SAFETY DATA SHEET

In accordance with Regulation (EC) 1907/2006 (REACH), Annex II

BENZOIC ACID

Created on November 8, 2010

1. IDENTIFICATION OF THE SUBSTANCE AND OF THE COMPANY		
1.1 Product identifier		
Trade name:	Benzoic acid	
Chemical name:	Benzoic acid	
Other names:	Benzenecarboxylic acid; Benzeneformic acid; Phenylcarboxylic acid; Phenylformic acid; Benzenemethanoic acid; Carboxybenzene	
REACH registration no	01-2119455536-33-0000	
1.2 Relevant identified uses of the substance and uses advised against		
Uses:	**Uses by workers in industrial settings**	**Reference to exposure scenario number in Annex**
	1. Manufacturing of the substance in a closed continuous process. An operator regulates the process from an operator room and regularly takes samples	ES1
	2. Storing and forwarding	ES2
	3. Sampling, loading, filling, transfer, dumping, bagging of substance (charging/discharging) at non-dedicated facilities. Industrial setting.	ES3
	4. Sampling, loading, filling, transfer, dumping, bagging of substance (charging/discharging) at dedicated facilities. Industrial setting.	ES4
	5. Sampling	ES1
	6. Transfer of substance into small containers (dedicated filling line, including weighing). Industrial setting.	ES5
	7. Use of benzoic acid in a closed batch process as an additive in the manufacturing of formulations. Some opportunity for contact with samples occur through sampling	ES6
	8. Use of benzoic acid as an additive in the manufacturing of formulations using technologies related to mixing	ES7

	and blending, and where the process is in stages and provides the opportunity for significant contact at any stage	
	9. Use of benzoic acid as an intermediate in a closed process to synthesise other substances	ES2
	10. Use of benzoic acid as an intermediate in closed, continuous process with occasional controlled exposure to synthesise other substances	ES1
	11. Use of benzoic acid as an intermediate in a closed batch process to synthesise other substances	ES6
	12. Use of benzoic acid as an intermediate in batch and other processes to synthesise other substances	ES8
	13. Use of benzoic acid as an auxiliary for polymerization processes in a closed process	ES2
	14. Use of benzoic acid as an auxiliary for polymerization processes in closed, continuous process with occasional controlled exposure	ES1
	15. Use of benzoic acid as an auxiliary for polymerization processes in a closed batch process	ES6
	16. Use of benzoic acid as an auxiliary for polymerization processes in batch and other processes	ES8
	Uses by professional workers	
	17. Use of lab chemicals in a professional setting	ES9
Most common technical function of substance (what it does):	Intermediate; additive	

Uses advised against:		None identified
1.3 Details of the supplier of the safety data sheet		
Manufacturer/Importer:		DSM Special Products B. V. Havennr. 4322 Montrealweg 15 3197 KH Rotterdam-Botlek The Netherlands
Person responsible for the import/manufacturing		DSM Special Products B.V. Mauritspark Mijnweg 1 6167 AC Geleen The Netherlands
Person responsible for the Safety Data Sheet		e-mail address of company responsible for the SDS: Purox.info@dsm.com
1.4 Emergency telephone number		
Emergency phone number:		Tel: +31 (0)181 249285
2. HAZARDS IDENTIFICATION		
2.1 Classification of the substance		
Classification in accordance with Regulation (EC) No 1272/2008		
Hazard statements:	H318 H335	Causes serious eye damage May cause respiratory irritation
Classification in accordance with EU Directive 67/548/EEC		
Risk phrases:	Xi;R41 Xi;R37	risk of serious damage to eyes irritating to respiratory system
2.2 Label elements		
Labelling in accordance with Regulation (EC) No 1272/2008		
Hazard pictograms:		 GHS05: corrosion
Signal word		Danger
Hazard statements:	H318 H335	Causes serious eye damage. May cause respiratory irritation.
Precautionary statements:	P280 P305+P351+P338 P310 P271 P261 P312	Wear protective gloves/protective clothing/eye protection/face protection. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or doctor/physician. Use only outdoors or in a well-ventilated area. Avoid breathing dust/fume/gas/mist/vapours/spray. Call a POISON CENTER or doctor/physician if you feel unwell.

	P304+P340	IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
Labelling in accordance with EU Directive 67/548/EEC		
Hazard symbols:		 Xi:Irritant
Risk phrases:	Xi;R41 Xi;R37	risk of serious damage to eyes irritating to respiratory system
Safety phrases:	S39 S26 S2 S46	wear eye/face protection in case of contact with eyes, rinse immediately with plenty of water and seek medical advice keep out of the reach of children if swallowed, seek medical advice immediately and show this container or label
2.3 Other hazards		
PBT/vPvB criteria		The substance does not meet the criteria for PBT or vPvB in accordance with REACH Annex XIII (see section 12.5).
Other hazards		Dust may cause mechanical irritation. Combustible. Possibility of explosion exists under dusty conditions.
3. COMPOSITION/INFORMATION ON INGREDIENTS		
3.1 Substances		
Substance/mixture:		According to the REACH Regulation the product is a substance

Chemical name	**CAS no.**	**EU no.**	**IUPAC name**	**Purity**
Benzoic acid	65-85-0	200-618-2	Benzoic acid	>99%

4. FIRST-AID MEASURES	
4.1 Description of first aid measures	
General:	Protection of first-aiders: Put on appropriate personal protective equipment. Ensure that eyewash stations and safety showers are close to the workstation location.
Eye contact:	Immediately flush eyes with running water for at least 15 minutes, keeping eyelids open. Get medical attention.
Skin contact:	Wash with soap and water. Remove contaminated clothing and shoes. Obtain medical attention if symptoms occur.
Ingestion:	If swallowed, rinse mouth with water (only if the person is conscious). Obtain medical attention if symptoms occur.

Inhalation:	If inhaled, remove to fresh air. Obtain medical attention if symptoms occur.
4.2 Most important symptoms and effects	
Eye contact:	Irritating to eyes (redness and pain)
Skin contact:	May cause allergic reactions in certain individuals. May be irritating.
Ingestion:	May be irritating.
Inhalation:	Over-exposure by inhalation may cause respiratory irritation. (coughing) Inhalation of dust may result in sensitization with allergic manifestations in predisposed persons.
4.3 Indication of any immediate medical attention and special treatment needed	
None identified	
5. FIRE-FIGHTING MEASURES	
5.1 Extinguishing media	
Suitable:	Small fire: Use dry chemical or CO2 Large fire: Use water, foam or dry chemical powder
Not suitable:	None identified
5.2 Special hazards arising from the substance or mixture	
Unusual fire/explosion hazards: Fine dust clouds may form explosive mixtures with air Hazardous thermal decomposition products: In case of fire, may produce hazardous decomposition products such as carbon monoxide, carbon dioxide	
5.3 Advice for firefighters	
Special fire-fighting procedures: Fight fire from protected location or maximum possible distance. Keep the area surrounding the fire cool. Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain. Protection of fire fighters: Wear suitable protective clothing. Self-contained breathing apparatus.	
6. ACCIDENTAL RELEASE MEASURES	
6.1 Personal precautions, protective equipment and emergency procedures	
Avoid creating dusty conditions and prevent wind dispersal. Avoid contact with eyes, skin, and clothing. Use suitable protective equipment. Keep away from sources of ignition. Take precautionary measures against static discharges. Use explosion-proof electrical (ventilating, lighting and material handling) equipment.	
6.2 Environmental precautions	
No special measures required.	
6.3 Methods and material for containment and cleaning up	
Small spill and leak: Vacuum or sweep up material and place in a designated, labelled waste container. Clean up affected area with a large amount of water.	

Large spill and leak: Vacuum the material and dispose of it in a designated and labelled waste contained. Recycle, if possible. Prevent formation of dust clouds. Clean up affected area with a large amount of water. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Keep away from sources of ignition.

6.4 Reference to other sections

See section 8 for personal protective equipment and section 13 for waste disposal

7. HANDLING AND STORAGE

7.1 Precautions for safe handling

Technical measures/ Precautions:	Use with adequate ventilation. Use suitable protective equipment. Avoid contact with eyes, skin and clothing. Avoid creating dusty conditions and prevent wind dispersal. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Take measures against static discharge. Keep away from sources of ignition.

7.2 Conditions for safe storage, including any incompatibilities

Technical measures/ Storage conditions:	Store in a fireproof location. Keep away from incompatible materials and avoid specific conditions (See section 10). The product has been produced and packaged in accordance with strict quality practices. Maintain this quality level by storing this product away from other chemicals. Keep container tightly closed in a cool, well- ventilated place. Keep container dry. Take precautionary measures against electrostatic discharges.
Incompatible products:	None known
Suitable packaging material:	Polyethylene

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1 Control parameters

Regulated occupational exposure limit values: None

Recommended occupational and consumer exposure limit values (following from the performed CSA)

Exposure pattern	Derived No Effect Level (DNEL)	
	Workers	**General population**
Long-term – dermal, systemic effects	34.7 mg/kg bw/day	20.8 mg/kg bw/day
Long-term – inhalation, systemic effects	10.4 mg/m³	2.1 mg/m³
Long-term – oral, systemic effects	Not relevant	25 mg/kg bw/day
Long-term – dermal, local effects	4.5 mg/cm²	2.7 mg/cm²
Long-term – inhalation, local effects	6.3 mg/m³	1.3 mg/m³

8.2 Exposure controls

Appropriate engineering controls:	Use only with adequate ventilation. Local exhaust ventilation should be provided. Use explosion proof electrical (ventilating, lighting and material handling) equipment.
Environmental exposure controls:	No special measures required.

Individual protection measures, such as personal protective equipment:	
Respiratory protection:	Wear dust protection mask P2.
Hand protection:	Wear suitable gloves. Recommended material(s): > 8 hours (breakthrough time): Butyl rubber (0.5 mm), nitrile rubber (0.35 mm), PVC (0.5 mm), neoprene (0.5 mm), Viton (0.4 mm). Replace damaged gloves.
Eye protection:	Safety glasses with side shields.
Skin and body protection:	Wear suitable protective clothing.
Hygiene measures:	When using do not eat, drink or smoke. Wash hands after handling compounds and before eating, smoking and using the lavatory and at the end of the day.
Further information:	Advice on personal protection is applicable for high exposure levels. Select proper personal protection based on a risk assessment of the actual exposure situation.
9. PHYSICAL AND CHEMICAL PROPERTIES	
9.1 Information on basic physical and chemical properties	
Appearance:	White, solid
Odour:	Odourless
pH:	2.8 at 25°C (saturated solution)
Melting/Freezing temperature:	122.4°C at 101325 Pa (from a peer reviewed handbook).
Boiling temperature: (initial and range)	249.2ºC at 760 mmHg (from a peer reviewed handbook).
Flash-point:	Not applicable, the substance is a solid.
Flammability:	Not flammable (EC A.10). Not flammable in contact with water (EC A.12, based on structure). Not flammable in contact with air (EC A.13, based on structure).
Explosive properties:	Not explosive (EC A.14, based on structure).
Oxidizing properties:	Not oxidizing (EC A.17 //21, based on structure)
Vapour pressure:	1.3 hPa at 96 °C (data from peer reviewed handbook)
Relative density (D4 (20)):	1.32 at 20°C (data from peer reviewed handbook)
Solubility in water:	2.9 g/l at 20°C (data from peer reviewed handbook)
Partition coefficient n-octanol/water:	log Kow 1.87 at unknown temperature (data from peer reviewed handbook)

Viscosity:	Not applicable, the substance is a solid.
Auto ignition temperature:	In accordance with REACH Annex VII, section 7.12., column 2 (specific rules for adaptation from column 1), the self-ignition temperature test does not need to be conducted because the substance is a solid with a melting point <160°C.
Surface tension:	Not surface active: 67.5 mN/m at 20.0°C (1 g/l / in water) (OECD 115, EC A.5: ring method).
Minimum Ignition Energy (MIE)	Product sample: median value of the tested sample > 0,5 mm does not ignite 3 - 10 mJ (test performed using a similar product, milled sample, median value of the tested sample > 0,063 mm, EN13821) The Minimum Ignition Energy (MIE) of a dust/air mix depends on the particle size the water content and the temperature of the dust. The finer and the dryer the dust the lower the MIE.

10. STABILITY AND REACTIVITY

10.1 Reactivity

10.2 Chemical stability

Stable under recommended storage and handling conditions

10.3 Possibility of hazardous reactions

10.4 Conditions to avoid

Keep away from heat, sparks and flame. Prevent formation of dust clouds.

10.5 Incompatible materials

Strong oxidising materials, reducing agents, bases, moisture, metals.

10.6 Hazardous decomposition products

Upon heating: formation of phenol, benzene. In case of fire, see fire-fighting measures

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

ACUTE TOXICITY	
Acute oral toxicity:	LD50 (rats/mice): 2565 mg/kg (OECD 423, EC B.1 tris)
Acute dermal toxicity:	LD50 (rabbits): 2000 mg/kg (OECD 402, EC B.3)
Acute inhalation toxicity:	LC50 (rat): 12.2 mg/l (OECD 403, EC B.2)
LOCAL EFFECTS	
Skin irritation:	Not irritating (OECD 404)
Eye irritation:	Corrosive (OECD 405)
Respiratory irritation:	Irritating
Skin sensitization:	Not sensitizing (several studies)
OTHER	

Sub-acute toxicity:	Dermal NOAEL: 2500 mg/kg bw/day (rabbit) Inhalation NOAEC: 250 mg/m3 (rat)
Chronic toxicity:	Oral NOAEL: 500 mg/kg bw/day (rat)
Mutagenicity:	Bacterial reverse mutation test (*S. typhimurium*): not mutagenic (OECD 471, EC B.13/14; Ames test). *In vitro* Mammalian Chromosome aberration (Chinese hamster fibroblasts): negative
Reproductive toxicity:	4 generation study in rats: oral NOAEL >500 mg/kg bw/day
Carcinogenicity:	No data available.
STOT-single exposure:	In a repeated dose inhalation study benzoic acid appeared to be irritating to the respiratory tract at high doses.

12. ECOLOGICAL INFORMATION

12.1 Toxicity

Fish:	96h-LC50: >100 mg/L
Daphnia magna:	48h-EC50: >100 mg/
Algae:	72h-EC50: >100 mg/l
Toxicity to aquatic micro-organisms:	3h-IC50: >1000 mg/L (OECD 209)

12.2 Persistence and degradability

Biodegradation:	Readily biodegradable (OECD 301, EC C.4; modified sturm test).

12.3 Bioaccumulative potential

Octanol-water partition coefficient (K_{ow}):	Log Kow = 1.88
Bioconcentration factor (BCF):	Not determined

12.4 Mobility in soil

Adsorption coefficient:	The substance is expected to have a low adsorption potential based on the low log Kow value of 1.88.

12.5 Results of PBT and vPvB assessment

	P	**B**	**T**
Relevant available data:	Readily biodegradable	Log P_{ow} = 1.88	L(E)C50: > 100 mg/L; Long term study for 1 trophic level available: NOEC: 10 mg/L; Not classified for any health hazard that triggers T
PBT and vPvB Criteria fulfilled?	No	No	No

13. DISPOSAL CONSIDERATIONS

Methods of disposal (waste of residues; contaminated packaging):	Waste must be disposed of in accordance with national and local environmental regulations. Controlled biodegradation in waste water treatment is possible.
14. TRANSPORT INFORMATION	
14.1 UN Number:	Not regulated for transport
14.2 UN Proper shipping name:	Not regulated for transport
14.3 Transport hazard classes:	Not regulated for transport
14.4 Packing group	Not regulated for transport
14.5 Environmental hazards:	Not regulated for transport
14.6 Special precautions for user	Not regulated for transport
14.7 Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code:	Not regulated for transport
15. REGULATORY INFORMATION	
15.1 Safety, health and environmental regulation/legislation specific for the substance or mixture:	Not applicable
15.2 Chemical safety assessment:	In accordance with REACH article 14, a Chemical Safety assessment has been carried out for this substance
16. OTHER INFORMATION	
The information contained in this Safety Data Sheet is based on our data available on the date of publication. The information is intended to aid the user in controlling the handling risks; it is not to be construed as a warranty or specification of the product quality. The information may not be or may not altogether be applicable to combinations of the product with other substances or to particular applications. The user is responsible for ensuring that appropriate precautions are taken and for satisfying themselves that the data are suitable and sufficient for the product's intended purpose. In case of any unclarity we advise consulting the supplier or an expert.	
Version:	5
Creation date:	04 November 2010
Revision date:	30 November 2010
Printing date:	30 November 2010
Created/Revised by:	Safety, Health & Environment Department

ANNEX

1 Exposure scenario (1) **Manufacturing of the substance, industrial use as intermediate and as auxiliary for polymerization in a closed continuous process, with occasional exposure**	
Use descriptors related to the life cycle stage	SU3/8/9 PC19/32 (for industrial use) PROC2 ERC1, ERC6A, ERC6D
Name of contributing environmental scenario (1) and corresponding ERC	1. Environmental release during manufacturing (ERC1), industrial use as intermediate (ERC6A) and as auxiliary for polymerization (ERC6D)
List of names of contributing worker scenarios (2) and corresponding PROC	2. Manufacturing, industrial use as intermediate and as auxiliary for polymerization in a closed continuous process, with occasional exposure (PROC2)
2.1 Contributing scenario (1) controlling environmental exposure during manufacturing, industrial use as intermediate and as auxiliary for polymerization	
Environmental release during manufacturing, industrial use as intermediate and as auxiliary for polymerization ERC1, ERC6A, ERC6D An environmental assessment has not been performed as the substance does not meet the criteria for being classified as dangerous for the environment.	
2.2 Contributing scenario (2) controlling worker exposure for manufacturing, industrial use as intermediate and as auxiliary for polymerization in a closed continuous process, with occasional exposure	
Manufacturing, industrial use as intermediate and as auxiliary for polymerization in a closed continuous process, with occasional exposure	
PROC2	
Product characteristic	
Product related conditions, e.g. the concentration of the substance in a mixture, the physical state of that mixture (solid, liquid; if solid: level of dustiness), package design affecting exposure)	Solid (flakes), low dustiness Substance as such (industrial use)
Amounts used	
Amounts used at a workplace (per task or per shift); note: sometimes this information is not needed for assessment of worker's exposure	Not applicable for first tier assessment using ECETOC TRA
Frequency and duration of use/exposure	
Duration per task/activity (e.g. hours per shift) and frequency (e.g. single events or repeated) of exposure	More than 4 hours per day, repeated exposure (working life)
Human factors not influenced by risk management	
Particular conditions of use, e.g. body parts potentially exposed as a result of the nature of the activity	Exposed skin surface (cm2): 480 (two hands, face only)
Other given operational conditions affecting workers exposure	
Other given operational conditions: e.g.	Indoors

technology or process techniques determining the initial release of substance from process into workers environment; room volume, whether the work is carried out outdoors/indoors, process conditions related to temperature and pressure.	
Technical conditions and measures at process level (source) to prevent release	
Process design aiming to prevent releases and hence exposure of workers; this in particular includes conditions ensuring rigorous containment; performance of containment to be specified (e.g. by quantification of residual losses or exposure)	Not applicable
Technical conditions and measures to control dispersion from source towards the worker	
Engineering controls, e.g. exhaust ventilation, general ventilation; specify effectiveness of measure	Not applicable
Organisational measures to prevent /limit releases, dispersion and exposure	
Specific organisational measures or measures needed to support the functioning of particular technical measures (e.g. training and supervision). Those measures need to be reported in particular for demonstrating strictly controlled conditions (to justify exposure based waiving).	Not applicable
Conditions and measures related to personal protection, hygiene and health evaluation	
Personal protection, e.g. wearing of gloves, face protection, full body dermal protection, goggles, respirator; specify effectiveness of measure; specify the suitable material for the PPE (where relevant) and advise how long the protective equipment can be used before replacement (if relevant)	- chemical goggles - substance task appropriate respirator
Exposure information and relevance to its source	
Information for contributing scenario 1	
An environmental assessment has not been performed as the substance does not meet the criteria for being classified as dangerous for the environment.	
Information for contributing scenario 2	
Workers exposure estimation is calculated with ECETOC TRA model.	

Workers exposure	Unit	Exposure estimation	DNEL
Long-term systemic dermal effects	mg/kg bw/day	1.37	34.7
Long-term systemic inhalation effects	mg/m3	1E-02	10.4
Long-term dermal local effects	mg/cm2/day	0.2	4.5
Long-term inhalation local effects	mg/m3	1E-02	6.3

Guidance to DU to evaluate whether he works inside the boundaries set by the ES
Using the first tier model of ECETOC TRA and assuming worst case operational conditions (no LEV, no PPE and 4-8 hours exposure) benzoic acid does not pose a risk to human health for workers in this scenario. Therefore, no additional RMMs beside those that are mentioned above are needed to guarantee safe use for

workers.
Additional good practice advice beyond the REACH CSA Additional good practices (Operational Conditions and Risk Management Measures) beyond the REACH Chemical Safety Assessment established within Chemical Industry are also advised and communicated through Safety Data Sheets. Such as: - Containment as appropriate; - Minimise number of staff exposed; - Segregation of the emitting process; - Effective contaminant extraction; - Good standard of general ventilation; - Minimisation of manual phases; - Avoidance of contact with contaminated tools and objects; - Regular cleaning of equipment and work area; - Management/supervision in place to check that RMMs in place are being used correctly and OCs followed; - Training staff on good practice; - Good standard of personal hygiene;

1 Exposure scenario (2) **Industrial use as an intermediate or auxiliary in polymerization processes in a closed continuous process, no likelihood of exposure including storing and forwarding**	
Use descriptors related to the life cycle stage	SU3 PC19/32 PROC1 ERC6A, ERC6D
Name of contributing environmental scenario (1) and corresponding ERC	1. Environmental release during industrial use as intermediate (ERC6A) and auxiliary for polymerization (ERC6D)
List of names of contributing worker scenarios (2) and corresponding PROC	2. Industrial use in a closed continuous process, no likelihood of exposure including storing and forwarding (PROC1)
2.1 Contributing scenario (1) controlling environmental exposure during industrial use as intermediate and auxiliary for polymerization	
Environmental release during industrial use as intermediate and auxiliary for polymerization ERC6A, ERC6D An environmental assessment has not been performed as the substance does not meet the criteria for being classified as dangerous for the environment.	
2.2 Contributing scenario (2) controlling worker exposure for industrial use in a closed continuous process, no likelihood of exposure	
Industrial use in a closed continuous process, no likelihood of exposure	
PROC1	
Product characteristic	
Product related conditions, e.g. the concentration of the substance in a mixture, the physical state of that mixture (solid, liquid; if solid: level of dustiness), package design affecting exposure)	Solid (flakes), low dustiness Substance as such
Amounts used	
Amounts used at a workplace (per task or per shift); note: sometimes this information is not needed for assessment of worker's exposure	Not applicable for first tier assessment using ECETOC TRA
Frequency and duration of use/exposure	
Duration per task/activity (e.g. hours per shift) and frequency (e.g. single events or repeated) of exposure	More than 4 hours per day, repeated exposure (working life)
Human factors not influenced by risk management	
Particular conditions of use, e.g. body parts potentially exposed as a result of the nature of the activity	Exposed skin surface (cm2): 240 (one hand, face only)
Other given operational conditions affecting workers exposure	
Other given operational conditions: e.g. technology or process techniques determining the initial release of substance from process into workers environment; room volume, whether the work is carried out outdoors/indoors, process	Indoors

conditions related to temperature and pressure.	
Technical conditions and measures at process level (source) to prevent release	
Process design aiming to prevent releases and hence exposure of workers; this in particular includes conditions ensuring rigorous containment; performance of containment to be specified (e.g. by quantification of residual losses or exposure)	Not applicable
Technical conditions and measures to control dispersion from source towards the worker	
Engineering controls, e.g. exhaust ventilation, general ventilation; specify effectiveness of measure	Not applicable
Organisational measures to prevent /limit releases, dispersion and exposure	
Specific organisational measures or measures needed to support the functioning of particular technical measures (e.g. training and supervision). Those measures need to be reported in particular for demonstrating strictly controlled conditions (to justify exposure based waiving).	Not applicable
Conditions and measures related to personal protection, hygiene and health evaluation	
Personal protection, e.g. wearing of gloves, face protection, full body dermal protection, goggles, respirator; specify effectiveness of measure; specify the suitable material for the PPE (where relevant) and advise how long the protective equipment can be used before replacement (if relevant)	- chemical goggles - substance task appropriate respirator

Exposure information and relevance to its source

Information for contributing scenario 1

An environmental assessment has not been performed as the substance does not meet the criteria for being classified as dangerous for the environment.

Information for contributing scenario 2

Workers exposure estimation is calculated with ECETOC TRA model.

Workers exposure	Unit	Exposure estimation	DNEL
Long-term systemic dermal effects	mg/kg bw/day	3.43E-01	34.7
Long-term systemic inhalation effects	mg/m3	1E-02	10.4
Long-term dermal local effects	mg/cm2/day	0.1	4.5
Long-term inhalation local effects	mg/m3	1E-02	6.3

Guidance to DU to evaluate whether he works inside the boundaries set by the ES

Using the first tier model of ECETOC TRA and assuming worst case operational conditions (no LEV, no PPE and 4-8 hours exposure) benzoic acid does not pose a risk to human health for workers in this scenario. Therefore, no additional RMMs beside those that are mentioned above are needed to guarantee safe use for workers.

Additional good practice advice beyond the REACH CSA

Additional good practices (Operational Conditions and Risk Management Measures) beyond the REACH

Chemical Safety Assessment established within Chemical Industry are also advised and communicated through Safety Data Sheets. Such as:

- Containment as appropriate;
- Minimise number of staff exposed;
- Segregation of the emitting process;
- Effective contaminant extraction;
- Good standard of general ventilation;
- Minimisation of manual phases;
- Avoidance of contact with contaminated tools and objects;
- Regular cleaning of equipment and work area;
- Management/supervision in place to check that RMMs in place are being used correctly and OCs followed;
- Training staff on good practice;
- Good standard of personal hygiene;

1 Exposure scenario (3) **Charging/discharging at non-dedicated facilities in an industrial setting**	
Use descriptors related to the life cycle stage	SU3 PROC8A ERC (not relevant, covered by industrial uses)
List of names of contributing worker scenarios (1) and corresponding PROC	1. Charging/discharging at non-dedicated facilities in an industrial setting (PROC8A)
2.1 Contributing scenario (1) controlling worker exposure for charging/discharging at non-dedicated facilities in an industrial setting	
Charging/discharging at non-dedicated facilities in an industrial setting	
PROC8A	
Product characteristic	
Product related conditions, e.g. the concentration of the substance in a mixture, the physical state of that mixture (solid, liquid; if solid: level of dustiness), package design affecting exposure)	Solid (flakes), low dustiness Substance as such
Amounts used	
Amounts used at a workplace (per task or per shift); note: sometimes this information is not needed for assessment of worker's exposure	Not applicable for first tier assessment using ECETOC TRA
Frequency and duration of use/exposure	
Duration per task/activity (e.g. hours per shift) and frequency (e.g. single events or repeated) of exposure	More than 4 hours per day, repeated exposure (working life)
Human factors not influenced by risk management	
Particular conditions of use, e.g. body parts potentially exposed as a result of the nature of the activity	Exposed skin surface (cm2): 960 (two hands)
Other given operational conditions affecting workers exposure	
Other given operational conditions: e.g. technology or process techniques determining the initial release of substance from process into workers environment; room volume, whether the work is carried out outdoors/indoors, process conditions related to temperature and pressure.	Indoors
Technical conditions and measures at process level (source) to prevent release	
Process design aiming to prevent releases and hence exposure of workers; this in particular includes conditions ensuring rigorous containment; performance of containment to be specified (e.g. by quantification of residual losses or exposure)	Not applicable
Technical conditions and measures to control dispersion from source towards the worker	
Engineering controls, e.g. exhaust ventilation, general ventilation; specify effectiveness of measure	Not applicable

Organisational measures to prevent /limit releases, dispersion and exposure	
Specific organisational measures or measures needed to support the functioning of particular technical measures (e.g. training and supervision). Those measures need to be reported in particular for demonstrating strictly controlled conditions (to justify exposure based waiving).	Not applicable
Conditions and measures related to personal protection, hygiene and health evaluation	
Personal protection, e.g. wearing of gloves, face protection, full body dermal protection, goggles, respirator; specify effectiveness of measure; specify the suitable material for the PPE (where relevant) and advise how long the protective equipment can be used before replacement (if relevant)	- chemical goggles - substance task appropriate respirator

Exposure information and relevance to its source

Information for contributing scenario 1

Workers exposure estimation is calculated with ECETOC TRA model.

Workers exposure	Unit	Exposure estimation	DNEL
Long-term systemic dermal effects	mg/kg bw/day	13.7	34.7
Long-term systemic inhalation effects	mg/m3	5E-01	10.4
Long-term dermal local effects	mg/cm2/day	1	4.5
Long-term inhalation local effects	mg/m3	5E-01	6.3

Guidance to DU to evaluate whether he works inside the boundaries set by the ES

Using the first tier model of ECETOC TRA and assuming worst case operational conditions (no LEV, no PPE and 4-8 hours exposure) benzoic acid does not pose a risk to human health for workers in this scenario. Therefore, no additional RMMs beside those that are mentioned above are needed to guarantee safe use for workers.

Additional good practice advice beyond the REACH CSA

Additional good practices (Operational Conditions and Risk Management Measures) beyond the REACH Chemical Safety Assessment established within Chemical Industry are also advised and communicated through Safety Data Sheets. Such as:

- Containment as appropriate;
- Minimise number of staff exposed;
- Segregation of the emitting process;
- Effective contaminant extraction;
- Good standard of general ventilation;
- Minimisation of manual phases;
- Avoidance of contact with contaminated tools and objects;
- Regular cleaning of equipment and work area;
- Management/supervision in place to check that RMMs in place are being used correctly and OCs followed;
- Training staff on good practice;
- Good standard of personal hygiene;

1 Exposure scenario (4) **Charging/discharging at dedicated facilities in an industrial setting**	
Use descriptors related to the life cycle stage	SU3 PROC8B ERC (not relevant, covered by industrial uses)
List of names of contributing worker scenarios (1) and corresponding PROC	1. Charging/discharging at dedicated facilities in an industrial setting (PROC8B)
2.1 Contributing scenario (1) controlling worker exposure for charging/discharging at dedicated facilities in an industrial setting	
Charging/discharging at dedicated facilities in an industrial setting	
PROC8B	
Product characteristic	
Product related conditions, e.g. the concentration of the substance in a mixture, the physical state of that mixture (solid, liquid; if solid: level of dustiness), package design affecting exposure)	Solid (flakes), low dustiness Substance as such
Amounts used	
Amounts used at a workplace (per task or per shift); note: sometimes this information is not needed for assessment of worker's exposure	Not applicable for first tier assessment using ECETOC TRA
Frequency and duration of use/exposure	
Duration per task/activity (e.g. hours per shift) and frequency (e.g. single events or repeated) of exposure	More than 4 hours per day, repeated exposure (working life)
Human factors not influenced by risk management	
Particular conditions of use, e.g. body parts potentially exposed as a result of the nature of the activity	Exposed skin surface (cm2): 480 (two hands, face only)
Other given operational conditions affecting workers exposure	
Other given operational conditions: e.g. technology or process techniques determining the initial release of substance from process into workers environment; room volume, whether the work is carried out outdoors/indoors, process conditions related to temperature and pressure.	Indoors
Technical conditions and measures at process level (source) to prevent release	
Process design aiming to prevent releases and hence exposure of workers; this in particular includes conditions ensuring rigorous containment; performance of containment to be specified (e.g. by quantification of residual losses or exposure)	Not applicable
Technical conditions and measures to control dispersion from source towards the worker	
Engineering controls, e.g. exhaust ventilation, general ventilation; specify effectiveness of measure	Not applicable
Organisational measures to prevent /limit releases, dispersion and exposure	

Specific organisational measures or measures needed to support the functioning of particular technical measures (e.g. training and supervision). Those measures need to be reported in particular for demonstrating strictly controlled conditions (to justify exposure based waiving).	Not applicable
Conditions and measures related to personal protection, hygiene and health evaluation	
Personal protection, e.g. wearing of gloves, face protection, full body dermal protection, goggles, respirator; specify effectiveness of measure; specify the suitable material for the PPE (where relevant) and advise how long the protective equipment can be used before replacement (if relevant)	- chemical goggles - substance task appropriate respirator

Exposure information and relevance to its source

Information for contributing scenario 1

Workers exposure estimation is calculated with ECETOC TRA model.

Workers exposure	Unit	Exposure estimation	DNEL
Long-term systemic dermal effects	mg/kg bw/day	6.86	34.7
Long-term systemic inhalation effects	mg/m3	1E-01	10.4
Long-term dermal local effects	mg/cm2/day	1	4.5
Long-term inhalation local effects	mg/m3	1E-01	6.3

Guidance to DU to evaluate whether he works inside the boundaries set by the ES

Using the first tier model of ECETOC TRA and assuming worst case operational conditions (no LEV, no PPE and 4-8 hours exposure) benzoic acid does not pose a risk to human health for workers in this scenario. Therefore, no additional RMMs beside those that are mentioned above are needed to guarantee safe use for workers.

Additional good practice advice beyond the REACH CSA

Additional good practices (Operational Conditions and Risk Management Measures) beyond the REACH Chemical Safety Assessment established within Chemical Industry are also advised and communicated through Safety Data Sheets. Such as:

- Containment as appropriate;
- Minimise number of staff exposed;
- Segregation of the emitting process;
- Effective contaminant extraction;
- Good standard of general ventilation;
- Minimisation of manual phases;
- Avoidance of contact with contaminated tools and objects;
- Regular cleaning of equipment and work area;
- Management/supervision in place to check that RMMs in place are being used correctly and OCs followed;
- Training staff on good practice;
- Good standard of personal hygiene;

1 Exposure scenario (5) **Transfer of substance into small containers in an industrial setting**	
Use descriptors related to the life cycle stage	SU3 PROC9 ERC (not relevant, covered by industrial uses)
List of names of contributing worker scenarios (1) and corresponding PROC	1. Transfer of substance into small containers in an industrial setting (PROC9)
2.1 Contributing scenario (1) controlling worker exposure for transfer of substance into small containers in an industrial setting	
Transfer of substance into small containers in an industrial setting	
PROC9	
Product characteristic	
Product related conditions, e.g. the concentration of the substance in a mixture, the physical state of that mixture (solid, liquid; if solid: level of dustiness), package design affecting exposure)	Solid (flakes), low dustiness Substance as such
Amounts used	
Amounts used at a workplace (per task or per shift); note: sometimes this information is not needed for assessment of worker's exposure	Not applicable for first tier assessment using ECETOC TRA
Frequency and duration of use/exposure	
Duration per task/activity (e.g. hours per shift) and frequency (e.g. single events or repeated) of exposure	More than 4 hours per day, repeated exposure (working life)
Human factors not influenced by risk management	
Particular conditions of use, e.g. body parts potentially exposed as a result of the nature of the activity	Exposed skin surface (cm2): 480 (two hands, face only)
Other given operational conditions affecting workers exposure	
Other given operational conditions: e.g. technology or process techniques determining the initial release of substance from process into workers environment; room volume, whether the work is carried out outdoors/indoors, process conditions related to temperature and pressure.	Indoors
Technical conditions and measures at process level (source) to prevent release	
Process design aiming to prevent releases and hence exposure of workers; this in particular includes conditions ensuring rigorous containment; performance of containment to be specified (e.g. by quantification of residual losses or exposure)	Not applicable
Technical conditions and measures to control dispersion from source towards the worker	
Engineering controls, e.g. exhaust ventilation, general ventilation; specify effectiveness of measure	Not applicable

Organisational measures to prevent /limit releases, dispersion and exposure	
Specific organisational measures or measures needed to support the functioning of particular technical measures (e.g. training and supervision). Those measures need to be reported in particular for demonstrating strictly controlled conditions (to justify exposure based waiving).	Not applicable
Conditions and measures related to personal protection, hygiene and health evaluation	
Personal protection, e.g. wearing of gloves, face protection, full body dermal protection, goggles, respirator; specify effectiveness of measure; specify the suitable material for the PPE (where relevant) and advise how long the protective equipment can be used before replacement (if relevant)	- chemical goggles - substance task appropriate respirator

Exposure information and relevance to its source

Information for contributing scenario 1

Workers exposure estimation is calculated with ECETOC TRA model.

Workers exposure	Unit	Exposure estimation	DNEL
Long-term systemic dermal effects	mg/kg bw/day	6.86	34.7
Long-term systemic inhalation effects	mg/m3	1E-01	10.4
Long-term dermal local effects	mg/cm2/day	1	4.5
Long-term inhalation local effects	mg/m3	1E-01	6.3

Guidance to DU to evaluate whether he works inside the boundaries set by the ES

Using the first tier model of ECETOC TRA and assuming worst case operational conditions (no LEV, no PPE and 4-8 hours exposure) benzoic acid does not pose a risk to human health for workers in this scenario. Therefore, no additional RMMs beside those that are mentioned above are needed to guarantee safe use for workers.

Additional good practice advice beyond the REACH CSA

Additional good practices (Operational Conditions and Risk Management Measures) beyond the REACH Chemical Safety Assessment established within Chemical Industry are also advised and communicated through Safety Data Sheets. Such as:

- Containment as appropriate;
- Minimise number of staff exposed;
- Segregation of the emitting process;
- Effective contaminant extraction;
- Good standard of general ventilation;
- Minimisation of manual phases;
- Avoidance of contact with contaminated tools and objects;
- Regular cleaning of equipment and work area;
- Management/supervision in place to check that RMMs in place are being used correctly and OCs followed;
- Training staff on good practice;
- Good standard of personal hygiene;

1 Exposure scenario (6) **Industrial use in closed batch process – formulation, intermediate use and auxiliary in polymerization processes**	
Use descriptors related to the life cycle stage	SU3/10 PC0/4/8/19/20/29/32/39 PROC3 ECR2, ERC6A, ERC6D
Name of contributing environmental scenario (1) and corresponding ERC	1. Environmental release during formulation (ERC2), industrial use as intermediate (ERC6A) and auxiliary for polymerization (ERC6D)
List of names of contributing worker scenarios (2) and corresponding PROC	2. Formulation and Industrial use in a closed batch process (PROC3)
2.1 Contributing scenario (1) controlling environmental exposure during formulation, industrial use as intermediate and auxiliary for polymerization	
Environmental release during formulation, industrial use as intermediate and auxiliary for polymerization ECR2, ERC6A, ERC6D An environmental assessment has not been performed as the substance does not meet the criteria for being classified as dangerous for the environment.	
2.2 Contributing scenario (2) controlling worker exposure for formulation and industrial use in a closed batch process	
Formulation and industrial use in a closed batch process	
PROC3	
Product characteristic	
Product related conditions, e.g. the concentration of the substance in a mixture, the physical state of that mixture (solid, liquid; if solid: level of dustiness), package design affecting exposure)	Solid (flakes), low dustiness Substance as such
Amounts used	
Amounts used at a workplace (per task or per shift); note: sometimes this information is not needed for assessment of worker's exposure	Not applicable for first tier assessment using ECETOC TRA
Frequency and duration of use/exposure	
Duration per task/activity (e.g. hours per shift) and frequency (e.g. single events or repeated) of exposure	More than 4 hours per day, repeated exposure (working life)
Human factors not influenced by risk management	
Particular conditions of use, e.g. body parts potentially exposed as a result of the nature of the activity	Exposed skin surface (cm2): 240 (one hand, face only)
Other given operational conditions affecting workers exposure	
Other given operational conditions: e.g. technology or process techniques determining the initial release of substance from process into workers environment; room volume, whether the work is carried out outdoors/indoors, process conditions related to	Indoors

temperature and pressure.	
Technical conditions and measures at process level (source) to prevent release	
Process design aiming to prevent releases and hence exposure of workers; this in particular includes conditions ensuring rigorous containment; performance of containment to be specified (e.g. by quantification of residual losses or exposure)	Not applicable
Technical conditions and measures to control dispersion from source towards the worker	
Engineering controls, e.g. exhaust ventilation, general ventilation; specify effectiveness of measure	Not applicable
Organisational measures to prevent /limit releases, dispersion and exposure	
Specific organisational measures or measures needed to support the functioning of particular technical measures (e.g. training and supervision). Those measures need to be reported in particular for demonstrating strictly controlled conditions (to justify exposure based waiving).	Not applicable
Conditions and measures related to personal protection, hygiene and health evaluation	
Personal protection, e.g. wearing of gloves, face protection, full body dermal protection, goggles, respirator; specify effectiveness of measure; specify the suitable material for the PPE (where relevant) and advise how long the protective equipment can be used before replacement (if relevant)	- chemical goggles - substance task appropriate respirator

Exposure information and relevance to its source

Information for contributing scenario 1

An environmental assessment has not been performed as the substance does not meet the criteria for being classified as dangerous for the environment.

Information for contributing scenario 2

Workers exposure estimation is calculated with ECETOC TRA model.

Workers exposure	Unit	Exposure estimation	DNEL
Long-term systemic dermal effects	mg/kg bw/day	3.43E-01	34.7
Long-term systemic inhalation effects	mg/m3	1E-01	10.4
Long-term dermal local effects	mg/cm2/day	0.1	4.5
Long-term inhalation local effects	mg/m3	1E-01	6.3

Guidance to DU to evaluate whether he works inside the boundaries set by the ES

Using the first tier model of ECETOC TRA and assuming worst case operational conditions (no LEV, no PPE and 4-8 hours exposure) benzoic acid does not pose a risk to human health for workers in this scenario. Therefore, no additional RMMs beside those that are mentioned above are needed to guarantee safe use for workers.

Additional good practice advice beyond the REACH CSA

Additional good practices (Operational Conditions and Risk Management Measures) beyond the REACH

Chemical Safety Assessment established within Chemical Industry are also advised and communicated through Safety Data Sheets. Such as:

- Containment as appropriate;
- Minimise number of staff exposed;
- Segregation of the emitting process;
- Effective contaminant extraction;
- Good standard of general ventilation;
- Minimisation of manual phases;
- Avoidance of contact with contaminated tools and objects;
- Regular cleaning of equipment and work area;
- Management/supervision in place to check that RMMs in place are being used correctly and OCs followed;
- Training staff on good practice;
- Good standard of personal hygiene;

1 Exposure scenario (7) **Formulation in batch processes with multistage and/or significant contact**	
Use descriptors related to the life cycle stage	SU10 PC0/4/8/20/29/39 PROC5 ECR2
Name of contributing environmental scenario (1) and corresponding ERC	1. Environmental release during formulation (ERC2)
List of names of contributing worker scenarios (2) and corresponding PROC	2. Formulation in batch processes with multistage and/or significant contact (PROC5)
2.1 Contributing scenario (1) controlling environmental exposure during formulation	
Environmental release during formulation ECR2 An environmental assessment has not been performed as the substance does not meet the criteria for being classified as dangerous for the environment.	
2.2 Contributing scenario (2) controlling worker exposure for formulation in batch processes with multistage and/or significant contact	
Formulation in batch processes with multistage and/or significant contact	
PROC5	
Product characteristic	
Product related conditions, e.g. the concentration of the substance in a mixture, the physical state of that mixture (solid, liquid; if solid: level of dustiness), package design affecting exposure)	Solid (flakes), low dustiness Substance as such
Amounts used	
Amounts used at a workplace (per task or per shift); note: sometimes this information is not needed for assessment of worker's exposure	Not applicable for first tier assessment using ECETOC TRA
Frequency and duration of use/exposure	
Duration per task/activity (e.g. hours per shift) and frequency (e.g. single events or repeated) of exposure	More than 4 hours per day, repeated exposure (working life)
Human factors not influenced by risk management	
Particular conditions of use, e.g. body parts potentially exposed as a result of the nature of the activity	Exposed skin surface (cm2): 480 (two hands, face only)
Other given operational conditions affecting workers exposure	
Other given operational conditions: e.g. technology or process techniques determining the initial release of substance from process into workers environment; room volume, whether the work is carried out outdoors/indoors, process conditions related to temperature and pressure.	Indoors
Technical conditions and measures at process level (source) to prevent release	

Process design aiming to prevent releases and hence exposure of workers; this in particular includes conditions ensuring rigorous containment; performance of containment to be specified (e.g. by quantification of residual losses or exposure)	Not applicable
Technical conditions and measures to control dispersion from source towards the worker	
Engineering controls, e.g. exhaust ventilation, general ventilation; specify effectiveness of measure	Not applicable
Organisational measures to prevent /limit releases, dispersion and exposure	
Specific organisational measures or measures needed to support the functioning of particular technical measures (e.g. training and supervision). Those measures need to be reported in particular for demonstrating strictly controlled conditions (to justify exposure based waiving).	Not applicable
Conditions and measures related to personal protection, hygiene and health evaluation	
Personal protection, e.g. wearing of gloves, face protection, full body dermal protection, goggles, respirator; specify effectiveness of measure; specify the suitable material for the PPE (where relevant) and advise how long the protective equipment can be used before replacement (if relevant)	- chemical goggles - substance task appropriate respirator

Exposure information and relevance to its source

Information for contributing scenario 1

An environmental assessment has not been performed as the substance does not meet the criteria for being classified as dangerous for the environment.

Information for contributing scenario 2

Workers exposure estimation is calculated with ECETOC TRA model.

Workers exposure	Unit	Exposure estimation	DNEL
Long-term systemic dermal effects	mg/kg bw/day	13.7	34.7
Long-term systemic inhalation effects	mg/m3	5E-01	10.4
Long-term dermal local effects	mg/cm2/day	2	4.5
Long-term inhalation local effects	mg/m3	5E-01	6.3

Guidance to DU to evaluate whether he works inside the boundaries set by the ES

Using the first tier model of ECETOC TRA and assuming worst case operational conditions (no LEV, no PPE and 4-8 hours exposure) benzoic acid does not pose a risk to human health for workers in this scenario. Therefore, no additional RMMs beside those that are mentioned above are needed to guarantee safe use for workers.

Additional good practice advice beyond the REACH CSA

Additional good practices (Operational Conditions and Risk Management Measures) beyond the REACH Chemical Safety Assessment established within Chemical Industry are also advised and communicated through Safety Data Sheets. Such as:

- Containment as appropriate;

- Minimise number of staff exposed;
- Segregation of the emitting process;
- Effective contaminant extraction;
- Good standard of general ventilation;
- Minimisation of manual phases;
- Avoidance of contact with contaminated tools and objects;
- Regular cleaning of equipment and work area;
- Management/supervision in place to check that RMMs in place are being used correctly and OCs followed;
- Training staff on good practice;
- Good standard of personal hygiene;

1 Exposure scenario (8) **Industrial use in batch and other process where opportunity for exposure arises**	
Use descriptors related to the life cycle stage	SU3 PROC4 PC19/32 ECR6A, ERC6D
Name of contributing environmental scenario (1) and corresponding ERC	1. Environmental release during industrial use as intermediate (ERC6A) and auxiliary for polymerization (ERC6D)
List of names of contributing worker scenarios (2) and corresponding PROC	2. Industrial use in batch and other process where opportunity for exposure arises (PROC4)
2.1 Contributing scenario (1) controlling environmental exposure during industrial use as intermediate and auxiliary for polymerization	
Environmental release during industrial use as intermediate and auxiliary for polymerization ERC6A, ERC6D An environmental assessment has not been performed as the substance does not meet the criteria for being classified as dangerous for the environment.	
2.2 Contributing scenario (2) controlling worker exposure for industrial use in batch and other process where opportunity for exposure arises	
Industrial use in batch and other process where opportunity for exposure arises	
PROC4	
Product characteristic	
Product related conditions, e.g. the concentration of the substance in a mixture, the physical state of that mixture (solid, liquid; if solid: level of dustiness), package design affecting exposure)	Solid (flakes), low dustiness Substance as such
Amounts used	
Amounts used at a workplace (per task or per shift); note: sometimes this information is not needed for assessment of worker's exposure	Not applicable for first tier assessment using ECETOC TRA
Frequency and duration of use/exposure	
Duration per task/activity (e.g. hours per shift) and frequency (e.g. single events or repeated) of exposure	More than 4 hours per day, repeated exposure (working life)
Human factors not influenced by risk management	
Particular conditions of use, e.g. body parts potentially exposed as a result of the nature of the activity	Exposed skin surface (cm2): 480 (two hands, face only)
Other given operational conditions affecting workers exposure	
Other given operational conditions: e.g. technology or process techniques determining the initial release of substance from process into workers environment; room volume, whether the work is carried out outdoors/indoors, process conditions related to temperature and pressure.	Indoors

Technical conditions and measures at process level (source) to prevent release	
Process design aiming to prevent releases and hence exposure of workers; this in particular includes conditions ensuring rigorous containment; performance of containment to be specified (e.g. by quantification of residual losses or exposure)	Not applicable
Technical conditions and measures to control dispersion from source towards the worker	
Engineering controls, e.g. exhaust ventilation, general ventilation; specify effectiveness of measure	Not applicable
Organisational measures to prevent /limit releases, dispersion and exposure	
Specific organisational measures or measures needed to support the functioning of particular technical measures (e.g. training and supervision). Those measures need to be reported in particular for demonstrating strictly controlled conditions (to justify exposure based waiving).	Not applicable
Conditions and measures related to personal protection, hygiene and health evaluation	
Personal protection, e.g. wearing of gloves, face protection, full body dermal protection, goggles, respirator; specify effectiveness of measure; specify the suitable material for the PPE (where relevant) and advise how long the protective equipment can be used before replacement (if relevant)	- chemical goggles - substance task appropriate respirator

Exposure information and relevance to its source

Information for contributing scenario 1

An environmental assessment has not been performed as the substance does not meet the criteria for being classified as dangerous for the environment.

Information for contributing scenario 2

Workers exposure estimation is calculated with ECETOC TRA model.

Workers exposure	Unit	Exposure estimation	DNEL
Long-term systemic dermal effects	mg/kg bw/day	6.86	34.7
Long-term systemic inhalation effects	mg/m3	5E-01	10.4
Long-term dermal local effects	mg/cm2/day	1	4.5
Long-term inhalation local effects	mg/m3	5E-01	6.3

Guidance to DU to evaluate whether he works inside the boundaries set by the ES

Using the first tier model of ECETOC TRA and assuming worst case operational conditions (no LEV, no PPE and 4-8 hours exposure) benzoic acid does not pose a risk to human health for workers in this scenario. Therefore, no additional RMMs beside those that are mentioned above are needed to guarantee safe use for workers.

Additional good practice advice beyond the REACH CSA

Additional good practices (Operational Conditions and Risk Management Measures) beyond the REACH Chemical Safety Assessment established within Chemical Industry are also advised and communicated through

Safety Data Sheets. Such as:

- Containment as appropriate;
- Minimise number of staff exposed;
- Segregation of the emitting process;
- Effective contaminant extraction;
- Good standard of general ventilation;
- Minimisation of manual phases;
- Avoidance of contact with contaminated tools and objects;
- Regular cleaning of equipment and work area;
- Management/supervision in place to check that RMMs in place are being used correctly and OCs followed;
- Training staff on good practice;
- Good standard of personal hygiene;

1 Exposure scenario (9) **Professional use of laboratory chemicals**	
Use descriptors related to the life cycle stage	SU22 PROC15 PC21 ECR8A
Name of contributing environmental scenario (1) and corresponding ERC	1. Environmental release during wide dispersive indoor use of processing aids in open systems (ERC8A)
List of names of contributing worker scenarios (2) and corresponding PROC	2. Professional use of laboratory chemicals (PROC15)
2.1 Contributing scenario (1) controlling environmental exposure during wide dispersive indoor use of processing aids in open systems	
Environmental release during wide dispersive indoor use of processing aids in open systems ERC8A An environmental assessment has not been performed as the substance does not meet the criteria for being classified as dangerous for the environment.	
2.2 Contributing scenario (2) controlling worker exposure for professional use of laboratory chemicals	
Professional use of laboratory chemicals	
PROC15	
Product characteristic	
Product related conditions, e.g. the concentration of the substance in a mixture, the physical state of that mixture (solid, liquid; if solid: level of dustiness), package design affecting exposure)	Solid (flakes), low dustiness Substance as such
Amounts used	
Amounts used at a workplace (per task or per shift); note: sometimes this information is not needed for assessment of worker's exposure	Not applicable for first tier assessment using ECETOC TRA
Frequency and duration of use/exposure	
Duration per task/activity (e.g. hours per shift) and frequency (e.g. single events or repeated) of exposure	More than 4 hours per day, repeated exposure (working life)
Human factors not influenced by risk management	
Particular conditions of use, e.g. body parts potentially exposed as a result of the nature of the activity	Exposed skin surface (cm2): 240 (one hand, face only)
Other given operational conditions affecting workers exposure	
Other given operational conditions: e.g. technology or process techniques determining the initial release of substance from process into workers environment; room volume, whether the work is carried out outdoors/indoors, process conditions related to temperature and pressure.	Indoors
Technical conditions and measures at process level (source) to prevent release	

Process design aiming to prevent releases and hence exposure of workers; this in particular includes conditions ensuring rigorous containment; performance of containment to be specified (e.g. by quantification of residual losses or exposure)	Not applicable
Technical conditions and measures to control dispersion from source towards the worker	
Engineering controls, e.g. exhaust ventilation, general ventilation; specify effectiveness of measure	Not applicable
Organisational measures to prevent /limit releases, dispersion and exposure	
Specific organisational measures or measures needed to support the functioning of particular technical measures (e.g. training and supervision). Those measures need to be reported in particular for demonstrating strictly controlled conditions (to justify exposure based waiving).	Not applicable
Conditions and measures related to personal protection, hygiene and health evaluation	
Personal protection, e.g. wearing of gloves, face protection, full body dermal protection, goggles, respirator; specify effectiveness of measure; specify the suitable material for the PPE (where relevant) and advise how long the protective equipment can be used before replacement (if relevant)	- chemical goggles - substance task appropriate respirator

Exposure information and relevance to its source

Information for contributing scenario 1

An environmental assessment has not been performed as the substance does not meet the criteria for being classified as dangerous for the environment.

Information for contributing scenario 2

Workers exposure estimation is calculated with ECETOC TRA model.

Workers exposure	Unit	Exposure estimation	DNEL
Long-term systemic dermal effects	mg/kg bw/day	3.43E-01	34.7
Long-term systemic inhalation effects	mg/m3	1E-01	10.4
Long-term dermal local effects	mg/cm2/day	0.1	4.5
Long-term inhalation local effects	mg/m3	1E-01	6.3

Guidance to DU to evaluate whether he works inside the boundaries set by the ES

Using the first tier model of ECETOC TRA and assuming worst case operational conditions (no LEV, no PPE and 4-8 hours exposure) benzoic acid does not pose a risk to human health for workers in this scenario. Therefore, no additional RMMs beside those that are mentioned above are needed to guarantee safe use for workers.

Additional good practice advice beyond the REACH CSA

Additional good practices (Operational Conditions and Risk Management Measures) beyond the REACH Chemical Safety Assessment established within Chemical Industry are also advised and communicated through Safety Data Sheets. Such as:

- Containment as appropriate;

- Minimise number of staff exposed;
- Segregation of the emitting process;
- Effective contaminant extraction;
- Good standard of general ventilation;
- Minimisation of manual phases;
- Avoidance of contact with contaminated tools and objects;
- Regular cleaning of equipment and work area;
- Management/supervision in place to check that RMMs in place are being used correctly and OCs followed;
- Training staff on good practice;
- Good standard of personal hygiene;