SAFETY DATA SHEET

in accordance with Regulation (EC) 1907/2006 (REACH) and its amendments

◘ **V10 –** *amendments in this revision* ◘

SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXURE AND OF THE COMPANY/UNDERTAKING

1.1 Product identifier

Substance name	**AMMONIUM HYDROGEN CARBONATE without anticaking agent**
Synonyms	Ammonium bicarbonate
CAS number:	1066-33-7
EC number:	213-911-5
REACH registration number:	01-2119486970-26-0003
Neochim PLC code	12-01

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

Uses:	- raw material in chemical synthesis; - in formulation of mixture; - raising agent in food industry
Uses advised against:	Unknown

1.3 Details of the supplier of the safety data sheet

Manufacturer: Address: ◘ **V10** Tel. URL website: Email:	NEOCHIM PLC East Industrial Zone, Himkombinatska Str. 6403 Dimitrovgrad, Bulgaria +359 391 65 205◘ http:/ / www.neochim.bg office@neochim.bg
e-mail address of competent person responsible for the SDS	reach-neochim@neochim.bg

1.4 Emergency telephone number

◘ **V10** National Toxicology Center Hospital for Active Medical Treatment and Emergency Medicine "N.I.Pirogov"	+ 359 2 9154 233 24/24 h 7/7 d ◘

SECTION 2: HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

Classification of the substance or mixture in accordance with Regulation 1272/2008 (CLP) and its amendments at the date of the issue of the document

Acute Toxicity-oral, hazard category 4 (Acute Tox 4.), H302 - Harmful if swallowed

2.2 Label elements

Labelling in accordance with Regulation 1272/2008 (CLP) and its amendments at the date of the issue of the document**.**

Hazard pictogram(s):		
Signal word		Warning
Hazard statement(s):	H302	Harmful if swallowed
Precautionary statement(s):	P264 P270 P301+P312+P330 P411 P501	Wash the exposed parts of the body thoroughly with water after handling. Do no eat, drink or smoke when using this product. IF SWALLOWED: Rinse mouth. Call a POISON CENTER if you feel unwell. Store at temperatures not exceeding 35°C. Packaging and content waste to be managed in accordance with national legislation**.**
2.3 Other hazards		
PBT/vPvB criteria:		This mixture does not contain any substances that are assessed to be a PBT or a vPvB
Endocrine disrupting properties		Data lacking

SECTION 3: HAZARDS IDENTIFICATION

3.1 Substances

CAS number	Name	Content, % (w/w)
1066-33-7	Ammonium hydrogen carbonate	9.4-100

SECTION 4: FIRST- AID MEASURES

4.1 Description of first aid measures

- general notes	Speed is essential. If unconscious, place casualty in a recovery position with head sideways to avoid choking. Consult physician in case of persisting adverse effects. Never give anything by mouth to an unconscious person or a person with spasms.
- following inhalation	After inhalation of decomposition products: Keep patient calm, remove to fresh air and seek medical attention.
- following skin contact	Wash the affected area with water and soap.
- following eye contact	Wash affected eyes for at least 15 minutes under running water with eyelids held open. Get medical attention if the irritation of the eyes continues.
- following ingestion	**Do not induce vomiting!** Carefully rinse the mouth immediately and then give the casualty plenty of water to drink. Seek medical attention
◘ **V10** - self-protection of the first aider	First aider should protect himself first◘**.**

4.2 Most important symptoms and effects, both acute and delayed

Acute effects	Irritation of the respiratory tract and eyes, runny nose, nausea, vomiting. Ingestion of very large quantities: drop in blood pressure, collapse, CNS damage, spasms, narcotic conditions etc.
Delayed effects	Repeated or prolonged contact with skin may cause dermatitis (red, cracked skin)

4.3 Indication of any immediate medical attention and special treatment needed

Notes for the doctor: Treat symptomatically. Special measure to be taken to prevent absorption in case of ingestion

SECTION 5: FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media:	Not combustible. Use extinguishing media appropriate for surrounding fire.
Unsuitable extinguishing media:	Unknown

5.2 Special hazards arising from the substance or mixture

Ammonia and carbon dioxide released during the fire are caught with water spay. Do not allow water from the fire or contaminated water to run into watercourses or drains.

5.3 Advice for firefighters

Special chemical protective suit, gloves, boots and self-contained breathing apparatus

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

6.1.1 **For non-emergency personnel**

Do not allow people not involved in emergency response and unprotected to enter the contamination zone. Ensure adequate ventilation. Wear personal protective equipment (PPE).

6.1.2 **For emergency responders**

Gloves, anti-dust masks, protective glasses. Filtering gas mask for protection against ammonia.

6.2 Environmental precautions

Limit scattering of the spilled material as well as contact with soil, surface water or entering sewage system.Ensure waste is collected and put into container. Inform authorities in case of accidental contamination of some environmental compartments.

6.3 Methods and material for containment and cleaning up

6.3.1 For containment: Collect the spilled material mechanically.
6.3.2 For cleaning up: Store it temporarily in properly labelled containers
6.3.3 Other information: Manage the waste in accordance with national legislation**.**

6.4 Reference to other sections

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

SECTION 7: HANDLING AND STORAGE

The information in this Section contains general advice and guidance. For the availability of specific information of the use listed in Section 16, refer to the Exposure Scenarios (EC) attached.

7.1 Precautions for safe handling

7.1.1Pritective measures:	No special measures are required if the product is handled properly. Avoid dust formation. Ensure adequate ventilation of stores and work areas.
7.1.2 Advice on general occupation hygiene:	When handling the product do not eat, drink or smoke. Wash hands after handling and before eating, smoking and using the lavatory and at the end of the working period. Respect the requirements of good industrial hygiene and safe practice.

7.2 Conditions for safe storage, including any incompatibilities

Segregate from nitrates, nitrites, alkaline substances, strong acids and bases.
Keep only in original tightly closed packaging in a cool, well-ventilated place. Palletizing the product is allowed The pallets must not be stacked one on top of the others, because the pressure thus applied would favor caking. Keep at temperature not exceeding 35 °C.
Changes in the properties of the product may occur if substance/product is stored above indicated temperature for extended periods of time.
Packing: polyethylene, polypropylene
Storage class: 13-11

◘ **V10 7.3 Specific end use(s):** see annex of this safety data sheet (exposure scenarios) ◘.

SECTION 8: EXPOSURE CONTROLS / PERSONAL PROTECTION

For the availability of specific information of the use listed in Section 16, refer to the Exposure Scenarios (ES) attached**.**

8.1 Control parameters

occupational exposure limit values	No specific data
Other exposure limit for potential decomposition products	EU limit values Ammonia - CAS № 7664-41-7 8 hours: 14 mg/m3 or 20ppm Short term(15 minutes) : 36 mg/m3 or 50ppm Carbon dioxide - CAS № 124-38-9 8 hours: 9000 mg/m3 or 5000ppm

Derived No Effect Level (DNEL) for workers

Exposure pattern	Acute effects local	Acute effects systemic	Chronic effects local	Chronic effects systemic
inhalation	160.7 mg/m^3	160.7 mg/m^3	62.5 mg/m^3	62.5 mg/m^3
dermal	no hazard was identified	no hazard was identified	no hazard was identified	57 mg/kg bw/day

Derived No Effect Level (DNEL) for general population

Exposure pattern	Acute effects local	Acute effects systemic	Chronic effects local	Chronic effects systemic
oral	Not applicable	34.05 mg/kg bw/day	Not applicable	17.1 mg/kg bw/day
inhalation	143.91 mg/m^3	143.91 mg/m^3	13.33 mg/m^3	13.33 mg/m^3
dermal	no hazard was identified	no hazard was identified	no hazard was identified	34.2 mg/kg bw/day

Predicted No Effect Concentration:

PNEC aqua (freshwater)	0.37 mg/L
PNEC aqua (marine water)	0.037 mg/L
PNEC aqua (intermittent releases)	0.63 mg/L
PNEC STP	1347 mg/L
PNEC sediment (freshwater)	0.1332 mg/kg sediment dw
PNEC sediment (marine water)	0.01332 mg/kg sediment dw
PNEC soil	74.9 mg/kg soil dw

8.2 Exposure controls

8.2.1Appropriate engineering controls:	Provide adequate ventilation.

8.2.2 Individual protection measures, such as personal protective equipment

8.2.2.1 Eye protection:	Safety goggles (EN 166)or full face shield
8.2.2.2 Skin protection: <u>Hand protection:</u>	They are selected depending on the type of activity and exposure. chemically resistant gloves complying with EN 374, including: material - nitrile, neoprene breakthough time - ≥ 480 min. Permeation resistance class - 6 Due to many conditions (e.g. temperature) it must be considered, that the practical usage of a chemical-protective glove in practice may be much shorter than the permeation time determined through testing.

8.2.2.3 Others:	Manufacturer's instructions for use must be respected because of wide variety of types of gloves and conditions of use. Depending on the risk and on the work performed, adequate protective equipment such as long-sleeved overall and shoes should be selected and approved by a specialist**.**
8.2.2.4 Respiratory protection:	Respiratory protection in case of gas / vapor formation: Mask/half mask with gas filter for gases/vapours of inorganic compounds (recommended EN 14387 Type B) or gas filter for gases/vapours of alkaline compounds such as ammonia, amines (recommended: EN 14387 Type K). Respiratory protection in case of dust formation: Half mask for finery dispersed dust - EN 149, FFP2. Mask / half mask with combined gas / vapor filter of organic and inorganic compounds, acids, bases and toxic particles (recommended: EN 14387 Type ABEK-P3). Suitable for respiratory protection at higher concentrations or for longer exposures: Self-contained breathing apparatus.
Thermal hazards:	Not applicable

8.2.3.Environmental exposure controls
Avoid conditions and processes connected with dust generation. Dispose of the flushing water in accordance with local and national regulations. Do not allow temperatures above 35^{o}C in order to avoid atmospheric air pollution from decomposition products.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a) Physical state	Fine crystals
b) Colour	white
c) Odour	Slightly ammonia. Odour threshold - not determined
d) Melting/Freezing point	Cannot be determined because it decomposes at temperatures above 35^{o}C
e) Boiling point;	Cannot be determined because it decomposes at temperatures above 35^{o}C
f) Flammability	Non flammable
g) Lower and upper exposure limit	Not applicable
h) Flash-point	Not applicable
i) Auto-ignition temperature	Not applicable
j) Decomposion temperature	>35^{o}C
k) pH	7.5-8.5 of 5% aqueous solution
l) Kinematic Viscosity	Not applicable to solids
m) Solubility	220 g/l in water at 20^{0}C
n) Partition coefficient n-octanol/water:	Not applicable
o) Vapour pressure:	78.6 hPa at 25.6°C
p) Density and/or relative density	1,58
q) Relative vapour density	Няма налична информация
r) Particle characteristics	Няма налична информация

9.2 Other information

9.2 Other information	
9.2.1.Information with regards to physical hazard classes	
Explosive properties:	Not explosive

Oxidizing properties:	Not oxidising
9.2.2 Other safety characteristics	
Bulk density	ca. 900g/l

SECTION 10: STABILITY AND REACTIVITY

10.1 Reactivity

The product is stable under recommended storage and handling conditions (see section 7, handling and storage).

10.2 Chemical stability

Stable under recommended storage and handling conditions (see section 7, handling and storage).

10.3 Possibility of hazardous reactions

Exothermic reaction. Reactions with nitrates, nitrites and strong alkalis.

10.4 Conditions to avoid

Temperatures above 35°C; contamination with incompatible materials; proximity with fire or ignition sources.

10.5 Incompatible materials

Incompatible with strong bases, strong acids, nitrates and nitrites.

10.6 Hazardous decomposition products

When product is heated ammonia and carbon dioxide are released.

SECTION 11: TOXICOLOGICAL INFORMATION

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

Acute toxisity

Assessment of available data for actute toxicity of ammonium hydrogen carbonate supports and confirms classification Acute Toxicity-oral, hazard category 4 (Acute Tox 4.)

Concerning acute dermal and inhalation toxicity, no classification is required

Method	Species	Route of exposure	Effective dose
EPA OTS 798.1150; analogy CAS 144-55-8, sodium hydrogencarbonate	rat	inhalation	LC_{50} > 4.74 mg/Л air - 4.5 hours
OECD Guideline 403, analogy CAS 7783-20-0, ammonium sulfate	rat	dermal	LD_{50}: > 2000 mg/kg bw
OECD Guideline 401	rat	oral	LD_{50}: ca 1576 mg/kg bw

Skin corrosion/irritation

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

Method	Species	Results
OECD, Guideline 431	human epidermis model	no skin irritation

Serious eye damage/irritation

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

Method	Results
in vitro (HET-CAM Test)	there are no indications of serious eye damage
in vivo EPA OTS 798.4500 analogy CAS 144-55-8, sodium hydrogencarbonate	not irritating

Respiratory or skin sensitisation

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

Method	Results
EPA 540/9-82-025; analogy CAS 12125-02-9, ammonium chloride	not sensitising

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

Genotoxicity in vitro	Method - Ames test OECD HPRT by analogy to CAS Nos7783-20-2 and 1111-78-0, Chromosome aberration test Result - negative
in vivo	MNT by analogy to CAS No. 12125-02-9, ammoniumchloride Result - negative

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

NOAEL >= 6400 ppm (104 weeks; Analogy CAS 144-55-8, sodium hydrogencarbonate)	Result - oral, negative
NOAEL >= 1104.6 mg/kg bw/day (30 months; Analogy CAS 12125-02-9; ammonium chloride)	Result - oral, negative

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

Developmental toxicity:
- oral: NOAEL >= 340 mg/kg bw/d (Analogy CAS 144-55-8, sodium hydrogencarbonate)

STOT – single exposure:
Based on available data, the classification criteria are not met.
STOT – repeated exposure:
Based on available data, the classification criteria are not met
Route of exposure: **oral**
Systemic effects
Species: rat
Result: NOAEL: 864 mg/kg bw/day (70 days feeding study; Analogy CAS 12125-02-9, ammonium chloride)

Route of exposure: **inhalation**
Systemic effects
Species: rat
Result: NOAEC: 262мg/m^3 (90 days; Analogy 7664-41-7, ammonia, anhydrous)

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

◘V10 11.2 Information on other hazards

11.2.1 Endocrine disrupting properties - data lacking

11.2.2 Other information - data lacking◘

SECTION 12: ECOLOGICAL INFORMATION

12.1 Toxicity (main constituent - ammonium bicarbonate)
Based on available data, the classification criteria are not met.

Acute (short-term) toxicity

Fish, freshwater: *Prosopium williamsoni* *Oncorhynchus mykiss*	LC_{50} (96 h) -68.4 mg/L LC_{50} (96 h) -63.4 mg/L
Aquatic invertebrates *Daphnia magna:*	LC_{50} (48h) – ca.324.9 mg/L

Chronic (long-term) toxicity	
Fish, freshwater:: *Lepomis macrochirus*	EC10 (30 d): 6.3 mg/L
Aquatic invertebrates *Daphnia magna*:	EC10 (10 wk): 3.7 mg/L
Algae: *Chlorella vulgaris*	EC_{50} (5 d) – 1921 mg/L
Other organisms: soil macro-organisms *Eisenia fetida* (annelids) short-term toxicity (laboratory study) Substrate: artificial soil EPA/600/3-88/029 (1988)	LC50 (14 d): ca. 241 mg/kg soil dw, analogy CAS No. 12125-02-9, ammonium chloride
12.2 Persistence and degradability	
Abiotic degradation:	There is no evidence for photodegradation of ammonium hydrogencarbonate. In aqueous solution, ammonium hydrogencarbonate is completely dissociated into the ammonium ion (NH4+) and the carbonate anion (HCO3-). Hydrolysis of ammonium hydrogencarbonate does not occur.
Biotic degradation	1) Due to the inorganic nature of the substance standard testing systems are not applicable. 2) Ammonia from ammonium hydrogencarbonate decomposition can be released from soils. Ammoniumremaining in soil is largely adsorbed onto negatively charged clayparticles, and will undergo nitrification and denitrification as part ofthe nitrogen cycle and be taken up by plants via nitrogen fixation
12.3 Bioaccumulative potential Based on the high water solubility and the ionic nature, ammonium hydrogencarbonate is not expected to adsorb or bioaccumulate to a significant extent. Ammonia is naturally assimilated by most organisms for protein synthesis.	
12.4 Mobility in soil The ammonium cation is relatively immobile in soils, because it is adsorbed on the negatively-charged clay colloids present in all soils. Ammonia may be lost from soils by volatilization, especially after the application of ammonia fertilizers, sewage, or manures, and by uptake of ammonium ions into root systems. However, the most likely fate of ammonium ions in soils is conversion to nitrate by nitrification. Nitrate is, in turn, lost from soils by: leaching, which occurs readily, since it is repulsed by the clay particles; denitrification, which occurs rapidly within a few days or weeks in warm, moist soils; and by uptake by the plant root system. Ammonia in soil is largely fixed	
12.5 Results of PBT and vPvB assessment This mixture does not contain any substances that are assessed to be a PBT or a vPvB	
12.6 Endocrine disrupting properties - Data lacking	
◘**V10 12.7** Other adverse effects **–** no other information available	
12.8 Additional information **-** Data lacking◘	

SECTION 13: DISPOSAL CONSIDERATIONS

◘**V10** 13.1 Waste treatment methods
13.1.1 Product/packaging disposal**:** We recommend to contact with the responsible authorities.
13.1.2 Waste treatment-relevant information: Treatment is carried out in accordance with national legislation. We recommend to contact with companies that deal with the disposal of special wastes. Chemical residues are treated as special waste and these companies are able to advise you how to dispose of them. Contaminated packaging is treated as the product itself. Unless otherwise stated, uncontaminated packaging may be recycled.
13.1.3 Sewage disposal - relevant information: Do not discharge the waste into the sewage
13.1.4 Other disposal recommendations: data lacking**.** ◘

SECTION 14: TRANSPORT INFORMATION

◘ **V10** 14.1 UN number or ID number
IMDG/ADR/RID/ADN/ICAO TI (IATA) not classified as hazardous
14.2 UN proper shipping name
IMDG/ADR/RID/ADN/ICAO TI (IATA) not applicable
14.3 Transport hazard class
IMDG/ADR/RID/ADN/ICAO TI (IATA) not applicable
14.4 Packing group
IMDG/ADR/RID/ADN/ICAO TI (IATA) not applicable
14.5 Environmental hazard
IMDG/ADR/RID/ADN/ICAO TI (IATA) not applicable
14.6 Special precautions for users
Do not transport together with food and incompatible materials - strong alkalis, nitrates and nitrites.
14.7 Maritime transport in bulk
according to IMO instruments not applicable◘

SECTION 15: REGULATORY INFORMATION

15.1 Safety, health and environmental regulation/legislation specific for the substance or mixture:
Regulation EC 1907/2006 (REACH), Regulation EC 1272/2008 (CLP), Regulation 1333/2008

* Regulations / legislation and amendments to the date of issue of the document are indicated

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

Indication of changes: Changes since the last version are highlighted with ◘ **V10...**◘ . This version replaces all previous versions

Uses:

*Formulation and repackaging of mixtures
*Use as raw material in chemical synthesis

List of abbreviations

PBT – persistent, bioaccumulative and toxic
vPvB - very persistent and very bioaccumulative
NOAEL - no observed adverse effect level
NOAEC - no observed adverse effect concentration
DNEL - derived no-effect level
PNEC - predicted no-effect concentration
PEC - predicted environmental concentration
LOEC - lowest observed effect concentration
NOEC - no observed effect concentration
OECD - Organisation for Economic Cooperation and Development
LC_X - lethal concentration
EC_X - effective concentration
LD_X - lethal dose

The information above is on the basis of our knowledge about the product and represents the data currently available to us t the moment of safety data sheet issue. This document is intended as guidance for the appropriate precautionary handling with the product by a properly trained person using this product, and does not legally bind in no way manufacturer with guarantee for specific properties, qualities and applications.
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Users are responsible to make their own investigations to determine the suitability of the information and the product for their particular purposes, and to comply with applicable laws.

ANNEX

Exposure Scenario 3	
Free short title	Formulation and repackaging of mixtures
Use descriptors related to the life cycle stage	Sector of end use: SU3; 10; Process category: PROC 4, 5, 8b, 9, 15, 19; Environmental release category: ERC 2, 5, 7, 8a
Name of contributing environmental scenario (1) and corresponding ERC	1. Formulation of mixture (ERC2) 2. Industrial end use resulting in inclusion into or onto a matrix (ERC5) 3. Industrial end use of substances in closed systems (ERC7) 4. Wide dispersive indoor use of processing aids in open systems (ERC8a)
List of names of contributing worker scenarios (2) and corresponding PROC	1. Use in batch and other processes where the potential for exposure occurs (PROC4) 2. Mixing and blending (PROC5) 3. Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities (PROC8b) 4. Transfer of formulations to small containers (PROC9) 5. Use as laboratory reagent (PROC15) 6. Hand-mixing with intimate contact and only PPE available (PROC19)
Contributing scenario (1) controlling environmental exposure for ES 3	
Formulation of mixture (ERC2); Industrial end use resulting in inclusion into or onto a matrix (ERC5); Industrial end use of substances in closed systems (ERC7); Wide dispersive indoor use of processing aids in open systems (ERC8a). An environmental assessment has not been performed as the product does not meet the criteria for being classified	
Contributing exposure scenario (2) controlling worker exposure for PROC 4	
Use descriptor covered	PROC 4 Use in batch and other process (synthesis) where opportunity for exposure arises
Assessment Method	ECETOC TRA Worker v2.0 with modifications
Product characteristic	
Physical state of the product	Solid (dust)
Concentration of substance in product	100%
Dustiness	high
Amounts used	
Not relevant.	
Frequency and duration of use/exposure	
Duration of exposure	> 4 Hours/day
Frequency of exposure	<= 240 Days /year
Human factors not influenced by risk management	
Palm of both hands (480 cm^2)	
Other given operational conditions affecting workers exposure	
Inside/outside	Inside
Domain	Professional

Technical conditions and measures at process level (source) to prevent release		
Not relevant		
Technical conditions and measures to control dispersion from source towards the worker		
Local exhaust ventilation	Yes	Effectiveness: 80%
Organisational measures to prevent /limit releases, dispersion and exposure		
Not relevant.		
Conditions and measures related to personal protection, hygiene and health evaluation		
Suitable gloves required	No	
Suitable respiratory protection required	No	
Contributing exposure scenario (3) controlling worker exposure for PROC 5		
Use descriptor covered	PROC 5 Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)	
Assessment Method	ECETOC TRA Worker v2.0 with modifications	
Product characteristic		
Physical state of the product	Solid (dust)	
Concentration of substance in product	100%	
Dustiness	high	
Amounts used		
Not relevant.		
Frequency and duration of use/exposure		
Duration of exposure	> 4 Hours/day	
Frequency of exposure	<= 240 Days /year	
Human factors not influenced by risk management		
Palm of both hands (480 cm^2)		
Other given operational conditions affecting workers exposure		
Inside/outside	Inside	
Domain	Professional	
Technical conditions and measures at process level (source) to prevent release		
Not relevant		
Technical conditions and measures to control dispersion from source towards the worker		
Local exhaust ventilation	yes	Effectiveness: 80%
Organisational measures to prevent /limit releases, dispersion and exposure		
Not relevant.		
Conditions and measures related to personal protection, hygiene and health evaluation		
Suitable gloves required	No	
Suitable respiratory protection required	No	
Contributing exposure scenario (4) controlling worker exposure for PROC 8b		
Use descriptor covered	PROC 8b Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	

Assessment Method	ECETOC TRA Worker v2.0 with modifications	
Product characteristic		
Physical state of the product	Solid (dust)	
Concentration of substance in product	100%	
Dustiness	high	
Amounts used		
Not relevant.		
Frequency and duration of use/exposure		
Duration of exposure	> 4 Hours/day	
Frequency of exposure	<= 240 Days /year	
Human factors not influenced by risk management		
Palm of both hands (480 cm^2)		
Other given operational conditions affecting workers exposure		
Inside/outside	Inside	
Domain	Professional	
Technical conditions and measures at process level (source) to prevent release		
Not relevant		
Technical conditions and measures to control dispersion from source towards the worker		
Local exhaust ventilation	Yes	Effectiveness: 80%
Organisational measures to prevent /limit releases, dispersion and exposure		
Not relevant.		
Conditions and measures related to personal protection, hygiene and health evaluation		
Suitable gloves required	No	
Suitable respiratory protection required	No	
Contributing exposure scenario (5) controlling worker exposure for PROC 9		
Use descriptor covered	PROC 9 Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	
Assessment Method	ECETOC TRA Worker v2.0 with modifications	
Product characteristic		
Physical state of the product	Solid (dust)	
Concentration of substance in product	100%	
Dustiness	high	
Amounts used		
Not relevant.		
Frequency and duration of use/exposure		
Duration of exposure	> 4 Hours/day	
Frequency of exposure	<= 240 Days /year	
Human factors not influenced by risk management		
Palm of both hands (480 cm^2)		

Other given operational conditions affecting workers exposure		
Inside/outside	Inside	
Domain	Professional	
Technical conditions and measures at process level (source) to prevent release		
Not relevant		
Technical conditions and measures to control dispersion from source towards the worker		
Local exhaust ventilation	Yes	Effectiveness: 80%
Organisational measures to prevent /limit releases, dispersion and exposure		
Not relevant.		
Conditions and measures related to personal protection, hygiene and health evaluation		
Suitable gloves required	No	
Suitable respiratory protection required	No	
Contributing exposure scenario (6) controlling worker exposure for PROC 15		
Use descriptor covered	PROC 15 Use as laboratory reagent	
Assessment Method	ECETOC TRA Worker v2.0 with modifications	
Product characteristic		
Physical state of the product	Solid (dust)	
Concentration of substance in product	100%	
Dustiness	high	
Amounts used		
Not relevant.		
Frequency and duration of use/exposure		
Duration of exposure	> 4 Hours/day	
Frequency of exposure	<= 240 Days /year	
Human factors not influenced by risk management		
Palm of one hand (240 cm^2)		
Other given operational conditions affecting workers exposure		
Inside/outside	Inside	
Domain	Professional	
Technical conditions and measures at process level (source) to prevent release		
Not relevant		
Technical conditions and measures to control dispersion from source towards the worker		
Local exhaust ventilation	Yes	Effectiveness: 80%
Organisational measures to prevent /limit releases, dispersion and exposure		
Not relevant.		
Conditions and measures related to personal protection, hygiene and health evaluation		
Suitable gloves required	No	
Suitable respiratory protection required	No	
Contributing exposure scenario (7) controlling worker exposure for PROC 19		

Use descriptor covered	PROC 19 Hand-mixing with intimate contact and only PPE available	
Assessment Method	ECETOC TRA Worker v2.0 with modifications	
Product characteristic		
Physical state of the product	Solid (dust)	
Concentration of substance in product	100 %	
Dustiness	high	
Amounts used		
Not relevant.		
Frequency and duration of use/exposure		
Duration of exposure	> 4 Hours/day	
Frequency of exposure	<= 240 Days /year	
Human factors not influenced by risk management		
(1980 cm^2)		
Other given operational conditions affecting workers exposure		
Inside/outside	Inside	
Domain	Professional	
Technical conditions and measures at process level (source) to prevent release		
Not relevant		
Technical conditions and measures to control dispersion from source towards the worker		
Local exhaust ventilation	Yes	Effectiveness: 80%
Organisational measures to prevent /limit releases, dispersion and exposure		
Not relevant.		
Conditions and measures related to personal protection, hygiene and health evaluation		
Suitable gloves required	Yes	Effectiveness: 90%
Suitable respiratory protection required	No	

Exposure estimation and reference to its source			
Exposure estimation to humans via the environment			
The toxicological and ecotoxicological properties of the substance give no reason for concern regarding a hazard for man via the indirect exposure route. Thus, a quantitative assessment has not been performed.			
Estimated exposure for professionals – PROC 4			
Route of exposure and type of effects	**Exposure estimate**		**RCR**
	Value	Unit	
Long-term exposure, systemic, dermal	6.86	mg/kg bw/d	0.12

Long-term exposure, local and systemic, inhalative	10.00	mg/m³	0.16
Long-term exposure, systemic, combined	8.29	mg/kg bw/d	0.28
Short-term exposure, systemic, dermal	6.86	mg/kg bw/d	0.12
Short-term exposure, local and systemic, inhalative	20.00	mg/m³	0.12
Short-term exposure, systemic, combined	6.95	mg/kg bw/d	0.24

Estimated exposure for professionals – PROC 5			
Route of exposure and type of effects	**Exposure estimate**		**RCR**
	Value	Unit	
Long-term exposure, systemic, dermal	13.71	mg/kg bw/d	0.24
Long-term exposure, local and systemic, inhalative	10.00	mg/m³	0.16
Long-term exposure, systemic, combined	15.14	mg/kg bw/d	0.4
Short-term exposure, systemic, dermal	13.71	mg/kg bw/d	0.24
Short-term exposure, local and systemic, inhalative	20.00	mg/m³	0.12
Short-term exposure, systemic, combined	13.80	mg/kg bw/d	0.37

Estimated exposure for professionals – PROC 8b			
Route of exposure and type of effects	**Exposure estimate**		**RCR**
	Value	Unit	
Long-term exposure, systemic, dermal	6.86	mg/kg bw/d	0.12
Long-term exposure, local and systemic, inhalative	10.00	mg/m³	0.16
Long-term exposure, systemic, combined	8.29	mg/kg bw/d	0.28
Short-term exposure, systemic, dermal	6.86	mg/kg bw/d	0.12
Short-term exposure, local and systemic, inhalative	20.00	mg/m³	0.12
Short-term exposure, systemic, combined	6.95	mg/kg bw/d	0.24

Estimated exposure for professionals – PROC 9			
Route of exposure and type of effects	**Exposure estimate**		**RCR**
	Value	Unit	
Long-term exposure, systemic, dermal	6.86	mg/kg bw/d	0.12
Long-term exposure, local and systemic, inhalative	20.00	mg/m³	0.32
Long-term exposure, systemic, combined	9.71	mg/kg bw/d	0.44
Short-term exposure, systemic, dermal	6.86	mg/kg bw/d	0.12
Short-term exposure, local and systemic, inhalative	40.00	mg/m³	0.24
Short-term exposure, systemic, combined	7.04	mg/kg bw/d	0.37

Estimated exposure for professionals – PROC 15			
Route of exposure and type of effects	**Exposure estimate**		**RCR**
	Value	Unit	
Long-term exposure, systemic, dermal	0.34	mg/kg bw/d	0.01
Long-term exposure, local and systemic, inhalative	5.00	mg/m³	0.08
Long-term exposure, systemic, combined	1.06	mg/kg bw/d	0.09
Short-term exposure, systemic, dermal	0.34	mg/kg bw/d	0.01
Short-term exposure, local and systemic, inhalative	10.00	mg/m³	0.06
Short-term exposure, systemic, combined	0.39	mg/kg bw/d	0.07

Estimated exposure for professionals – PROC 19			
Route of exposure and type of effects	**Exposure estimate**		**RCR**
	Value	Unit	
Long-term exposure, systemic, dermal	14.14	mg/kg bw/d	0.25
Long-term exposure, local and systemic, inhalative	10.00	mg/m³	0.16

Long-term exposure, systemic, combined	15.57	mg/kg bw/d	0.41
Short-term exposure, systemic, dermal	14.14	mg/kg bw/d	0.25
Short-term exposure, local and systemic, inhalative	20.00	mg/m^3	0.12
Short-term exposure, systemic, combined	14.23	mg/kg bw/d	0.37

Exposure Scenario 4	
Free short title	Use as raw material in chemical synthesis
Use descriptors related to the life cycle stage	Sector of end use: SU 3, 8, 9; Process category: PROC 3, 4, 8b, 15; Environmental release category: ERC 1, 6a, 7
Name of contributing environmental scenario(1) and corresponding ERC	1. Manufacture of substances (ERC1) 2. Industrial use resulting of manufacture of another substance(use of intermediates) (ERC6a) 3. Industrial use of substances in close systems (ERC7)
List of names of contributing worker scenarios (2) and corresponding PROC	1. Use in closed batch processes (PROC 3) 2. Use in batch and other processes where the potential for exposureoccurs (PROC 4) 3. Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities (PROC 8b) 4. Laboratory use (PROC 15)
Contributing scenario (1) controlling environmental exposure for ES 4	
Manufacture of substances (ERC1); Industrial use resulting of manufacture of another substance (use of intermediates) (ERC6a); Industrial use of substances in close systems (ERC7) An environmental assessment has not been performed as the product does not meet the criteria for being classified	
Contributing exposure scenario (2) controlling workers exposure for PROC 3	
Use descriptor covered	PROC 3 Use in closed batch process (synthesis or formulation)
Assessment Method	ECETOC TRA Worker v2.0 with modifications
Product characteristic	
Physical state of the product	Solid (dust)
Concentration of substance in product	100 %
Dustiness	high
Amounts used	Not relevant.
Frequency and duration of use/exposure	
Duration of exposure	> 4 Hours/day
Frequency of exposure	<= 240 Days /year
Human factors not influenced by risk management	

Palm of both hands (480 cm2)		
Other given operational conditions affecting workers exposure		
Inside/outside	Inside	
Domain	Industrial	
Technical conditions and measures at process level (source) to prevent release		
Not relevant		
Technical conditions and measures to control dispersion from source towards the worker		
Local exhaust ventilation	No	
Organisational measures to prevent /limit releases, dispersion and exposure		
Not relevant.		
Conditions and measures related to personal protection, hygiene and health evaluation		
Suitable gloves required	No	
Suitable respiratory protection required	No	
Contributing exposure scenario (3) controlling workers exposure for PROC 4		
Use descriptor covered	PROC 4 Use in batch and other process (synthesis) where opportunity for exposure arises	
Assessment Method	ECETOC TRA Worker v2.0 with modifications	
Product characteristic		
Physical state of the product	Solid (dust)	
Concentration of substance in product	100%	
Dustiness	high	
Amounts used		
Not relevant.		
Frequency and duration of use/exposure		
Duration of exposure	> 4 Hours/day	
Frequency of exposure	<= 240 Days /year	
Human factors not influenced by risk management		
Palm of both hands (480 cm^2)		
Other given operational conditions affecting workers exposure		
Inside/outside	Inside	
Domain	Industrial	
Technical conditions and measures at process level (source) to prevent release		
Not relevant		
Technical conditions and measures to control dispersion from source towards the worker		
Local exhaust ventilation	Yes	Effectiveness: 80%
Organisational measures to prevent /limit releases, dispersion and exposure		
Not relevant.		

Conditions and measures related to personal protection, hygiene and health evaluation	
Suitable gloves required	No
Suitable respiratory protection required	No
Contributing exposure scenario (4) controlling workers exposure for PROC 8b	
Use descriptor covered	PROC 8b Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Assessment Method	ECETOC TRA Worker v2.0 with modifications
Product characteristic	
Physical state of the product	Solid (dust)
Concentration of substance in product	100%
Dustiness	high
Amounts used	
Not relevant.	
Frequency and duration of use/exposure	
Duration of exposure	> 4 Hours/day
Frequency of exposure	<= 240 Days /year
Human factors not influenced by risk management	
Palm of both hands (480 cm^2)	
Other given operational conditions affecting workers exposure	
Inside/outside	Inside
Domain	Industrial
Technical conditions and measures at process level (source) to prevent release	
Not relevant	
Technical conditions and measures to control dispersion from source towards the worker	
Local exhaust ventilation	No
Organisational measures to prevent /limit releases, dispersion and exposure	
Not relevant.	
Conditions and measures related to personal protection, hygiene and health evaluation	
Suitable gloves required	No
Suitable respiratory protection required	No
Contributing exposure scenario (5) controlling workers exposure for PROC 15	
Use descriptor covered	PROC 15 Use as laboratory reagent
Assessment Method	ECETOC TRA Worker v2.0 with modifications
Product characteristic	
Physical state of the product	Solid (dust)
Concentration of substance in product	100%
Dustiness	high
Amounts used	

Not relevant.	
Frequency and duration of use/exposure	
Duration of exposure	> 4 Hours/day
Frequency of exposure	<= 240 Days /year
Human factors not influenced by risk management	
Palm of one hand (240 cm^2)	
Other given operational conditions affecting workers exposure	
Inside/outside	Inside
Domain	Industrial
Technical conditions and measures at process level (source) to prevent release	
Not relevant	
Technical conditions and measures to control dispersion from source towards the worker	
Local exhaust ventilation	No
Organisational measures to prevent /limit releases, dispersion and exposure	
Not relevant.	
Conditions and measures related to personal protection, hygiene and health evaluation	
Suitable gloves required	No
Suitable respiratory protection required	No

Exposure estimation and reference to its source			
Exposure estimation and reference to its source			
Exposure estimation to humans via the environment			
The toxicological and ecotoxicological properties of the substance give no reason for concern regarding a hazard for man via the indirect exposure route. Thus, a quantitative assessment has not been performed.			
Estimated exposure for workers – PROC 3			
Route of exposure and type of effects	**Exposure estimate**		**RCR**
	Value	Unit	
Long-term exposure, systemic, dermal	0.34	mg/kg bw/d	0.01
Long-term exposure, local and systemic, inhalative	1.00	mg/m^3	0.02
Long-term exposure, systemic, combined	0.49	mg/kg bw/d	0.02
Short-term exposure, systemic, dermal	0.34	mg/kg bw/d	0.01
Short-term exposure, local and systemic,	2.00	mg/m^3	0.01

inhalative			
Short-term exposure, systemic, combined	0.35	mg/kg bw/d	0.02

Estimated exposure for workers – PROC 4			
Route of exposure and type of effects	**Exposure estimate**		**RCR**
	Value	Unit	
Long-term exposure, systemic, dermal	6.86	mg/kg bw/d	0.12
Long-term exposure, local and systemic, inhalative	25.00	mg/m³	0.40
Long-term exposure, systemic, combined	10.43	mg/kg bw/d	0.52
Short-term exposure, systemic, dermal	6.86	mg/kg bw/d	0.12
Short-term exposure, local and systemic, inhalative	50.00	mg/m³	0.31
Short-term exposure, systemic, combined	7.08	mg/kg bw/d	0.43

Estimated exposure for workers – PROC 8b			
Route of exposure and type of effects	**Exposure estimate**		**RCR**
	Value	Unit	
Long-term exposure, systemic, dermal	6.86	mg/kg bw/d	0.12
Long-term exposure, local and systemic, inhalative	25.00	mg/m³	0.40
Long-term exposure, systemic, combined	10.43	mg/kg bw/d	0.52
Short-term exposure, systemic, dermal	6.86	mg/kg bw/d	0.12
Short-term exposure, local and systemic, inhalative	50.00	mg/m³	0.31
Short-term exposure, systemic, combined	7.08	mg/kg bw/d	0.43

Estimated exposure for workers – PROC 15			
Route of exposure and type of effects	**Exposure estimate**		**RCR**
	Value	Unit	
Long-term exposure, systemic, dermal	0.34	mg/kg bw/d	0.01
Long-term exposure, local and systemic, inhalative	5.00	mg/m³	0.08
Long-term exposure, systemic, combined	1.06	mg/kg bw/d	0.09
Short-term exposure, systemic, dermal	0.34	mg/kg bw/d	0.01
Short-term exposure, local and systemic, inhalative	10.00	mg/m³	0.06
Short-term exposure, systemic, combined	0.39	mg/kg bw/d	0.07