

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

Revision Date 18.05.2020

Version 18.3

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

Catalogue No.	100958
Product name	Trichloroethylene EMPLURA®
REACH Registration Number	01-2119490731-36-XXXX 01-2119490731-36-XXXX
CAS-No.	79-01-6

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

Identified uses	Reagent for analysis Scientific research and development In compliance with the conditions described in the annex to this safety data sheet. For additional information on uses please refer to the Merck Chemicals portal (www.merckgroup.com).
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1.3 Details of the supplier of the safety data sheet

Company	Merck KGaA * 64271 Darmstadt * Germany * Phone: +49 6151 72-0
Responsible Department	LS-QHC * e-mail: prodsafe@merckgroup.com

1.4 Emergency telephone number **Please contact the regional company representation in your country.****SECTION 2. Hazards identification****2.1 Classification of the substance or mixture****Classification (REGULATION (EC) No 1272/2008)**

Skin irritation, Category 2, H315
Eye irritation, Category 2, H319
Skin sensitisation, Category 1, H317
Germ cell mutagenicity, Category 2, H341
Carcinogenicity, Category 1B, H350
Specific target organ toxicity - single exposure, Category 3, Central nervous system, H336
Long-term (chronic) aquatic hazard, Category 3, H412
For the full text of the H-Statements mentioned in this Section, see Section 16.

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2.2 Label elements

Labelling (REGULATION (EC) No 1272/2008)

Hazard pictograms



Signal word

Danger

Hazard statements

H350 May cause cancer.
H315 Causes skin irritation.
H317 May cause an allergic skin reaction.
H319 Causes serious eye irritation.
H336 May cause drowsiness or dizziness.
H341 Suspected of causing genetic defects.
H412 Harmful to aquatic life with long lasting effects.

Precautionary statements

Prevention

P201 Obtain special instructions before use.
P273 Avoid release to the environment.
P280 Wear protective gloves.

Response

P302 + P352 IF ON SKIN: Wash with plenty of soap and water.
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes.
Remove contact lenses, if present and easy to do. Continue rinsing.
P308 + P313 IF exposed or concerned: Get medical advice/ attention.

Restricted to professional users.

Reduced labelling (≤125 ml)

Hazard pictograms



Signal word

Danger

Hazard statements

H350 May cause cancer.
H317 May cause an allergic skin reaction.
H341 Suspected of causing genetic defects.
H412 Harmful to aquatic life with long lasting effects.

Precautionary statements

P201 Obtain special instructions before use.
P280 Wear protective gloves.
P302 + P352 IF ON SKIN: Wash with plenty of soap and water.
P308 + P313 IF exposed or concerned: Get medical advice/ attention.

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Index-No. 602-027-00-9

2.3 Other hazards

None known.

SECTION 3. Composition/information on ingredients

Chemical nature Organic substance.

3.1 Substance

Formula	Cl ₂ CCHCl	C ₂ HCl ₃ (Hill)
Index-No.	602-027-00-9	
EC-No.	201-167-4	
Molar mass	131,39 g/mol	

Hazardous components (REGULATION (EC) No 1272/2008)

Chemical name (Concentration)

CAS-No.	Registration number	Classification
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trichloroethylene (>= 80 % - <= 100 %)

Substance does not meet the criteria for PBT or vPvB according to Regulation (EC) No 1907/2006, Annex XIII.

79-01-6	01-2119490731-36-XXXX	01-2119490731-36-XXXX	Skin irritation, Category 2, H315
			Eye irritation, Category 2, H319
			Skin sensitisation, Category 1, H317
			Germ cell mutagenicity, Category 2, H341
			Carcinogenicity, Category 1B, H350
			Specific target organ toxicity - single exposure, Category 3, H336
			Long-term (chronic) aquatic hazard, Category 3, H412

For the full text of the H-Statements mentioned in this Section, see Section 16.

3.2 Mixture

Not applicable

SECTION 4. First aid measures

4.1 Description of first aid measures

After inhalation: fresh air. Call in physician.

In case of skin contact: Take off immediately all contaminated clothing. Rinse skin with water/ shower. Consult a physician.

After eye contact: rinse out with plenty of water. Call in ophthalmologist. Remove contact lenses.

After swallowing: caution if victim vomits. Risk of aspiration! Keep airways free. Pulmonary failure possible after aspiration of vomit. Call a physician immediately. Laxative: Sodium sulfate (1 tablespoon/1/4 l water). activated charcoal (20 - 40 g in 10% slurry).

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After swallowing: immediately make victim drink water (two glasses at most).
Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed

Cough, Shortness of breath, Dizziness, narcosis, agitation, spasms, inebriation,
Nausea, Vomiting, Headache
irritant effects, Allergic reactions, somnolence, Drowsiness

4.3 Indication of any immediate medical attention and special treatment needed

No information available.

SECTION 5. Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media

Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Unsuitable extinguishing media

For this substance/mixture no limitations of extinguishing agents are given.

5.2 Special hazards arising from the substance or mixture

Not combustible.

Fire may cause evolution of:

Hydrogen chloride gas

Ambient fire may liberate hazardous vapours.

5.3 Advice for firefighters

Special protective equipment for firefighters

Stay in danger area only with self-contained breathing apparatus. Prevent skin contact by keeping a safe distance or by wearing suitable protective clothing.

Further information

Suppress (knock down) gases/vapours/mists with a water spray jet. Prevent fire extinguishing water from contaminating surface water or the ground water system.

SECTION 6. Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Advice for non-emergency personnel: Do not breathe vapours, aerosols. Avoid substance contact. Ensure adequate ventilation. Evacuate the danger area, observe emergency procedures, consult an expert.

Advice for emergency responders:

Protective equipment see section 8.

6.2 Environmental precautions

Do not let product enter drains.

6.3 Methods and materials for containment and cleaning up

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Cover drains. Collect, bind, and pump off spills. Observe possible material restrictions (see sections 7 and 10). Take up carefully with liquid-absorbent material (e.g. Chemizorb®). Dispose of properly. Clean up affected area.

6.4 Reference to other sections

Indications about waste treatment see section 13.

SECTION 7. Handling and storage

7.1 Precautions for safe handling

Advice on safe handling

Observe label precautions.

Work under hood. Do not inhale substance/mixture. Avoid generation of vapours/aerosols.

Hygiene measures

Immediately change contaminated clothing. Apply preventive skin protection. Wash hands and face after working with substance.

7.2 Conditions for safe storage, including any incompatibilities

Storage conditions

Tightly closed. Keep in a well-ventilated place. Keep locked up or in an area accessible only to qualified or authorised persons.

Recommended storage temperature see product label.

7.3 Specific end use(s)

See exposure scenario in the Annex to this MSDS.

SECTION 8. Exposure controls/personal protection

8.1 Control parameters

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Derived No Effect Level (DNEL)

Worker DNEL, acute	Systemic effects	inhalation	164,1 mg/m ³
Worker DNEL, acute	Local effects	inhalation	164,1 mg/m ³
Worker DNEL, longterm	Systemic effects	dermal	7,8 mg/kg Body weight
Worker DNEL, longterm	Systemic effects	inhalation	54,7 mg/m ³

Predicted No Effect Concentration (PNEC)

PNEC Fresh water	0,115 mg/l
PNEC Marine water	0,0115 mg/l
PNEC Aquatic intermittent release	0,208 mg/l
PNEC Sewage treatment plant	2,6 mg/l
PNEC Fresh water sediment	2,04 mg/kg
PNEC Marine sediment	0,204 mg/kg
PNEC Soil	0,344 mg/kg
PNEC oral	13,8 mg/kg

8.2 Exposure controls

Engineering measures

Technical measures and appropriate working operations should be given priority over the use of personal protective equipment.

See section 7.1.

Individual protection measures

Protective clothing needs to be selected specifically for the workplace, depending on concentrations and quantities of the hazardous substances handled. The chemical resistance of the protective equipment should be enquired at the respective supplier.

Eye/face protection

Safety glasses

Hand protection

full contact:

Glove material:	Viton (R)
Glove thickness:	0,70 mm
Break through time:	> 480 min

splash contact:

Glove material:	Nitrile rubber
Glove thickness:	0,40 mm
Break through time:	> 10 min

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The protective gloves to be used must comply with the specifications of EC Directive 89/686/EEC and the related standard EN374, for example KCL 890 Vitoject® (full contact), KCL 730 Camatril® -Velours (splash contact).

The breakthrough times stated above were determined by KCL in laboratory tests acc. to EN374 with samples of the recommended glove types.

This recommendation applies only to the product stated in the safety data sheet, supplied by us and for the designated use. When dissolving in or mixing with other substances and under conditions deviating from those stated in EN374 please contact the supplier of CE-approved gloves (e.g. KCL GmbH, D-36124 Eichenzell, Internet: www.kcl.de).

Other protective equipment
protective clothing

Respiratory protection

required when vapours/aerosols are generated.

Recommended Filter type: Filter A (acc. to DIN 3181) for vapours of organic compounds

The entrepreneur has to ensure that maintenance, cleaning and testing of respiratory protective devices are carried out according to the instructions of the producer.

These measures have to be properly documented.

required when vapours/aerosols are generated.

Environmental exposure controls

Do not let product enter drains.

SECTION 9. Physical and chemical properties

9.1 Information on basic physical and chemical properties

Form	liquid
Colour	colourless
Odour	characteristic
Odour Threshold	28 - 2160 ppm
pH	No information available.
Melting point	-84,8 °C at 1.013 hPa
Boiling point/boiling range	87 °C at 1.013 hPa
Flash point	does not flash
Evaporation rate	No information available.

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Flammability (solid, gas)	No information available.
Lower explosion limit	No information available.
Upper explosion limit	No information available.
Vapour pressure	77 hPa at 20 °C
Relative vapour density	4,53
Density	1,46 g/cm ³ at 20 °C
Relative density	No information available.
Water solubility	1,28 g/l at 25 °C
Partition coefficient: n-octanol/water	log Pow: 2,53 (20 °C) Bioaccumulation is not expected. (ECHA)
Auto-ignition temperature	No information available.
Decomposition temperature	> 110 °C
Viscosity, dynamic	0,55 mPa.s at 25 °C
Explosive properties	Not classified as explosive.
Oxidizing properties	none

9.2 Other data

Ignition temperature	410 °C
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SECTION 10. Stability and reactivity

10.1 Reactivity

See section 10.3

10.2 Chemical stability

heat-sensitive

The product is chemically stable under standard ambient conditions (room temperature) .

10.3 Possibility of hazardous reactions

Violent reactions possible with:

Oxygen, (as liquefied gas)

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Alkaline earth metals, alkali amides, semimetallic hydrogen compounds, perchloric acid, Light metals, aluminium chloride, Strong oxidizing agents, potassium nitrate

Risk of explosion with:

Alkali metals, Aluminium, Barium, alkali hydroxides, Lithium, magnesium, Powdered metals, sodium amide, Strong oxidizing agents, nitrogen dioxide, Boranes

Oxygen, with, alkali hydroxides

Oxygen, with, Pressure

Risk of ignition or formation of inflammable gases or vapours with:

Titanium, Beryllium, Epoxy constituents

10.4 Conditions to avoid

Strong heating (decomposition).

Distillation (Risk of explosion).

no information available

10.5 Incompatible materials

various plastics

10.6 Hazardous decomposition products

in the event of fire: See section 5.

SECTION 11. Toxicological information

11.1 Information on toxicological effects

Acute oral toxicity

LD50 Rat: 5.400 - 7.200 mg/kg

(ECHA)

Symptoms: Nausea, Vomiting, Risk of aspiration upon vomiting., Aspiration may cause pulmonary oedema and pneumonitis.
absorption

Acute inhalation toxicity

LC50 Rat: 64,42 mg/l/12500 ppm; 4 h ; vapour

(ECHA)

Symptoms: Possible damages:, mucosal irritations, After a latency period:, Lung oedema

Acute dermal toxicity

LD50 Rabbit: > 20.000 mg/kg

(ECHA)

absorption

Skin irritation

Rabbit

Result: irritating

OECD Test Guideline 404

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Drying-out effect resulting in rough and chapped skin.
Causes skin irritation.

Eye irritation

Rabbit

Result: Eye irritation

(IUCLID)

Causes serious eye irritation.

Sensitisation

Local lymph node assay (LLNA) Mouse

Result: positive

Method: OECD Test Guideline 429

May cause an allergic skin reaction.

Germ cell mutagenicity

Genotoxicity in vivo

Chromosome aberration test

Rat

male

inhalation (vapour)

Bone marrow

Result: negative

Method: OECD Test Guideline 474

Genotoxicity in vitro

Ames test

Salmonella typhimurium

Result: negative

Method: OECD Test Guideline 471

Mutagenicity (mammal cell test): chromosome aberration.

Chinese hamster ovary cells

Result: negative

(ECHA)

Ames test

Escherichia coli

Result: negative

(Lit.)

Carcinogenicity

This information is not available.

Reproductive toxicity

This information is not available.

Teratogenicity

This information is not available.

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CMR effects

Carcinogenicity:

May cause cancer.

Mutagenicity:

Suspected of causing genetic defects.

Specific target organ toxicity - single exposure

May cause drowsiness or dizziness.

Target Organs: Central nervous system

Specific target organ toxicity - repeated exposure

This information is not available.

Aspiration hazard

This information is not available.

11.2 Further information

After absorption:

Headache, Dizziness, Cardiac irregularities, Nausea, agitation, spasms, inebriation, narcosis

Absorption can result in damage to:

Liver, Kidney

After long-term exposure to the chemical:

Toxic effect on:

Central nervous system

Other dangerous properties can not be excluded.

Handle in accordance with good industrial hygiene and safety practice.

This substance should be handled with particular care.

SECTION 12. Ecological information

12.1 Toxicity

Toxicity to fish

flow-through test LC50 Pimephales promelas (fathead minnow): 40,7 mg/l; 96 h
US-EPA

Toxicity to daphnia and other aquatic invertebrates

static test EC50 Daphnia magna (Water flea): 20,8 mg/l; 48 h

Toxicity to algae

ErC50 Chlamydomonas reinhardtii (green algae): 36,5 mg/l; 72 h

Analytical monitoring: yes

(ECHA)

Toxicity to bacteria

static test EC50 activated sludge: 260 mg/l; 3 h

OECD Test Guideline 209

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)

NOEC Daphnia magna (Water flea): 10 mg/l; 21 d

(ECOTOX Database)

12.2 Persistence and degradability

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Biodegradability

2,4 %; 28 d; aerobic

OECD Test Guideline 301C

Not readily biodegradable.

12.3 Bioaccumulative potential

Partition coefficient: n-octanol/water

log Pow: 2,53 (20 °C)

Bioaccumulation is not expected. (ECHA)

Bioaccumulation

Bioconcentration factor (BCF): 17

Lepomis macrochirus (Bluegill sunfish) 0,00823 mg/l; 14 d

Temperature: 16 °C

12.4 Mobility in soil

Distribution among environmental compartments

Adsorption/Soil

log Koc: 1,97

(experimental)

Mobile in soils

12.5 Results of PBT and vPvB assessment

Substance does not meet the criteria for PBT or vPvB according to Regulation (EC)

No 1907/2006, Annex XIII.

12.6 Other adverse effects

Henry constant

998 Pa*m³/mol

(Lit.) Distribution preferentially in air.

Discharge into the environment must be avoided.

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SECTION 13. Disposal considerations

Waste treatment methods

See www.retrologistik.com for processes regarding the return of chemicals and containers, or contact us there if you have further questions.

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SECTION 14. Transport information

Land transport (ADR/RID)

14.1 UN number	UN 1710
14.2 Proper shipping name	TRICHLOROETHYLENE
14.3 Class	6.1
14.4 Packing group	III
14.5 Environmentally hazardous	--
14.6 Special precautions for user	yes
Tunnel restriction code	E

Inland waterway transport (ADN)

Not relevant

Air transport (IATA)

14.1 UN number	UN 1710
14.2 Proper shipping name	TRICHLOROETHYLENE
14.3 Class	6.1
14.4 Packing group	III
14.5 Environmentally hazardous	--
14.6 Special precautions for user	no

Sea transport (IMDG)

14.1 UN number	UN 1710
14.2 Proper shipping name	TRICHLOROETHYLENE
14.3 Class	6.1
14.4 Packing group	III
14.5 Environmentally hazardous	--

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14.6 Special precautions for user yes

EmS F-A S-A

14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Not relevant

SECTION 15. Regulatory information

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

EU regulations

Major Accident Hazard SEVESO III
Legislation Not applicable

Occupational restrictions Take note of Dir 94/33/EC on the protection of young people at work. Observe work restrictions regarding maternity protection in accordance to Dir 92/85/EEC or stricter national regulations where applicable.

Regulation (EC) No 1005/2009 on substances that deplete the ozone layer not regulated

Regulation (EC) No 850/2004 of the European Parliament and of the Council of 29 April 2004 on persistent organic pollutants and amending Directive 79/117/EEC not regulated

Substances of very high concern (SVHC) This product does contain substances of very high concern according to Regulation (EC) No 1907/2006 (REACH), Article 59 above the respective regulatory concentration limit of > 0.1 % (w/w).

Contains: trichloroethylene

This product contains a substance listed on Annex XIV of the REACH Regulation (EC) Nr. 1907/2006.

Listed substance / Sunset Date: trichloroethylene / 21.04.2016

After the sunset date the use of this substance requires either an authorization or can only be used for exempted uses, e.g. use in scientific research and development which includes routine analytics or use as intermediate.

National legislation

Storage class 6.1 D

15.2 Chemical safety assessment

For this product a chemical safety assessment was not carried out.

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SECTION 16. Other information

Full text of H-Statements referred to under sections 2 and 3.

H315	Causes skin irritation.
H317	May cause an allergic skin reaction.
H319	Causes serious eye irritation.
H336	May cause drowsiness or dizziness.
H341	Suspected of causing genetic defects.
H350	May cause cancer.
H412	Harmful to aquatic life with long lasting effects.

Training advice

Provide adequate information, instruction and training for operators.

Labelling

Hazard pictograms



Signal word

Danger

Hazard statements

H315 Causes skin irritation.
H317 May cause an allergic skin reaction.
H319 Causes serious eye irritation.
H336 May cause drowsiness or dizziness.
H341 Suspected of causing genetic defects.
H350 May cause cancer.
H412 Harmful to aquatic life with long lasting effects.

Precautionary statements

Prevention

P201 Obtain special instructions before use.
P273 Avoid release to the environment.
P280 Wear protective gloves.

Response

P302 + P352 IF ON SKIN: Wash with plenty of soap and water.
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes.
Remove contact lenses, if present and easy to do. Continue rinsing.
P308 + P313 IF exposed or concerned: Get medical advice/ attention.

Further information

Restricted to professional users.

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

Used abbreviations and acronyms can be looked up at www.wikipedia.org.

Regional representation

This information is given on the authorised Safety Data Sheet for your country.

The information contained herein is based on the present state of our knowledge. It characterises the product with regard to the appropriate safety precautions. It does not represent a guarantee of any properties of the product.

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EXPOSURE SCENARIO 1 (Industrial use)

1. Industrial use Reagent for analysis)

Sectors of end-use

<i>SU 3</i>	Industrial uses: Uses of substances as such or in preparations at industrial sites
<i>SU9</i>	Manufacture of fine chemicals
<i>SU 10</i>	Formulation [mixing] of preparations and/ or re-packaging (excluding alloys)

Chemical product category

<i>PC21</i>	Laboratory chemicals
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Process categories

<i>PROC1</i>	Use in closed process, no likelihood of exposure
<i>PROC2</i>	Use in closed, continuous process with occasional controlled exposure
<i>PROC3</i>	Use in closed batch process (synthesis or formulation)
<i>PROC4</i>	Use in batch and other process (synthesis) where opportunity for exposure arises
<i>PROC5</i>	Mixing or blending in batch processes for formulation of preparations and articles (multistage and/ or significant contact)
<i>PROC8a</i>	Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities
<i>PROC8b</i>	Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities
<i>PROC9</i>	Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
<i>PROC10</i>	Roller application or brushing
<i>PROC15</i>	Use as laboratory reagent

Environmental Release Categories

<i>ERC1</i>	Manufacture of substances
<i>ERC2</i>	Formulation of preparations
<i>ERC4</i>	Industrial use of processing aids in processes and products, not becoming part of articles
<i>ERC6a</i>	Industrial use resulting in manufacture of another substance (use of intermediates)

2. Contributing scenarios: Operational conditions and risk management measures

2.1 Contributing scenario controlling environmental exposure for: ERC1

Environment factors not influenced by risk management

Dilution Factor (River)	589
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Other given operational conditions affecting environmental exposure

Number of emission days per year	365
Emission or Release Factor:	4,8 kg/day
Air	

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Emission or Release Factor: 1,9 kg/day
Water

Technical conditions and measures / Organizational measures

Air Use of air emission abatement equipments.

Conditions and measures related to municipal sewage treatment plant

Type of Sewage Treatment Default industrial size
Plant
Effectiveness (of a measure) 99,9 %
Sludge Treatment Sewage sludge should be incinerated.

2.2 Contributing scenario controlling environmental exposure for: ERC2, SpERC ESVOC 3

Amount used

Daily amount per site 412,9 t

Environment factors not influenced by risk management

Dilution Factor (River) 10
Dilution Factor (Coastal Areas) 100

Other given operational conditions affecting environmental exposure

Continuous exposure
Number of emission days per year 300
Emission or Release Factor: 0,01 %
Air
Emission or Release Factor: 0,001 %
Water
Emission or Release Factor: 0,001 %
Soil
Remarks Apply risk management measures and operational conditions as specified in the SpERC description.

Conditions and measures related to municipal sewage treatment plant

Type of Sewage Treatment Municipal sewage treatment plant
Plant
Percentage removed from waste water 88,8 %

2.3 Contributing scenario controlling environmental exposure for: ERC4, SpERC ESVOC 44

Amount used

Daily amount per site 140 kg

Environment factors not influenced by risk management

Dilution Factor (River) 10
Dilution Factor (Coastal Areas) 100

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Other given operational conditions affecting environmental exposure

Continuous exposure
Number of emission days per year 300
Emission or Release Factor: 10 %
Air
Emission or Release Factor: 0 %
Water
Emission or Release Factor: 0,001 %
Soil
Remarks Apply risk management measures and operational conditions as specified in the SpERC description.

Conditions and measures related to municipal sewage treatment plant

Percentage removed from waste water 88,8 %

2.4 Contributing scenario controlling environmental exposure for: ERC6a, SpERC ESVOC 2

Amount used

Daily amount per site 54,795 t

Environment factors not influenced by risk management

Dilution Factor (River) 10
Dilution Factor (Coastal Areas) 100

Other given operational conditions affecting environmental exposure

Continuous exposure
Number of emission days per year 365
Emission or Release Factor: 0,0009 %
Air
Emission or Release Factor: 0 %
Water
Emission or Release Factor: 0,1 %
Soil
Remarks Apply risk management measures and operational conditions as specified in the SpERC description.

Technical conditions and measures / Organizational measures

Air Enclosed process
Water Enclosed process
Soil Enclosed process

Conditions and measures related to municipal sewage treatment plant

Remarks No discharge of substance into waste water

2.5 Contributing scenario controlling worker exposure for: PROC1

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Product characteristics

Concentration of the Substance in Mixture/Article	Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use)	High volatile liquid

Frequency and duration of use

Frequency of use	8 hours/day
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Other operational conditions affecting workers exposure

Outdoor / Indoor	Indoor without local exhaust ventilation (LEV)
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Additional good practice advice beyond the REACH Chemical Safety Assessment

Additional good practice advice	Wear suitable gloves (tested to EN374) and eye protection. Wear suitable coveralls to prevent exposure to the skin.
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2.6 Contributing scenario controlling worker exposure for: PROC2

Product characteristics

Concentration of the Substance in Mixture/Article	Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use)	High volatile liquid

Frequency and duration of use

Frequency of use	8 hours/day
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Other operational conditions affecting workers exposure

Outdoor / Indoor	Indoor with enhanced general ventilation
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Additional good practice advice beyond the REACH Chemical Safety Assessment

Additional good practice advice	Wear suitable gloves (tested to EN374) and eye protection. Wear suitable coveralls to prevent exposure to the skin.
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2.7 Contributing scenario controlling worker exposure for: PROC3, PROC8b, PROC15

Product characteristics

Concentration of the Substance in Mixture/Article	Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use)	High volatile liquid

Frequency and duration of use

Frequency of use	8 hours/day
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Other operational conditions affecting workers exposure

Outdoor / Indoor	Indoor with local exhaust ventilation (LEV)
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Additional good practice advice beyond the REACH Chemical Safety Assessment

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

Catalogue No.	100958
Product name	Trichloroethylene EMPLURA®

Additional good practice advice	Wear suitable gloves (tested to EN374) and eye protection. Wear suitable coveralls to prevent exposure to the skin.
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2.8 Contributing scenario controlling worker exposure for: PROC4, PROC5, PROC8a, PROC9

Product characteristics

Concentration of the Substance in Mixture/Article	Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use)	High volatile liquid

Frequency and duration of use

Frequency of use	8 hours/day
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Other operational conditions affecting workers exposure

Outdoor / Indoor	Indoor with LEV and enhanced general ventilation
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Additional good practice advice beyond the REACH Chemical Safety Assessment

Additional good practice advice	Wear suitable gloves (tested to EN374) and eye protection. Wear suitable coveralls to prevent exposure to the skin.
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2.9 Contributing scenario controlling worker exposure for: PROC10

Product characteristics

Concentration of the Substance in Mixture/Article	Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use)	High volatile liquid

Frequency and duration of use

Frequency of use	8 hours/day
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Other operational conditions affecting workers exposure

Outdoor / Indoor	Indoor with LEV and enhanced general ventilation
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Conditions and measures related to personal protection, hygiene and health evaluation

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.

Additional good practice advice beyond the REACH Chemical Safety Assessment

Additional good practice advice	Use suitable eye protection. Wear suitable coveralls to prevent exposure to the skin.
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3. Exposure estimation and reference to its source

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

Catalogue No. 100958
Product name Trichloroethylene EMPLURA®

Environment

CS	Use descriptor	Msafe	Compartment	RCR	Exposure Assessment Method
2.1	ERC1		All compartments	< 1	Measured data
2.2	ERC2		All compartments	< 1	ECETOC TRA
2.3	ERC4		All compartments	< 1	ECETOC TRA
2.4	ERC6a		All compartments	< 1	ECETOC TRA

Workers

CS	Use descriptor	Exposure duration, route, effect	RCR	Exposure Assessment Method
2.5	PROC1	longterm, inhalative, systemic	< 0,01	ECETOC TRA 3
		longterm, dermal, systemic	< 0,01	ECETOC TRA 3
		longterm, combined, systemic	< 0,01	
2.6	PROC2	longterm, inhalative, systemic	0,75	ECETOC TRA 3
		longterm, dermal, systemic	0,18	ECETOC TRA 3
		longterm, combined, systemic	0,93	
2.7	PROC3	longterm, inhalative, systemic	0,50	ECETOC TRA 3
		longterm, dermal, systemic	< 0,01	ECETOC TRA 3
		longterm, combined, systemic	0,51	
2.7	PROC8b	longterm, inhalative, systemic	0,53	ECETOC TRA 3
		longterm, dermal, systemic	0,09	ECETOC TRA 3
		longterm, combined, systemic	0,61	
2.7	PROC15	longterm, inhalative, systemic	0,50	ECETOC TRA 3
		longterm, dermal, systemic	< 0,01	ECETOC TRA 3
		longterm, combined, systemic	0,50	
2.8	PROC4	longterm, inhalative, systemic	0,30	ECETOC TRA 3
		longterm, dermal, systemic	0,09	ECETOC TRA 3
		longterm, combined, systemic	0,39	
2.8	PROC5	longterm, inhalative, systemic	0,75	ECETOC TRA 3
		longterm, dermal, systemic	0,18	ECETOC TRA 3
		longterm, combined, systemic	0,93	
2.8	PROC8a	longterm, inhalative, systemic	0,75	ECETOC TRA 3
		longterm, dermal, systemic	0,18	ECETOC TRA 3
		longterm, combined, systemic	0,93	
2.8	PROC9	longterm, inhalative, systemic	0,60	ECETOC TRA 3
		longterm, dermal, systemic	0,09	ECETOC TRA 3
		longterm, combined, systemic	0,69	
2.9	PROC10	longterm, inhalative, systemic	0,75	ECETOC TRA 3
		longterm, dermal, systemic	0,18	ECETOC TRA 3
		longterm, combined, systemic	0,93	

The default parameters and -efficiencies of the applied exposure assessment model were used for the calculation (unless stated differently).

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according to Regulation (EC) No. 1907/2006

Catalogue No.	100958
Product name	Trichloroethylene EMPLURA®

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

Please refer to the following documents: ECHA Guidance on information requirements and chemical safety assessment Chapter R.12: Use descriptor system; ECHA Guidance for downstream users; ECHA Guidance on information requirements and chemical safety assessment Part D: Exposure Scenario Building, Part E: Risk Characterisation and Part G: Extending the SDS; VCI/Cefic REACH Practical Guides on Exposure Assessment and Communications in the Supply Chain; CEFIC Guidance Specific Environmental Release Categories (SPERCs).

For scaling of worker exposure assessments performed with ECETOC TRA, please consult the Merck tool ScIDeEx® at www.merckmillipore.com/scideex.

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

Catalogue No. 100958
Product name Trichloroethylene EMPLURA®

EXPOSURE SCENARIO 2 (Professional use)

1. Professional use Reagent for analysis)

Sectors of end-use

SU 22 Professional uses: Public domain (administration, education, entertainment, services, craftsmen)

Chemical product category

PC21 Laboratory chemicals

Process categories

PROC15 Use as laboratory reagent

Environmental Release Categories

ERC2 Formulation of preparations

ERC6a Industrial use resulting in manufacture of another substance (use of intermediates)

2. Contributing scenarios: Operational conditions and risk management measures

2.1 Contributing scenario controlling environmental exposure for: ERC2, SpERC ESVOC 3

Amount used

Daily amount per site 412,9 t

Environment factors not influenced by risk management

Dilution Factor (River) 10

Dilution Factor (Coastal Areas) 100

Other given operational conditions affecting environmental exposure

Continuous exposure

Number of emission days per year 300

Emission or Release Factor: 0,01 %

Air

Emission or Release Factor: 0,001 %

Water

Emission or Release Factor: 0,001 %

Soil

Remarks Apply risk management measures and operational conditions as specified in the SpERC description.

Conditions and measures related to municipal sewage treatment plant

Type of Sewage Treatment Plant Municipal sewage treatment plant

Percentage removed from waste water 88,8 %

2.2 Contributing scenario controlling environmental exposure for: ERC6a, SpERC ESVOC 2

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

Catalogue No.	100958
Product name	Trichloroethylene EMPLURA®

Amount used

Daily amount per site	54,795 t
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Environment factors not influenced by risk management

Dilution Factor (River)	10
Dilution Factor (Coastal Areas)	100

Other given operational conditions affecting environmental exposure

Continuous exposure	
Number of emission days per year	365
Emission or Release Factor: Air	0,0009 %
Emission or Release Factor: Water	0 %
Emission or Release Factor: Soil	0,1 %
Remarks	Apply risk management measures and operational conditions as specified in the SpERC description.

Technical conditions and measures / Organizational measures

Air	Enclosed process
Water	Enclosed process
Soil	Enclosed process

Conditions and measures related to municipal sewage treatment plant

Remarks	No discharge of substance into waste water
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2.3 Contributing scenario controlling worker exposure for: PROC1

Product characteristics

Concentration of the Substance in Mixture/Article	Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use)	High volatile liquid

Frequency and duration of use

Frequency of use	8 hours/day
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Other operational conditions affecting workers exposure

Outdoor / Indoor	Indoor with LEV and good general ventilation
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Additional good practice advice beyond the REACH Chemical Safety Assessment

Additional good practice advice	Wear suitable gloves (tested to EN374) and eye protection. Wear suitable coveralls to prevent exposure to the skin.
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3. Exposure estimation and reference to its source

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

Catalogue No. 100958
Product name Trichloroethylene EMPLURA®

Environment

CS	Use descriptor	Msafe	Compartment	RCR	Exposure Assessment Method
2.1	ERC2		All compartments	< 1	ECETOC TRA
2.2	ERC6a		All compartments	< 1	ECETOC TRA

Workers

CS	Use descriptor	Exposure duration, route, effect	RCR	Exposure Assessment Method
2.3	PROC15	longterm, inhalative, systemic	0,70	ECETOC TRA 3
		longterm, dermal, systemic	< 0,01	ECETOC TRA 3
		longterm, combined, systemic	0,71	

The default parameters and -efficiencies of the applied exposure assessment model were used for the calculation (unless stated differently).

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

Please refer to the following documents: ECHA Guidance on information requirements and chemical safety assessment Chapter R.12: Use descriptor system; ECHA Guidance for downstream users; ECHA Guidance on information requirements and chemical safety assessment Part D: Exposure Scenario Building, Part E: Risk Characterisation and Part G: Extending the SDS; VCI/Cefic REACH Practical Guides on Exposure Assessment and Communications in the Supply Chain; CEFIC Guidance Specific Environmental Release Categories (SPERCs).

For scaling of worker exposure assessments performed with ECETOC TRA, please consult the Merck tool ScIDeEx® at www.merckmillipore.com/scideex.

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