

Safety data sheet

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BASF safety data sheet. This is a translation of the country-specific safety data sheet into a language other than that required by law. This document does not replace the safety data sheet provided according to Regulation (EC) No 1907/2006.

Date / Revised: 25.03.2022

Version: 1.0

Date previous version: not applicable

Previous version: none

Date / First version: 25.03.2022

Product: **Citronellol**

(ID no. 30035053/SDS_GEN_IT/EN)

Date of print 14.10.2025

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

1.1. Product identifier

Citronellol

Chemical name: Citronellol

CAS Number: 106-22-9

REACH registration number: 01-2119453995-23-0000, 01-2119453995-23-0008

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

Relevant identified uses: Chemical, Chemical for detergents, Cosmetic and oral care chemical, flavoring substance

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 Italia S.p.A.
Via Marconato 8
20811 Cesano Maderno (MB)
ITALY

Telephone: +39 0362 512-1

E-mail address: Sicurezzaprodotti.BASF-Italia@basf.com

1.4. Emergency telephone number

International emergency number:

Telephone: +49 180 2273-112

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SECTION 2: Hazards Identification

2.1. Classification of the substance or mixture

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

Skin Corr./Irrit. 2	H315 Causes skin irritation.
Eye Dam./Irrit. 2	H319 Causes serious eye irritation.
Skin Sens. 1B	H317 May cause an allergic skin reaction.

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

2.2. Label elements

Globally Harmonized System, EU (GHS)

Pictogram:



Signal Word:

Warning

Hazard Statement:

H319	Causes serious eye irritation.
H315	Causes skin irritation.
H317	May cause an allergic skin reaction.

Precautionary Statements (Prevention):

P280	Wear protective gloves and eye protection or face protection.
P261	Avoid breathing mist or vapour or spray.

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.
P302 + P352	IF ON SKIN: Wash with plenty of soap and water.
P333 + P313	If skin irritation or rash occurs: Get medical attention.

Precautionary Statements (Disposal):

P501	Dispose of contents and container to hazardous or special waste collection point.
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2.3. Other hazards

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

The product does not contain a substance fulfilling the PBT (persistent/bioaccumulative/toxic) criteria or the vPvB (very persistent/very bioaccumulative) criteria. The product does not contain a substance that is identified to have endocrine disrupting properties according to Regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 or is included in the Candidate List of substances of very high concern according to EU REACH Article 59 for having endocrine disrupting properties.

SECTION 3: Composition/Information on Ingredients

3.1. Substances

Chemical nature

Citronellol

CAS Number: 106-22-9

EC-Number: 203-375-0

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

Remove contaminated clothing.

If inhaled:

Keep patient calm, remove to fresh air, seek medical attention.

On skin contact:

Wash thoroughly with soap and water

On contact with eyes:

Wash affected eyes for at least 15 minutes under running water with eyelids held open, consult an eye specialist.

On ingestion:

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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

Symptoms: 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., (Further) symptoms and / or effects are not known so far

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:
carbon dioxide, foam, dry powder

5.2. Special hazards arising from the substance or mixture

Endangering substances: carbon oxides, harmful vapours
Advice: The substances/groups of substances mentioned can be released in case of fire.

5.3. Advice for fire-fighters

Special protective equipment:
Wear a self-contained breathing apparatus.

Further information:

Dispose of fire debris and contaminated extinguishing water in accordance with official regulations.
Cool endangered containers with water-spray.

SECTION 6: Accidental Release Measures

6.1. Personal precautions, protective equipment and emergency procedures

Use personal protective clothing. Information regarding personal protective measures, see section 8.
Ensure adequate ventilation. Do not breathe vapour/spray. Avoid contact with the skin, eyes and clothing.

6.2. Environmental precautions

Do not discharge into drains/surface waters/groundwater.

6.3. Methods and material for containment and cleaning up

For small amounts: Contain with absorbent material (e.g. sand, silica gel, acid binder, general purpose binder, sawdust).

For large amounts: Dike spillage. Pump off product.

Dispose of absorbed material in accordance with regulations.

6.4. Reference to other sections

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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

Ensure thorough ventilation of stores and work areas. Wear suitable protective clothing and eye/face protection. Avoid contact with the skin, eyes and clothing. Keep container tightly sealed. This product may cause irritations; wash your hands after every contact.

Protection against fire and explosion:

Take precautionary measures against static discharges. Avoid all sources of ignition: heat, sparks, open flame.

7.2. Conditions for safe storage, including any incompatibilities

Suitable materials for containers: Low density polyethylene (LDPE), glass, High density polyethylene (HDPE), Aluminium, Stove-lacquer RDL 50, stove lacquer R78433

Further information on storage conditions: Keep container tightly closed and dry; store in a cool place. Protect from air.

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

No substance specific occupational exposure limits known.

PNEC

freshwater: 0,0024 mg/l

marine water: 0,00024 mg/l

intermittent release: 0,024 mg/l

STP: 580 mg/l

sediment (freshwater): 0,0256 mg/kg

sediment (marine water): 0,00256 mg/kg

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soil: 0,00371 mg/kg

DNEL

worker:

Long-term exposure- systemic effects, Inhalation: 161,6 mg/m³

worker:

Long-term exposure- systemic effects, dermal: 327,4 mg/kg

worker:

Short-term exposure - local effects, dermal: 2,95 mg/cm²

consumer:

Long-term exposure- systemic effects, Inhalation: 47,8 mg/m³

consumer:

Long-term exposure- systemic effects, dermal: 196,4 mg/kg

consumer:

Long-term exposure- systemic effects, oral: 13,8 mg/kg

consumer:

Short-term exposure - local effects, dermal: 2,95 mg/cm²

worker:

Long- and short-term exposure - local effects, Inhalation: 10 mg/m³

consumer:

Long- and short-term exposure - local effects, Inhalation: 10 mg/m³

8.2. Exposure controls

Personal protective equipment

Respiratory protection:

Suitable respiratory protection for higher concentrations or long-term effect: Gas filter for gases/vapours of organic compounds (boiling point >65 °C, e. g. EN 14387 Type A)

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.

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Eye protection:

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

Body protection:

Body protection must be chosen depending on activity and possible exposure, e.g. apron, protecting boots, chemical-protection suit (according to EN 14605 in case of splashes or EN ISO 13982 in case of dust).

General safety and hygiene measures

Handle in accordance with good industrial hygiene and safety practice. Wearing of closed work clothing is required additionally to the stated personal protection equipment. Avoid contact with skin and eyes. No eating, drinking, smoking or tobacco use at the place of work. Hands and/or face should be washed before breaks and at the end of the shift. Store work clothing separately.

SECTION 9: Physical and Chemical Properties

9.1. Information on basic physical and chemical properties

Form:	oily	
Colour:	colourless	
Odour:	mild, of essential oil	
Odour threshold:	not determined	
pH value:	approx. 7	
Melting point:	< -20 °C	
Boiling point:	223,8 °C (1.013 hPa)	(measured)
Flash point:	107 °C	(DIN 51758, closed cup)
Evaporation rate:	Value can be approximated from Henry's Law Constant or vapor pressure.	
Flammability:	hardly combustible	(derived from flash point)
Lower explosion limit:	For liquids not relevant for classification and labelling., The lower explosion point may be 5 - 15 °C below the flash point.	
Upper explosion limit:	For liquids not relevant for classification and labelling.	
Ignition temperature:	240 °C	(DIN 51794)
Vapour pressure:	0,086 hPa (20 °C) dynamic	(measured)
Density:	0,8549 g/cm ³ (20 °C)	(pycnometer)

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	0,83 g/cm ³ (55 °C)	
Relative density:	0,8549 (20 °C)	(pycnometer)
Relative vapour density (air):	> 1 Heavier than air.	
Solubility in water:		
	307 mg/l (25 °C)	
Partitioning coefficient n-octanol/water (log Kow):	3,41 (25 °C)	(Directive 92/69/EEC, A.8)
Self ignition:	Based on its structural properties the product is not classified as self-igniting.	
Thermal decomposition:	No decomposition if correctly stored and handled.	
Viscosity, dynamic:	11,1 mPa.s (20 °C)	(OECD 114)
	5,33 mPa.s (40 °C)	(OECD 114)
Viscosity, kinematic:	13 mm ² /s (20 °C)	(OECD 114)
	6,34 mm ² /s (40 °C)	(OECD 114)
Explosion hazard:	Based on the chemical structure there is no indication of explosive properties.	
Fire promoting properties:	Based on its structural properties the product is not classified as oxidizing.	

9.2. Other information

Self heating ability:	It is not a substance capable of spontaneous heating.	
pKA:	The substance does not dissociate.	
Adsorption/water - soil:	KOC: 70,79; log KOC: 1,85	(calculated)
Surface tension:	Based on chemical structure, surface activity is not to be expected.	
Grain size distribution:	The substance / product is marketed or used in a non solid or granular form.	
Molar mass:	156,27 g/mol	

SECTION 10: Stability and Reactivity

10.1. Reactivity

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

Corrosion to metals: No corrosive effect on metal.

Formation of Remarks:

flammable gases:

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

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

10.4. Conditions to avoid

Avoid all sources of ignition: heat, sparks, open flame. Avoid contact with air. See SDS section 7 - Handling and storage.

10.5. Incompatible materials

Substances to avoid:

acids, bases

10.6. Hazardous decomposition products

Hazardous decomposition products:

No hazardous decomposition products if stored and handled as prescribed/indicated.

SECTION 11: Toxicological Information

11.1. Information on toxicological effects

Acute toxicity

Assessment of acute toxicity:

Of low toxicity after single ingestion. Of low toxicity after short-term skin contact.

Experimental/calculated data:

LD50 rat (oral): 3.450 mg/kg

LD50 rabbit (dermal): 2.650 mg/kg

Irritation

Assessment of irritating effects:

Skin contact causes irritation. Eye contact causes irritation.

Experimental/calculated data:

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Skin corrosion/irritation

rabbit: Irritant. (OECD Guideline 404)

Serious eye damage/irritation

rabbit: Irritant. (Draize test)

Respiratory/Skin sensitization

Assessment of sensitization:

Sensitization after skin contact possible.

Experimental/calculated data:

Mouse Local Lymph Node Assay (LLNA) mouse: skin sensitizing (OECD Guideline 429)

Germ cell mutagenicity

Assessment of mutagenicity:

Results from a number of mutagenicity studies with microorganisms, mammalian cell culture and mammals are available. Taking into account all of the information, there is no indication that the substance is mutagenic. 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:

The results of animal studies gave no indication of a fertility impairing effect. The results were determined in a Screening test (OECD 421/422). The product has not been tested. The statement has been derived from substances/products of a similar structure or composition.

Developmental toxicity

Assessment of teratogenicity:

No indications of a developmental toxic / teratogenic effect were seen in animal studies. The results were determined in a Screening test (OECD 421/422). 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 available data, the classification criteria are not met.

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

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Assessment of repeated dose toxicity:

The information available on the product provides no indication of toxicity on target organs after repeated exposure. The product has not been tested. The statement has been derived from substances/products of a similar structure or composition.

Aspiration hazard

No aspiration hazard expected.

SECTION 12: Ecological Information

12.1. Toxicity

Assessment of aquatic toxicity:

Acutely toxic 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) 14,66 mg/l, *Leuciscus idus* (DIN 38412 Part 15, static)

The details of the toxic effect relate to the nominal concentration.

Aquatic invertebrates:

EC50 (48 h) 17,48 mg/l, *Daphnia magna* (Directive 79/831/EEC, static)

The details of the toxic effect relate to the nominal concentration. The product has low solubility in the test medium. An aqueous solution prepared with solubilizers has been tested.

Aquatic plants:

EC50 (72 h) 2,4 mg/l (growth rate), *Scenedesmus subspicatus* (DIN 38412 Part 9, static)

The details of the toxic effect relate to the nominal concentration. The product has low solubility in the test medium. An aqueous solution prepared with solubilizers has been tested.

Microorganisms/Effect on activated sludge:

EC10 (30 min) 580 mg/l, *Pseudomonas putida* (DIN 38412 Part 27 (draft), aquatic)

The details of the toxic effect relate to the nominal concentration.

Chronic toxicity to fish:

Study scientifically not justified.

Chronic toxicity to aquatic invertebrates:

Study scientifically not justified.

Assessment of terrestrial toxicity:

No data available.

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 - 90 % BOD of the ThOD (28 d) (OECD 301F; ISO 9408; 92/69/EEC, C.4-D) (aerobic, activated sludge, domestic)

Assessment of stability in water:

Substance is readily biodegradable, therefore hydrolysis is not expected to be relevant.

Information on Stability in Water (Hydrolysis):

Study scientifically not justified.

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.

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

According to Annex XIII of Regulation (EC) No.1907/2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH): The product does not fulfill the criteria for PBT (Persistent/bioaccumulative/toxic) and vPvB (very persistent/very bioaccumulative). Self classification

12.6. Other adverse effects

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

SECTION 13: Disposal Considerations

13.1. Waste treatment methods

Observe national and local legal requirements.

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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

IMDG

Not classified as a dangerous good under transport regulations

UN number or ID number: Not applicable

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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.

14.7. Maritime transport in bulk according to IMO instruments

Maritime transport in bulk is not intended.

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SECTION 15: Regulatory Information

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

Prohibitions, Restrictions and Authorizations

Annex XVII of Regulation (EC) No 1907/2006: Number on List: 3, 75

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

Regulations (Italy): 1) 1272/2008/CE Regulation and subsequent amendments; 2) 2012/18/EU Directive (Seveso III) and Legislative Decree 105/2015; 3) Legislative Decree 81/2008 and Legislative Decree 152/2006.

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)

Acute Tox. 5 (oral)
Acute Tox. 5 (dermal)
Skin Corr./Irrit. 2
Aquatic Acute 2
Eye Dam./Irrit. 2A
Skin Sens. 1B

Any other intended applications should be discussed with the manufacturer. Corresponding occupational protection measurements must be followed.

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

Skin Corr./Irrit.	Skin corrosion/irritation
Eye Dam./Irrit.	Serious eye damage/eye irritation
Skin Sens.	Skin sensitization
H319	Causes serious eye irritation.
H315	Causes skin irritation.
H317	May cause an allergic skin reaction.

Abbreviations

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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 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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Annex: Exposure Scenarios

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1. Short title of exposure scenario

Use in/as Formulation

ERC2; PROC1, PROC2, PROC3, PROC5, PROC8b, PROC15

Control of exposure and risk management measures

Contributing exposure scenario	
Use descriptors covered	ERC2: Formulation of preparations
Operational conditions	
Annual amount per site	950.000 kg
Minimum emission days per year Continuous	250
Emission factor air	2,5 %
Emission factor water	0,05 %

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Emission factor soil	0,01 %
	REACH exposure scenarios for fragrances, released 2010
Receive Surf. Water (Flow Rate).	18.000 m3/d
Dilution factor river	10
Dilution factor coast	100
Other Factors: Environment	Indoor use.
Risk Management Measures	
	No special measures are required.
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	ECETOC TRA v2.0 Environment
Risk Characterization Ratio (RCR)	0,2157
	Risk from environmental exposure is driven by freshwater sediment.
Maximum amount of safe use	529 kg/d
Risk from environmental exposure is driven by freshwater sediment.	

Contributing exposure scenario	
Use descriptors covered	PROC1: Use in closed process, no likelihood of exposure. PROC3: Use in closed batch process (synthesis or formulation). Use domain: industrial
Operational conditions	
Concentration of the substance	Citronellol Content: >= 0 % - <= 100 %
Physical state	Liquid, low fugacity
Vapour pressure of the substance during use	0,034 hPa
Duration and Frequency of activity	480 min 220 days per year
Indoor/Outdoor	Indoor
Risk Management Measures	
Provide basic employee training to prevent/minimize exposures.	
Wear chemically resistant gloves in combination with 'basic' employee training.	Effectiveness: 90 %
Use suitable eye protection.	
Risk Management Measures are	

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based on qualitative risk characterisation.	
Exposure estimate and reference to its source	
PROC1	
Assessment method	ECETOC TRA v2.0 Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	0,07 mg/m ³
Risk Characterization Ratio (RCR)	0,000
PROC1	
Assessment method	ECETOC TRA v2.0 Worker
	Worker - dermal, long-term - local
Exposure estimate	10,0 µg/cm ³
Risk Characterization Ratio (RCR)	0,000
PROC1	
Assessment method	ECETOC TRA v2.0 Worker, Use of gloves has been considered additionally.
	Worker - dermal, long-term - systemic
Exposure estimate	0,03 mg/kg bw/day
Risk Characterization Ratio (RCR)	0,01
PROC3	
Assessment method	ECETOC TRA v2.0 Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	19,54 mg/m ³
Risk Characterization Ratio (RCR)	0,124
PROC3	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: Use of gloves has been considered additionally.
	Worker - dermal, long-term - local
Exposure estimate	10 µg/cm ³
Risk Characterization Ratio (RCR)	0,000
PROC3	
Assessment method	ECETOC TRA v2.0 Worker, Use of gloves and working clothes have been considered additionally.
	Consumer - dermal, long-term - systemic
Exposure estimate	0,03 mg/kg bw/day
Risk Characterization Ratio (RCR)	0,001
Additional good practice advice	
Keep substance away from direct sunlight. When not in use, keep containers tightly closed. Store substance in dry places. Store substance in cool places. Store substance in well ventilated places. Segregate substance from incompatible materials.	
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra	
Contributing exposure scenario	
Use descriptors covered	PROC2: Use in closed, continuous process with occasional controlled exposure. Use domain: industrial

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Operational conditions	
Concentration of the substance	Citronellol Content: $\geq 0\%$ - $\leq 100\%$
Physical state	Liquid, low fugacity
Vapour pressure of the substance during use	0,034 hPa
Duration and Frequency of activity	480 min 220 days per year
Indoor/Outdoor	Indoor
Risk Management Measures	
Provide basic employee training to prevent/minimize exposures.	
Wear chemically resistant gloves in combination with 'basic' employee training.	Effectiveness: 90 %
Use suitable eye protection.	
Risk Management Measures are based on qualitative risk characterisation.	
Exposure estimate and reference to its source	
Assessment method	ECETOC TRA v2.0 Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	6,51 mg/m ³
Risk Characterization Ratio (RCR)	0,04
Assessment method	ECETOC TRA modified version: Use of gloves has been considered additionally., ECETOC TRA v2.0 Worker; modified version
	Worker - dermal, long-term - local
Exposure estimate	20,0 µg/cm ³
Risk Characterization Ratio (RCR)	0,001
Assessment method	ECETOC TRA v2.0 Worker, Use of gloves has been considered additionally.
	Worker - dermal, long-term - systemic
Exposure estimate	0,14 mg/kg bw/day
Risk Characterization Ratio (RCR)	0,03
Additional good practice advice	
Keep substance away from direct sunlight. When not in use, keep containers tightly closed. Store substance in dry places. Store substance in cool places. Store substance in well ventilated places. Segregate substance from incompatible materials.	
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 for formulation of preparations and articles (multistage and/or significant contact).

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	Use domain: industrial
Operational conditions	
Concentration of the substance	Citronellol Content: >= 0 % - <= 100 %
Physical state	Liquid, low fugacity
Vapour pressure of the substance during use	0,034 hPa
Duration and Frequency of activity	240 min 220 days per year
Indoor/Outdoor	Indoor
Risk Management Measures	
Provide basic employee training to prevent/minimize exposures.	
Wear chemically resistant gloves in combination with 'basic' employee training.	Effectiveness: 90 %
Use suitable eye protection.	
Risk Management Measures are based on qualitative risk characterisation.	
Exposure estimate and reference to its source	
PROC5	
Assessment method	ECETOC TRA v2.0 Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	19,54 mg/m ³
Risk Characterization Ratio (RCR)	0,121
PROC5	
Assessment method	ECETOC TRA v2.0 Worker, Use of gloves has been considered additionally.
	Worker - dermal, long-term - local
Exposure estimate	200,0 µg/cm ³
Risk Characterization Ratio (RCR)	0,007
PROC5	
Assessment method	ECETOC TRA v2.0 Worker, Use of gloves has been considered additionally.
	Worker - dermal, long-term - systemic
Exposure estimate	1,37 mg/kg bw/day
Risk Characterization Ratio (RCR)	0,03
Additional good practice advice	
Keep substance away from direct sunlight. Store substance in cool places. Store substance in dry places. Store substance in well ventilated places. Segregate substance from incompatible materials. When not in use, keep containers tightly closed.	
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra	

Contributing exposure scenario

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Use descriptors covered	PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities Use domain: industrial
Operational conditions	
Concentration of the substance	Citronellol Content: $\geq 0\%$ - $\leq 20\%$
Physical state	Liquid, low fugacity
Vapour pressure of the substance during use	0,034 hPa
Duration and Frequency of activity	480 min 220 days per year
Indoor/Outdoor	Indoor
Risk Management Measures	
Provide basic employee training to prevent/minimize exposures.	
Wear chemically resistant gloves in combination with 'basic' employee training.	Effectiveness: 90 %
Use suitable eye protection.	Effectiveness: 90 %
Risk Management Measures are based on qualitative risk characterisation.	
Exposure estimate and reference to its source	
PROC8b	
Assessment method	ECETOC TRA v2.0 Worker; modified version, The concentration of the substance has been considered using a linear approach.
	Worker - inhalation, long-term - systemic
Exposure estimate	6,51 mg/m ³
Risk Characterization Ratio (RCR)	0,04
PROC8b	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: Use of gloves has been considered additionally., The concentration of the substance has been considered using a linear approach.
	Worker - dermal, long-term - local
Exposure estimate	20 µg/cm ³
Risk Characterization Ratio (RCR)	0,007
PROC8b	
Assessment method	ECETOC TRA v2.0 Worker; modified version, The concentration of the substance has been considered using a linear approach., ECETOC TRA modified version: Use of gloves has been considered additionally.
	Worker - dermal, long-term - systemic
Exposure estimate	0,14 mg/kg bw/day

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Risk Characterization Ratio (RCR)	0,003
Additional good practice advice	
Keep substance away from direct sunlight. Store substance in cool places. Store substance in dry places. Store substance in well ventilated places. Segregate substance from incompatible materials. When not in use, keep containers tightly closed.	
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. PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities Use domain: industrial
Operational conditions	
Concentration of the substance	Citronellol Content: $\geq 0\%$ - $\leq 100\%$
Physical state	Liquid, low fugacity
Vapour pressure of the substance during use	0,034 hPa
Duration and Frequency of activity	60 min 220 days per year
Indoor/Outdoor	Indoor
Risk Management Measures	
Provide basic employee training to prevent/minimize exposures.	
Wear chemically resistant gloves in combination with 'basic' employee training.	Effectiveness: 90 %
Use suitable eye protection.	
Risk Management Measures are based on qualitative risk characterisation.	
Exposure estimate and reference to its source	
PROC8b	
Assessment method	ECETOC TRA v2.0 Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	6,51 mg/m ³
Risk Characterization Ratio (RCR)	0,04
PROC8b	
Assessment method	ECETOC TRA v2.0 Worker, Use of gloves has been considered additionally.
	Worker - dermal, long-term - local
Exposure estimate	100,0 µg/cm ³
Risk Characterization Ratio (RCR)	0,003
PROC8b	

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Assessment method	ECETOC TRA v2.0 Worker, Use of gloves has been considered additionally.
	Worker - dermal, long-term - systemic
Exposure estimate	0,69 mg/kg bw/day
Risk Characterization Ratio (RCR)	0,015
PROC15	
Assessment method	ECETOC TRA v2.0 Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	6,51 mg/m ³
Risk Characterization Ratio (RCR)	0,04
PROC15	
Assessment method	ECETOC TRA v2.0 Worker, Use of gloves has been considered additionally.
	Worker - dermal, long-term - local
Exposure estimate	10,0 µg/cm ³
Risk Characterization Ratio (RCR)	0,000
PROC15	
Assessment method	ECETOC TRA v2.0 Worker, Use of gloves has been considered additionally.
	Worker - dermal, long-term - systemic
Exposure estimate	0,03 mg/kg bw/day
Risk Characterization Ratio (RCR)	0,001
Additional good practice advice	
Keep substance away from direct sunlight. Store substance in cool places. Store substance in dry places. Store substance in well ventilated places. Segregate substance from incompatible materials. When not in use, keep containers tightly closed.	
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	Citronellol Content: >= 0 % - <= 20 %
Physical state	Liquid, low fugacity
Vapour pressure of the substance during use	0,034 hPa
Duration and Frequency of activity	240 min 220 days per year
Indoor/Outdoor	Indoor
Risk Management Measures	
Provide basic employee training to prevent/minimize exposures.	
Wear chemically resistant gloves in combination with 'basic' employee	Effectiveness: 90 %

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training.	
Use suitable eye protection.	
Risk Management Measures are based on qualitative risk characterisation.	
Exposure estimate and reference to its source	
PROC15	
Assessment method	ECETOC TRA v2.0 Worker; modified version, The concentration of the substance has been considered using a linear approach.
	Worker - inhalation, long-term - systemic
Exposure estimate	3,91 mg/m ³
Risk Characterization Ratio (RCR)	0,024
PROC15	
Assessment method	ECETOC TRA v2.0 Worker; modified version, The concentration of the substance has been considered using a linear approach., ECETOC TRA modified version: Use of gloves has been considered additionally.
	Worker - dermal, long-term - local
Exposure estimate	2,0 µg/cm ³
Risk Characterization Ratio (RCR)	0,000
PROC15	
Assessment method	ECETOC TRA v2.0 Worker; modified version, The concentration of the substance has been considered using a linear approach., ECETOC TRA modified version: Use of gloves has been considered additionally.
	Worker - dermal, long-term - systemic
Exposure estimate	0,01 mg/kg bw/day
Risk Characterization Ratio (RCR)	0,000
Additional good practice advice	
Keep substance away from direct sunlight. Store substance in cool places. Store substance in dry places. Store substance in well ventilated places. Segregate substance from incompatible materials. When not in use, keep containers tightly closed.	
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra	
Please note that a modified version has been used (see exposure estimates)	

2. Short title of exposure scenario

Formulation

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

Control of exposure and risk management measures

Contributing exposure scenario	
Use descriptors covered	ERC2: Formulation of preparations

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Operational conditions	
Annual amount per site	950.000 kg
Minimum emission days per year Continuous	220
Emission factor air	0 %
Emission factor water	3 %
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	ECETOC TRA v2.0 Environment
Risk Characterization Ratio (RCR)	0,837
	Risk from environmental exposure is driven by freshwater sediment.
Maximum amount of safe use	11 kg/d
Risk from environmental exposure is driven by marine sediment.	

Contributing exposure scenario	
Use descriptors covered	PROC1: Use in closed process, no likelihood of exposure. PROC2: Use in closed, continuous process with occasional controlled exposure. PROC3: Use in closed batch process (synthesis or formulation). PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact). Use domain: industrial
Operational conditions	
Concentration of the substance	Citronellol Content: >= 0 % - <= 20 %
Physical state	Liquid, low fugacity
Vapour pressure of the substance during use	0,034 hPa
Duration and Frequency of activity	240 min 220 days per year

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Indoor/Outdoor	Indoor
Risk Management Measures	
Provide basic employee training to prevent/minimize exposures.	
Wear chemically resistant gloves in combination with 'basic' employee training.	Effectiveness: 90 %
Use suitable eye protection.	
Risk Management Measures are based on qualitative risk characterisation.	
Exposure estimate and reference to its source	
PROC1	
Assessment method	ECETOC TRA v2.0 Worker; modified version, The concentration of the substance has been considered using a linear approach.
	Worker - inhalation, long-term - systemic
Exposure estimate	0,01 mg/m ³
Risk Characterization Ratio (RCR)	0,000
PROC1	
Assessment method	ECETOC TRA v2.0 Worker; modified version, The concentration of the substance has been considered using a linear approach., ECETOC TRA modified version: Use of gloves has been considered additionally.
	Worker - dermal, long-term - local
Exposure estimate	2,0 µg/cm ³
Risk Characterization Ratio (RCR)	0,000
PROC1	
Assessment method	ECETOC TRA v2.0 Worker; modified version, The concentration of the substance has been considered using a linear approach., ECETOC TRA modified version: Use of gloves has been considered additionally.
	Worker - dermal, long-term - systemic
Exposure estimate	0,01 mg/kg bw/day
Risk Characterization Ratio (RCR)	0,000
PROC2	
Assessment method	ECETOC TRA v2.0 Worker; modified version, The concentration of the substance has been considered using a linear approach.
	Worker - inhalation, long-term - systemic
Exposure estimate	0,78 mg/m ³
PROC2	
Assessment method	ECETOC TRA v2.0 Worker; modified version, The concentration of the substance has been considered using a linear approach., ECETOC TRA modified version: Use of gloves has been considered additionally.
	Worker - dermal, long-term - local

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Exposure estimate	4,0 µg/cm ³
Risk Characterization Ratio (RCR)	0,000
PROC2	
Assessment method	ECETOC TRA v2.0 Worker; modified version, The concentration of the substance has been considered using a linear approach., ECETOC TRA modified version: Use of gloves has been considered additionally.
	Worker - dermal, long-term - systemic
Exposure estimate	0,03 mg/kg bw/day
Risk Characterization Ratio (RCR)	0,001
PROC3	
Assessment method	ECETOC TRA v2.0 Worker; modified version, The concentration of the substance has been considered using a linear approach.
	Worker - inhalation, long-term - systemic
Exposure estimate	2,34 mg/m ³
Risk Characterization Ratio (RCR)	0,015
PROC3	
Assessment method	ECETOC TRA v2.0 Worker; modified version, The concentration of the substance has been considered using a linear approach., ECETOC TRA modified version: Use of gloves has been considered additionally.
	Worker - dermal, long-term - local
Exposure estimate	2,0 µg/cm ³
Risk Characterization Ratio (RCR)	0,000
PROC3	
Assessment method	ECETOC TRA v2.0 Worker; modified version, The concentration of the substance has been considered using a linear approach., ECETOC TRA modified version: Use of gloves has been considered additionally.
	Worker - dermal, long-term - systemic
Exposure estimate	0,01 mg/kg bw/day
Risk Characterization Ratio (RCR)	0,000
PROC5	
Assessment method	ECETOC TRA v2.0 Worker; modified version, The concentration of the substance has been considered using a linear approach.
	Worker - inhalation, long-term - systemic
Exposure estimate	3,91 mg/m ³
Risk Characterization Ratio (RCR)	0,024
PROC5	
Assessment method	ECETOC TRA v2.0 Worker; modified version, The concentration of the substance has been considered using a linear approach., ECETOC TRA modified version: Use of gloves has been considered additionally.
	Worker - dermal, long-term - systemic
Exposure estimate	0,27 mg/kg bw/day
Risk Characterization Ratio (RCR)	0,006

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PROC5	
Assessment method	ECETOC TRA v2.0 Worker; modified version, The concentration of the substance has been considered using a linear approach., ECETOC TRA modified version: Use of gloves has been considered additionally.
	Worker - dermal, long-term - local
Exposure estimate	40 µg/cm ³
Risk Characterization Ratio (RCR)	0,001
Additional good practice advice	
Keep substance away from direct sunlight. Store substance in cool places. Store substance in dry places. Store substance in well ventilated places. Segregate substance from incompatible materials. When not in use, keep containers tightly closed.	
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). PROC14: Production of preparations or articles by tableting, compression, extrusion, pelettisation. PROC15: Use a laboratory reagent. PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities Use domain: industrial
Operational conditions	
Concentration of the substance	Citronellol Content: >= 0 % - <= 0,5 %
Physical state	Liquid, low fugacity
Vapour pressure of the substance during use	0,034 hPa
Duration and Frequency of activity	480 min 220 days per year
Indoor/Outdoor	Indoor
Risk Management Measures	
Provide basic employee training to prevent/minimize exposures.	
Exposure estimate and reference to its source	
PROC8b	
Assessment method	ECETOC TRA v2.0 Worker; modified version, The concentration of the substance has been considered using a linear approach.
	Worker - inhalation, long-term - systemic
Exposure estimate	0,16 mg/m ³
Risk Characterization Ratio (RCR)	0,001
PROC8b	

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Assessment method	ECETOC TRA v2.0 Worker; modified version, The concentration of the substance has been considered using a linear approach.
	Worker - dermal, long-term - local
Exposure estimate	5,0 µg/cm ³
Risk Characterization Ratio (RCR)	0,000
PROC8b	
Assessment method	ECETOC TRA v2.0 Worker; modified version, The concentration of the substance has been considered using a linear approach.
	Worker - dermal, long-term - systemic
Exposure estimate	0,03 mg/kg bw/day
Risk Characterization Ratio (RCR)	0,01
PROC9	
Assessment method	ECETOC TRA v2.0 Worker; modified version, The concentration of the substance has been considered using a linear approach.
	Worker - inhalation, long-term - systemic
Exposure estimate	0,16 mg/m ³
Risk Characterization Ratio (RCR)	0,001
PROC9	
Assessment method	ECETOC TRA v2.0 Worker; modified version, The concentration of the substance has been considered using a linear approach.
	Worker - dermal, long-term - local
Exposure estimate	5,0 µg/cm ³
Risk Characterization Ratio (RCR)	0,000
PROC9	
Assessment method	ECETOC TRA v2.0 Worker; modified version, The concentration of the substance has been considered using a linear approach.
	Worker - dermal, long-term - systemic
Exposure estimate	0,03 mg/kg bw/day
Risk Characterization Ratio (RCR)	0,001
PROC14	
Assessment method	ECETOC TRA v2.0 Worker; modified version, The concentration of the substance has been considered using a linear approach.
	Worker - inhalation, long-term - systemic
Exposure estimate	0,16 mg/m ³
Risk Characterization Ratio (RCR)	0,001
PROC14	
Assessment method	ECETOC TRA v2.0 Worker; modified version, The concentration of the substance has been considered using a linear approach.
	Worker - dermal, long-term - systemic
Exposure estimate	0,02 mg/kg bw/day
Risk Characterization Ratio (RCR)	0,000

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PROC14	
Assessment method	ECETOC TRA v2.0 Worker; modified version, The concentration of the substance has been considered using a linear approach.
	Worker - dermal, long-term - local
Exposure estimate	2,5 µg/cm ³
Risk Characterization Ratio (RCR)	0,000
PROC15	
Assessment method	ECETOC TRA v2.0 Worker; modified version, The concentration of the substance has been considered using a linear approach.
	Worker - inhalation, long-term - systemic
Exposure estimate	0,16 mg/m ³
Risk Characterization Ratio (RCR)	0,001
PROC15	
Assessment method	ECETOC TRA v2.0 Worker; modified version, The concentration of the substance has been considered using a linear approach.
	Worker - dermal, long-term - systemic
Exposure estimate	0,00 mg/kg bw/day
Risk Characterization Ratio (RCR)	0,000
PROC15	
Assessment method	ECETOC TRA v2.0 Worker; modified version, The concentration of the substance has been considered using a linear approach.
	Worker - dermal, long-term - local
Exposure estimate	0,5 µg/cm ³
Risk Characterization Ratio (RCR)	0,000
Additional good practice advice	
Keep substance away from direct sunlight. Store substance in cool places. Store substance in dry places. Store substance in well ventilated places. Segregate substance from incompatible materials. When not in use, keep containers tightly closed.	
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra	
Please note that a modified version has been used (see exposure estimates)	

3. Short title of exposure scenario

Use in Cleaning Agents, (use in industrial settings)

PROC5, PROC7, PROC8a, PROC8b, PROC10, PROC13; PC35

Control of exposure and risk management measures

Contributing exposure scenario	
Use descriptors covered	PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact). PROC7: Industrial spraying PROC8a:

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	Transfer of substance or preparation (charging/discharging) from/to ves-sels/large containers at non-dedicated facilities PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC10: Roller application or brushing PROC13: Treatment of articles by dipping and pouring. PC35: Washing and Cleaning Products (including solvent based products). Use domain: industrial
Operational conditions	
Concentration of the substance	Citronellol Content: $\geq 0\%$ - $\leq 1\%$
Physical state	Liquid, low fugacity
Vapour pressure of the substance during use	0,034 hPa
Duration and Frequency of activity	240 min 220 days per year
Indoor/Outdoor	Indoor
Risk Management Measures	
Provide basic employee training to prevent/minimize exposures.	
Exposure estimate and reference to its source	
PROC5	
Assessment method	ECETOC TRA v2.0 Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	1,95 mg/m ³
Risk Characterization Ratio (RCR)	0,012
PROC5	
Assessment method	ECETOC TRA v2.0 Worker
	Worker - dermal, long-term - systemic
Exposure estimate	1,37 mg/kg bw/day
Risk Characterization Ratio (RCR)	0,03
PROC5	
Assessment method	ECETOC TRA v2.0 Worker
	Worker - dermal, long-term - local
Exposure estimate	200 µg/cm ³
Risk Characterization Ratio (RCR)	0,007
PROC7	
Assessment method	ECETOC TRA v2.0 Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	39,08 mg/m ³
Risk Characterization Ratio (RCR)	0,241
PROC7	
Assessment method	ECETOC TRA v2.0 Worker
	Worker - dermal, long-term - systemic

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Exposure estimate	4,29 mg/kg bw/day
Risk Characterization Ratio (RCR)	0,094
PROC7	
Assessment method	ECETOC TRA v2.0 Worker
	Worker - dermal, long-term - local
Exposure estimate	200 µg/cm ³
Risk Characterization Ratio (RCR)	0,007
PROC8a	
Assessment method	ECETOC TRA v2.0 Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	3,91 mg/m ³
Risk Characterization Ratio (RCR)	0,024
PROC8a	
Assessment method	ECETOC TRA v2.0 Worker
	Worker - dermal, long-term - systemic
Exposure estimate	1,37 mg/kg bw/day
Risk Characterization Ratio (RCR)	0,03
PROC8a	
Assessment method	ECETOC TRA v2.0 Worker
	Worker - dermal, long-term - local
Exposure estimate	100 µg/cm ³
Risk Characterization Ratio (RCR)	0,003
PROC8b	
Assessment method	ECETOC TRA v2.0 Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	1,95 mg/m ³
Risk Characterization Ratio (RCR)	0,012
PROC8a	
Assessment method	ECETOC TRA v2.0 Worker
	Worker - dermal, long-term - systemic
Exposure estimate	0,69 mg/kg bw/day
Risk Characterization Ratio (RCR)	0,015
PROC8a	
Assessment method	ECETOC TRA v2.0 Worker
	Worker - dermal, long-term - local
Exposure estimate	100 µg/cm ³
Risk Characterization Ratio (RCR)	0,003
PROC10	
Assessment method	ECETOC TRA v2.0 Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	3,91 mg/m ³
Risk Characterization Ratio (RCR)	0,024
PROC10	
Assessment method	ECETOC TRA v2.0 Worker
	Worker - dermal, long-term - systemic
Exposure estimate	2,74 mg/m ³
Risk Characterization Ratio (RCR)	0,06

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PROC10	
Assessment method	ECETOC TRA v2.0 Worker
	Worker - dermal, long-term - local
Exposure estimate	200 µg/cm ³
Risk Characterization Ratio (RCR)	0,007
PROC13	
Assessment method	ECETOC TRA v2.0 Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	3,91 mg/m ³
Risk Characterization Ratio (RCR)	0,024
PROC13	
Assessment method	ECETOC TRA v2.0 Worker
	Worker - dermal, long-term - systemic
Exposure estimate	1,37 mg/kg bw/day
Risk Characterization Ratio (RCR)	0,03
PROC13	
Assessment method	ECETOC TRA v2.0 Worker
	Worker - dermal, long-term - local
Exposure estimate	200 µg/cm ³
Risk Characterization Ratio (RCR)	0,007
Additional good practice advice	
Keep substance away from direct sunlight. Store substance in cool places. Store substance in dry places. Store substance in well ventilated places. Segregate substance from incompatible materials. When not in use, keep containers tightly closed.	
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra	

4. Short title of exposure scenario

Use in Cleaning Agents, (use in professional settings)

ERC8d; PROC5, PROC6, PROC8, PROC9, PROC8a, PROC8b, PROC10, PROC11, PROC19

Control of exposure and risk management measures

Contributing exposure scenario	
Use descriptors covered	ERC8d: Wide dispersive outdoor use of processing aids in open systems
Operational conditions	
Annual amount for wide disperse uses	950.000 kg
Minimum emission days per year Dispersive use	365
Emission factor air	90 %
Emission factor water	10 %

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Emission factor soil	0 %
Receive Surf. Water (Flow Rate).	18.000 m3/d
Dilution factor river	10
Dilution factor coast	100
Other Factors: Environment	Outdoor use.
Risk Management Measures	
	No special measures are required.
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	ECETOC TRA v2.0 Environment
Risk Characterization Ratio (RCR)	0,203
	Risk from environmental exposure is driven by freshwater.
Maximum amount of safe use	2.564 kg/d
Risk from environmental exposure is driven by freshwater sediment.	

Contributing exposure scenario	
Use descriptors covered	PROC8a: Transfer of substance or preparation (charging/discharging) from/to ves-sels/large containers at non-dedicated facilities PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC10: Roller application or brushing PROC11: Non industrial spraying PROC19: Hand-mixing with intimate contact and only PPE available. PC31: Polishes and Wax Blends., PC35: Washing and Cleaning Products (including solvent based products). Use domain: professional
Operational conditions	
Concentration of the substance	Citronellol Content: >= 0 % - <= 1 %
Physical state	Liquid, low fugacity
Vapour pressure of the substance during use	0,034 hPa
Duration and Frequency of activity	480 min 220 days per year
Indoor/Outdoor	Indoor
Risk Management Measures	
Provide basic employee training to prevent/minimize exposures.	

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Exposure estimate and reference to its source	
PROC8a	
Assessment method	ECETOC TRA v2.0 Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	16,28 mg/m ³
Risk Characterization Ratio (RCR)	0,101
PROC8a	
Assessment method	ECETOC TRA v2.0 Worker
	Worker - dermal, long-term - systemic
Exposure estimate	1,37 mg/kg bw/day
Risk Characterization Ratio (RCR)	0,03
PROC8a	
Assessment method	ECETOC TRA v2.0 Worker
	Worker - dermal, long-term - local
Exposure estimate	100 µg/cm ³
Risk Characterization Ratio (RCR)	0,003
PROC8b	
Assessment method	ECETOC TRA v2.0 Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	6,51 mg/m ³
Risk Characterization Ratio (RCR)	0,04
PROC8a	
Assessment method	ECETOC TRA v2.0 Worker
	Worker - dermal, long-term - systemic
Exposure estimate	0,69 mg/kg bw/day
Risk Characterization Ratio (RCR)	0,015
PROC8a	
Assessment method	ECETOC TRA v2.0 Worker
	Worker - dermal, long-term - local
Exposure estimate	100 µg/cm ³
Risk Characterization Ratio (RCR)	0,003
PROC10	
Assessment method	ECETOC TRA v2.0 Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	16,28 mg/m ³
Risk Characterization Ratio (RCR)	0,101
PROC10	
Assessment method	ECETOC TRA v2.0 Worker
	Worker - dermal, long-term - systemic
Exposure estimate	2,74 mg/kg bw/day
Risk Characterization Ratio (RCR)	0,06
PROC10	
Assessment method	ECETOC TRA v2.0 Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	200 µg/cm ³
Risk Characterization Ratio (RCR)	0,007
PROC11	

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Assessment method	ECETOC TRA v2.0 Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	65,13 mg/m ³
Risk Characterization Ratio (RCR)	0,403
PROC11	
Assessment method	ECETOC TRA v2.0 Worker
	Worker - dermal, long-term - systemic
Exposure estimate	10,71 mg/kg bw/day
Risk Characterization Ratio (RCR)	0,234
PROC11	
Assessment method	ECETOC TRA v2.0 Worker
	Worker - dermal, long-term - local
Exposure estimate	500 µg/cm ³
Risk Characterization Ratio (RCR)	0,017
PROC19	
Assessment method	ECETOC TRA v2.0 Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	16,28 mg/m ³
Risk Characterization Ratio (RCR)	0,101
PROC19	
Assessment method	ECETOC TRA v2.0 Worker
	Worker - dermal, long-term - systemic
Exposure estimate	14,14 mg/kg bw/day
Risk Characterization Ratio (RCR)	0,309
PROC19	
Assessment method	ECETOC TRA v2.0 Worker
	Worker - dermal, long-term - local
Exposure estimate	500 µg/cm ³
Risk Characterization Ratio (RCR)	0,007
Additional good practice advice	
Keep substance away from direct sunlight. Store substance in cool places. Store substance in dry places. Store substance in well ventilated places. Segregate substance from incompatible materials. When not in use, keep containers tightly closed.	
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra	

5. Short title of exposure scenario

Use in Cleaning Agents, (consumer use)

ERC8d; PROC5, PROC6, PROC8, PROC9; PC31, PC35

Control of exposure and risk management measures

Contributing exposure scenario	
Use descriptors covered	ERC8d: Wide dispersive outdoor use of processing aids in open systems

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Operational conditions	
Annual amount for wide disperse uses	950.000 kg
Minimum emission days per year Dispersive use	365
Emission factor air	90 %
Emission factor water	10 %
Emission factor soil	0 %
Receive Surf. Water (Flow Rate).	18.000 m3/d
Dilution factor river	10
Dilution factor coast	100
Other Factors: Environment	Outdoor use.
Risk Management Measures	
	No special measures are required.
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	ECETOC TRA v2.0 Environment
Risk Characterization Ratio (RCR)	0,203
	Risk from environmental exposure is driven by freshwater.
Maximum amount of safe use	2.564 kg/d
Risk from environmental exposure is driven by freshwater sediment.	

Contributing exposure scenario	
Use descriptors covered	SU21: Consumer uses PC31: Polishes and Wax Blends., PC35: Washing and Cleaning Products (including solvent based products)., Furniture, floor and leather care, Laundry regular, Laundry compact, Fabric conditioners, Laundry additives, Hand dishwashing liquids, Machine dishwashing products, Surface cleaning, Laundry aids, Wipes
Operational conditions	
Concentration of the substance	Citronellol Content: >= 0 % - <= 0,5 %
Physical state	Liquid, low fugacity
Vapour pressure of the substance during use	0,034 hPa
Duration and Frequency of activity	Exposure duration:

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Duration and Frequency of activity	Application duration:
Duration and Frequency of activity	Spray duration: Relevant for the spraying process.
Indoor/Outdoor	Indoor
Release area	
Risk Management Measures	
Consumer Measures	Ensure spraying away from persons. Relevant for the spraying process.
Exposure estimate and reference to its source	
PC31	
Assessment method	AISE Reach Exposure Assessment Consumer Tool (REACT)
	Consumer - dermal, long-term - systemic
Exposure estimate	1,18 mg/kg bw/day
Risk Characterization Ratio (RCR)	0,0429
PC31	
Assessment method	AISE Reach Exposure Assessment Consumer Tool (REACT)
	Consumer - inhalation, long-term - systemic
Exposure estimate	0,0080 mg/kg bw/day
Risk Characterization Ratio (RCR)	0,00504
PC35	
Assessment method	AISE Reach Exposure Assessment Consumer Tool (REACT)
	Consumer - dermal, long-term - systemic
Exposure estimate	0,245 mg/kg bw/day
Risk Characterization Ratio (RCR)	0,0089
PC35	
Assessment method	AISE Reach Exposure Assessment Consumer Tool (REACT)
	Consumer - dermal, long-term - systemic
Exposure estimate	0,245 mg/kg bw/day
Risk Characterization Ratio (RCR)	0,366
PC35	
Assessment method	AISE Reach Exposure Assessment Consumer Tool (REACT)
	Consumer - dermal, long-term - systemic
Exposure estimate	0,0156 mg/kg bw/day
Risk Characterization Ratio (RCR)	0,000568
PC35	
Assessment method	AISE Reach Exposure Assessment Consumer Tool (REACT)
	Consumer - dermal, long-term - systemic
Exposure estimate	0,236 mg/kg bw/day
Risk Characterization Ratio (RCR)	0,00858
PC35	

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Assessment method	AISE Reach Exposure Assessment Consumer Tool (REACT)
	Consumer - dermal, long-term - systemic
Exposure estimate	0,015 mg/kg bw/day
Risk Characterization Ratio (RCR)	0,00545
PC35	
Assessment method	AISE Reach Exposure Assessment Consumer Tool (REACT)
	Consumer - oral, long-term - systemic
Exposure estimate	0,0000 mg/kg bw/day
Risk Characterization Ratio (RCR)	0,00000
PC35	
Assessment method	AISE Reach Exposure Assessment Consumer Tool (REACT)
	Consumer - oral, long-term - systemic
Exposure estimate	0,0000 mg/kg bw/day
Risk Characterization Ratio (RCR)	0,00000
PC35	
Assessment method	AISE Reach Exposure Assessment Consumer Tool (REACT)
	Consumer - dermal, long-term - systemic
Exposure estimate	0,914 mg/kg bw/day
Risk Characterization Ratio (RCR)	0,0332
PC35	
Assessment method	AISE Reach Exposure Assessment Consumer Tool (REACT)
	Consumer - inhalation, long-term - systemic
Exposure estimate	0,0060 mg/kg bw/day
Risk Characterization Ratio (RCR)	0,000378
PC35	
Assessment method	AISE Reach Exposure Assessment Consumer Tool (REACT)
	Consumer - dermal, long-term - systemic
Exposure estimate	0,0083 mg/kg bw/day
Risk Characterization Ratio (RCR)	0,00303
PC35	
Assessment method	AISE Reach Exposure Assessment Consumer Tool (REACT)
	Consumer - inhalation, long-term - systemic
Exposure estimate	0,0128 mg/kg bw/day
Risk Characterization Ratio (RCR)	0,000804
PC35	
Assessment method	AISE Reach Exposure Assessment Consumer Tool (REACT)
	Consumer - dermal, long-term - systemic
Exposure estimate	0,458 mg/kg bw/day
Risk Characterization Ratio (RCR)	0,0167

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6. Short title of exposure scenario

Use in/as Air care products, (consumer use)

ERC8a; PC3

Control of exposure and risk management measures

Contributing exposure scenario	
Use descriptors covered	SU21: Consumer uses PC3: Air care products., Air care products (non-aerosol), Air care products (aerosol)
Operational conditions	
Concentration of the substance	Citronellol Content: $\geq 0\%$ - $\leq 1\%$ Relevant for air care products (aerosol)
	Citronellol Content: $\geq 0\%$ - $\leq 100\%$ Relevant for air care products (non-aerosol)
Physical state	Liquid, low fugacity
Vapour pressure of the substance during use	0,034 hPa
Duration and Frequency of activity	Exposure duration:
Duration and Frequency of activity	Application duration:
Duration and Frequency of activity	Spray duration: Relevant for the spraying process.
Indoor/Outdoor	Indoor
Release area	
Risk Management Measures	
Consumer Measures	Ensure spraying away from persons.
Exposure estimate and reference to its source	
Assessment method	AISE Reach Exposure Assessment Consumer Tool (REACT)
	Consumer - inhalation, long-term - systemic
Exposure estimate	0,0596 mg/kg bw/day
Risk Characterization Ratio (RCR)	0,00375
Assessment method	AISE Reach Exposure Assessment Consumer Tool (REACT)
	Consumer - inhalation, long-term - systemic
Exposure estimate	0,0494 mg/kg bw/day
Risk Characterization Ratio (RCR)	0,00311

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7. Short title of exposure scenario

Use in Personal care products, (consumer use)

ERC8d; PC28, PC39

Control of exposure and risk management measures

Contributing exposure scenario	
Use descriptors covered	ERC8d: Wide dispersive outdoor use of processing aids in open systems
Operational conditions	
Annual amount for wide disperse uses	950.000 kg
Minimum emission days per year Dispersive use	365
Emission factor air	90 %
Emission factor water	10 %
Emission factor soil	0 %
Receive Surf. Water (Flow Rate).	18.000 m3/d
Dilution factor river	10
Dilution factor coast	100
Other Factors: Environment	Outdoor use.
Risk Management Measures	
	No special measures are required.
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	ECETOC TRA v2.0 Environment
Risk Characterization Ratio (RCR)	0,203
	Risk from environmental exposure is driven by freshwater.
Maximum amount of safe use	2.564 kg/d
Risk from environmental exposure is driven by freshwater sediment.	

Contributing exposure scenario	
Use descriptors covered	SU21: Consumer uses PC28: Perfumes, Fragrances., PC39: Cosmetics, personal care products. In accordance to the Article 14 (5b) of the REACh Regulation (EC) No 1907/2006, exposure estimation and

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Date previous version: not applicable

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	risk characterisation needs not to be performed for end uses in cosmetic products within the scope of Directive EC 1223/2009.
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8. Short title of exposure scenario

Consumer applications

ERC8d; PC8, PC9a, PC9b, PC9c, PC18; AC31, AC32, AC34, AC35, AC36

Control of exposure and risk management measures

Contributing exposure scenario	
Use descriptors covered	ERC8d: Wide dispersive outdoor use of processing aids in open systems
Operational conditions	
Annual amount for wide disperse uses	950.000 kg
Minimum emission days per year Dispersive use	365
Emission factor air	90 %
Emission factor water	10 %
Emission factor soil	0 %
Receive Surf. Water (Flow Rate).	18.000 m3/d
Dilution factor river	10
Dilution factor coast	100
Other Factors: Environment	Outdoor use.
Risk Management Measures	
	No special measures are required.
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	ECETOC TRA v2.0 Environment
Risk Characterization Ratio (RCR)	0,203
	Risk from environmental exposure is driven by freshwater.
Maximum amount of safe use	2.564 kg/d
Risk from environmental exposure is driven by freshwater sediment.	

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Contributing exposure scenario	
Use descriptors covered	PC8: Biocidal Products. In accordance to the Article 15 (2) of the REACH Regulation (EC) No 1907/2006, exposure estimation and risk characterisation needs not to be performed for end uses in biocidal products within the scope of Regulation (EU) 528/2012.
Contributing exposure scenario	
Use descriptors covered	SU21: Consumer uses PC18: Ink and Toners., PC9a: Coatings and paints, thinners, paint removers, PC9b: Fillers, putties, plasters, modelling clay, PC9c: Finger paints, Surface cleaning, Hand dishwashing liquids
Operational conditions	
Concentration of the substance	Citronellol Content: $\geq 0\%$ - $\leq 0,5\%$
Physical state	Liquid, low fugacity
Vapour pressure of the substance during use	0,034 hPa
Duration and Frequency of activity	Exposure duration:
Duration and Frequency of activity	Application duration:
Duration and Frequency of activity	Spray duration: Relevant for the spraying process.
Indoor/Outdoor	Indoor
Release area	
Risk Management Measures	
Consumer Measures	Ensure spraying away from persons. Relevant for the spraying process.
Exposure estimate and reference to its source	
PC9a	
Assessment method	AISE Reach Exposure Assessment Consumer Tool (REACT)
	Consumer - dermal, long-term - systemic
Exposure estimate	0,914 mg/kg bw/day
Risk Characterization Ratio (RCR)	0,0332
	Calculated as PC35
PC9a	
Assessment method	AISE Reach Exposure Assessment Consumer Tool (REACT)
	Consumer - inhalation, long-term - systemic
Exposure estimate	0,006 mg/kg bw/day
Risk Characterization Ratio (RCR)	0,000378

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	Calculated as PC35
PC9b	
Assessment method	AISE Reach Exposure Assessment Consumer Tool (REACT)
	Consumer - dermal, long-term - systemic
Exposure estimate	0,914 mg/kg bw/day
Risk Characterization Ratio (RCR)	0,0332
	Calculated as PC35
PC9b	
Assessment method	AISE Reach Exposure Assessment Consumer Tool (REACT)
	Consumer - inhalation, long-term - systemic
Exposure estimate	0,006 mg/kg bw/day
Risk Characterization Ratio (RCR)	0,000378
	Calculated as PC35
Assessment method	AISE Reach Exposure Assessment Consumer Tool (REACT)
	Consumer - dermal, long-term - systemic
Exposure estimate	0,015 mg/kg bw/day
Risk Characterization Ratio (RCR)	0,000545
	Calculated as PC35
Assessment method	AISE Reach Exposure Assessment Consumer Tool (REACT)
	Consumer - oral, long-term - systemic
Exposure estimate	0,0000 mg/kg bw/day
Risk Characterization Ratio (RCR)	0,000002
	Calculated as PC35
PC18	
	Exposure is considered negligible.

Contributing exposure scenario	
Use descriptors covered	SU21: Consumer uses Fabric conditioners, Wipes, Air care products (aerosol) AC31: Scented clothes AC32: Scented eraser AC34: Scented toys AC35: Scented paper articles AC36: Scented CD
Operational conditions	
Concentration of the substance	Citronellol Content: >= 0 % - <= 1 %
Physical state	Liquid, low fugacity
Vapour pressure of the substance during use	0,034 hPa
Duration and Frequency of activity	Exposure duration:
Duration and Frequency of activity	Spray duration: Relevant for the spraying process.

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Duration and Frequency of activity	Application duration:
Indoor/Outdoor	Indoor
Release area	
Risk Management Measures	
Consumer Measures	Ensure spraying away from persons.
	Relevant for the spraying process.
Exposure estimate and reference to its source	
AC31	
Assessment method	AISE Reach Exposure Assessment Consumer Tool (REACT)
	Consumer - dermal, long-term - systemic
Exposure estimate	0,0156 mg/kg bw/day
Risk Characterization Ratio (RCR)	0,000568
	Calculated as PC35
AC32	
Assessment method	AISE Reach Exposure Assessment Consumer Tool (REACT)
	Consumer - dermal, long-term - systemic
Exposure estimate	0,458 mg/kg bw/day
Risk Characterization Ratio (RCR)	0,0167
	Calculated as PC35
AC34	
Assessment method	AISE Reach Exposure Assessment Consumer Tool (REACT)
	Consumer - dermal, long-term - systemic
Exposure estimate	0,0156 mg/kg bw/day
Risk Characterization Ratio (RCR)	0,000568
	Calculated as PC35
AC35	
Assessment method	AISE Reach Exposure Assessment Consumer Tool (REACT)
	Consumer - dermal, long-term - systemic
Exposure estimate	0,458 mg/kg bw/day
Risk Characterization Ratio (RCR)	0,0167
	Calculated as PC35
AC36	
Assessment method	AISE Reach Exposure Assessment Consumer Tool (REACT)
	Consumer - inhalation, long-term - systemic
Exposure estimate	0,0596 mg/kg bw/day
Risk Characterization Ratio (RCR)	0,00375
	Calculated as PC35
