

Safety data sheet

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BASF Safety data sheet according to Regulation UK SI 2019/758 and UK SI 2020/1577 as amended from time to time.

Date / Revised: 20.01.2023

Version: 13.1

Date previous version: 11.01.2023

Previous version: 13.0

Date / First version: 14.02.2003

Product: **Ammonium carbamate crystals**

(ID no. 30041205/SDS_GEN_GB/EN)

Date of print 21.10.2025

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

1.1. Product identifier

Ammonium carbamate crystals

Chemical name: ammonium carbamate

CAS Number: 1111-78-0

REACH registration number: 01-2119493982-22-0000

UFI: 712X-CGFT-D00W-10UA

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

Relevant identified uses: Chemical

Recommended use: Raw material, propellant

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

1.3. Details of the supplier of the safety data sheet

Company:

BASF SE
67056 Ludwigshafen
GERMANY

Contact address:

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

Telephone: +44 161 475 3000

E-mail address: product-safety-uk-and-ireland@basf.com

1.4. Emergency telephone number

International emergency number:

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Telephone: +49 180 2273-112

SECTION 2: Hazards Identification

2.1. Classification of the substance or mixture

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

Acute Tox. 4 (oral)

H302 Harmful if swallowed.

Eye Dam./Irrit. 1

H318 Causes serious eye damage.

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

2.2. Label elements

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

Pictogram:



Signal Word:

Danger

Hazard Statement:

H318

Causes serious eye damage.

H302

Harmful if swallowed.

Precautionary Statements (Prevention):

P280

Wear eye and face protection.

P270

Do not eat, drink or smoke when using this product.

P264

Wash contaminated body parts thoroughly after handling.

Precautionary Statements (Response):

P305 + P351 + P338

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

P310

Immediately call a POISON CENTER or physician.

P330

Rinse mouth

Precautionary Statements (Disposal):

P501

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

Hazard determining component(s) for labelling: Ammonium carbamate

2.3. Other hazards

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

If applicable information is provided in this section on other hazards which do not result in classification but which may contribute to the overall hazards of the substance or mixture.

No specific dangers known, if the regulations/notes for storage and handling are considered.

The product does not contain a substance above legal limits fulfilling the PBT (persistent/bioaccumulative/toxic) criteria or the vPvB (very persistent/very bioaccumulative) criteria.

SECTION 3: Composition/Information on Ingredients

3.1. Substances

Chemical nature

Ammonium carbamate

CAS Number: 1111-78-0

EC-Number: 214-185-2

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

3.2. Mixtures

Not applicable

SECTION 4: First-Aid Measures

4.1. Description of first aid measures

If inhaled:

After inhalation of decomposition products: Keep patient calm, remove to fresh air, seek medical attention.

On skin contact:

Wash thoroughly with soap and water

On contact with eyes:

In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

On ingestion:

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

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

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Symptoms: Eye irritation, respiratory disorders, Information, i.e. additional information on symptoms and effects may be included in the GHS labeling phrases available in Section 2 and in the Toxicological assessments available in Section 11.

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

Treatment: Treat according to symptoms (decontamination, vital functions), no known specific antidote.

SECTION 5: Fire-Fighting Measures

5.1. Extinguishing media

Suitable extinguishing media:
water spray, carbon dioxide, foam

5.2. Special hazards arising from the substance or mixture

Endangering substances: ammonia, anhydrous, Carbon dioxide
Advice: The substances/groups of substances mentioned can be released in case of fire.

5.3. Advice for fire-fighters

Further information:
Product itself is non-combustible; fire extinguishing method of surrounding areas must be considered.

SECTION 6: Accidental Release Measures

6.1. Personal precautions, protective equipment and emergency procedures

Breathing protection required. Handle in accordance with good industrial hygiene and safety practice.

6.2. Environmental precautions

Prevent entry into drains and surface waters. Ensure compliance with local regulations before discharging into effluent treatment plants.

6.3. Methods and material for containment and cleaning up

For residues: Sweep/shovel up.
Dispose of absorbed material in accordance with regulations.

6.4. Reference to other sections

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

SECTION 7: Handling and Storage

7.1. Precautions for safe handling

Avoid dust formation.

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Protection against fire and explosion:

Store in a cool place. If heated the drums can burst due to pressure build-up.

7.2. Conditions for safe storage, including any incompatibilities

Segregate from nitrites and alkaline substances.

Do not store with: Sodium nitrate

Suitable materials for containers: High density polyethylene (HDPE), Low density polyethylene (LDPE), Stainless steel 1.4541, Stainless steel 1.4571

Further information on storage conditions: Store in unopened original containers in a cool and dry place.

Protect from temperatures above: 30 °C

Changes in the properties of the product may occur if substance/product is stored above indicated temperature for extended periods of time.

7.3. Specific end use(s)

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

SECTION 8: Exposure Controls/Personal Protection

8.1. Control parameters

Components with occupational exposure limits

When the product is handled at elevated temperature, the following occupational exposure limit should be noted:

124-38-9: Carbon dioxide

TWA value 9,150 mg/m³ ; 5,000 ppm (WEL/EH 40 (UK))

TWA value 9,000 mg/m³ ; 5,000 ppm (OEL (EU))

indicative

STEL value 27,400 mg/m³ ; 15,000 ppm (WEL/EH 40 (UK))

Ceiling limit value/factor: 15 min

1111-78-0: Ammonium carbamate

7664-41-7: ammonia, anhydrous

TWA value 18 mg/m³ ; 25 ppm (WEL/EH 40 (UK))

STEL value 36 mg/m³ ; 50 ppm (OEL (EU))

indicative

TWA value 14 mg/m³ ; 20 ppm (OEL (EU))

indicative

STEL value 25 mg/m³ ; 35 ppm (WEL/EH 40 (UK))

Ceiling limit value/factor: 15 min

PNEC

freshwater: 0.418 mg/l

marine water: 0.0418 mg/l

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intermittent release: 0.37 mg/l

sediment (freshwater): 1.89 mg/kg

sediment (marine water): 0.189 mg/kg

soil: 0.133 mg/kg

STP: 10 mg/l

DNEL

worker:

Long-term exposure- systemic effects, dermal: 14.1 mg/kg

worker:

Long-term exposure- systemic effects, Inhalation: 49.8 mg/m³

consumer:

Long-term exposure- systemic effects, dermal: 7.1 mg/kg

consumer:

Long-term exposure- systemic effects, Inhalation: 12.3 mg/m³

8.2. Exposure controls

Personal protective equipment

Respiratory protection:

Suitable respiratory protection for lower concentrations or short-term effect: Gas filter for gases/vapours of alkaline compounds such as ammonia, amines (e.g. EN 14387 Type K). Combination filter for gases/vapours of organic, inorganic, acid inorganic, alkaline compounds and toxic particles (e. g. EN 14387 Type ABEK-P3) Suitable respiratory protection for higher concentrations or long-term effect: Self-contained breathing apparatus.

Hand protection:

Suitable chemical resistant safety gloves (EN ISO 374-1) also with prolonged, direct contact (Recommended: Protective index 6, corresponding > 480 minutes of permeation time according to EN ISO 374-1): E.g. nitrile rubber (0.4 mm), chloroprene rubber (0.5 mm), butyl rubber (0.7 mm) etc. Supplementary note: The specifications are based on tests, literature data and information of glove manufacturers or are derived from similar substances by analogy. 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. Manufacturer's directions for use should be observed because of great diversity of types.

Eye protection:

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

General safety and hygiene measures

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Do not breathe dust. At the end of the shift the skin should be cleaned and skin-care agents applied.

SECTION 9: Physical and Chemical Properties

9.1. Information on basic physical and chemical properties

Form:	crystalline, powder	
Colour:	white	
Odour:	ammonia-like	
Odour threshold:	Not determined due to potential health hazard by inhalation.	
pH value:	10.0 (100 g/l, 20 °C)	(pH Meter)
decomposition point:	Unspecified	(DTA)
Melting point:	none	(OECD Guideline 102)
boiling temperature:	(1,013.25 hPa) The substance / product decomposes therefore not determined.	
Flash point:	not applicable	
Evaporation rate:	negligible, Value can be approximated from Henry's Law Constant or vapor pressure.	
Flammability:	not highly flammable	(other)
Lower explosion limit:	For solids not relevant for classification and labelling.	
Upper explosion limit:	For solids not relevant for classification and labelling.	
Ignition temperature:	not applicable	
Vapour pressure:	82 mbar (20 °C) Literature data. 442 mbar (45 °C) Literature data.	
Density:	1.37 g/cm ³ (19.9 °C, 1,013 hPa) Literature data.	(other)

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Solubility in water:	490 - 580 g/l (20 °C)	(other)
Solubility (quantitative) solvent(s):	Water approx. 423 g/kg (0 °C)	
Partitioning coefficient n-octanol/water (log Kow):	The substance / product decomposes therefore not determined.	(other)
Self ignition:	not self-igniting	Test type: Spontaneous self- ignition at room-temperature.
	not self-igniting	Test type: Self-ignition at high temperatures. (Method: other)
Thermal decomposition:	35 °C To avoid thermal decomposition, do not overheat.	
Viscosity, dynamic:	not applicable	
Explosion hazard:	not explosive	(other)
Fire promoting properties:	Based on its structural properties the product is not classified as oxidizing.	(other)

9.2. Other information

Self heating ability:	It is not a substance capable of spontaneous heating.	
Minimum ignition energy:	(1 bar, 25 °C) Grain size distribution: 63 µm The product is not capable of a dust explosion.	(VDI 2263, sheet 1, 2.1.2)
Bulk density:	780 - 850 kg/m ³	(other)
pKA:	not applicable	
Hygroscopy:	Non-hygroscopic	
Adsorption/water - soil:	KOC: 9.25; log KOC: 0.966	(calculated)
Surface tension:	Based on chemical structure, surface activity is not to be expected.	
Grain size distribution	500 - 710 µm	(D50, other (measured))

SECTION 10: Stability and Reactivity

10.1. Reactivity

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

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Formation of
flammable gases:

Remarks:

Forms no flammable gases in the
presence of water.

10.2. Chemical stability

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

10.3. Possibility of hazardous reactions

Exothermic reaction. Reacts with alkalis and nitrites. Reacts with nitrates. Incompatible with bases.

10.4. Conditions to avoid

Avoid heat. Avoid moisture. See SDS section 7 - Handling and storage.

10.5. Incompatible materials

Substances to avoid:
bases, acids

10.6. Hazardous decomposition products

Hazardous decomposition products:
ammonia, anhydrous, Carbon dioxide

SECTION 11: Toxicological Information

11.1. Information on toxicological effects

Acute toxicity

Assessment of acute toxicity:

Of moderate toxicity after single ingestion. In animal studies the substance is virtually nontoxic after short-term inhalation. In animal studies the substance is virtually nontoxic after a single skin contact. The product has not been fully tested. The statements have been derived in parts from products of a similar structure or composition.

Experimental/calculated data:

LD50 rat (oral): > 681 mg/kg (OECD Guideline 401)

LC50 rat (by inhalation): 6.6 mg/l 4 h (OECD Guideline 403)

The product has not been tested. The statement has been derived from substances/products of a similar structure or composition. Product not examined: Value is calculated from the data of the components.

LD50 rat (dermal): > 2,000 mg/kg

The product has not been tested. The statement has been derived from substances/products of a similar structure or composition.

Irritation

Assessment of irritating effects:

May cause severe damage to the eyes. Not irritating to the skin.

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Experimental/calculated data:

Skin corrosion/irritation

rabbit: non-irritant (OECD Guideline 404)

Serious eye damage/irritation

rabbit: irreversible damage (OECD Guideline 405)

Respiratory/Skin sensitization

Assessment of sensitization:

Skin sensitizing effects were not observed in animal studies.

Experimental/calculated data:

mouse: Non-sensitizing. (similar to OECD guideline 429)

Germ cell mutagenicity

Assessment of mutagenicity:

Mutagenicity tests revealed no genotoxic potential. The product has not been fully tested. The statements have been derived in parts from products of a similar structure or composition.

Carcinogenicity

Assessment of carcinogenicity:

Did not show carcinogenic effects in animal experiments. The product has not been tested. The statement has been derived from substances/products of a similar structure or composition.

Reproductive toxicity

Assessment of reproduction toxicity:

Study scientifically not justified.

Developmental toxicity

Assessment of teratogenicity:

No indications of a developmental toxic / teratogenic effect were seen in animal studies. The product has not been tested. The statement has been derived from substances/products of a similar structure or composition.

Specific target organ toxicity (single exposure)

Assessment of STOT single:

Based on the available information there is no specific target organ toxicity to be expected after a single exposure.

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

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Assessment of repeated dose toxicity:

No substance-specific organotoxicity was observed after repeated administration to animals. The product has not been tested. The statement has been derived from substances/products of a similar structure or composition.

Aspiration hazard

not applicable

SECTION 12: Ecological Information

12.1. Toxicity

Assessment of aquatic toxicity:

Acutely harmful for aquatic organisms. The inhibition of the degradation activity of activated sludge is not anticipated when introduced to biological treatment plants in appropriate low concentrations.

Toxicity to fish:

LC50 (96 h) 37.0 mg/l, *Pimephales promelas* (EPA 72-1, static)

Aquatic invertebrates:

EC50 (48 h) 63.7 mg/l, *Daphnia magna* (OECD Guideline 202, part 1, static)

Aquatic plants:

EC50 (72 h) 129.13 mg/l (growth rate), *Scenedesmus subspicatus* (DIN 38412 Part 9, static)

Microorganisms/Effect on activated sludge:

EC20 (0.5 h) 1,000 mg/l, activated sludge, domestic (OECD Guideline 209, aerobic)

EC50 (17 h) 1,180 mg/l, *Pseudomonas putida* (DIN 38412 Part 8, aquatic)

Chronic toxicity to fish:

Study scientifically not justified.

EC10 (28 d) 4.18 mg/l, *Pimephales promelas* (other, Flow through.)

The product has not been tested. The statement has been derived from the properties of the hydrolysis products.

Chronic toxicity to aquatic invertebrates:

EC10 (21 d) 4.81 mg/l, *Daphnia magna* (OECD Guideline 211, semistatic)

The product has not been tested. The statement has been derived from the properties of the hydrolysis products.

Assessment of terrestrial toxicity:

No data available concerning terrestrial toxicity.

Study scientifically not justified.

12.2. Persistence and degradability

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

Elimination information:

> 80 % CO₂ formation relative to the theoretical value (28 d) (OECD 301B; ISO 9439; 92/69/EEC, C.4-C) (aerobic, activated sludge, domestic) Readily biodegradable (according to OECD criteria).

Assessment of stability in water:

In contact with water the substance will hydrolyse rapidly.

12.3. Bioaccumulative potential

Assessment bioaccumulation potential:

Because of the n-octanol/water distribution coefficient (log Pow) accumulation in organisms is not to be expected.

Bioaccumulation potential:

Study scientifically not justified.

12.4. Mobility in soil

Assessment transport between environmental compartments:

Volatility: The substance will slowly evaporate into the atmosphere from the water surface.

Adsorption in soil: Adsorption to solid soil phase is not expected.

12.5. Results of PBT and vPvB assessment

The product does not fulfill the criteria for PBT (Persistent/bioaccumulative/toxic) and vPvB (very persistent/very bioaccumulative).

12.6. Other adverse effects

The substance is not listed in Regulation (EC) 1005/2009 on substances that deplete the ozone layer.

12.7. Additional information

Other ecotoxicological advice:

Do not release untreated into natural waters. Decomposition to non-hazardous substances takes place in water.

SECTION 13: Disposal Considerations

13.1. Waste treatment methods

The UK Environmental Protection (Duty of Care) Regulations (EP) and amendments should be noted (United Kingdom).

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This product and any uncleaned containers must be disposed of as hazardous waste in accordance with the 2005 Hazardous Waste Regulations and amendments (United Kingdom)

SECTION 14: Transport Information

Land transport

ADR

	Not classified as a dangerous good under transport regulations
UN number or ID number:	Not applicable
UN proper shipping name:	Not applicable
Transport hazard class(es):	Not applicable
Packing group:	Not applicable
Environmental hazards:	Not applicable
Special precautions for user	None known

RID

	Not classified as a dangerous good under transport regulations
UN number or ID number:	Not applicable
UN proper shipping name:	Not applicable
Transport hazard class(es):	Not applicable
Packing group:	Not applicable
Environmental hazards:	Not applicable
Special precautions for user	None known

Inland waterway transport

ADN

	Not classified as a dangerous good under transport regulations
UN number or ID number:	Not applicable
UN proper shipping name:	Not applicable
Transport hazard class(es):	Not applicable
Packing group:	Not applicable
Environmental hazards:	Not applicable
Special precautions for user:	None known

Transport in inland waterway vessel

Not evaluated

Sea transport

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IMDG

	Not classified as a dangerous good under transport regulations
UN number or ID number:	Not applicable
UN proper shipping name:	Not applicable
Transport hazard class(es):	Not applicable
Packing group:	Not applicable
Environmental hazards:	Not applicable
Special precautions for user	None known

Air transport

IATA/ICAO

	Not classified as a dangerous good under transport regulations
UN number or ID number:	Not applicable
UN proper shipping name:	Not applicable
Transport hazard class(es):	Not applicable
Packing group:	Not applicable
Environmental hazards:	Not applicable
Special precautions for user	None known

14.1. UN number or ID number

See corresponding entries for "UN number or ID number" for the respective regulations in the tables above.

14.2. UN proper shipping name

See corresponding entries for "UN proper shipping name" for the respective regulations in the tables above.

14.3. Transport hazard class(es)

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

14.4. Packing group

See corresponding entries for "Packing group" for the respective regulations in the tables above.

14.5. Environmental hazards

See corresponding entries for "Environmental hazards" for the respective regulations in the tables above.

14.6. Special precautions for user

See corresponding entries for "Special precautions for user" for the respective regulations in the tables above.

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14.7. Maritime transport in bulk according to IMO instruments

Maritime transport in bulk is not intended.

Further information

Specific national features of transport regulations must be observed. They are to be found in the shipping documents.

SECTION 15: Regulatory Information

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

Directive 2012/18/EU - Control of Major Accident Hazards involving dangerous substances (EU):
Listed in above regulation: no

The data should be considered when making any assessment under the Control of Substances Hazardous to Health Regulations (COSHH), and related guidance, for example, 'COSHH Essentials' (United Kingdom).

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

15.2. Chemical Safety Assessment

Chemical Safety Assessment performed

SECTION 16: Other Information

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

Aquatic Acute 3
Acute Tox. 4 (oral)
Eye Dam./Irrit. 1

This product is of industrial quality and unless otherwise specified or agreed intended exclusively for industrial use.

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

Acute Tox.	Acute toxicity
Eye Dam./Irrit.	Serious eye damage/eye irritation
H318	Causes serious eye damage.
H302	Harmful if swallowed.

Abbreviations

ADR = The European Agreement concerning the International Carriage of Dangerous Goods by Road.

ADN = The European Agreement concerning the International Carriage of Dangerous Goods by Inland

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

The data contained in this safety data sheet are based on our current knowledge and experience and describe the product only with regard to safety requirements. This safety data sheet is neither a Certificate of Analysis (CoA) nor technical data sheet and shall not be mistaken for a specification agreement. Identified uses in this safety data sheet do neither represent an agreement on the corresponding contractual quality of the substance/mixture nor a contractually designated use. It is the responsibility of the recipient of the product to ensure any proprietary rights and existing laws and legislation are observed.

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

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Product: **Ammonium carbamate crystals**

(ID no. 30041205/SDS_GEN_GB/EN)

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12. Use as a Process chemical, Use in sewage water treatment, Production, Industrial applications, (handling as solid in solution)

SU3; SU3; ERC6b; PROC3, PROC4, PROC5, PROC6, PROC7, PROC8b, PROC9, PROC10, PROC12, PROC13, PROC14, PROC15, PROC16, PROC19

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SU3; SU3; ERC2; PROC4, PROC5, PROC8b, PROC9, PROC15, PROC19

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SU3; SU3; ERC2; PROC4, PROC5, PROC8b, PROC9, PROC15, PROC19

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1. Short title of exposure scenario

Manufacture of substance, Distribution of substance, Industrial applications

SU3; SU3; ERC1; PROC2, PROC9, PROC15

Control of exposure and risk management measures

Contributing exposure scenario	
Use descriptors covered	ERC1: Manufacture of the substance
Operational conditions	
Annual amount used in the EU	5,500,000 kg
Minimum emission days per year	220
Emission factor air	5 %
Emission factor water	6 %
Emission factor soil	0.01 %
Receive Surf. Water (Flow Rate).	44,040 m3/min
Dilution factor river	189.74
Dilution factor coast	100
Risk Management Measures	
Soil treatment measures considered suitable are, e.g.	No application of sludge to soil
Type of STP	Municipal STP
Assumed sewage treatment plant flow (m3/d)	336,000 m3/d
Exposure estimate and reference to its source	

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Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Environment
Risk Characterization Ratio (RCR)	0.204435
	Risk from environmental exposure is driven by soil.
Maximum amount of safe use	122,288.3 kg/d
Risk from environmental exposure is driven by soil.	

Contributing exposure scenario	
Use descriptors covered	PROC2: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions Use domain: industrial
Operational conditions	
Concentration of the substance	Ammonium carbamate Content: >= 0 % - <= 100 %
Physical state	Solid, medium dustiness
Vapour pressure of the substance during use	8234 Pa
Process temperature	20 °C
Duration and Frequency of activity	15 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Wear chemically resistant gloves in combination with 'basic' employee training.	Effectiveness: 90 %
In case of potential exposure:, Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	0.1508 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.010696
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	1.676 mg/m ³
Risk Characterization Ratio (RCR)	0.033655
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra	

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

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Operational conditions	
Concentration of the substance	Ammonium carbamate Content: $\geq 0\%$ - $\leq 100\%$
Physical state	Solid, medium dustiness
Vapour pressure of the substance during use	8234 Pa
Process temperature	20 °C
Duration and Frequency of activity	60 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Wear chemically resistant gloves in combination with 'basic' employee training.	Effectiveness: 90 %
In case of potential exposure:, Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	0.8229 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.058359
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	33.529 mg/m ³
Risk Characterization Ratio (RCR)	0.67327
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra	

Contributing exposure scenario	
Use descriptors covered	PROC15: Use a laboratory reagent. Use domain: industrial
Operational conditions	
Concentration of the substance	Ammonium carbamate Content: $\geq 0\%$ - $\leq 100\%$
Physical state	Solid, medium dustiness
Vapour pressure of the substance during use	8234 Pa
Process temperature	20 °C
Duration and Frequency of activity	60 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Wear chemically resistant gloves in combination with 'basic' employee	Effectiveness: 90 %

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training.	
In case of potential exposure:, Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	0.0411 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.002918
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	6.606 mg/m ³
Risk Characterization Ratio (RCR)	0.135566
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra	

2. Short title of exposure scenario

Formulation & (re)packing of substances and mixtures, Downstream User, Industrial applications, (handling as solid)

SU3; SU3; ERC2; PROC4, PROC5, PROC8b, PROC9, PROC15, PROC19

Control of exposure and risk management measures

Contributing exposure scenario	
Use descriptors covered	ERC2: Formulation into mixture
Operational conditions	
Annual amount used in the EU	250,000 kg
Minimum emission days per year	100
Emission factor air	2.5 %
Emission factor water	2 %
Emission factor soil	0.01 %
Receive Surf. Water (Flow Rate).	18,000 m ³ /d
Dilution factor river	10
Dilution factor coast	100
Risk Management Measures	
Type of STP	Municipal STP
Assumed sewage treatment plant flow (m ³ /d)	2,000 m ³ /d
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Environment

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Product: **Ammonium carbamate crystals**

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Risk Characterization Ratio (RCR)	0.75538
	Risk from environmental exposure is driven by freshwater sediment.
Maximum amount of safe use	3,309.6 kg/d
Risk from environmental exposure is driven by freshwater sediment.	

Contributing exposure scenario	
Use descriptors covered	PROC4: Chemical production where opportunity for exposure arises Use domain: industrial
Operational conditions	
Concentration of the substance	Ammonium carbamate Content: >= 0 % - <= 100 %
Physical state	Solid, medium dustiness
Vapour pressure of the substance during use	8234 Pa
Process temperature	20 °C
Duration and Frequency of activity	240 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 90 %
Wear chemically resistant gloves in combination with 'basic' employee training.	Effectiveness: 90 %
In case of potential exposure:, Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	1.0971 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.077812
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	4.204 mg/m ³
Risk Characterization Ratio (RCR)	0.084418
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra	

Contributing exposure scenario	
Use descriptors covered	PROC5: Mixing or blending in batch processes Use domain: industrial
Operational conditions	

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Concentration of the substance	Ammonium carbamate Content: $\geq 0\%$ - $\leq 100\%$
Physical state	Solid, medium dustiness
Vapour pressure of the substance during use	8234 Pa
Process temperature	20 °C
Duration and Frequency of activity	240 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 90 %
Wear chemically resistant gloves in combination with 'basic' employee training.	Effectiveness: 90 %
In case of potential exposure:, Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	2.1943 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.155621
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	10.059 mg/m ³
Risk Characterization Ratio (RCR)	0.201988
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra	

Contributing exposure scenario	
Use descriptors covered	PROC8b: Transfer of substance or mixture (charging and discharging) at dedicated facilities Use domain: industrial
Operational conditions	
Concentration of the substance	Ammonium carbamate Content: $\geq 0\%$ - $\leq 100\%$
Physical state	Solid, medium dustiness
Vapour pressure of the substance during use	8234 Pa
Process temperature	20 °C
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 95 %

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Wear chemically resistant gloves in combination with 'basic' employee training.	Effectiveness: 90 %
In case of potential exposure:, Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	2.742 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.194468
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	4.116 mg/m ³
Risk Characterization Ratio (RCR)	0.082654
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra	

Contributing exposure scenario	
Use descriptors covered	PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing). Use domain: industrial
Operational conditions	
Concentration of the substance	Ammonium carbamate Content: >= 0 % - <= 100 %
Physical state	Solid, medium dustiness
Vapour pressure of the substance during use	8234 Pa
Process temperature	20 °C
Duration and Frequency of activity	240 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 90 %
Wear chemically resistant gloves in combination with 'basic' employee training.	Effectiveness: 90 %
In case of potential exposure:, Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	1.0971 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.077812
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	10.059 mg/m ³

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Risk Characterization Ratio (RCR)	0.201988
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra	

Contributing exposure scenario	
Use descriptors covered	PROC15: Use a laboratory reagent. Use domain: industrial
Operational conditions	
Concentration of the substance	Ammonium carbamate Content: >= 0 % - <= 100 %
Physical state	Solid, medium dustiness
Vapour pressure of the substance during use	8234 Pa
Process temperature	20 °C
Duration and Frequency of activity	240 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Wear chemically resistant gloves in combination with 'basic' employee training.	Effectiveness: 90 %
In case of potential exposure:, Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	0.0549 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.003891
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	19.818 mg/m ³
Risk Characterization Ratio (RCR)	0.397952
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra	

Contributing exposure scenario	
Use descriptors covered	PROC19: Manual activities involving hand contact Use domain: industrial
Operational conditions	
Concentration of the substance	Ammonium carbamate Content: >= 0 % - <= 5 %
Physical state	Solid, medium dustiness
Vapour pressure of the substance during use	8234 Pa

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Process temperature	20 °C
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 90 %
Wear chemically resistant gloves in combination with 'basic' employee training.	Effectiveness: 90 %
In case of potential exposure:, Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	5.658 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.401277
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	3.353 mg/m ³
Risk Characterization Ratio (RCR)	0.067329
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra	

3. Short title of exposure scenario

Formulation & (re)packing of substances and mixtures, Downstream User, Industrial applications, (handling as solid in solution)

SU3; SU3; ERC2; PROC4, PROC5, PROC8b, PROC9, PROC15, PROC19

Control of exposure and risk management measures

Contributing exposure scenario	
Use descriptors covered	ERC2: Formulation into mixture
Operational conditions	
Annual amount used in the EU	250,000 kg
Minimum emission days per year	100
Emission factor air	2.5 %
Emission factor water	2 %
Emission factor soil	0.01 %
Receive Surf. Water (Flow Rate).	18,000 m3/d

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Dilution factor river	10
Dilution factor coast	100
Risk Management Measures	
Type of STP	Municipal STP
Assumed sewage treatment plant flow (m3/d)	2,000 m3/d
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Environment
Risk Characterization Ratio (RCR)	0.75538
	Risk from environmental exposure is driven by freshwater sediment.
Maximum amount of safe use	3,309.6 kg/d
Risk from environmental exposure is driven by freshwater sediment.	

Contributing exposure scenario	
Use descriptors covered	PROC4: Chemical production where opportunity for exposure arises Use domain: industrial
Operational conditions	
Concentration of the substance	Ammonium carbamate Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance during use	8234 Pa
Process temperature	20 °C
Duration and Frequency of activity	240 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 90 %
Wear chemically resistant gloves in combination with 'basic' employee training.	Effectiveness: 90 %
In case of potential exposure:, Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	0.4114 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.029179
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	3.9035 mg/m ³

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Risk Characterization Ratio (RCR)	0.078384
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

Contributing exposure scenario	
Use descriptors covered	PROC5: Mixing or blending in batch processes Use domain: industrial
Operational conditions	
Concentration of the substance	Ammonium carbamate Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance during use	8234 Pa
Process temperature	20 °C
Duration and Frequency of activity	240 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 90 %
Wear chemically resistant gloves in combination with 'basic' employee training.	Effectiveness: 90 %
In case of potential exposure:, Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	0.8229 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.058359
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	9.7588 mg/m ³
Risk Characterization Ratio (RCR)	0.19596
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

Contributing exposure scenario	
Use descriptors covered	PROC8b: Transfer of substance or mixture (charging and discharging) at dedicated facilities Use domain: industrial
Operational conditions	
Concentration of the substance	Ammonium carbamate Content: >= 0 % - <= 100 %

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Physical state	liquid
Vapour pressure of the substance during use	8234 Pa
Process temperature	20 °C
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 95 %
Wear chemically resistant gloves in combination with 'basic' employee training.	Effectiveness: 90 %
In case of potential exposure:, Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	1.3714 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.097264
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	4.0662 mg/m ³
Risk Characterization Ratio (RCR)	0.08165
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

Contributing exposure scenario	
Use descriptors covered	PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing). Use domain: industrial
Operational conditions	
Concentration of the substance	Ammonium carbamate Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance during use	8234 Pa
Process temperature	20 °C
Duration and Frequency of activity	240 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 90 %
Wear chemically resistant gloves in	Effectiveness: 90 %

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Date / Revised: 20.01.2023

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Date / First version: 14.02.2003

Product: **Ammonium carbamate crystals**

(ID no. 30041205/SDS_GEN_GB/EN)

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combination with 'basic' employee training.	
In case of potential exposure:, Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	0.4114 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.029179
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	9.7588 mg/m ³
Risk Characterization Ratio (RCR)	0.19596
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

Contributing exposure scenario	
Use descriptors covered	PROC15: Use a laboratory reagent. Use domain: industrial
Operational conditions	
Concentration of the substance	Ammonium carbamate Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance during use	8234 Pa
Process temperature	20 °C
Duration and Frequency of activity	240 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Wear chemically resistant gloves in combination with 'basic' employee training.	Effectiveness: 90 %
In case of potential exposure:, Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	0.0206 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.001459
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	19.5176 mg/m ³
Risk Characterization Ratio (RCR)	0.39192
Guidance to Downstream Users	

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Product: **Ammonium carbamate crystals**

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

Contributing exposure scenario	
Use descriptors covered	PROC19: Manual activities involving hand contact Use domain: industrial
Operational conditions	
Concentration of the substance	Ammonium carbamate Content: >= 0 % - <= 5 %
Physical state	liquid
Vapour pressure of the substance during use	8234 Pa
Process temperature	20 °C
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 90 %
Wear chemically resistant gloves in combination with 'basic' employee training.	Effectiveness: 90 %
In case of potential exposure:, Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	2.8286 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.200608
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	3.2529 mg/m ³
Risk Characterization Ratio (RCR)	0.06532
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

4. Short title of exposure scenario

Formulation & (re)packing of substances and mixtures, Downstream User, Professional applications, (handling as solid)

SU22; SU22; ERC2; PROC4, PROC5, PROC8b, PROC9, PROC15, PROC19

Control of exposure and risk management measures

Contributing exposure scenario

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Product: **Ammonium carbamate crystals**

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Date of print 21.10.2025

Use descriptors covered	ERC2: Formulation into mixture	
Operational conditions		
Annual amount used in the EU	250,000 kg	
Minimum emission days per year	10	
Emission factor air	2.5 %	
Emission factor water	2 %	
Emission factor soil	0.01 %	
Receive Surf. Water (Flow Rate).	18,000 m3/d	
Dilution factor river	10	
Dilution factor coast	100	
Risk Management Measures		
Type of STP	Municipal STP	
Assumed sewage treatment plant flow (m3/d)	2,000 m3/d	
Exposure estimate and reference to its source		
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Environment	
Risk Characterization Ratio (RCR)	0.75538	
	Risk from environmental exposure is driven by freshwater sediment.	
Maximum amount of safe use	3,309.6 kg/d	
Risk from environmental exposure is driven by freshwater sediment.		

Contributing exposure scenario	
Use descriptors covered	PROC4: Chemical production where opportunity for exposure arises Use domain: professional
Operational conditions	
Concentration of the substance	Ammonium carbamate Content: >= 0 % - <= 100 %
Physical state	Solid, medium dustiness
Vapour pressure of the substance during use	8234 Pa
Process temperature	20 °C
Duration and Frequency of activity	240 min 5 days per week
Indoor/Outdoor	Indoor

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Risk Management Measures	
Local exhaust ventilation	Effectiveness: 80 %
Wear chemically resistant gloves in combination with 'basic' employee training.	Effectiveness: 90 %
In case of potential exposure:, Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	0.6857 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.048632
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	20.118 mg/m ³
Risk Characterization Ratio (RCR)	0.403976
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

Contributing exposure scenario	
Use descriptors covered	PROC5: Mixing or blending in batch processes Use domain: professional
Operational conditions	
Concentration of the substance	Ammonium carbamate Content: >= 0 % - <= 100 %
Physical state	Solid, medium dustiness
Vapour pressure of the substance during use	8234 Pa
Process temperature	20 °C
Duration and Frequency of activity	60 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 80 %
Wear chemically resistant gloves in combination with 'basic' employee training.	Effectiveness: 90 %
In case of potential exposure:, Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	1.6453 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.116687
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker

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Product: **Ammonium carbamate crystals**

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	Worker - inhalation, long-term - systemic
Exposure estimate	13.212 mg/m ³
Risk Characterization Ratio (RCR)	0.2653
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

Contributing exposure scenario	
Use descriptors covered	PROC8b: Transfer of substance or mixture (charging and discharging) at dedicated facilities Use domain: professional
Operational conditions	
Concentration of the substance	Ammonium carbamate Content: >= 0 % - <= 100 %
Physical state	Solid, medium dustiness
Vapour pressure of the substance during use	8234 Pa
Process temperature	20 °C
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 80 %
Wear chemically resistant gloves in combination with 'basic' employee training.	Effectiveness: 90 %
In case of potential exposure:, Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	2.742 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.194468
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	17.265 mg/m ³
Risk Characterization Ratio (RCR)	0.34668
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra	

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

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Product: **Ammonium carbamate crystals**

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Concentration of the substance	Ammonium carbamate Content: $\geq 0\%$ - $\leq 100\%$
Physical state	Solid, medium dustiness
Vapour pressure of the substance during use	8234 Pa
Process temperature	20 °C
Duration and Frequency of activity	60 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 80 %
Wear chemically resistant gloves in combination with 'basic' employee training.	Effectiveness: 90 %
In case of potential exposure:, Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	0.8223 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.058358
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	13.212 mg/m ³
Risk Characterization Ratio (RCR)	0.265296
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

Contributing exposure scenario	
Use descriptors covered	PROC15: Use a laboratory reagent. Use domain: professional
Operational conditions	
Concentration of the substance	Ammonium carbamate Content: $\geq 0\%$ - $\leq 100\%$
Physical state	Solid, medium dustiness
Vapour pressure of the substance during use	8234 Pa
Process temperature	20 °C
Duration and Frequency of activity	240 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Wear chemically resistant gloves in	Effectiveness: 90 %

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combination with 'basic' employee training.	
In case of potential exposure:, Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	0.0338 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.002401
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	19.818 mg/m ³
Risk Characterization Ratio (RCR)	0.397951
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra	

Contributing exposure scenario	
Use descriptors covered	PROC19: Manual activities involving hand contact Use domain: professional
Operational conditions	
Concentration of the substance	Ammonium carbamate Content: >= 0 % - <= 5 %
Physical state	Solid, medium dustiness
Vapour pressure of the substance during use	8234 Pa
Process temperature	20 °C
Duration and Frequency of activity	240 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 80 %
Wear chemically resistant gloves in combination with 'basic' employee training.	Effectiveness: 90 %
In case of potential exposure:, Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	4.526 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.320993
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	7.927 mg/m ³
Risk Characterization Ratio (RCR)	0.159177
Guidance to Downstream Users	

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

5. Short title of exposure scenario

Formulation & (re)packing of substances and mixtures, Downstream User, Professional applications, (handling as solid in solution)

SU22; SU22; ERC2; PROC4, PROC5, PROC8b, PROC9, PROC15, PROC19

Control of exposure and risk management measures

Contributing exposure scenario	
Use descriptors covered	ERC2: Formulation into mixture
Operational conditions	
Annual amount used in the EU	250,000 kg
Minimum emission days per year	10
Emission factor air	2.5 %
Emission factor water	2 %
Emission factor soil	0.01 %
Receive Surf. Water (Flow Rate).	18,000 m3/d
Dilution factor river	10
Dilution factor coast	100
Risk Management Measures	
Type of STP	Municipal STP
Assumed sewage treatment plant flow (m3/d)	2,000 m3/d
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Environment
Risk Characterization Ratio (RCR)	0.75538
	Risk from environmental exposure is driven by freshwater sediment.
Maximum amount of safe use	3,309.6 kg/d
Risk from environmental exposure is driven by freshwater sediment.	

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

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Product: **Ammonium carbamate crystals**

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Operational conditions	
Concentration of the substance	Ammonium carbamate Content: $\geq 0\%$ - $\leq 100\%$
Physical state	liquid
Vapour pressure of the substance during use	8234 Pa
Process temperature	20 °C
Duration and Frequency of activity	240 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 80 %
Wear chemically resistant gloves in combination with 'basic' employee training.	Effectiveness: 90 %
In case of potential exposure:, Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	0.4114 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.029179
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	19.5176 mg/m ³
Risk Characterization Ratio (RCR)	0.39192
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

Contributing exposure scenario	
Use descriptors covered	PROC5: Mixing or blending in batch processes Use domain: professional
Operational conditions	
Concentration of the substance	Ammonium carbamate Content: $\geq 0\%$ - $\leq 100\%$
Physical state	liquid
Vapour pressure of the substance during use	8234 Pa
Process temperature	20 °C
Duration and Frequency of activity	60 min 5 days per week
Indoor/Outdoor	Indoor

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Risk Management Measures	
Local exhaust ventilation	Effectiveness: 80 %
Wear chemically resistant gloves in combination with 'basic' employee training.	Effectiveness: 90 %
In case of potential exposure:, Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	0.2743 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.019453
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	13.0118 mg/m ³
Risk Characterization Ratio (RCR)	0.26128
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

Contributing exposure scenario	
Use descriptors covered	PROC8b: Transfer of substance or mixture (charging and discharging) at dedicated facilities Use domain: professional
Operational conditions	
Concentration of the substance	Ammonium carbamate Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance during use	8234 Pa
Process temperature	20 °C
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 90 %
Wear chemically resistant gloves in combination with 'basic' employee training.	Effectiveness: 90 %
In case of potential exposure:, Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	1.3714 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.097264

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Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	16.2647 mg/m ³
Risk Characterization Ratio (RCR)	0.3266
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

Contributing exposure scenario	
Use descriptors covered	PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing). Use domain: professional
Operational conditions	
Concentration of the substance	Ammonium carbamate Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance during use	8234 Pa
Process temperature	20 °C
Duration and Frequency of activity	60 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 80 %
Wear chemically resistant gloves in combination with 'basic' employee training.	Effectiveness: 90 %
In case of potential exposure:, Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	0.1371 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.009726
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	13.0118 mg/m ³
Risk Characterization Ratio (RCR)	0.26128
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

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

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Operational conditions	
Concentration of the substance	Ammonium carbamate Content: $\geq 0\%$ - $\leq 100\%$
Physical state	liquid
Vapour pressure of the substance during use	8234 Pa
Process temperature	20 °C
Duration and Frequency of activity	240 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Wear chemically resistant gloves in combination with 'basic' employee training.	Effectiveness: 90 %
In case of potential exposure:, Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	0.0206 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.001459
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	19.5176 mg/m ³
Risk Characterization Ratio (RCR)	0.39192
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

Contributing exposure scenario	
Use descriptors covered	PROC19: Manual activities involving hand contact Use domain: professional
Operational conditions	
Concentration of the substance	Ammonium carbamate Content: $\geq 0\%$ - $\leq 5\%$
Physical state	liquid
Vapour pressure of the substance during use	8234 Pa
Process temperature	20 °C
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 80 %

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Wear chemically resistant gloves in combination with 'basic' employee training.	Effectiveness: 90 %
In case of potential exposure:, Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	2.8286 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.200608
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	13.0118 mg/m ³
Risk Characterization Ratio (RCR)	0.26128
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

6. Short title of exposure scenario

Use as raw material, Use in Blowing agents, Use as a Process chemical, Use as processing aid, Industrial applications, (handling as solid)
 SU3; SU3; ERC6b; PROC3, PROC4, PROC5, PROC6, PROC7, PROC8b, PROC9, PROC10, PROC12, PROC13, PROC14, PROC15, PROC16, PROC19, PROC21, PROC23

Control of exposure and risk management measures

Contributing exposure scenario	
Use descriptors covered	ERC6b: Use of reactive processing aid at industrial site (no inclusion into or onto article)
Operational conditions	
Annual amount per site	70,000 kg
Minimum emission days per year	20
Emission factor air	0.1 %
Emission factor water	5 %
Emission factor soil	0.025 %
Receive Surf. Water (Flow Rate).	18,000 m ³ /d
Dilution factor river	10
Dilution factor coast	100

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Risk Management Measures	
Type of STP	Municipal STP
Assumed sewage treatment plant flow (m3/d)	2,000 m3/d
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Environment
Risk Characterization Ratio (RCR)	0.266503
	Risk from environmental exposure is driven by freshwater sediment.
Maximum amount of safe use	1,313.3 kg/d
Risk from environmental exposure is driven by freshwater sediment.	
Contributing exposure scenario	
Use descriptors covered	PROC3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition Use domain: industrial
Operational conditions	
Concentration of the substance	Ammonium carbamate Content: >= 0 % - <= 100 %
Physical state	Solid, medium dustiness
Vapour pressure of the substance during use	8234 Pa
Process temperature	20 °C
Duration and Frequency of activity	240 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 90 %
Wear chemically resistant gloves in combination with 'basic' employee training.	Effectiveness: 90 %
In case of potential exposure:, Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	0.1097 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.007781
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	2.012 mg/m ³
Risk Characterization Ratio (RCR)	0.040402
Guidance to Downstream Users	

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

Contributing exposure scenario	
Use descriptors covered	PROC4: Chemical production where opportunity for exposure arises Use domain: industrial
Operational conditions	
Concentration of the substance	Ammonium carbamate Content: $\geq 0\%$ - $\leq 100\%$
Physical state	Solid, medium dustiness
Vapour pressure of the substance during use	8234 Pa
Process temperature	20 °C
Duration and Frequency of activity	240 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 90 %
Wear chemically resistant gloves in combination with 'basic' employee training.	Effectiveness: 90 %
In case of potential exposure:, Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	1.0971 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.077812
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	4.204 mg/m ³
Risk Characterization Ratio (RCR)	0.084418
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra	

Contributing exposure scenario	
Use descriptors covered	PROC5: Mixing or blending in batch processes Use domain: industrial
Operational conditions	
Concentration of the substance	Ammonium carbamate Content: $\geq 0\%$ - $\leq 100\%$
Physical state	Solid, medium dustiness
Vapour pressure of the substance during use	8234 Pa

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Process temperature	20 °C
Duration and Frequency of activity	240 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 90 %
Wear chemically resistant gloves in combination with 'basic' employee training.	Effectiveness: 90 %
In case of potential exposure:, Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	2.2537 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.155593
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	10.059 mg/m ³
Risk Characterization Ratio (RCR)	0.201988
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra	

Contributing exposure scenario	
Use descriptors covered	PROC6: Calendering operations Use domain: industrial
Operational conditions	
Concentration of the substance	Ammonium carbamate Content: >= 0 % - <= 100 %
Physical state	Solid, medium dustiness
Vapour pressure of the substance during use	8234 Pa
Process temperature	20 °C
Duration and Frequency of activity	240 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 90 %
Wear chemically resistant gloves in combination with 'basic' employee training.	Effectiveness: 90 %
In case of potential exposure:, Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker

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	Worker - dermal, long-term - systemic
Exposure estimate	4.389 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.311246
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	10.059 mg/m ³
Risk Characterization Ratio (RCR)	0.201988
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra	

Contributing exposure scenario	
Use descriptors covered	PROC7: Industrial spraying Use domain: industrial
Operational conditions	
Concentration of the substance	Ammonium carbamate Content: >= 0 % - <= 5 %
Physical state	Solid, medium dustiness
Vapour pressure of the substance during use	8234 Pa
Process temperature	20 °C
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 95 %
Wear chemically resistant gloves in combination with 'basic' employee training.	Effectiveness: 90 %
In case of potential exposure:, Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	1.7143 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.12158
Assessment method	EASY TRA v4.1, Workplace measurements
	Worker - inhalation, long-term - systemic
Exposure estimate	28.04 mg/m ³
Risk Characterization Ratio (RCR)	0.563052
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

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

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	Use domain: industrial
Operational conditions	
Concentration of the substance	Ammonium carbamate Content: $\geq 0\%$ - $\leq 100\%$
Physical state	Solid, medium dustiness
Vapour pressure of the substance during use	8234 Pa
Process temperature	20 °C
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 95 %
Wear chemically resistant gloves in combination with 'basic' employee training.	Effectiveness: 90 %
In case of potential exposure:, Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	2.742 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.1945
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	4.116 mg/m ³
Risk Characterization Ratio (RCR)	0.082651
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra	

Contributing exposure scenario	
Use descriptors covered	PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing). Use domain: industrial
Operational conditions	
Concentration of the substance	Ammonium carbamate Content: $\geq 0\%$ - $\leq 100\%$
Physical state	Solid, medium dustiness
Vapour pressure of the substance during use	8234 Pa
Process temperature	20 °C
Duration and Frequency of activity	240 min 5 days per week

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Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 90 %
Wear chemically resistant gloves in combination with 'basic' employee training.	Effectiveness: 90 %
In case of potential exposure:, Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	1.0971 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.077812
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	10.059 mg/m ³
Risk Characterization Ratio (RCR)	0.201988
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra	

Contributing exposure scenario	
Use descriptors covered	PROC10: Roller application or brushing Use domain: industrial
Operational conditions	
Concentration of the substance	Ammonium carbamate Content: >= 0 % - <= 100 %
Physical state	Solid, medium dustiness
Vapour pressure of the substance during use	8234 Pa
Process temperature	20 °C
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 90 %
Wear chemically resistant gloves in combination with 'basic' employee training.	Effectiveness: 90 %
In case of potential exposure:, Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	5.486 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.3891
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker

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	Worker - inhalation, long-term - systemic
Exposure estimate	16.765 mg/m ³
Risk Characterization Ratio (RCR)	0.33664
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra	

Contributing exposure scenario	
Use descriptors covered	PROC12: Use of blowing agents in manufacture of foam Use domain: industrial
Operational conditions	
Concentration of the substance	Ammonium carbamate Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance during use	8234 Pa
Process temperature	20 °C
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
In case of potential exposure:, Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	0.3429 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.024316
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, worker, modified version
	Worker - inhalation, long-term - systemic
Exposure estimate	13.0118 mg/m ³
Risk Characterization Ratio (RCR)	0.26128
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

Contributing exposure scenario	
Use descriptors covered	PROC13: Treatment of articles by dipping and pouring. Use domain: industrial
Operational conditions	
Concentration of the substance	Ammonium carbamate Content: >= 0 % - <= 100 %
Physical state	Solid, medium dustiness
Vapour pressure of the substance	8234 Pa

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during use	
Process temperature	20 °C
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 90 %
Wear chemically resistant gloves in combination with 'basic' employee training.	Effectiveness: 90 %
In case of potential exposure:, Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	2.742 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.194528
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	16.365 mg/m ³
Risk Characterization Ratio (RCR)	0.328614
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra	

Contributing exposure scenario	
Use descriptors covered	PROC14: Tableting, compression, extrusion, pelletisation, granulation Use domain: industrial
Operational conditions	
Concentration of the substance	Ammonium carbamate Content: >= 0 % - <= 100 %
Physical state	Solid, medium dustiness
Vapour pressure of the substance during use	8234 Pa
Process temperature	20 °C
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 90 %
Wear chemically resistant gloves in combination with 'basic' employee training.	Effectiveness: 90 %
In case of potential exposure:, Use suitable eye protection.	

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Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	0.6857 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.048632
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	16.365 mg/m ³
Risk Characterization Ratio (RCR)	0.328614
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra	

Contributing exposure scenario	
Use descriptors covered	PROC15: Use a laboratory reagent. Use domain: industrial
Operational conditions	
Concentration of the substance	Ammonium carbamate Content: >= 0 % - <= 100 %
Physical state	Solid, medium dustiness
Vapour pressure of the substance during use	8234 Pa
Process temperature	20 °C
Duration and Frequency of activity	240 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Wear chemically resistant gloves in combination with 'basic' employee training.	Effectiveness: 90 %
In case of potential exposure:, Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	0.0549 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.003891
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	19.818 mg/m ³
Risk Characterization Ratio (RCR)	0.397952
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra	

Contributing exposure scenario	
Use descriptors covered	PROC16: Use of fuels Use domain: industrial

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Operational conditions	
Concentration of the substance	Ammonium carbamate Content: $\geq 0\%$ - $\leq 100\%$
Physical state	Solid, medium dustiness
Vapour pressure of the substance during use	8234 Pa
Process temperature	20 °C
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Wear chemically resistant gloves in combination with 'basic' employee training.	Effectiveness: 90 %
In case of potential exposure:, Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	0.0686 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.004865
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	21.265 mg/m ³
Risk Characterization Ratio (RCR)	0.427002
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra	

Contributing exposure scenario	
Use descriptors covered	PROC19: Manual activities involving hand contact Use domain: industrial
Operational conditions	
Concentration of the substance	Ammonium carbamate Content: $\geq 0\%$ - $\leq 5\%$
Physical state	Solid, medium dustiness
Vapour pressure of the substance during use	8234 Pa
Process temperature	20 °C
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 90 %

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Wear chemically resistant gloves in combination with 'basic' employee training.	Effectiveness: 90 %
In case of potential exposure:, Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	5.6572 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.401219
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	3.353 mg/m ³
Risk Characterization Ratio (RCR)	0.067328
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra	

Contributing exposure scenario	
Use descriptors covered	PROC21: Low energy manipulation and handling of substances bound in/on materials or articles Use domain: industrial
Operational conditions	
Concentration of the substance	Ammonium carbamate Content: >= 0 % - <= 100 %
Physical state	Solid, medium dustiness
Vapour pressure of the substance during use	8234 Pa
Process temperature	20 °C
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Wear chemically resistant gloves in combination with 'basic' employee training.	Effectiveness: 90 %
In case of potential exposure:, Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	0.2829 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.020061
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	3 mg/m ³
Risk Characterization Ratio (RCR)	0.060241

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Guidance to Downstream Users

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

Contributing exposure scenario

Use descriptors covered	PROC23: Open processing and transfer operations at substantially elevated temperature Use domain: industrial
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Operational conditions

Concentration of the substance	Ammonium carbamate Content: $\geq 0\%$ - $\leq 100\%$
Physical state	Solid, medium dustiness
Vapour pressure of the substance during use	8234 Pa
Process temperature	20 °C
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor

Risk Management Measures

Wear chemically resistant gloves in combination with 'basic' employee training.	Effectiveness: 90 %
In case of potential exposure:, Use suitable eye protection.	

Exposure estimate and reference to its source

Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	0.1414 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.01003
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	3 mg/m ³
Risk Characterization Ratio (RCR)	0.060241

Guidance to Downstream Users

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

7. Short title of exposure scenario

Use as raw material, Use in Blowing agents, Use as a Process chemical, Use as processing aid, Industrial applications, (handling as solid in solution)

SU3; SU3; ERC6b; PROC3, PROC4, PROC5, PROC6, PROC7, PROC8b, PROC9, PROC10, PROC12, PROC13, PROC14, PROC15, PROC16, PROC19

Control of exposure and risk management measures

Contributing exposure scenario

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Use descriptors covered	ERC6b: Use of reactive processing aid at industrial site (no inclusion into or onto article)	
Operational conditions		
Annual amount per site	70,000 kg	
Minimum emission days per year	20	
Emission factor air	0.1 %	
Emission factor water	5 %	
Emission factor soil	0.025 %	
Receive Surf. Water (Flow Rate).	18,000 m3/d	
Dilution factor river	10	
Dilution factor coast	100	
Risk Management Measures		
Type of STP	Municipal STP	
Assumed sewage treatment plant flow (m3/d)	2,000 m3/d	
Exposure estimate and reference to its source		
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Environment	
Risk Characterization Ratio (RCR)	0.266503	
	Risk from environmental exposure is driven by freshwater sediment.	
Maximum amount of safe use	1,313.3 kg/d	
Risk from environmental exposure is driven by freshwater sediment.		

Contributing exposure scenario	
Use descriptors covered	PROC3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition Use domain: industrial
Operational conditions	
Concentration of the substance	Ammonium carbamate Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance during use	8234 Pa
Process temperature	20 °C

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Duration and Frequency of activity	240 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 90 %
Wear chemically resistant gloves in combination with 'basic' employee training.	Effectiveness: 90 %
In case of potential exposure:, Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	0.0411 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.002918
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	1.9518 mg/m ³
Risk Characterization Ratio (RCR)	0.039192
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

Contributing exposure scenario	
Use descriptors covered	PROC4: Chemical production where opportunity for exposure arises Use domain: industrial
Operational conditions	
Concentration of the substance	Ammonium carbamate Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance during use	8234 Pa
Process temperature	20 °C
Duration and Frequency of activity	240 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 90 %
Wear chemically resistant gloves in combination with 'basic' employee training.	Effectiveness: 90 %
In case of potential exposure:, Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker

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	Worker - dermal, long-term - systemic
Exposure estimate	0.4114 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.029179
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	3.9035 mg/m ³
Risk Characterization Ratio (RCR)	0.078384
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

Contributing exposure scenario	
Use descriptors covered	PROC5: Mixing or blending in batch processes Use domain: industrial
Operational conditions	
Concentration of the substance	Ammonium carbamate Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance during use	8234 Pa
Process temperature	20 °C
Duration and Frequency of activity	240 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 90 %
Wear chemically resistant gloves in combination with 'basic' employee training.	Effectiveness: 90 %
In case of potential exposure:, Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	0.8229 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.058359
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	9.7588 mg/m ³
Risk Characterization Ratio (RCR)	0.19596
Guidance to Downstream Users	
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Contributing exposure scenario	
Use descriptors covered	PROC6: Calendering operations

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Product: **Ammonium carbamate crystals**

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	Use domain: industrial
Operational conditions	
Concentration of the substance	Ammonium carbamate Content: $\geq 0\%$ - $\leq 100\%$
Physical state	liquid
Vapour pressure of the substance during use	8234 Pa
Process temperature	20 °C
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 90 %
Wear chemically resistant gloves in combination with 'basic' employee training.	Effectiveness: 90 %
In case of potential exposure:, Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	2.7429 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.194529
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	16.2647 mg/m ³
Risk Characterization Ratio (RCR)	0.3266
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

Contributing exposure scenario	
Use descriptors covered	PROC7: Industrial spraying Use domain: industrial
Operational conditions	
Concentration of the substance	Ammonium carbamate Content: $\geq 0\%$ - $\leq 100\%$
Physical state	liquid
Vapour pressure of the substance during use	8234 Pa
Process temperature	20 °C
Duration and Frequency of activity	60 min 5 days per week

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Product: **Ammonium carbamate crystals**

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Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 95 %
Wear suitable respiratory protection.	Effectiveness: 90 %
Wear chemically resistant gloves in combination with 'basic' employee training.	Effectiveness: 90 %
In case of potential exposure:, Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	0.8571 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.06079
Assessment method	EASY TRA v4.1, Workplace measurements
	Worker - inhalation, long-term - systemic
Exposure estimate	25 mg/m ³
Risk Characterization Ratio (RCR)	0.502008
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

Contributing exposure scenario	
Use descriptors covered	PROC8b: Transfer of substance or mixture (charging and discharging) at dedicated facilities Use domain: industrial
Operational conditions	
Concentration of the substance	Ammonium carbamate Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance during use	8234 Pa
Process temperature	20 °C
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 95 %
Wear chemically resistant gloves in combination with 'basic' employee training.	Effectiveness: 90 %
In case of potential exposure:, Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic

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Product: **Ammonium carbamate crystals**

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Exposure estimate	1.3714 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.097264
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	4.0662 mg/m ³
Risk Characterization Ratio (RCR)	0.08165
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

Contributing exposure scenario	
Use descriptors covered	PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing). Use domain: industrial
Operational conditions	
Concentration of the substance	Ammonium carbamate Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance during use	8234 Pa
Process temperature	20 °C
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 90 %
Wear chemically resistant gloves in combination with 'basic' employee training.	Effectiveness: 90 %
In case of potential exposure:, Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	0.6857 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.048632
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	16.2647 mg/m ³
Risk Characterization Ratio (RCR)	0.3266
Guidance to Downstream Users	
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Contributing exposure scenario	
Use descriptors covered	PROC10: Roller application or brushing

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Product: **Ammonium carbamate crystals**

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	Use domain: industrial
Operational conditions	
Concentration of the substance	Ammonium carbamate Content: $\geq 0\%$ - $\leq 100\%$
Physical state	liquid
Vapour pressure of the substance during use	8234 Pa
Process temperature	20 °C
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 90 %
Wear chemically resistant gloves in combination with 'basic' employee training.	Effectiveness: 90 %
In case of potential exposure:, Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	2.7429 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.194529
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	16.2647 mg/m ³
Risk Characterization Ratio (RCR)	0.3266
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

Contributing exposure scenario	
Use descriptors covered	PROC12: Use of blowing agents in manufacture of foam Use domain: industrial
Operational conditions	
Concentration of the substance	Ammonium carbamate Content: $\geq 0\%$ - $\leq 100\%$
Physical state	liquid
Vapour pressure of the substance during use	8234 Pa
Process temperature	20 °C
Duration and Frequency of activity	480 min 5 days per week

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Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 90 %
In case of potential exposure:, Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	0.3429 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.024316
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	6.5059 mg/m ³
Risk Characterization Ratio (RCR)	0.13064
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

Contributing exposure scenario	
Use descriptors covered	PROC13: Treatment of articles by dipping and pouring. Use domain: industrial
Operational conditions	
Concentration of the substance	Ammonium carbamate Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance during use	8234 Pa
Process temperature	20 °C
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 90 %
Wear chemically resistant gloves in combination with 'basic' employee training.	Effectiveness: 90 %
In case of potential exposure:, Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	1.3714 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.097264
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	16.2647 mg/m ³

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Risk Characterization Ratio (RCR)	0.3266
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

Contributing exposure scenario	
Use descriptors covered	PROC14: Tableting, compression, extrusion, pelletisation, granulation Use domain: industrial
Operational conditions	
Concentration of the substance	Ammonium carbamate Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance during use	8234 Pa
Process temperature	20 °C
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 90 %
Wear chemically resistant gloves in combination with 'basic' employee training.	Effectiveness: 90 %
In case of potential exposure:, Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	0.3429 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.024316
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	16.2647 mg/m ³
Risk Characterization Ratio (RCR)	0.3266
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

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

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Physical state	liquid
Vapour pressure of the substance during use	8234 Pa
Process temperature	20 °C
Duration and Frequency of activity	240 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Wear chemically resistant gloves in combination with 'basic' employee training.	Effectiveness: 90 %
In case of potential exposure:, Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	0.0206 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.001459
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	19.5176 mg/m ³
Risk Characterization Ratio (RCR)	0.39192
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

Contributing exposure scenario	
Use descriptors covered	PROC16: Use of fuels Use domain: industrial
Operational conditions	
Concentration of the substance	Ammonium carbamate Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance during use	8234 Pa
Process temperature	20 °C
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Wear chemically resistant gloves in combination with 'basic' employee training.	Effectiveness: 90 %
In case of potential exposure:, Use	

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suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	0.0343 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.002432
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	16.2647 mg/m ³
Risk Characterization Ratio (RCR)	0.3266
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

Contributing exposure scenario	
Use descriptors covered	PROC19: Manual activities involving hand contact Use domain: industrial
Operational conditions	
Concentration of the substance	Ammonium carbamate Content: >= 0 % - <= 5 %
Physical state	liquid
Vapour pressure of the substance during use	8234 Pa
Process temperature	20 °C
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 90 %
Wear chemically resistant gloves in combination with 'basic' employee training.	Effectiveness: 90 %
In case of potential exposure:, Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	2.8286 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.200608
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	3.2529 mg/m ³
Risk Characterization Ratio (RCR)	0.06532
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

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8. Short title of exposure scenario

Use as raw material, Use in Blowing agents, Use as a Process chemical, Use as processing aid, Professional applications, (handling as solid)

SU22; SU22; ERC8b; PROC4, PROC5, PROC13, PROC14, PROC15, PROC16, PROC19, PROC21

Control of exposure and risk management measures

Contributing exposure scenario	
Use descriptors covered	ERC8b: Widespread use of reactive processing aid (no inclusion into or onto article, indoor)
Operational conditions	
Annual amount used in the EU	350,000 kg
Minimum emission days per year	365
Emission factor air	0.1 %
Emission factor water	2 %
Emission factor soil	0 %
Receive Surf. Water (Flow Rate).	18,000 m3/d
Dilution factor river	10
Dilution factor coast	100
Risk Management Measures	
Type of STP	Municipal STP
Assumed sewage treatment plant flow (m3/d)	2,000 m3/d
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Environment
Risk Characterization Ratio (RCR)	0.00332
	Risk from environmental exposure is driven by freshwater sediment.
Maximum amount of safe use	57.8 kg/d
Risk from environmental exposure is driven by freshwater sediment.	

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

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Operational conditions	
Concentration of the substance	Ammonium carbamate Content: $\geq 0\%$ - $\leq 100\%$
Physical state	Solid, medium dustiness
Vapour pressure of the substance during use	8234 Pa
Process temperature	20 °C
Duration and Frequency of activity	240 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 80 %
Wear chemically resistant gloves in combination with 'basic' employee training.	Effectiveness: 90 %
In case of potential exposure:, Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	1.0971 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.077812
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	20.118 mg/m ³
Risk Characterization Ratio (RCR)	0.403976
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

Contributing exposure scenario	
Use descriptors covered	PROC5: Mixing or blending in batch processes Use domain: professional
Operational conditions	
Concentration of the substance	Ammonium carbamate Content: $\geq 0\%$ - $\leq 100\%$
Physical state	Solid, medium dustiness
Vapour pressure of the substance during use	8234 Pa
Process temperature	20 °C
Duration and Frequency of activity	60 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	

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Local exhaust ventilation	Effectiveness: 80 %
Wear chemically resistant gloves in combination with 'basic' employee training.	Effectiveness: 90 %
In case of potential exposure:, Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	1.6453 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.116687
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	13.212 mg/m ³
Risk Characterization Ratio (RCR)	0.265301
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

Contributing exposure scenario	
Use descriptors covered	PROC13: Treatment of articles by dipping and pouring. Use domain: professional
Operational conditions	
Concentration of the substance	Ammonium carbamate Content: >= 0 % - <= 100 %
Physical state	Solid, medium dustiness
Vapour pressure of the substance during use	8234 Pa
Process temperature	20 °C
Duration and Frequency of activity	60 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 80 %
Wear chemically resistant gloves in combination with 'basic' employee training.	Effectiveness: 90 %
In case of potential exposure:, Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	1.6453 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.116687
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic

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Product: **Ammonium carbamate crystals**

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Exposure estimate	13.212 mg/m ³
Risk Characterization Ratio (RCR)	0.265301
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

Contributing exposure scenario	
Use descriptors covered	PROC14: Tableting, compression, extrusion, pelletisation, granulation Use domain: professional
Operational conditions	
Concentration of the substance	Ammonium carbamate Content: >= 0 % - <= 100 %
Physical state	Solid, medium dustiness
Vapour pressure of the substance during use	8234 Pa
Process temperature	20 °C
Duration and Frequency of activity	60 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 80 %
Wear chemically resistant gloves in combination with 'basic' employee training.	Effectiveness: 90 %
In case of potential exposure:, Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	0.4114 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.029179
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	13.212 mg/m ³
Risk Characterization Ratio (RCR)	0.265301
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

Contributing exposure scenario	
Use descriptors covered	PROC15: Use a laboratory reagent. Use domain: professional
Operational conditions	
Concentration of the substance	Ammonium carbamate

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	Content: $\geq 0\%$ - $\leq 100\%$
Physical state	Solid, medium dustiness
Vapour pressure of the substance during use	8234 Pa
Process temperature	20 °C
Duration and Frequency of activity	240 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 80 %
Wear chemically resistant gloves in combination with 'basic' employee training.	Effectiveness: 90 %
In case of potential exposure:, Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	0.0549 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.038906
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	3.964 mg/m ³
Risk Characterization Ratio (RCR)	0.079598
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra	

Contributing exposure scenario	
Use descriptors covered	PROC16: Use of fuels Use domain: professional
Operational conditions	
Concentration of the substance	Ammonium carbamate Content: $\geq 0\%$ - $\leq 100\%$
Physical state	Solid, medium dustiness
Vapour pressure of the substance during use	8234 Pa
Process temperature	20 °C
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 80 %
Wear chemically resistant gloves in combination with 'basic' employee	Effectiveness: 90 %

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Product: **Ammonium carbamate crystals**

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training.	
In case of potential exposure:, Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	0.0686 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.004863
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	10.506 mg/m ³
Risk Characterization Ratio (RCR)	0.210964
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra	

Contributing exposure scenario	
Use descriptors covered	PROC19: Manual activities involving hand contact Use domain: professional
Operational conditions	
Concentration of the substance	Ammonium carbamate Content: >= 0 % - <= 5 %
Physical state	Solid, medium dustiness
Vapour pressure of the substance during use	8234 Pa
Process temperature	20 °C
Duration and Frequency of activity	240 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 80 %
Wear chemically resistant gloves in combination with 'basic' employee training.	Effectiveness: 90 %
In case of potential exposure:, Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	4.526 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.320993
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	7.927 mg/m ³
Risk Characterization Ratio (RCR)	0.159177
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see	

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exposure estimates)

Contributing exposure scenario	
Use descriptors covered	PROC21: Low energy manipulation and handling of substances bound in/on materials or articles Use domain: professional
Operational conditions	
Concentration of the substance	Ammonium carbamate Content: >= 0 % - <= 100 %
Physical state	Solid, medium dustiness
Vapour pressure of the substance during use	8234 Pa
Process temperature	20 °C
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Wear chemically resistant gloves in combination with 'basic' employee training.	Effectiveness: 90 %
In case of potential exposure:, Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	0.2829 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.020061
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	5 mg/m ³
Risk Characterization Ratio (RCR)	0.100402
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra	

9. Short title of exposure scenario

Use as raw material, Use in Blowing agents, Use as a Process chemical, Use as processing aid, Professional applications, (handling as solid in solution)

SU22; SU22; ERC8b; PROC4, PROC5, PROC13, PROC14, PROC15, PROC16, PROC19

Control of exposure and risk management measures

Contributing exposure scenario	
Use descriptors covered	ERC8b: Widespread use of reactive processing aid (no inclusion into or onto article, indoor)

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Operational conditions	
Annual amount used in the EU	350,000 kg
Minimum emission days per year	365
Emission factor air	0.1 %
Emission factor water	2 %
Emission factor soil	0 %
Receive Surf. Water (Flow Rate).	18,000 m3/d
Dilution factor river	10
Dilution factor coast	100
Risk Management Measures	
Type of STP	Municipal STP
Assumed sewage treatment plant flow (m3/d)	2,000 m3/d
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Environment
Risk Characterization Ratio (RCR)	0.00332
	Risk from environmental exposure is driven by freshwater sediment.
Maximum amount of safe use	57.8 kg/d
Risk from environmental exposure is driven by freshwater sediment.	

Contributing exposure scenario	
Use descriptors covered	PROC4: Chemical production where opportunity for exposure arises Use domain: professional
Operational conditions	
Concentration of the substance	Ammonium carbamate Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance during use	8234 Pa
Process temperature	20 °C
Duration and Frequency of activity	240 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	

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Local exhaust ventilation	Effectiveness: 80 %
Wear chemically resistant gloves in combination with 'basic' employee training.	Effectiveness: 90 %
In case of potential exposure:, Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	0.4114 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.029179
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	19.5176 mg/m ³
Risk Characterization Ratio (RCR)	0.39192
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

Contributing exposure scenario	
Use descriptors covered	PROC5: Mixing or blending in batch processes Use domain: professional
Operational conditions	
Concentration of the substance	Ammonium carbamate Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance during use	8234 Pa
Process temperature	20 °C
Duration and Frequency of activity	60 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 80 %
Wear chemically resistant gloves in combination with 'basic' employee training.	Effectiveness: 90 %
In case of potential exposure:, Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	0.2743 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.019453
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic

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Exposure estimate	13.0118 mg/m ³
Risk Characterization Ratio (RCR)	0.26128
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

Contributing exposure scenario	
Use descriptors covered	PROC13: Treatment of articles by dipping and pouring. Use domain: professional
Operational conditions	
Concentration of the substance	Ammonium carbamate Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance during use	8234 Pa
Process temperature	20 °C
Duration and Frequency of activity	60 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 80 %
Wear chemically resistant gloves in combination with 'basic' employee training.	Effectiveness: 90 %
In case of potential exposure:, Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	0.2743 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.019453
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	13.0118 mg/m ³
Risk Characterization Ratio (RCR)	0.26128
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

Contributing exposure scenario	
Use descriptors covered	PROC14: Tableting, compression, extrusion, pelletisation, granulation Use domain: professional
Operational conditions	
Concentration of the substance	Ammonium carbamate

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	Content: $\geq 0\%$ - $\leq 100\%$
Physical state	liquid
Vapour pressure of the substance during use	8234 Pa
Process temperature	20 °C
Duration and Frequency of activity	60 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 80 %
Wear chemically resistant gloves in combination with 'basic' employee training.	Effectiveness: 90 %
In case of potential exposure:, Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	0.0686 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.004863
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	13.0118 mg/m ³
Risk Characterization Ratio (RCR)	0.26128
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

Contributing exposure scenario	
Use descriptors covered	PROC15: Use a laboratory reagent. Use domain: professional
Operational conditions	
Concentration of the substance	Ammonium carbamate Content: $\geq 0\%$ - $\leq 100\%$
Physical state	liquid
Vapour pressure of the substance during use	8234 Pa
Process temperature	20 °C
Duration and Frequency of activity	240 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Wear chemically resistant gloves in combination with 'basic' employee	Effectiveness: 90 %

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training.	
In case of potential exposure:, Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	0.0206 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.001459
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	19.5176 mg/m ³
Risk Characterization Ratio (RCR)	0.39192
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

Contributing exposure scenario	
Use descriptors covered	PROC16: Use of fuels Use domain: professional
Operational conditions	
Concentration of the substance	Ammonium carbamate Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance during use	8234 Pa
Process temperature	20 °C
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 80 %
Wear chemically resistant gloves in combination with 'basic' employee training.	Effectiveness: 90 %
In case of potential exposure:, Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	0.0343 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.002432
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	6.5059 mg/m ³
Risk Characterization Ratio (RCR)	0.13064
Guidance to Downstream Users	

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Contributing exposure scenario	
Use descriptors covered	PROC19: Manual activities involving hand contact Use domain: professional
Operational conditions	
Concentration of the substance	Ammonium carbamate Content: >= 0 % - <= 5 %
Physical state	liquid
Vapour pressure of the substance during use	8234 Pa
Process temperature	20 °C
Duration and Frequency of activity	240 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 80 %
Wear chemically resistant gloves in combination with 'basic' employee training.	Effectiveness: 90 %
In case of potential exposure:, Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	1.6971 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.120365
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	7.8071 mg/m ³
Risk Characterization Ratio (RCR)	0.156768
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

10. Short title of exposure scenario

Use as raw material, Use in chemical synthesis, Industrial applications, (handling as solid)
SU3; SU3; ERC6a; PROC3, PROC4, PROC8b, PROC15

Control of exposure and risk management measures

Contributing exposure scenario	
Use descriptors covered	ERC6a: Use of intermediate

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Operational conditions	
Annual amount used in the EU	500,000 kg
Minimum emission days per year	20
Emission factor air	5 %
Emission factor water	0.7 %
Emission factor soil	0.1 %
Receive Surf. Water (Flow Rate).	400,000 m3/d
Dilution factor river	41
Dilution factor coast	100
Risk Management Measures	
Type of STP	Municipal STP
Assumed sewage treatment plant flow (m3/d)	10,000 m3/d
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Environment
Risk Characterization Ratio (RCR)	0.529599
	Risk from environmental exposure is driven by marine sediment.
Maximum amount of safe use	47,205.5 kg/d
Risk from environmental exposure is driven by marine sediment.	

Contributing exposure scenario	
Use descriptors covered	PROC3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition Use domain: industrial
Operational conditions	
Concentration of the substance	Ammonium carbamate Content: >= 0 % - <= 100 %
Physical state	Solid, medium dustiness
Vapour pressure of the substance during use	8234 Pa
Process temperature	20 °C
Duration and Frequency of activity	240 min 5 days per week

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Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 90 %
Wear chemically resistant gloves in combination with 'basic' employee training.	Effectiveness: 90 %
In case of potential exposure:, Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	0.1097 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.007781
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	2.012 mg/m ³
Risk Characterization Ratio (RCR)	0.040401
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra	

Contributing exposure scenario	
Use descriptors covered	PROC4: Chemical production where opportunity for exposure arises Use domain: industrial
Operational conditions	
Concentration of the substance	Ammonium carbamate Content: >= 0 % - <= 100 %
Physical state	Solid, medium dustiness
Vapour pressure of the substance during use	8234 Pa
Process temperature	20 °C
Duration and Frequency of activity	240 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 90 %
Wear chemically resistant gloves in combination with 'basic' employee training.	Effectiveness: 90 %
In case of potential exposure:, Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	1.0971 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.077812

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Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	4.204 mg/m ³
Risk Characterization Ratio (RCR)	0.084418
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra	

Contributing exposure scenario	
Use descriptors covered	PROC8b: Transfer of substance or mixture (charging and discharging) at dedicated facilities Use domain: industrial
Operational conditions	
Concentration of the substance	Ammonium carbamate Content: >= 0 % - <= 100 %
Physical state	Solid, medium dustiness
Vapour pressure of the substance during use	8234 Pa
Process temperature	20 °C
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 95 %
Wear chemically resistant gloves in combination with 'basic' employee training.	Effectiveness: 90 %
In case of potential exposure:, Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	2.7428 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.194525
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	4.116 mg/m ³
Risk Characterization Ratio (RCR)	0.082651
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra	

Contributing exposure scenario	
Use descriptors covered	PROC15: Use a laboratory reagent. Use domain: industrial
Operational conditions	
Concentration of the substance	Ammonium carbamate

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	Content: $\geq 0\%$ - $\leq 100\%$
Physical state	liquid
Vapour pressure of the substance during use	8234 Pa
Process temperature	20 °C
Duration and Frequency of activity	240 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Wear chemically resistant gloves in combination with 'basic' employee training.	Effectiveness: 90 %
In case of potential exposure:, Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	0.0549 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.003891
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	19.8176 mg/m ³
Risk Characterization Ratio (RCR)	0.397944
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra	

11. Short title of exposure scenario

Use as a Process chemical, Use in sewage water treatment, Production, Industrial applications, (handling as solid)

SU3; SU3; ERC6b; PROC3, PROC4, PROC5, PROC6, PROC7, PROC8b, PROC9, PROC10, PROC12, PROC13, PROC14, PROC15, PROC16, PROC19, PROC21, PROC23

Control of exposure and risk management measures

Contributing exposure scenario	
Use descriptors covered	ERC6b: Use of reactive processing aid at industrial site (no inclusion into or onto article)
Operational conditions	
Annual amount used in the EU	3,800,000 kg
Minimum emission days per year	220
Emission factor air	0.1 %

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Emission factor water	5 %
Emission factor soil	0.025 %
Receive Surf. Water (Flow Rate).	44,040 m3/min
Dilution factor river	189.74
Dilution factor coast	100
Risk Management Measures	
Soil treatment measures considered suitable are, e.g.	No application of sludge to soil
Type of STP	Municipal STP
Assumed sewage treatment plant flow (m3/d)	336,000 m3/d
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Environment
Risk Characterization Ratio (RCR)	0.032305
	Risk from environmental exposure is driven by wastewater treatment plant microbes.
Maximum amount of safe use	534,671.2 kg/d
Risk from environmental exposure is driven by wastewater treatment plant microbes.	

Contributing exposure scenario	
Use descriptors covered	PROC3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition Use domain: industrial
Operational conditions	
Concentration of the substance	Ammonium carbamate Content: >= 0 % - <= 100 %
Physical state	Solid, medium dustiness
Vapour pressure of the substance during use	8234 Pa
Process temperature	20 °C
Duration and Frequency of activity	240 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 90 %
Wear chemically resistant gloves in combination with 'basic' employee training.	Effectiveness: 90 %
In case of potential exposure:, Use	

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suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	0.1097 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.007781
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	2.012 mg/m ³
Risk Characterization Ratio (RCR)	0.040401
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra	

Contributing exposure scenario	
Use descriptors covered	PROC4: Chemical production where opportunity for exposure arises Use domain: industrial
Operational conditions	
Concentration of the substance	Ammonium carbamate Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance during use	8234 Pa
Process temperature	20 °C
Duration and Frequency of activity	240 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 90 %
Wear chemically resistant gloves in combination with 'basic' employee training.	Effectiveness: 90 %
In case of potential exposure:, Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	1.0971 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.077812
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	4.204 mg/m ³
Risk Characterization Ratio (RCR)	0.084408
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra	

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Date / First version: 14.02.2003

Product: **Ammonium carbamate crystals**

(ID no. 30041205/SDS_GEN_GB/EN)

Date of print 21.10.2025

Contributing exposure scenario	
Use descriptors covered	PROC5: Mixing or blending in batch processes Use domain: industrial
Operational conditions	
Concentration of the substance	Ammonium carbamate Content: $\geq 0\%$ - $\leq 100\%$
Physical state	liquid
Vapour pressure of the substance during use	8234 Pa
Process temperature	20 °C
Duration and Frequency of activity	240 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 90 %
Wear chemically resistant gloves in combination with 'basic' employee training.	Effectiveness: 90 %
In case of potential exposure:, Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	2.1939 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.155593
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	10.0588 mg/m ³
Risk Characterization Ratio (RCR)	0.201984
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra	

Contributing exposure scenario	
Use descriptors covered	PROC6: Calendering operations Use domain: industrial
Operational conditions	
Concentration of the substance	Ammonium carbamate Content: $\geq 0\%$ - $\leq 100\%$
Physical state	Solid, medium dustiness
Vapour pressure of the substance during use	8234 Pa
Process temperature	20 °C
Duration and Frequency of activity	240 min 5 days per week

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Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 90 %
Wear chemically resistant gloves in combination with 'basic' employee training.	Effectiveness: 90 %
In case of potential exposure:, Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	4.389 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.311246
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	10.0588 mg/m ³
Risk Characterization Ratio (RCR)	0.201984
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra	

Contributing exposure scenario	
Use descriptors covered	PROC7: Industrial spraying Use domain: industrial
Operational conditions	
Concentration of the substance	Ammonium carbamate Content: >= 0 % - <= 5 %
Physical state	Solid, medium dustiness
Vapour pressure of the substance during use	8234 Pa
Process temperature	20 °C
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 95 %
Wear chemically resistant gloves in combination with 'basic' employee training.	Effectiveness: 90 %
In case of potential exposure:, Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	1.7143 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.121581

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Assessment method	EASY TRA v4.1, Workplace measurements
	Worker - inhalation, long-term - systemic
Exposure estimate	28.04 mg/m ³
Risk Characterization Ratio (RCR)	0.563052
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

Contributing exposure scenario	
Use descriptors covered	PROC8b: Transfer of substance or mixture (charging and discharging) at dedicated facilities Use domain: industrial
Operational conditions	
Concentration of the substance	Ammonium carbamate Content: >= 0 % - <= 100 %
Physical state	Solid, medium dustiness
Vapour pressure of the substance during use	8234 Pa
Process temperature	20 °C
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 95 %
Wear chemically resistant gloves in combination with 'basic' employee training.	Effectiveness: 90 %
In case of potential exposure:, Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	2.742 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.194468
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	4.116 mg/m ³
Risk Characterization Ratio (RCR)	0.082651
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra	

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

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Product: **Ammonium carbamate crystals**

(ID no. 30041205/SDS_GEN_GB/EN)

Date of print 21.10.2025

Operational conditions	
Concentration of the substance	Ammonium carbamate Content: $\geq 0\%$ - $\leq 100\%$
Physical state	Solid, medium dustiness
Vapour pressure of the substance during use	8234 Pa
Process temperature	20 °C
Duration and Frequency of activity	240 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 90 %
Wear chemically resistant gloves in combination with 'basic' employee training.	Effectiveness: 90 %
In case of potential exposure:, Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	1.0971 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.077812
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	10.0588 mg/m ³
Risk Characterization Ratio (RCR)	0.201984
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra	

Contributing exposure scenario	
Use descriptors covered	PROC10: Roller application or brushing Use domain: industrial
Operational conditions	
Concentration of the substance	Ammonium carbamate Content: $\geq 0\%$ - $\leq 100\%$
Physical state	liquid
Vapour pressure of the substance during use	8234 Pa
Process temperature	20 °C
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 90 %

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Wear chemically resistant gloves in combination with 'basic' employee training.	Effectiveness: 90 %
In case of potential exposure:, Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	5.4858 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.389064
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	16.765 mg/m ³
Risk Characterization Ratio (RCR)	0.336646
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra	

Contributing exposure scenario	
Use descriptors covered	PROC12: Use of blowing agents in manufacture of foam Use domain: industrial
Operational conditions	
Concentration of the substance	Ammonium carbamate Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance during use	8234 Pa
Process temperature	20 °C
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
In case of potential exposure:, Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	0.3429 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.024316
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, worker, modified version
	Worker - inhalation, long-term - systemic
Exposure estimate	13.0118 mg/m ³
Risk Characterization Ratio (RCR)	0.26128
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

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Contributing exposure scenario	
Use descriptors covered	PROC13: Treatment of articles by dipping and pouring. Use domain: industrial
Operational conditions	
Concentration of the substance	Ammonium carbamate Content: $\geq 0\%$ - $\leq 100\%$
Physical state	liquid
Vapour pressure of the substance during use	8234 Pa
Process temperature	20 °C
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 90 %
Wear chemically resistant gloves in combination with 'basic' employee training.	Effectiveness: 90 %
In case of potential exposure:, Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	2.7428 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.194525
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	16.3647 mg/m ³
Risk Characterization Ratio (RCR)	0.328608
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra	

Contributing exposure scenario	
Use descriptors covered	PROC14: Tableting, compression, extrusion, pelletisation, granulation Use domain: industrial
Operational conditions	
Concentration of the substance	Ammonium carbamate Content: $\geq 0\%$ - $\leq 100\%$
Physical state	Solid, medium dustiness
Vapour pressure of the substance during use	8234 Pa
Process temperature	20 °C

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Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 90 %
Wear chemically resistant gloves in combination with 'basic' employee training.	Effectiveness: 90 %
In case of potential exposure:, Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	0.6857 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.048632
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	16.365 mg/m ³
Risk Characterization Ratio (RCR)	0.328614
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra	

Contributing exposure scenario	
Use descriptors covered	PROC15: Use a laboratory reagent. Use domain: industrial
Operational conditions	
Concentration of the substance	Ammonium carbamate Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance during use	8234 Pa
Process temperature	20 °C
Duration and Frequency of activity	240 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Wear chemically resistant gloves in combination with 'basic' employee training.	Effectiveness: 90 %
In case of potential exposure:, Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	0.0549 mg/kg bw/day

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Risk Characterization Ratio (RCR)	0.003891
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	19.8176 mg/m ³
Risk Characterization Ratio (RCR)	0.397944
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra	

Contributing exposure scenario	
Use descriptors covered	PROC16: Use of fuels Use domain: industrial
Operational conditions	
Concentration of the substance	Ammonium carbamate Content: >= 0 % - <= 100 %
Physical state	Solid, medium dustiness
Vapour pressure of the substance during use	8234 Pa
Process temperature	20 °C
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Wear chemically resistant gloves in combination with 'basic' employee training.	Effectiveness: 90 %
In case of potential exposure:, Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	0.0686 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.004864
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	21.265 mg/m ³
Risk Characterization Ratio (RCR)	0.427008
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra	

Contributing exposure scenario	
Use descriptors covered	PROC19: Manual activities involving hand contact Use domain: industrial
Operational conditions	
Concentration of the substance	Ammonium carbamate Content: >= 0 % - <= 5 %

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Physical state	Solid, medium dustiness
Vapour pressure of the substance during use	8234 Pa
Process temperature	20 °C
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 90 %
Wear chemically resistant gloves in combination with 'basic' employee training.	Effectiveness: 90 %
In case of potential exposure:, Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	5.6572 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.401220
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	3.353 mg/m ³
Risk Characterization Ratio (RCR)	0.067329
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra	

Contributing exposure scenario	
Use descriptors covered	PROC21: Low energy manipulation and handling of substances bound in/on materials or articles Use domain: industrial
Operational conditions	
Concentration of the substance	Ammonium carbamate Content: >= 0 % - <= 100 %
Physical state	Solid, medium dustiness
Vapour pressure of the substance during use	8234 Pa
Process temperature	20 °C
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Wear chemically resistant gloves in combination with 'basic' employee training.	Effectiveness: 90 %

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In case of potential exposure:, Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	0.2829 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.020061
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	3 mg/m ³
Risk Characterization Ratio (RCR)	0.060241
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra	

Contributing exposure scenario	
Use descriptors covered	PROC23: Open processing and transfer operations at substantially elevated temperature Use domain: industrial
Operational conditions	
Concentration of the substance	Ammonium carbamate Content: >= 0 % - <= 100 %
Physical state	Solid, medium dustiness
Vapour pressure of the substance during use	8234 Pa
Process temperature	20 °C
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Wear chemically resistant gloves in combination with 'basic' employee training.	Effectiveness: 90 %
In case of potential exposure:, Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	0.1414 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.01003
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	3 mg/m ³
Risk Characterization Ratio (RCR)	0.060241
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra	

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12. Short title of exposure scenario

Use as a Process chemical, Use in sewage water treatment, Production, Industrial applications, (handling as solid in solution)

SU3; SU3; ERC6b; PROC3, PROC4, PROC5, PROC6, PROC7, PROC8b, PROC9, PROC10, PROC12, PROC13, PROC14, PROC15, PROC16, PROC19

Control of exposure and risk management measures

Contributing exposure scenario	
Use descriptors covered	ERC6b: Use of reactive processing aid at industrial site (no inclusion into or onto article)
Operational conditions	
Annual amount used in the EU	3,800,000 kg
Minimum emission days per year	220
Emission factor air	0.1 %
Emission factor water	5 %
Emission factor soil	0.025 %
Receive Surf. Water (Flow Rate).	44,040 m3/min
Dilution factor river	189.74
Dilution factor coast	100
Risk Management Measures	
Soil treatment measures considered suitable are, e.g.	No application of sludge to soil
Type of STP	Municipal STP
Assumed sewage treatment plant flow (m3/d)	336,000 m3/d
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Environment
Risk Characterization Ratio (RCR)	0.032305
	Risk from environmental exposure is driven by wastewater treatment plant microbes.
Maximum amount of safe use	534,671.2 kg/d
Risk from environmental exposure is driven by wastewater treatment plant microbes.	

Contributing exposure scenario	
Use descriptors covered	PROC3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent

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	containment condition Use domain: industrial
Operational conditions	
Concentration of the substance	Ammonium carbamate Content: $\geq 0\%$ - $\leq 100\%$
Physical state	liquid
Vapour pressure of the substance during use	8234 Pa
Process temperature	20 °C
Duration and Frequency of activity	240 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 90 %
Wear chemically resistant gloves in combination with 'basic' employee training.	Effectiveness: 90 %
In case of potential exposure:, Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	0.0411 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.002918
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	1.9518 mg/m ³
Risk Characterization Ratio (RCR)	0.039192
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

Contributing exposure scenario	
Use descriptors covered	PROC4: Chemical production where opportunity for exposure arises Use domain: industrial
Operational conditions	
Concentration of the substance	Ammonium carbamate Content: $\geq 0\%$ - $\leq 100\%$
Physical state	liquid
Vapour pressure of the substance during use	8234 Pa
Process temperature	20 °C

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Duration and Frequency of activity	240 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 90 %
Wear chemically resistant gloves in combination with 'basic' employee training.	Effectiveness: 90 %
In case of potential exposure:, Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	0.4114 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.029179
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	3.9035 mg/m ³
Risk Characterization Ratio (RCR)	0.078384
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

Contributing exposure scenario	
Use descriptors covered	PROC5: Mixing or blending in batch processes Use domain: industrial
Operational conditions	
Concentration of the substance	Ammonium carbamate Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance during use	8234 Pa
Process temperature	20 °C
Duration and Frequency of activity	240 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 90 %
Wear chemically resistant gloves in combination with 'basic' employee training.	Effectiveness: 90 %
In case of potential exposure:, Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic

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Exposure estimate	0.8229 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.058359
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	9.7588 mg/m ³
Risk Characterization Ratio (RCR)	0.19596
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

Contributing exposure scenario	
Use descriptors covered	PROC6: Calendering operations Use domain: industrial
Operational conditions	
Concentration of the substance	Ammonium carbamate Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance during use	8234 Pa
Process temperature	20 °C
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 90 %
Wear chemically resistant gloves in combination with 'basic' employee training.	Effectiveness: 90 %
In case of potential exposure:, Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	2.7429 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.194529
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	16.2647 mg/m ³
Risk Characterization Ratio (RCR)	0.3266
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

Contributing exposure scenario	
Use descriptors covered	PROC7: Industrial spraying Use domain: industrial

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Product: **Ammonium carbamate crystals**

(ID no. 30041205/SDS_GEN_GB/EN)

Date of print 21.10.2025

Operational conditions	
Concentration of the substance	Ammonium carbamate Content: $\geq 0\%$ - $\leq 100\%$
Physical state	liquid
Vapour pressure of the substance during use	8234 Pa
Process temperature	20 °C
Duration and Frequency of activity	60 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 95 %
Wear suitable respiratory protection.	Effectiveness: 90 %
Wear chemically resistant gloves in combination with 'basic' employee training.	Effectiveness: 90 %
In case of potential exposure:, Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	0.8571 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.06079
Assessment method	EASY TRA v4.1, Workplace measurements
	Worker - inhalation, long-term - systemic
Exposure estimate	25 mg/m ³
Risk Characterization Ratio (RCR)	0.502008
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

Contributing exposure scenario	
Use descriptors covered	PROC8b: Transfer of substance or mixture (charging and discharging) at dedicated facilities Use domain: industrial
Operational conditions	
Concentration of the substance	Ammonium carbamate Content: $\geq 0\%$ - $\leq 100\%$
Physical state	liquid
Vapour pressure of the substance during use	8234 Pa
Process temperature	20 °C
Duration and Frequency of activity	480 min 5 days per week

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Product: **Ammonium carbamate crystals**

(ID no. 30041205/SDS_GEN_GB/EN)

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Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 95 %
Wear chemically resistant gloves in combination with 'basic' employee training.	Effectiveness: 90 %
In case of potential exposure:, Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	1.3714 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.097264
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	4.0662 mg/m ³
Risk Characterization Ratio (RCR)	0.08165
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

Contributing exposure scenario	
Use descriptors covered	PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing). Use domain: industrial
Operational conditions	
Concentration of the substance	Ammonium carbamate Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance during use	8234 Pa
Process temperature	20 °C
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 90 %
Wear chemically resistant gloves in combination with 'basic' employee training.	Effectiveness: 90 %
In case of potential exposure:, Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic

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Exposure estimate	0.6857 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.048632
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	16.2647 mg/m ³
Risk Characterization Ratio (RCR)	0.3266
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

Contributing exposure scenario	
Use descriptors covered	PROC10: Roller application or brushing Use domain: industrial
Operational conditions	
Concentration of the substance	Ammonium carbamate Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance during use	8234 Pa
Process temperature	20 °C
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 90 %
Wear chemically resistant gloves in combination with 'basic' employee training.	Effectiveness: 90 %
In case of potential exposure:, Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	2.7429 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.194529
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	16.2647 mg/m ³
Risk Characterization Ratio (RCR)	0.3266
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

Contributing exposure scenario	
Use descriptors covered	PROC12: Use of blowing agents in manufacture of foam Use domain: industrial

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Product: **Ammonium carbamate crystals**

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Operational conditions	
Concentration of the substance	Ammonium carbamate Content: $\geq 0\%$ - $\leq 100\%$
Physical state	liquid
Vapour pressure of the substance during use	8234 Pa
Process temperature	20 °C
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 90 %
In case of potential exposure:, Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	0.3429 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.024316
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	6.5059 mg/m ³
Risk Characterization Ratio (RCR)	0.13064
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

Contributing exposure scenario	
Use descriptors covered	PROC13: Treatment of articles by dipping and pouring. Use domain: industrial
Operational conditions	
Concentration of the substance	Ammonium carbamate Content: $\geq 0\%$ - $\leq 100\%$
Physical state	liquid
Vapour pressure of the substance during use	8234 Pa
Process temperature	20 °C
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 90 %
Wear chemically resistant gloves in	Effectiveness: 90 %

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Product: **Ammonium carbamate crystals**

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combination with 'basic' employee training.	
In case of potential exposure:, Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	1.3714 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.097264
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	16.2647 mg/m ³
Risk Characterization Ratio (RCR)	0.3266
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

Contributing exposure scenario	
Use descriptors covered	PROC14: Tableting, compression, extrusion, pelletisation, granulation Use domain: industrial
Operational conditions	
Concentration of the substance	Ammonium carbamate Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance during use	8234 Pa
Process temperature	20 °C
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 90 %
Wear chemically resistant gloves in combination with 'basic' employee training.	Effectiveness: 90 %
In case of potential exposure:, Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	0.3429 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.024316
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	16.2647 mg/m ³

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Risk Characterization Ratio (RCR)	0.3266
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

Contributing exposure scenario	
Use descriptors covered	PROC15: Use a laboratory reagent. Use domain: industrial
Operational conditions	
Concentration of the substance	Ammonium carbamate Content: $\geq 0\%$ - $\leq 100\%$
Physical state	liquid
Vapour pressure of the substance during use	8234 Pa
Process temperature	20 °C
Duration and Frequency of activity	240 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Wear chemically resistant gloves in combination with 'basic' employee training.	Effectiveness: 90 %
In case of potential exposure:, Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	0.0206 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.001459
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	19.5176 mg/m ³
Risk Characterization Ratio (RCR)	0.39192
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

Contributing exposure scenario	
Use descriptors covered	PROC16: Use of fuels Use domain: industrial
Operational conditions	
Concentration of the substance	Ammonium carbamate Content: $\geq 0\%$ - $\leq 100\%$
Physical state	liquid

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Vapour pressure of the substance during use	8234 Pa
Process temperature	20 °C
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Wear chemically resistant gloves in combination with 'basic' employee training.	Effectiveness: 90 %
In case of potential exposure:, Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	0.0343 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.002432
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	16.2647 mg/m ³
Risk Characterization Ratio (RCR)	0.3266
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

Contributing exposure scenario	
Use descriptors covered	PROC19: Manual activities involving hand contact Use domain: industrial
Operational conditions	
Concentration of the substance	Ammonium carbamate Content: >= 0 % - <= 5 %
Physical state	liquid
Vapour pressure of the substance during use	8234 Pa
Process temperature	20 °C
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 90 %
Wear chemically resistant gloves in combination with 'basic' employee training.	Effectiveness: 90 %
In case of potential exposure:, Use suitable eye protection.	

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Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	2.8286 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.200608
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	3.2529 mg/m ³
Risk Characterization Ratio (RCR)	0.06532
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

13. Short title of exposure scenario

Formulation, Production, Industrial applications, (handling as solid)

SU3; SU3; ERC2; PROC4, PROC5, PROC8b, PROC9, PROC15, PROC19

Control of exposure and risk management measures

Contributing exposure scenario	
Use descriptors covered	ERC2: Formulation into mixture
Operational conditions	
Annual amount used in the EU	1,500,000 kg
Minimum emission days per year	220
Emission factor air	2.5 %
Emission factor water	2 %
Emission factor soil	0.01 %
Receive Surf. Water (Flow Rate).	44,040 m ³ /min
Dilution factor river	189.74
Dilution factor coast	100
Risk Management Measures	
Type of STP	Municipal STP
Assumed sewage treatment plant flow (m ³ /d)	336,000 m ³ /d
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Environment
Risk Characterization Ratio (RCR)	0.034845
	Risk from environmental exposure is driven by soil.
Maximum amount of safe use	195,674.4

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	kg/d
Risk from environmental exposure is driven by soil.	

Contributing exposure scenario	
Use descriptors covered	PROC4: Chemical production where opportunity for exposure arises Use domain: industrial
Operational conditions	
Concentration of the substance	Ammonium carbamate Content: $\geq 0\%$ - $\leq 100\%$
Physical state	Solid, medium dustiness
Vapour pressure of the substance during use	8234 Pa
Process temperature	20 °C
Duration and Frequency of activity	240 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 90 %
Wear chemically resistant gloves in combination with 'basic' employee training.	Effectiveness: 90 %
In case of potential exposure:, Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	1.0971 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.077812
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	4.204 mg/m ³
Risk Characterization Ratio (RCR)	0.084418
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra	

Contributing exposure scenario	
Use descriptors covered	PROC5: Mixing or blending in batch processes Use domain: industrial
Operational conditions	
Concentration of the substance	Ammonium carbamate Content: $\geq 0\%$ - $\leq 100\%$
Physical state	Solid, medium dustiness

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Vapour pressure of the substance during use	8234 Pa
Process temperature	20 °C
Duration and Frequency of activity	240 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 90 %
Wear chemically resistant gloves in combination with 'basic' employee training.	Effectiveness: 90 %
In case of potential exposure:, Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	2.1943 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.155621
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	10.059 mg/m ³
Risk Characterization Ratio (RCR)	0.201988
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra	

Contributing exposure scenario	
Use descriptors covered	PROC8b: Transfer of substance or mixture (charging and discharging) at dedicated facilities Use domain: industrial
Operational conditions	
Concentration of the substance	Ammonium carbamate Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance during use	8234 Pa
Process temperature	20 °C
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 95 %
Wear chemically resistant gloves in combination with 'basic' employee training.	Effectiveness: 90 %
In case of potential exposure:, Use	

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suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	2.7428 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.194525
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	4.116 mg/m ³
Risk Characterization Ratio (RCR)	0.082651
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra	

Contributing exposure scenario	
Use descriptors covered	PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing). Use domain: industrial
Operational conditions	
Concentration of the substance	Ammonium carbamate Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance during use	8234 Pa
Process temperature	20 °C
Duration and Frequency of activity	240 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 90 %
Wear chemically resistant gloves in combination with 'basic' employee training.	Effectiveness: 90 %
In case of potential exposure:, Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	1.0971 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.077811
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	10.059 mg/m ³
Risk Characterization Ratio (RCR)	0.201988
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra	

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Contributing exposure scenario	
Use descriptors covered	PROC15: Use a laboratory reagent. Use domain: industrial
Operational conditions	
Concentration of the substance	Ammonium carbamate Content: >= 0 % - <= 100 %
Physical state	Solid, medium dustiness
Vapour pressure of the substance during use	8234 Pa
Process temperature	20 °C
Duration and Frequency of activity	240 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Wear chemically resistant gloves in combination with 'basic' employee training.	Effectiveness: 90 %
In case of potential exposure:, Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	0.0549 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.003891
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	19.818 mg/m ³
Risk Characterization Ratio (RCR)	0.397944
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra	

Contributing exposure scenario	
Use descriptors covered	PROC19: Manual activities involving hand contact Use domain: industrial
Operational conditions	
Concentration of the substance	Ammonium carbamate Content: >= 0 % - <= 5 %
Physical state	liquid
Vapour pressure of the substance during use	8234 Pa
Process temperature	20 °C
Duration and Frequency of activity	480 min 5 days per week

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Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 90 %
Wear chemically resistant gloves in combination with 'basic' employee training.	Effectiveness: 90 %
In case of potential exposure:, Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	5.658 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.4013
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	3.3529 mg/m ³
Risk Characterization Ratio (RCR)	0.067329
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra	

14. Short title of exposure scenario

Formulation, Production, Industrial applications, (handling as solid in solution)

SU3; SU3; ERC2; PROC4, PROC5, PROC8b, PROC9, PROC15, PROC19

Control of exposure and risk management measures

Contributing exposure scenario	
Use descriptors covered	ERC2: Formulation into mixture
Operational conditions	
Annual amount used in the EU	1,500,000 kg
Minimum emission days per year	220
Emission factor air	2.5 %
Emission factor water	2 %
Emission factor soil	0.01 %
Receive Surf. Water (Flow Rate).	44,040 m ³ /min
Dilution factor river	189.74
Dilution factor coast	100
Risk Management Measures	

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Product: **Ammonium carbamate crystals**

(ID no. 30041205/SDS_GEN_GB/EN)

Date of print 21.10.2025

Type of STP	Municipal STP
Assumed sewage treatment plant flow (m3/d)	336,000 m3/d
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Environment
Risk Characterization Ratio (RCR)	0.034845
	Risk from environmental exposure is driven by soil.
Maximum amount of safe use	195,674.4 kg/d
Risk from environmental exposure is driven by soil.	

Contributing exposure scenario	
Use descriptors covered	PROC4: Chemical production where opportunity for exposure arises Use domain: industrial
Operational conditions	
Concentration of the substance	Ammonium carbamate Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance during use	8234 Pa
Process temperature	20 °C
Duration and Frequency of activity	240 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 90 %
Wear chemically resistant gloves in combination with 'basic' employee training.	Effectiveness: 90 %
In case of potential exposure:, Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	0.4114 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.029179
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	3.9035 mg/m ³
Risk Characterization Ratio (RCR)	0.078384
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

Contributing exposure scenario

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Product: **Ammonium carbamate crystals**

(ID no. 30041205/SDS_GEN_GB/EN)

Date of print 21.10.2025

Use descriptors covered	PROC5: Mixing or blending in batch processes Use domain: industrial
Operational conditions	
Concentration of the substance	Ammonium carbamate Content: $\geq 0\%$ - $\leq 100\%$
Physical state	liquid
Vapour pressure of the substance during use	8234 Pa
Process temperature	20 °C
Duration and Frequency of activity	240 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 90 %
Wear chemically resistant gloves in combination with 'basic' employee training.	Effectiveness: 90 %
In case of potential exposure:, Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	0.8229 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.058359
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	9.7588 mg/m ³
Risk Characterization Ratio (RCR)	0.19596
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

Contributing exposure scenario	
Use descriptors covered	PROC8b: Transfer of substance or mixture (charging and discharging) at dedicated facilities Use domain: industrial
Operational conditions	
Concentration of the substance	Ammonium carbamate Content: $\geq 0\%$ - $\leq 100\%$
Physical state	liquid
Vapour pressure of the substance during use	8234 Pa
Process temperature	20 °C

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Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 95 %
Wear chemically resistant gloves in combination with 'basic' employee training.	Effectiveness: 90 %
In case of potential exposure:, Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	1.3714 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.097264
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	4.0662 mg/m ³
Risk Characterization Ratio (RCR)	0.08165
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

Contributing exposure scenario	
Use descriptors covered	PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing). Use domain: industrial
Operational conditions	
Concentration of the substance	Ammonium carbamate Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance during use	8234 Pa
Process temperature	20 °C
Duration and Frequency of activity	240 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 90 %
Wear chemically resistant gloves in combination with 'basic' employee training.	Effectiveness: 90 %
In case of potential exposure:, Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker

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Product: **Ammonium carbamate crystals**

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	Worker - dermal, long-term - systemic
Exposure estimate	0.4114 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.029179
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	9.7588 mg/m ³
Risk Characterization Ratio (RCR)	0.19596
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

Contributing exposure scenario	
Use descriptors covered	PROC15: Use a laboratory reagent. Use domain: industrial
Operational conditions	
Concentration of the substance	Ammonium carbamate Content: >= 0 % - <= 100 %
Physical state	liquid
Vapour pressure of the substance during use	8234 Pa
Process temperature	20 °C
Duration and Frequency of activity	240 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Wear chemically resistant gloves in combination with 'basic' employee training.	Effectiveness: 90 %
In case of potential exposure:, Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	0.0206 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.001459
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	19.5176 mg/m ³
Risk Characterization Ratio (RCR)	0.39192
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

Contributing exposure scenario	
Use descriptors covered	PROC19: Manual activities involving hand contact Use domain: industrial

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Product: **Ammonium carbamate crystals**

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Operational conditions	
Concentration of the substance	Ammonium carbamate Content: $\geq 0\%$ - $\leq 5\%$
Physical state	liquid
Vapour pressure of the substance during use	8234 Pa
Process temperature	20 °C
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 90 %
Wear chemically resistant gloves in combination with 'basic' employee training.	Effectiveness: 90 %
In case of potential exposure:, Use suitable eye protection.	
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	2.8286 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.200608
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	3.2529 mg/m ³
Risk Characterization Ratio (RCR)	0.06532
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

15. Short title of exposure scenario

Use in/as Laundry agents, Use in Cleaning Agents
SU21; SU21; ERC8a; PC35

Control of exposure and risk management measures

Contributing exposure scenario	
Use descriptors covered	ERC8a: Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor)
Operational conditions	
Annual amount used in the EU	250,000 kg
Minimum emission days per year	365

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Product: **Ammonium carbamate crystals**

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Emission factor air	100 %
Emission factor water	100 %
Emission factor soil	0 %
Receive Surf. Water (Flow Rate).	18,000 m3/d
Dilution factor river	10
Dilution factor coast	100
Risk Management Measures	
Type of STP	Municipal STP
Assumed sewage treatment plant flow (m3/d)	2,000 m3/d
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Environment
Risk Characterization Ratio (RCR)	0.005323
	Risk from environmental exposure is driven by freshwater sediment.
Maximum amount of safe use	25.7 kg/d
Risk from environmental exposure is driven by freshwater sediment.	

Contributing exposure scenario	
Use descriptors covered	PC35: Washing and Cleaning Products (including solvent based products).
Operational conditions	
Concentration of the substance	Ammonium carbamate Content: >= 0 % - <= 100 %
Vapour pressure of the substance during use	8234 Pa
Process temperature	20 °C
Duration and Frequency of activity	Exposure duration: 0.25 min Relevant for inhalative exposure estimates
Duration and Frequency of activity	365 uses per year Relevant for inhalative exposure estimates
Room size	1 m3
Ventilation rate per hour	2
body weight	65 kg
	Amount per use 0 g Relevant for inhalative exposure estimates
Exposure estimate and reference to its source	

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Assessment method	EASY TRA v4.1, ConsExpo v4.1, Inhalation model: evaporation model - instantaneous release
	Consumer - inhalation, long-term - systemic
Exposure estimate	0.0001 mg/m ³
Risk Characterization Ratio (RCR)	0.000001
	The exposure calculation is based on the mean concentration per year.
Guidance to Downstream Users	
For scaling see: http://www.rivm.nl/en/healthanddisease/productsafety/ConsExpo.jsp	

Contributing exposure scenario	
Use descriptors covered	PC35: Washing and Cleaning Products (including solvent based products).
Operational conditions	
Concentration of the substance	Ammonium carbamate Content: >= 0 % - <= 42 %
Vapour pressure of the substance during use	8234 Pa
Process temperature	20 °C
Duration and Frequency of activity	Exposure duration: 0.75 min Relevant for inhalative exposure estimates
Duration and Frequency of activity	Application duration: 0.3 min Relevant for inhalative exposure estimates
Duration and Frequency of activity	365 uses per year Relevant for inhalative exposure estimates
Duration and Frequency of activity	365 uses per year Relevant for dermal exposure estimates
Temperature (Application)	25 °C
body weight	65 kg
Uptake fraction dermal	100 %
	Amount per use 0.01 g Relevant for dermal exposure estimates
Release area	20 cm ²
	Release area is constant
Release duration	0.3 min
	Relevant for inhalative exposure estimates
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ConsExpo v4.1, Dermal model: instant application, Uptake model: Uptake fraction
	Consumer - dermal, long-term - systemic
Exposure estimate	0.0646 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.009101
	The calculation is based on the internal chronic dose.
Assessment method	EASY TRA v4.1, ConsExpo v4.1, Inhalation model:

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	exposure to vapour - evaporation
	Consumer - inhalation, long-term - systemic
Exposure estimate	0.0082 mg/m ³
Risk Characterization Ratio (RCR)	0.000669
	The exposure calculation is based on the mean concentration per year.
Guidance to Downstream Users	
For scaling see: http://www.rivm.nl/en/healthandddisease/productsafety/ConsExpo.jsp	

Contributing exposure scenario	
Use descriptors covered	PC35: Washing and Cleaning Products (including solvent based products).
Operational conditions	
Concentration of the substance	Ammonium carbamate Content: >= 0 % - <= 0.4199 %
Vapour pressure of the substance during use	8234 Pa
Process temperature	20 °C
Duration and Frequency of activity	104 uses per year Relevant for dermal exposure estimates
body weight	65 kg
Uptake fraction dermal	100 %
	Amount per use 19 g Relevant for dermal exposure estimates
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ConsExpo v4.1, Dermal model: instant application, Uptake model: Uptake fraction
	Consumer - dermal, long-term - systemic
Exposure estimate	0.3498 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.049269
	The calculation is based on the internal chronic dose.
Guidance to Downstream Users	
For scaling see: http://www.rivm.nl/en/healthandddisease/productsafety/ConsExpo.jsp	

Contributing exposure scenario	
Use descriptors covered	PC35: Washing and Cleaning Products (including solvent based products).
Operational conditions	
Concentration of the substance	Ammonium carbamate Content: >= 0 % - <= 2.1 %
Vapour pressure of the substance during use	8234 Pa

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Process temperature	20 °C
Duration and Frequency of activity	Exposure duration: 240 min Relevant for inhalative exposure estimates
Duration and Frequency of activity	Application duration: 30 min Relevant for inhalative exposure estimates
Duration and Frequency of activity	104 uses per year Relevant for inhalative exposure estimates
Duration and Frequency of activity	104 uses per year Relevant for dermal exposure estimates
Temperature (Application)	25 °C
body weight	65 kg
Uptake fraction dermal	100 %
	Amount per use 19 g Relevant for dermal exposure estimates
Release area	220000 cm ²
	Release area increases over time
Release duration	30 min
	Relevant for inhalative exposure estimates
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ConsExpo v4.1, Dermal model: instant application, Uptake model: Uptake fraction
	Consumer - dermal, long-term - systemic
Exposure estimate	1.749 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.246344
	The calculation is based on the internal chronic dose.
Assessment method	EASY TRA v4.1, ConsExpo v4.1, Inhalation model: exposure to vapour - evaporation
	Consumer - inhalation, long-term - systemic
Exposure estimate	6.3976 mg/m ³
Risk Characterization Ratio (RCR)	0.52013
	The exposure calculation is based on the mean concentration per year.
Guidance to Downstream Users	
For scaling see: http://www.rivm.nl/en/healthanddisease/productsafety/ConsExpo.jsp	

16. Short title of exposure scenario

Use in Biocidal products, Use in Plant protection products, Use as Reactive process agent
SU21; SU21; ERC8e; PC8, PC27

Control of exposure and risk management measures

Contributing exposure scenario	
Use descriptors covered	ERC8e: Widespread use of reactive processing aid (no inclusion into or onto article, outdoor)

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Product: **Ammonium carbamate crystals**

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Operational conditions	
Annual amount used in the EU	350,000 kg
Minimum emission days per year	365
Emission factor air	0.1 %
Emission factor water	2 %
Emission factor soil	1 %
Receive Surf. Water (Flow Rate).	18,000 m3/d
Dilution factor river	10
Dilution factor coast	100
Risk Management Measures	
Type of STP	Municipal STP
Assumed sewage treatment plant flow (m3/d)	2,000 m3/d
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Environment
Risk Characterization Ratio (RCR)	0.00332
	Risk from environmental exposure is driven by freshwater sediment.
Maximum amount of safe use	57.8 kg/d
Risk from environmental exposure is driven by freshwater sediment.	

Contributing exposure scenario	
Use descriptors covered	PC8: Biocidal Products.
Operational conditions	
Concentration of the substance	Ammonium carbamate Content: >= 0 % - <= 25 %
Vapour pressure of the substance during use	8234 Pa
Process temperature	20 °C
body weight	65 kg
Guidance to Downstream Users	
For scaling see: http://www.rivm.nl/en/healthanddisease/productsafety/ConsExpo.jsp	

Contributing exposure scenario	
Use descriptors covered	PC27: Plant Protection products.

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Operational conditions	
Concentration of the substance	Ammonium carbamate Content: $\geq 0\%$ - $\leq 21\%$
Vapour pressure of the substance during use	82.34 hPa
Process temperature	20 °C
body weight	65 kg
Guidance to Downstream Users	
For scaling see: http://www.rivm.nl/en/healthanddisease/productsafety/ConsExpo.jsp	
