributing Scenario [CS] 8	Worker - dermal, long-term - systemic	Used ECETOC TRA model	0.34 mg/kg bw/day	0.227
Contributing Scenario [CS] 8	Worker - combined, long-term - systemic			0.246

Section 4 - Guidance to check compliance with the exposure scenario

Predicted exposures are not expected to exceed the DN(M)EL when the risk management measures/operational conditions

outlined in section 2 are implemented. Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

Product Name	BEPD
Chemical Name	2-butyl-2-ethylpropanediol
CAS No	115-84-4
EC No	204-111-7
REACH registration number	01-2119450133-52-0000
Pure substance/mixture	Substance

Exposure scenario

Section 1 - Title

Title	ES2 - Formulation and (re)packing of substances and mixtures. Distribution and storage.
Version	2
Product Name	BEPD
Revision Date	20-Aug-2015

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) ERC2 - Formulation of preparations (mixtures)

Remarks
 Not relevant since not classified as dangerous for the environment.

Section 2.2 - Control of worker exposure

Control of worker exposure

Title	Contributing Scenario [CS] 1
Process category(ies)	PROC1 - Use in closed process, no likelihood of exposure
Covers concentrations up to	100%
Physical form of product	Solid, low dustiness
Vapour pressure	0.08 Pa @ 25°C (SPARC, MPBPWIN v1.43)
Exposure duration	Avoid carrying out operation for more than 8h
Technical conditions and measures to control dispersion from source towards the worker	Minimisation of manual phases/work tasks Provide a basic standard of general ventilation (1 to 3 air changes per hour)
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Tight sealing safety goggles Avoid splashing Avoid contact with contaminated tools and objects Clean contaminated surface thoroughly
Organisational measures to prevent /limit releases, dispersion and exposure	Supervision in place to check that the RMMs in place are being used correctly and OCs followed Assumes a good basic standard of occupational hygiene is implemented Ensure operatives are trained to minimise exposures
Covers skin contact area up to	240 cm ²
Remarks	Palm of one hand
Indoor/Outdoor use	Indoor
Operational conditions	Assumes activities are at ambient temperature (unless stated differently)

Title	Contributing Scenario [CS]
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	2
Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	100%
Physical form of product	Solid, low dustiness
Vapour pressure	0.08 Pa @ 25°C (SPARC, MPBPWIN v1.43)
Exposure duration	Avoid carrying out operation for more than 8h
Technical conditions and measures to control dispersion from source towards the worker	Minimisation of manual phases/work tasks Provide a basic standard of general ventilation (1 to 3 air changes per hour)
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection and gloves Tight sealing safety goggles Wear chemically resistant gloves (tested to EN374) in combination with specific activity training Avoid splashing Avoid contact with contaminated tools and objects Clean contaminated surface thoroughly
Organisational measures to prevent/limit releases, dispersion and exposure	Supervision in place to check that the RMMs in place are being used correctly and OCs followed Assumes a good basic standard of occupational hygiene is implemented Ensure operatives are trained to minimise exposures
Covers skin contact area up to	480 cm ²
Remarks	Palm of both hands
Indoor/Outdoor use	Indoor
Operational conditions	Assumes activities are at ambient temperature (unless stated differently)

Title	Contributing Scenario [CS] 3
Process category(ies)	PROC3 - Use in closed batch process (synthesis or formulation)
Covers concentrations up to	100%
Physical form of product	Solid, low dustiness
Vapour pressure	0.08 Pa @ 25°C (SPARC, MPBPWIN v1.43)
Exposure duration	Avoid carrying out operation for more than 8h
Technical conditions and measures to control dispersion from source towards the worker	Minimisation of manual phases/work tasks Provide a basic standard of general ventilation (1 to 3 air changes per hour)
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Tight sealing safety goggles Avoid splashing Avoid contact with contaminated tools and objects Clean contaminated surface thoroughly
Organisational measures to prevent/limit releases, dispersion and exposure	Supervision in place to check that the RMMs in place are being used correctly and OCs followed Assumes a good basic standard of occupational hygiene is implemented Ensure operatives are trained to minimise exposures
Covers skin contact area up to	240 cm ²
Remarks	Palm of one hand
Indoor/Outdoor use	Indoor
Operational conditions	Assumes activities are at ambient temperature (unless stated differently)

Title	Contributing Scenario [CS] 4
Process category(ies)	PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises
Covers concentrations up to	100%
Physical form of product	Solid, low dustiness
Vapour pressure	0.08 Pa @ 25°C (SPARC, MPBPWIN v1.43)
Exposure duration	Avoid carrying out operation for more than 8h
Technical conditions and measures to control dispersion from source towards the worker	Minimisation of manual phases/work tasks Provide a basic standard of general ventilation (1 to 3 air changes per hour)
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection and gloves Tight sealing safety goggles Wear chemically resistant gloves (tested to EN374) in combination with specific activity

	training Avoid splashing Avoid contact with contaminated tools and objects Clean contaminated surface thoroughly
Organisational measures to prevent/limit releases, dispersion and exposure	Supervision in place to check that the RMMs in place are being used correctly and OCs followed Assumes a good basic standard of occupational hygiene is implemented Ensure operatives are trained to minimise exposures
Covers skin contact area up to	480 cm ²
Remarks	Palm of both hands
Indoor/Outdoor use	Indoor
Operational conditions	Assumes activities are at ambient temperature (unless stated differently)
Title	Contributing Scenario [CS] 5
Process category(ies)	PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)
Covers concentrations up to	100%
Physical form of product	Solid, low dustiness
Vapour pressure	0.08 Pa @ 25°C (SPARC, MPBPWIN v1.43)
Exposure duration	Avoid carrying out operation for more than 8h
Technical conditions and measures to control dispersion from source towards the worker	Minimisation of manual phases/work tasks Provide a basic standard of general ventilation (1 to 3 air changes per hour)
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection and gloves Tight sealing safety goggles Wear chemically resistant gloves (tested to EN374) in combination with specific activity training Avoid splashing Avoid contact with contaminated tools and objects Clean contaminated surface thoroughly
Organisational measures to prevent/limit releases, dispersion and exposure	Supervision in place to check that the RMMs in place are being used correctly and OCs followed Assumes a good basic standard of occupational hygiene is implemented Ensure operatives are trained to minimise exposures
Covers skin contact area up to	480 cm ²
Remarks	Palm of both hands
Indoor/Outdoor use	Indoor
Operational conditions	Assumes activities are at ambient temperature (unless stated differently)
Title	Contributing Scenario [CS] 6
Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
Covers concentrations up to	100%
Physical form of product	Solid, low dustiness
Vapour pressure	0.08 Pa @ 25°C (SPARC, MPBPWIN v1.43)
Exposure duration	Avoid carrying out operation for more than 8h
Technical conditions and measures to control dispersion from source towards the worker	Minimisation of manual phases/work tasks Provide a basic standard of general ventilation (1 to 3 air changes per hour)
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection and gloves Tight sealing safety goggles Wear chemically resistant gloves (tested to EN374) in combination with specific activity training Avoid splashing Avoid contact with contaminated tools and objects Clean contaminated surface thoroughly
Organisational measures to prevent/limit releases, dispersion and exposure	Supervision in place to check that the RMMs in place are being used correctly and OCs followed Assumes a good basic standard of occupational hygiene is implemented Ensure operatives are trained to minimise exposures
Covers skin contact area up to	960 cm ²
Remarks	Both hands
Indoor/Outdoor use	Indoor

Operational conditions	Assumes activities are at ambient temperature (unless stated differently)
Title	Contributing Scenario [CS] 7
Process category(ies)	PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Covers concentrations up to	100%
Physical form of product	Solid, low dustiness
Vapour pressure	0.08 Pa @ 25°C (SPARC, MPBPWIN v1.43)
Exposure duration	Avoid carrying out operation for more than 8h
Technical conditions and measures to control dispersion from source towards the worker	Minimisation of manual phases/work tasks Provide a basic standard of general ventilation (1 to 3 air changes per hour)
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection and gloves Tight sealing safety goggles Wear chemically resistant gloves (tested to EN374) in combination with specific activity training Avoid splashing Avoid contact with contaminated tools and objects Clean contaminated surface thoroughly
Organisational measures to prevent/limit releases, dispersion and exposure	Supervision in place to check that the RMMs in place are being used correctly and OCs followed Assumes a good basic standard of occupational hygiene is implemented Ensure operatives are trained to minimise exposures
Covers skin contact area up to	960 cm ²
Remarks	Both hands
Indoor/Outdoor use	Indoor
Operational conditions	Assumes activities are at ambient temperature (unless stated differently)
Title	Contributing Scenario [CS] 8
Process category(ies)	PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Covers concentrations up to	100%
Physical form of product	Solid, medium dustiness Fumes
Vapour pressure	0.08 Pa @ 25°C (SPARC, MPBPWIN v1.43)
Exposure duration	Avoid carrying out operation for more than 8h
Technical conditions and measures to control dispersion from source towards the worker	Minimisation of manual phases/work tasks Provide a basic standard of general ventilation (1 to 3 air changes per hour)
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection and gloves Tight sealing safety goggles Wear chemically resistant gloves (tested to EN374) in combination with specific activity training Avoid splashing Avoid contact with contaminated tools and objects Clean contaminated surface thoroughly
Organisational measures to prevent/limit releases, dispersion and exposure	Supervision in place to check that the RMMs in place are being used correctly and OCs followed Assumes a good basic standard of occupational hygiene is implemented Ensure operatives are trained to minimise exposures
Covers skin contact area up to	960 cm ²
Remarks	Both hands
Indoor/Outdoor use	Outdoor
Operational conditions	Operation is carried out at elevated temperature (> 20°C above ambient temperature) > melting point
Title	Contributing Scenario [CS] 9
Process category(ies)	PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
Covers concentrations up to	100%

Physical form of product	Solid, low dustiness
Vapour pressure	0.08 Pa @ 25°C (SPARC, MPBPWIN v1.43)
Exposure duration	Avoid carrying out operation for more than 8h
Technical conditions and measures to control dispersion from source towards the worker	Minimisation of manual phases/work tasks Provide a basic standard of general ventilation (1 to 3 air changes per hour)
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection and gloves Tight sealing safety goggles Wear chemically resistant gloves (tested to EN374) in combination with specific activity training Avoid splashing Avoid contact with contaminated tools and objects Clean contaminated surface thoroughly
Organisational measures to prevent/limit releases, dispersion and exposure	Supervision in place to check that the RMMs in place are being used correctly and OCs followed Assumes a good basic standard of occupational hygiene is implemented Ensure operatives are trained to minimise exposures
Covers skin contact area up to	480 cm ²
Remarks	Palm of both hands
Indoor/Outdoor use	Indoor
Operational conditions	Assumes activities are at ambient temperature (unless stated differently)

Title	Contributing Scenario [CS] 10
Process category(ies)	PROC15 - Use as laboratory reagent
Covers concentrations up to	100%
Physical form of product	Solid, low dustiness
Vapour pressure	0.08 Pa @ 25°C (SPARC, MPBPWIN v1.43)
Exposure duration	Avoid carrying out operation for more than 8h
Technical conditions and measures to control dispersion from source towards the worker	Minimisation of manual phases/work tasks Provide a basic standard of general ventilation (1 to 3 air changes per hour)
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Tight sealing safety goggles Avoid splashing Avoid contact with contaminated tools and objects Clean contaminated surface thoroughly
Organisational measures to prevent/limit releases, dispersion and exposure	Supervision in place to check that the RMMs in place are being used correctly and OCs followed Assumes a good basic standard of occupational hygiene is implemented Ensure operatives are trained to minimise exposures
Covers skin contact area up to	240 cm ²
Remarks	Palm of one hand
Indoor/Outdoor use	Indoor
Operational conditions	Assumes activities are at ambient temperature (unless stated differently)

Section 3 - Exposure estimation

Environmental exposure

Environmental release category(ies)

ERC2 - Formulation of preparations (mixtures)

Remarks

Not relevant since not classified as dangerous for the environment.

worker

Control of worker exposure

Calculation method

Risk management measures are based on qualitative risk characterization

Used ECETOC TRA model

Title	Exposure route	Calculation method	predicted exposure level	Risk characterisation ratio (RCR)
Contributing Scenario [CS] 1	Worker - inhalative, long-term - systemic	Used ECETOC TRA model	0.01 mg/m ³	<0.01
Contributing Scenario [CS] 1	Worker - dermal, long-term - systemic	Used ECETOC TRA model	0.034 mg/kg bw/day	0.023
Contributing Scenario [CS] 1	Worker - combined, long-term - systemic			0.025
Contributing Scenario [CS] 2	Worker - inhalative, long-term - systemic	Used ECETOC TRA model	0.01 mg/m ³	<0.01
Contributing Scenario [CS] 2	Worker - dermal, long-term - systemic	Used ECETOC TRA model	0.068 mg/kg bw/day	0.046
Contributing Scenario [CS] 2	Worker - combined, long-term - systemic			0.048
Contributing Scenario [CS] 3	Worker - inhalative, long-term - systemic	Used ECETOC TRA model	0.1 mg/m ³	0.019
Contributing Scenario [CS] 3	Worker - dermal, long-term - systemic	Used ECETOC TRA model	0.69 mg/kg bw/day	0.46
Contributing Scenario [CS] 3	Worker - combined, long-term - systemic			0.479
Contributing Scenario [CS] 4	Worker - inhalative, long-term - systemic	Used ECETOC TRA model	0.5 mg/m ³	0.094
Contributing Scenario [CS] 4	Worker - dermal, long-term - systemic	Used ECETOC TRA model	0.343 mg/kg bw/day	0.229
Contributing Scenario [CS] 4	Worker - combined, long-term - systemic			0.323
Contributing Scenario [CS] 5	Worker - inhalative, long-term - systemic	Used ECETOC TRA model	0.5 mg/m ³	0.094
Contributing Scenario [CS] 5	Worker - dermal, long-term - systemic	Used ECETOC TRA model	0.686 mg/kg bw/day	0.457
Contributing Scenario [CS] 5	Worker - combined, long-term - systemic			0.551
Contributing Scenario [CS] 6	Worker - inhalative, long-term - systemic	Used ECETOC TRA model	0.5 mg/m ³	0.094
Contributing Scenario [CS] 6	Worker - dermal, long-term - systemic	Used ECETOC TRA model	0.686 mg/kg bw/day	0.457
Contributing Scenario [CS] 6	Worker - combined, long-term - systemic			0.551
Contributing Scenario [CS] 7	Worker - inhalative, long-term - systemic	Used ECETOC TRA model	0.1 mg/m ³	0.019
Contributing Scenario [CS] 7	Worker - dermal, long-term - systemic	Used ECETOC TRA model	0.686 mg/kg bw/day	0.457
Contributing Scenario [CS] 7	Worker - combined, long-term - systemic			0.476
Contributing Scenario [CS] 8	Worker - inhalative, long-term - systemic	Used ECETOC TRA model	0.7 mg/m ³	0.132
Contributing Scenario [CS] 8	Worker - dermal, long-term - systemic	Used ECETOC TRA model	0.686 mg/kg bw/day	0.457
Contributing Scenario [CS] 8	Worker - combined, long-term - systemic			0.589
Contributing Scenario [CS] 9	Worker - inhalative, long-term - systemic	Used ECETOC TRA model	0.1 mg/m ³	0.019
Contributing Scenario [CS] 9	Worker - dermal, long-term - systemic	Used ECETOC TRA model	0.343 mg/kg bw/day	0.229
Contributing Scenario [CS] 9	Worker - combined, long-term - systemic			0.248
Contributing Scenario [CS] 10	Worker - inhalative, long-term - systemic	Used ECETOC TRA model	0.1 mg/m ³	0.019
Contributing Scenario [CS] 10	Worker - dermal, long-term - systemic	Used ECETOC TRA model	0.34 mg/kg bw/day	0.227
Contributing Scenario [CS] 10	Worker - combined, long-term - systemic			0.246

Section 4 - Guidance to check compliance with the exposure scenario

Predicted exposures are not expected to exceed the DN(M)EL when the risk management measures/operational conditions outlined in section 2 are implemented. Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

Product Name BEPD
Chemical Name 2-butyl-2-ethylpropanediol
CAS No 115-84-4
EC No 204-111-7
REACH registration number 01-2119450133-52-0000
Pure substance/mixture Substance

Exposure scenario

Section 1 - Title

Title ES3 - Industrial manufacturing of polymers
Version 2
Product Name BEPD
Revision Date 20-Aug-2015

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) ERC6c - Industrial use of monomers for manufacture of thermoplastics

Remarks

Not relevant since not classified as dangerous for the environment.

Section 2.2 - Control of worker exposure

Control of worker exposure

Title	Contributing Scenario [CS] 1
Process category(ies)	PROC1 - Use in closed process, no likelihood of exposure
Covers concentrations up to	100%
Physical form of product	Solid, low dustiness
Vapour pressure	0.08 Pa @ 25°C (SPARC, MPBPWIN v1.43)
Exposure duration	Avoid carrying out operation for more than 8h
Technical conditions and measures to control dispersion from source towards the worker	Minimisation of manual phases/work tasks Provide a basic standard of general ventilation (1 to 3 air changes per hour)
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Tight sealing safety goggles Avoid splashing Avoid contact with contaminated tools and objects Clean contaminated surface thoroughly
Organisational measures to prevent /limit releases, dispersion and exposure	Supervision in place to check that the RMMs in place are being used correctly and OCS followed Assumes a good basic standard of occupational hygiene is implemented Ensure operatives are trained to minimise exposures
Covers skin contact area up to	240 cm ²
Remarks	Palm of one hand
Indoor/Outdoor use	Indoor
Operational conditions	Assumes activities are at ambient temperature (unless stated differently)

Title	Contributing Scenario [CS]
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	2
Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	100%
Physical form of product	Solid, low dustiness
Vapour pressure	0.08 Pa @ 25°C (SPARC, MPBPWIN v1.43)
Exposure duration	Avoid carrying out operation for more than 8h
Technical conditions and measures to control dispersion from source towards the worker	Minimisation of manual phases/work tasks Provide a basic standard of general ventilation (1 to 3 air changes per hour)
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection and gloves Tight sealing safety goggles Wear chemically resistant gloves (tested to EN374) in combination with specific activity training Avoid splashing Avoid contact with contaminated tools and objects Clean contaminated surface thoroughly
Organisational measures to prevent/limit releases, dispersion and exposure	Supervision in place to check that the RMMs in place are being used correctly and OCs followed Assumes a good basic standard of occupational hygiene is implemented Ensure operatives are trained to minimise exposures
Covers skin contact area up to	480 cm ²
Remarks	Palm of both hands
Indoor/Outdoor use	Indoor
Operational conditions	Assumes activities are at ambient temperature (unless stated differently)

Title	Contributing Scenario [CS] 3
Process category(ies)	PROC3 - Use in closed batch process (synthesis or formulation)
Covers concentrations up to	100%
Physical form of product	Solid, low dustiness
Vapour pressure	0.08 Pa @ 25°C (SPARC, MPBPWIN v1.43)
Exposure duration	Avoid carrying out operation for more than 8h
Technical conditions and measures to control dispersion from source towards the worker	Minimisation of manual phases/work tasks Provide a basic standard of general ventilation (1 to 3 air changes per hour)
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Tight sealing safety goggles Avoid splashing Avoid contact with contaminated tools and objects Clean contaminated surface thoroughly
Organisational measures to prevent/limit releases, dispersion and exposure	Supervision in place to check that the RMMs in place are being used correctly and OCs followed Assumes a good basic standard of occupational hygiene is implemented Ensure operatives are trained to minimise exposures
Covers skin contact area up to	240 cm ²
Remarks	Palm of one hand
Indoor/Outdoor use	Indoor
Operational conditions	Assumes activities are at ambient temperature (unless stated differently)

Title	Contributing Scenario [CS] 4
Process category(ies)	PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises
Covers concentrations up to	100%
Physical form of product	Solid, low dustiness
Vapour pressure	0.08 Pa @ 25°C (SPARC, MPBPWIN v1.43)
Exposure duration	Avoid carrying out operation for more than 8h
Technical conditions and measures to control dispersion from source towards the worker	Minimisation of manual phases/work tasks Provide a basic standard of general ventilation (1 to 3 air changes per hour)
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection and gloves Tight sealing safety goggles Wear chemically resistant gloves (tested to EN374) in combination with specific activity

	training Avoid splashing Avoid contact with contaminated tools and objects Clean contaminated surface thoroughly
Organisational measures to prevent/limit releases, dispersion and exposure	Supervision in place to check that the RMMs in place are being used correctly and OCs followed Assumes a good basic standard of occupational hygiene is implemented Ensure operatives are trained to minimise exposures
Covers skin contact area up to	480 cm ²
Remarks	Palm of both hands
Indoor/Outdoor use	Indoor
Operational conditions	Assumes activities are at ambient temperature (unless stated differently)
Title	Contributing Scenario [CS] 5
Process category(ies)	PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)
Covers concentrations up to	100%
Physical form of product	Solid, low dustiness
Vapour pressure	0.08 Pa @ 25°C (SPARC, MPBPWIN v1.43)
Exposure duration	Avoid carrying out operation for more than 8h
Technical conditions and measures to control dispersion from source towards the worker	Minimisation of manual phases/work tasks Provide a basic standard of general ventilation (1 to 3 air changes per hour)
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection and gloves Tight sealing safety goggles Wear chemically resistant gloves (tested to EN374) in combination with specific activity training Avoid splashing Avoid contact with contaminated tools and objects Clean contaminated surface thoroughly
Organisational measures to prevent/limit releases, dispersion and exposure	Supervision in place to check that the RMMs in place are being used correctly and OCs followed Assumes a good basic standard of occupational hygiene is implemented Ensure operatives are trained to minimise exposures
Covers skin contact area up to	480 cm ²
Remarks	Palm of both hands
Indoor/Outdoor use	Indoor
Operational conditions	Assumes activities are at ambient temperature (unless stated differently)
Title	Contributing Scenario [CS] 6
Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
Covers concentrations up to	100%
Physical form of product	Solid, low dustiness
Vapour pressure	0.08 Pa @ 25°C (SPARC, MPBPWIN v1.43)
Exposure duration	Avoid carrying out operation for more than 8h
Technical conditions and measures to control dispersion from source towards the worker	Minimisation of manual phases/work tasks Provide a basic standard of general ventilation (1 to 3 air changes per hour)
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection and gloves Tight sealing safety goggles Wear chemically resistant gloves (tested to EN374) in combination with specific activity training Avoid splashing Avoid contact with contaminated tools and objects Clean contaminated surface thoroughly
Organisational measures to prevent/limit releases, dispersion and exposure	Supervision in place to check that the RMMs in place are being used correctly and OCs followed Assumes a good basic standard of occupational hygiene is implemented Ensure operatives are trained to minimise exposures
Covers skin contact area up to	960 cm ²
Remarks	Both hands
Indoor/Outdoor use	Indoor

Operational conditions	Assumes activities are at ambient temperature (unless stated differently)
Title	Contributing Scenario [CS] 7
Process category(ies)	PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Covers concentrations up to	100%
Physical form of product	Solid, low dustiness
Vapour pressure	0.08 Pa @ 25°C (SPARC, MPBPWIN v1.43)
Exposure duration	Avoid carrying out operation for more than 8h
Technical conditions and measures to control dispersion from source towards the worker	Minimisation of manual phases/work tasks Provide a basic standard of general ventilation (1 to 3 air changes per hour)
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection and gloves Tight sealing safety goggles Wear chemically resistant gloves (tested to EN374) in combination with specific activity training Avoid splashing Avoid contact with contaminated tools and objects Clean contaminated surface thoroughly
Organisational measures to prevent/limit releases, dispersion and exposure	Supervision in place to check that the RMMs in place are being used correctly and OCs followed Assumes a good basic standard of occupational hygiene is implemented Ensure operatives are trained to minimise exposures
Covers skin contact area up to	960 cm ²
Remarks	Both hands
Indoor/Outdoor use	Indoor
Operational conditions	Assumes activities are at ambient temperature (unless stated differently)
Title	Contributing Scenario [CS] 8
Process category(ies)	PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Covers concentrations up to	100%
Physical form of product	Solid, medium dustiness Fumes
Vapour pressure	0.08 Pa @ 25°C (SPARC, MPBPWIN v1.43)
Exposure duration	Avoid carrying out operation for more than 8h
Technical conditions and measures to control dispersion from source towards the worker	Minimisation of manual phases/work tasks Provide a basic standard of general ventilation (1 to 3 air changes per hour)
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection and gloves Tight sealing safety goggles Wear chemically resistant gloves (tested to EN374) in combination with specific activity training Avoid splashing Avoid contact with contaminated tools and objects Clean contaminated surface thoroughly
Organisational measures to prevent/limit releases, dispersion and exposure	Supervision in place to check that the RMMs in place are being used correctly and OCs followed Assumes a good basic standard of occupational hygiene is implemented Ensure operatives are trained to minimise exposures
Covers skin contact area up to	960 cm ²
Remarks	Both hands
Indoor/Outdoor use	Outdoor
Operational conditions	Operation is carried out at elevated temperature (> 20°C above ambient temperature) > melting point
Title	Contributing Scenario [CS] 9
Process category(ies)	PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
Covers concentrations up to	100%

Physical form of product	Solid, low dustiness
Vapour pressure	0.08 Pa @ 25°C (SPARC, MPBPWIN v1.43)
Exposure duration	Avoid carrying out operation for more than 8h
Technical conditions and measures to control dispersion from source towards the worker	Minimisation of manual phases/work tasks Provide a basic standard of general ventilation (1 to 3 air changes per hour)
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection and gloves Tight sealing safety goggles Wear chemically resistant gloves (tested to EN374) in combination with specific activity training Avoid splashing Avoid contact with contaminated tools and objects Clean contaminated surface thoroughly
Organisational measures to prevent/limit releases, dispersion and exposure	Supervision in place to check that the RMMs in place are being used correctly and OCs followed Assumes a good basic standard of occupational hygiene is implemented Ensure operatives are trained to minimise exposures
Covers skin contact area up to	480 cm ²
Remarks	Palm of both hands
Indoor/Outdoor use	Indoor
Operational conditions	Assumes activities are at ambient temperature (unless stated differently)

Title	Contributing Scenario [CS] 10
Process category(ies)	PROC15 - Use as laboratory reagent
Covers concentrations up to	100%
Physical form of product	Solid, low dustiness
Vapour pressure	0.08 Pa @ 25°C (SPARC, MPBPWIN v1.43)
Exposure duration	Avoid carrying out operation for more than 8h
Technical conditions and measures to control dispersion from source towards the worker	Minimisation of manual phases/work tasks Provide a basic standard of general ventilation (1 to 3 air changes per hour)
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Tight sealing safety goggles Avoid splashing Avoid contact with contaminated tools and objects Clean contaminated surface thoroughly
Organisational measures to prevent/limit releases, dispersion and exposure	Supervision in place to check that the RMMs in place are being used correctly and OCs followed Assumes a good basic standard of occupational hygiene is implemented Ensure operatives are trained to minimise exposures
Covers skin contact area up to	240 cm ²
Remarks	Palm of one hand
Indoor/Outdoor use	Indoor
Operational conditions	Assumes activities are at ambient temperature (unless stated differently)

Section 3 - Exposure estimation

Environmental exposure

Environmental release category(ies)

ERC6c - Industrial use of monomers for manufacture of thermoplastics

Remarks

Not relevant since not classified as dangerous for the environment.

worker

Control of worker exposure

Calculation method

Risk management measures are based on qualitative risk characterization
Used ECETOC TRA model

Title	Exposure route	Calculation method	predicted exposure level	Risk characterisation ratio (RCR)
Contributing Scenario [CS] 1	Worker - inhalative, long-term - systemic	Used ECETOC TRA model	0.01 mg/m ³	<0.01
Contributing Scenario [CS] 1	Worker - dermal, long-term - systemic	Used ECETOC TRA model	0.034 mg/kg bw/day	0.023
Contributing Scenario [CS] 1	Worker - combined, long-term - systemic			0.025
Contributing Scenario [CS] 2	Worker - inhalative, long-term - systemic	Used ECETOC TRA model	0.01 mg/m ³	<0.01
Contributing Scenario [CS] 2	Worker - dermal, long-term - systemic	Used ECETOC TRA model	0.068 mg/kg bw/day	0.046
Contributing Scenario [CS] 2	Worker - combined, long-term - systemic			0.048
Contributing Scenario [CS] 3	Worker - inhalative, long-term - systemic	Used ECETOC TRA model	0.1 mg/m ³	0.019
Contributing Scenario [CS] 3	Worker - dermal, long-term - systemic	Used ECETOC TRA model	0.69 mg/kg bw/day	0.46
Contributing Scenario [CS] 3	Worker - combined, long-term - systemic			0.479
Contributing Scenario [CS] 4	Worker - inhalative, long-term - systemic	Used ECETOC TRA model	0.5 mg/m ³	0.094
Contributing Scenario [CS] 4	Worker - dermal, long-term - systemic	Used ECETOC TRA model	0.343 mg/kg bw/day	0.229
Contributing Scenario [CS] 4	Worker - combined, long-term - systemic			0.323
Contributing Scenario [CS] 5	Worker - inhalative, long-term - systemic	Used ECETOC TRA model	0.5 mg/m ³	0.094
Contributing Scenario [CS] 5	Worker - dermal, long-term - systemic	Used ECETOC TRA model	0.686 mg/kg bw/day	0.457
Contributing Scenario [CS] 5	Worker - combined, long-term - systemic			0.551
Contributing Scenario [CS] 6	Worker - inhalative, long-term - systemic	Used ECETOC TRA model	0.5 mg/m ³	0.094
Contributing Scenario [CS] 6	Worker - dermal, long-term - systemic	Used ECETOC TRA model	0.686 mg/kg bw/day	0.457
Contributing Scenario [CS] 6	Worker - combined, long-term - systemic			0.551
Contributing Scenario [CS] 7	Worker - inhalative, long-term - systemic	Used ECETOC TRA model	0.1 mg/m ³	0.019
Contributing Scenario [CS] 7	Worker - dermal, long-term - systemic	Used ECETOC TRA model	0.686 mg/kg bw/day	0.457
Contributing Scenario [CS] 7	Worker - combined, long-term - systemic			0.476
Contributing Scenario [CS] 8	Worker - inhalative, long-term - systemic	Used ECETOC TRA model	0.7 mg/m ³	0.132
Contributing Scenario [CS] 8	Worker - dermal, long-term - systemic	Used ECETOC TRA model	0.686 mg/kg bw/day	0.457
Contributing Scenario [CS] 8	Worker - combined, long-term - systemic			0.589
Contributing Scenario [CS] 9	Worker - inhalative, long-term - systemic	Used ECETOC TRA model	0.1 mg/m ³	0.019
Contributing Scenario [CS] 9	Worker - dermal, long-term - systemic	Used ECETOC TRA model	0.343 mg/kg bw/day	0.229
Contributing Scenario [CS] 9	Worker - combined, long-term - systemic			0.248
Contributing Scenario [CS] 10	Worker - inhalative, long-term - systemic	Used ECETOC TRA model	0.1 mg/m ³	0.019
Contributing Scenario [CS] 10	Worker - dermal, long-term - systemic	Used ECETOC TRA model	0.34 mg/kg bw/day	0.227
Contributing Scenario [CS] 10	Worker - combined, long-term - systemic			0.246

Section 4 - Guidance to check compliance with the exposure scenario

Predicted exposures are not expected to exceed the DN(M)EL when the risk management measures/operational conditions outlined in section 2 are implemented. Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

Product Name	BEPD
Chemical Name	2-butyl-2-ethylpropanediol
CAS No	115-84-4
EC No	204-111-7
REACH registration number	01-2119450133-52-0000
Pure substance/mixture	Substance

Exposure scenario

Section 1 - Title

Title	ES4 - Industrial manufacturing of oligomers and Substances
Version	2
Product Name	BEPD
Revision Date	20-Aug-2015

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies)	ERC6d - Industrial use of process regulators for polymerisation processes in production of resins, rubbers, polymers
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Remarks

Not relevant since not classified as dangerous for the environment.

Section 2.2 - Control of worker exposure

Control of worker exposure

Title	Contributing Scenario [CS] 1
Process category(ies)	PROC1 - Use in closed process, no likelihood of exposure
Covers concentrations up to	100%
Physical form of product	Solid, low dustiness
Vapour pressure	0.08 Pa @ 25°C (SPARC, MPBPWIN v1.43)
Exposure duration	Avoid carrying out operation for more than 8h
Technical conditions and measures to control dispersion from source towards the worker	Minimisation of manual phases/work tasks Provide a basic standard of general ventilation (1 to 3 air changes per hour)
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Tight sealing safety goggles Avoid splashing Avoid contact with contaminated tools and objects Clean contaminated surface thoroughly
Organisational measures to prevent /limit releases, dispersion and exposure	Supervision in place to check that the RMMs in place are being used correctly and OCS followed Assumes a good basic standard of occupational hygiene is implemented Ensure operatives are trained to minimise exposures
Covers skin contact area up to	240 cm ²
Remarks	Palm of one hand
Indoor/Outdoor use	Indoor
Operational conditions	Assumes activities are at ambient temperature (unless stated differently)

Title	Contributing Scenario [CS]
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	2
Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure
Covers concentrations up to	100%
Physical form of product	Solid, low dustiness
Vapour pressure	0.08 Pa @ 25°C (SPARC, MPBPWIN v1.43)
Exposure duration	Avoid carrying out operation for more than 8h
Technical conditions and measures to control dispersion from source towards the worker	Minimisation of manual phases/work tasks Provide a basic standard of general ventilation (1 to 3 air changes per hour)
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection and gloves Tight sealing safety goggles Wear chemically resistant gloves (tested to EN374) in combination with specific activity training Avoid splashing Avoid contact with contaminated tools and objects Clean contaminated surface thoroughly
Organisational measures to prevent/limit releases, dispersion and exposure	Supervision in place to check that the RMMs in place are being used correctly and OCs followed Assumes a good basic standard of occupational hygiene is implemented Ensure operatives are trained to minimise exposures
Covers skin contact area up to	480 cm ²
Remarks	Palm of both hands
Indoor/Outdoor use	Indoor
Operational conditions	Assumes activities are at ambient temperature (unless stated differently)

Title	Contributing Scenario [CS] 3
Process category(ies)	PROC3 - Use in closed batch process (synthesis or formulation)
Covers concentrations up to	100%
Physical form of product	Solid, low dustiness
Vapour pressure	0.08 Pa @ 25°C (SPARC, MPBPWIN v1.43)
Exposure duration	Avoid carrying out operation for more than 8h
Technical conditions and measures to control dispersion from source towards the worker	Minimisation of manual phases/work tasks Provide a basic standard of general ventilation (1 to 3 air changes per hour)
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Tight sealing safety goggles Avoid splashing Avoid contact with contaminated tools and objects Clean contaminated surface thoroughly
Organisational measures to prevent/limit releases, dispersion and exposure	Supervision in place to check that the RMMs in place are being used correctly and OCs followed Assumes a good basic standard of occupational hygiene is implemented Ensure operatives are trained to minimise exposures
Covers skin contact area up to	240 cm ²
Remarks	Palm of one hand
Indoor/Outdoor use	Indoor
Operational conditions	Assumes activities are at ambient temperature (unless stated differently)

Title	Contributing Scenario [CS] 4
Process category(ies)	PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises
Covers concentrations up to	100%
Physical form of product	Solid, low dustiness
Vapour pressure	0.08 Pa @ 25°C (SPARC, MPBPWIN v1.43)
Exposure duration	Avoid carrying out operation for more than 8h
Technical conditions and measures to control dispersion from source towards the worker	Minimisation of manual phases/work tasks Provide a basic standard of general ventilation (1 to 3 air changes per hour)
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection and gloves Tight sealing safety goggles Wear chemically resistant gloves (tested to EN374) in combination with specific activity

	training Avoid splashing Avoid contact with contaminated tools and objects Clean contaminated surface thoroughly
Organisational measures to prevent/limit releases, dispersion and exposure	Supervision in place to check that the RMMs in place are being used correctly and OCs followed Assumes a good basic standard of occupational hygiene is implemented Ensure operatives are trained to minimise exposures
Covers skin contact area up to	480 cm ²
Remarks	Palm of both hands
Indoor/Outdoor use	Indoor
Operational conditions	Assumes activities are at ambient temperature (unless stated differently)
Title	Contributing Scenario [CS] 5
Process category(ies)	PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)
Covers concentrations up to	100%
Physical form of product	Solid, low dustiness
Vapour pressure	0.08 Pa @ 25°C (SPARC, MPBPWIN v1.43)
Exposure duration	Avoid carrying out operation for more than 8h
Technical conditions and measures to control dispersion from source towards the worker	Minimisation of manual phases/work tasks Provide a basic standard of general ventilation (1 to 3 air changes per hour)
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection and gloves Tight sealing safety goggles Wear chemically resistant gloves (tested to EN374) in combination with specific activity training Avoid splashing Avoid contact with contaminated tools and objects Clean contaminated surface thoroughly
Organisational measures to prevent/limit releases, dispersion and exposure	Supervision in place to check that the RMMs in place are being used correctly and OCs followed Assumes a good basic standard of occupational hygiene is implemented Ensure operatives are trained to minimise exposures
Covers skin contact area up to	480 cm ²
Remarks	Palm of both hands
Indoor/Outdoor use	Indoor
Operational conditions	Assumes activities are at ambient temperature (unless stated differently)
Title	Contributing Scenario [CS] 6
Process category(ies)	PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
Covers concentrations up to	100%
Physical form of product	Solid, low dustiness
Vapour pressure	0.08 Pa @ 25°C (SPARC, MPBPWIN v1.43)
Exposure duration	Avoid carrying out operation for more than 8h
Technical conditions and measures to control dispersion from source towards the worker	Minimisation of manual phases/work tasks Provide a basic standard of general ventilation (1 to 3 air changes per hour)
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection and gloves Tight sealing safety goggles Wear chemically resistant gloves (tested to EN374) in combination with specific activity training Avoid splashing Avoid contact with contaminated tools and objects Clean contaminated surface thoroughly
Organisational measures to prevent/limit releases, dispersion and exposure	Supervision in place to check that the RMMs in place are being used correctly and OCs followed Assumes a good basic standard of occupational hygiene is implemented Ensure operatives are trained to minimise exposures
Covers skin contact area up to	960 cm ²
Remarks	Both hands
Indoor/Outdoor use	Indoor

Operational conditions	Assumes activities are at ambient temperature (unless stated differently)
Title	Contributing Scenario [CS] 7
Process category(ies)	PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Covers concentrations up to	100%
Physical form of product	Solid, low dustiness
Vapour pressure	0.08 Pa @ 25°C (SPARC, MPBPWIN v1.43)
Exposure duration	Avoid carrying out operation for more than 8h
Technical conditions and measures to control dispersion from source towards the worker	Minimisation of manual phases/work tasks Provide a basic standard of general ventilation (1 to 3 air changes per hour)
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection and gloves Tight sealing safety goggles Wear chemically resistant gloves (tested to EN374) in combination with specific activity training Avoid splashing Avoid contact with contaminated tools and objects Clean contaminated surface thoroughly
Organisational measures to prevent/limit releases, dispersion and exposure	Supervision in place to check that the RMMs in place are being used correctly and OCs followed Assumes a good basic standard of occupational hygiene is implemented Ensure operatives are trained to minimise exposures
Covers skin contact area up to	960 cm ²
Remarks	Both hands
Indoor/Outdoor use	Indoor
Operational conditions	Assumes activities are at ambient temperature (unless stated differently)
Title	Contributing Scenario [CS] 8
Process category(ies)	PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Covers concentrations up to	100%
Physical form of product	Solid, medium dustiness Fumes
Vapour pressure	0.08 Pa @ 25°C (SPARC, MPBPWIN v1.43)
Exposure duration	Avoid carrying out operation for more than 8h
Technical conditions and measures to control dispersion from source towards the worker	Minimisation of manual phases/work tasks Provide a basic standard of general ventilation (1 to 3 air changes per hour)
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection and gloves Tight sealing safety goggles Wear chemically resistant gloves (tested to EN374) in combination with specific activity training Avoid splashing Avoid contact with contaminated tools and objects Clean contaminated surface thoroughly
Organisational measures to prevent/limit releases, dispersion and exposure	Supervision in place to check that the RMMs in place are being used correctly and OCs followed Assumes a good basic standard of occupational hygiene is implemented Ensure operatives are trained to minimise exposures
Covers skin contact area up to	960 cm ²
Remarks	Both hands
Indoor/Outdoor use	Outdoor
Operational conditions	Operation is carried out at elevated temperature (> 20°C above ambient temperature) > melting point
Title	Contributing Scenario [CS] 9
Process category(ies)	PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
Covers concentrations up to	100%

Physical form of product	Solid, low dustiness
Vapour pressure	0.08 Pa @ 25°C (SPARC, MPBPWIN v1.43)
Exposure duration	Avoid carrying out operation for more than 8h
Technical conditions and measures to control dispersion from source towards the worker	Minimisation of manual phases/work tasks Provide a basic standard of general ventilation (1 to 3 air changes per hour)
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection and gloves Tight sealing safety goggles Wear chemically resistant gloves (tested to EN374) in combination with specific activity training Avoid splashing Avoid contact with contaminated tools and objects Clean contaminated surface thoroughly
Organisational measures to prevent/limit releases, dispersion and exposure	Supervision in place to check that the RMMs in place are being used correctly and OCs followed Assumes a good basic standard of occupational hygiene is implemented Ensure operatives are trained to minimise exposures
Covers skin contact area up to	480 cm ²
Remarks	Palm of both hands
Indoor/Outdoor use	Indoor
Operational conditions	Assumes activities are at ambient temperature (unless stated differently)

Title	Contributing Scenario [CS] 10
Process category(ies)	PROC15 - Use as laboratory reagent
Covers concentrations up to	100%
Physical form of product	Solid, low dustiness
Vapour pressure	0.08 Pa @ 25°C (SPARC, MPBPWIN v1.43)
Exposure duration	Avoid carrying out operation for more than 8h
Technical conditions and measures to control dispersion from source towards the worker	Minimisation of manual phases/work tasks Provide a basic standard of general ventilation (1 to 3 air changes per hour)
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Tight sealing safety goggles Avoid splashing Avoid contact with contaminated tools and objects Clean contaminated surface thoroughly
Organisational measures to prevent/limit releases, dispersion and exposure	Supervision in place to check that the RMMs in place are being used correctly and OCs followed Assumes a good basic standard of occupational hygiene is implemented Ensure operatives are trained to minimise exposures
Covers skin contact area up to	240 cm ²
Remarks	Palm of one hand
Indoor/Outdoor use	Indoor
Operational conditions	Assumes activities are at ambient temperature (unless stated differently)

Section 3 - Exposure estimation

Environmental exposure

Environmental release category(ies)

ERC6d - Industrial use of process regulators for polymerisation processes in production of resins, rubbers, polymers

Remarks

Not relevant since not classified as dangerous for the environment.

worker

Control of worker exposure

Calculation method

Risk management measures are based on qualitative risk characterization
Used ECETOC TRA model

Title	Exposure route	Calculation method	predicted exposure level	Risk characterisation ratio (RCR)
Contributing Scenario [CS] 1	Worker - inhalative, long-term - systemic	Used ECETOC TRA model	0.01 mg/m ³	<0.01
Contributing Scenario [CS] 1	Worker - dermal, long-term - systemic	Used ECETOC TRA model	0.034 mg/kg bw/day	0.023
Contributing Scenario [CS] 1	Worker - combined, long-term - systemic			0.025
Contributing Scenario [CS] 2	Worker - inhalative, long-term - systemic	Used ECETOC TRA model	0.01 mg/m ³	<0.01
Contributing Scenario [CS] 2	Worker - dermal, long-term - systemic	Used ECETOC TRA model	0.068 mg/kg bw/day	0.046
Contributing Scenario [CS] 2	Worker - combined, long-term - systemic			0.048
Contributing Scenario [CS] 3	Worker - inhalative, long-term - systemic	Used ECETOC TRA model	0.1 mg/m ³	0.019
Contributing Scenario [CS] 3	Worker - dermal, long-term - systemic	Used ECETOC TRA model	0.69 mg/kg bw/day	0.46
Contributing Scenario [CS] 3	Worker - combined, long-term - systemic			0.479
Contributing Scenario [CS] 4	Worker - inhalative, long-term - systemic	Used ECETOC TRA model	0.5 mg/m ³	0.094
Contributing Scenario [CS] 4	Worker - dermal, long-term - systemic	Used ECETOC TRA model	0.343 mg/kg bw/day	0.229
Contributing Scenario [CS] 4	Worker - combined, long-term - systemic			0.323
Contributing Scenario [CS] 5	Worker - inhalative, long-term - systemic	Used ECETOC TRA model	0.5 mg/m ³	0.094
Contributing Scenario [CS] 5	Worker - dermal, long-term - systemic	Used ECETOC TRA model	0.686 mg/kg bw/day	0.457
Contributing Scenario [CS] 5	Worker - combined, long-term - systemic			0.551
Contributing Scenario [CS] 6	Worker - inhalative, long-term - systemic	Used ECETOC TRA model	0.5 mg/m ³	0.094
Contributing Scenario [CS] 6	Worker - dermal, long-term - systemic	Used ECETOC TRA model	0.686 mg/kg bw/day	0.457
Contributing Scenario [CS] 6	Worker - combined, long-term - systemic			0.551
Contributing Scenario [CS] 7	Worker - inhalative, long-term - systemic	Used ECETOC TRA model	0.1 mg/m ³	0.019
Contributing Scenario [CS] 7	Worker - dermal, long-term - systemic	Used ECETOC TRA model	0.686 mg/kg bw/day	0.457
Contributing Scenario [CS] 7	Worker - combined, long-term - systemic			0.476
Contributing Scenario [CS] 8	Worker - inhalative, long-term - systemic	Used ECETOC TRA model	0.7 mg/m ³	0.132
Contributing Scenario [CS] 8	Worker - dermal, long-term - systemic	Used ECETOC TRA model	0.686 mg/kg bw/day	0.457
Contributing Scenario [CS] 8	Worker - combined, long-term - systemic			0.589
Contributing Scenario [CS] 9	Worker - inhalative, long-term - systemic	Used ECETOC TRA model	0.1 mg/m ³	0.019
Contributing Scenario [CS] 9	Worker - dermal, long-term - systemic	Used ECETOC TRA model	0.343 mg/kg bw/day	0.229
Contributing Scenario [CS] 9	Worker - combined, long-term - systemic			0.248
Contributing Scenario [CS] 10	Worker - inhalative, long-term - systemic	Used ECETOC TRA model	0.1 mg/m ³	0.019
Contributing Scenario [CS] 10	Worker - dermal, long-term - systemic	Used ECETOC TRA model	0.34 mg/kg bw/day	0.227
Contributing Scenario [CS] 10	Worker - combined, long-term - systemic			0.246

Section 4 - Guidance to check compliance with the exposure scenario

Predicted exposures are not expected to exceed the DN(M)EL when the risk management measures/operational conditions outlined in section 2 are implemented. Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

Product Name BEPD
Chemical Name 2-butyl-2-ethylpropanediol
CAS No 115-84-4
EC No 204-111-7
REACH registration number 01-2119450133-52-0000
Pure substance/mixture Substance

Exposure scenario

Section 1 - Title

Title ES5 - Professional: Use as laboratory reagent.
Version 2
Product Name BEPD
Revision Date 20-Aug-2015

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) ERC8b - Wide dispersive indoor use of reactive substances in open systems

Remarks
Not relevant since not classified as dangerous for the environment.

Section 2.2 - Control of worker exposure

Control of worker exposure

Title	Contributing Scenario [CS] 1
Process category(ies)	PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
Covers concentrations up to	100%
Physical form of product	Solid, low dustiness
Vapour pressure	0.08 Pa @ 25°C (SPARC, MPBPWIN v1.43)
Exposure duration	Avoid carrying out operation for more than 8h
Technical conditions and measures to control dispersion from source towards the worker	Minimisation of manual phases/work tasks Provide a basic standard of general ventilation (1 to 3 air changes per hour)
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection and gloves Tight sealing safety goggles Wear chemically resistant gloves (tested to EN374) in combination with specific activity training Avoid splashing Avoid contact with contaminated tools and objects Clean contaminated surface thoroughly
Organisational measures to prevent /limit releases, dispersion and exposure	Supervision in place to check that the RMMs in place are being used correctly and OCs followed Assumes a good basic standard of occupational hygiene is implemented Ensure operatives are trained to minimise exposures
Covers skin contact area up to	480 cm ²
Remarks	Palm of both hands
Indoor/Outdoor use	Indoor

Operational conditions	Assumes activities are at ambient temperature (unless stated differently)
Title	Contributing Scenario [CS] 2
Process category(ies)	PROC15 - Use as laboratory reagent
Covers concentrations up to	100%
Physical form of product	Solid, low dustiness
Vapour pressure	0.08 Pa @ 25°C (SPARC, MPBPWIN v1.43)
Exposure duration	Avoid carrying out operation for more than 8h
Technical conditions and measures to control dispersion from source towards the worker	Minimisation of manual phases/work tasks Provide a basic standard of general ventilation (1 to 3 air changes per hour)
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection Tight sealing safety goggles Avoid splashing Avoid contact with contaminated tools and objects Clean contaminated surface thoroughly
Organisational measures to prevent /limit releases, dispersion and exposure	Supervision in place to check that the RMMs in place are being used correctly and OCs followed Assumes a good basic standard of occupational hygiene is implemented Ensure operatives are trained to minimise exposures
Covers skin contact area up to	240 cm ²
Remarks	Palm of one hand
Indoor/Outdoor use	Indoor
Operational conditions	Assumes activities are at ambient temperature (unless stated differently)

Section 3 - Exposure estimation

Environmental exposure

Environmental release category(ies) ERC8b - Wide dispersive indoor use of reactive substances in open systems

Remarks
Not relevant since not classified as dangerous for the environment.

worker
Control of worker exposure

Calculation method Risk management measures are based on qualitative risk characterization
Used ECETOC TRA model

Title	Exposure route	Calculation method	predicted exposure level	Risk characterisation ratio (RCR)
Contributing Scenario [CS] 1	Worker - inhalative, long-term - systemic	Used ECETOC TRA model	0.5 mg/m ³	0.094
Contributing Scenario [CS] 1	Worker - dermal, long-term - systemic	Used ECETOC TRA model	0.686 mg/kg bw/day	0.457
Contributing Scenario [CS] 1	Worker - combined, long-term - systemic			0.552
Contributing Scenario [CS] 2	Worker - inhalative, long-term - systemic	Used ECETOC TRA model	0.1 mg/m ³	0.019
Contributing Scenario [CS] 2	Worker - dermal, long-term - systemic	Used ECETOC TRA model	0.34 mg/kg bw/day	0.227
Contributing Scenario [CS] 2	Worker - combined, long-term - systemic			0.246

Section 4 - Guidance to check compliance with the exposure scenario

Predicted exposures are not expected to exceed the DN(M)EL when the risk management measures/operational conditions outlined in section 2 are implemented. Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.