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

1.1 Product identifier

Trade name

DOWPER™* Pure Power Perchloroethylene

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

Relevant identified uses of the substance or mixture
Industrial use:
Formulation and (re)packing of substance and mixtures
Use in textile cleaning - industrial use
Professional use:
Use in textile cleaning - professional use

Uses advised against
Uses which are not mentioned in the relevant identified uses.

Reference to relevant exposure scenarios
For an overview of the exact titles of the relevant exposure scenarios please refer to section 16 of this SDS.

1.3 Details of the supplier of the safety data sheet

Address
SAFECHEM Europe GmbH
Tersteegenstr. 25
40474 Düsseldorf
Germany

Telephone no.	+49 211 4389300
Fax no.	+49 211 4389389
e-mail	service@safechem.com

Advice on Safety Data Sheet
sds@safechem.com

1.4 Emergency telephone number

For medical advice (in German and English):
+49 (0)551 192 40 (Giftinformationszentrum Nord)
In case of transport incidents and other emergencies:
+44 (0) 1235 239 670 (NCEC, National Chemical Emergency Centre)

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Classification in accordance with Regulation (EC) No 1272/2008 (CLP)
Aquatic Chronic 2; H411
Carc. 2; H351
Eye Irrit. 2; H319
Skin Irrit. 2; H315
Skin Sens. 1B; H317
STOT SE 3; H336

Classification information
This product is assessed and classified using the methods and criteria below referred to in Article 9 of Regulation (EC) n° 1272/2008:
Physical hazards: determined through assessment data based on the methods or standards referred to in part 2 of Annex I to CLP
Health hazards and environmental hazards: determined through toxicological and ecotoxicological assessment data based on the methods or standards referred to in Part 3, 4 and 5 of Annex I to CLP.

2.2 Label elements

Labelling according to Regulation (EC) No 1272/2008 (CLP Regulation)

Hazard pictograms


GHS07


GHS08


GHS09

Signal word
Warning

Hazardous component(s) to be indicated on label:
tetrachloroethylene

Hazard statement(s)

H315	Causes skin irritation.
H317	May cause an allergic skin reaction.
H319	Causes serious eye irritation.
H336	May cause drowsiness or dizziness.
H351	Suspected of causing cancer.
H411	Toxic to aquatic life with long lasting effects.

Precautionary statement(s)

P201	Obtain special instructions before use.
P261	Avoid breathing dust/fume/gas/mist/vapours/spray.
P273	Avoid release to the environment.
P280	Wear protective gloves/protective clothing/eye protection/face protection.
P304+P340	IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P312	Call a POISON CENTER/doctor if you feel unwell.
P362+P364	Take off contaminated clothing and wash it before reuse.
P502	Refer to manufacturer or supplier for information on recovery or recycling.

2.3 Other hazards

PBT assessment
The product is not considered to be a PBT.

vPvB assessment
The product is not considered to be a vPvB.

SECTION 3: Composition/information on ingredients

3.1 Substances

Not applicable. The product is not a substance.

3.2 Mixtures

Hazardous ingredients

No	Substance name		Additional information	
	CAS / EC / Index / REACH no	Classification (EC) 1272/2008 (CLP)	Concentration	%
1	**tetrachloroethylene**			
	127-18-4 204-825-9 602-028-00-4 01-2119475329-28	Aquatic Chronic 2; H411 Carc. 2; H351 Skin Irrit. 2; H315 STOT SE 3; H336 Skin Sens. 1B; H317 Eye Irrit. 2; H319	< 100.00	wt%

Full Text for all H-phrases and EUH-phrases: pls. see section 16

SECTION 4: First aid measures

4.1 Description of first aid measures

General information
Adhere to personal protective measures when giving first aid. If the patient is likely to become unconscious, place and transport in stable sideways position. In case of persisting adverse effects, consult a physician. In case of allergic symptoms, especially respiratory tract related, seek medical help immediately. Remove contaminated clothing and shoes immediately, and launder thoroughly before reusing.

After inhalation
Remove affected persons from dangerous area by observing suitable respiratory protection measures. Remove to fresh air, keep patient warm and at rest. If breathing is irregular or stopped, administer artificial respiration. When giving mouth-to-mouth resuscitation first aider should take precautions to protect himself using a mask. Take medical treatment.

After skin contact
In case of contact with skin wash off immediately with soap and water.

After eye contact
Remove contact lenses. Rinse eye thoroughly under running water keeping eyelids wide open and protecting the unaffected eye (at least 10 to 15 minutes). Get medical attention if pain still persists.

After ingestion
Call a doctor immediately. Do not induce vomiting without medical advice. Never give anything by mouth to an unconscious person.

4.2 Most important symptoms and effects, both acute and delayed
No data available.

4.3 Indication of any immediate medical attention and special treatment needed
Exposure to product may lead to increased myocardial irritability. Only give patients sympathetic nervous system stimulating agents in extreme emergencies. Consumption of alcohol before or after exposure may increase side effects.

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media
Product itself is non-combustible; adapt fire extinguishing measures to surrounding areas.

Unsuitable extinguishing media
High power water jet

5.2 Special hazards arising from the substance or mixture
In the event of fire, the following can be released: Carbon monoxide and carbon dioxide; Hydrogen chloride (HCl); Chlorine (Cl2); Phosgene; Traces of: Polychlorinated dioxins and furans (PCDD, PCDF); Explosive dichloroacetylene is formed at low pyrolysis temperatures. Vapours are heavier than air and may spread along floors.

5.3 Advice for firefighters
In event of a fire immediately cordon off the area and evacuate all persons from the danger zone. Use self-contained breathing apparatus. Wear full protective suit. Containers close to fire should be transferred to a safe place. Cool closed containers exposed to fire with water. Do not allow run-off from fire fighting to enter drains or water courses.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

For non-emergency personnel
Only engage trained and adequately protected personnel. Use personal protective clothing. Keep people away and stay on the upwind side. Provide good room ventilation even at ground level (vapours are heavier than air).

For emergency responders
Personal protective equipment (PPE) - see section 8.

6.2 Environmental precautions
Do not discharge into the drains/surface waters/groundwater. Do not discharge into the subsoil/soil. In case of entry into waterways, soil or drains, inform the responsible authorities.

6.3 Methods and material for containment and cleaning up
Contain and collect spillage with non-combustible absorbent materials, e.g. sand, earth, vermiculite, diatomaceous earth and place in container for disposal according to local regulations (see section 13). Prevent spread over a wide area (by containment with sand or earth).

6.4 Reference to other sections
Information regarding safe handling, see section 7. Information regarding personal protective measures, see section 8. Information regarding waste disposal, see section 13.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Advice on safe handling
Risks inherent to handling the product must be minimised by applying the appropriate protective and preventive measures. Working processes should - so far as possible, according to the state of the art - be designed to rule out bodily contact or the release of hazardous substances. Provide good room ventilation even at ground level (vapours are heavier than air).

General protective and hygiene measures
Do not inhale vapours. Do not eat, drink or smoke during work time. After worktime and during work intervals the affected skin areas must be thoroughly cleaned. Avoid contact with eyes and skin. Keep away from foodstuffs and beverages. Provide eye wash fountain in work area. Have emergency shower available.

Advice on protection against fire and explosion
The product vapours are heavier than air.

7.2 Conditions for safe storage, including any incompatibilities

Technical measures and storage conditions
Keep container tightly closed and dry in a cool, well-ventilated place. Protect from heat and direct sunlight. Keep away from sources of ignition. Protect from light.

Requirements for storage rooms and vessels
Containers which are opened must be carefully closed and kept upright to prevent leakage.
Inappropriate material zinc; aluminium; aluminum alloys; plastic

Incompatible products
Substances to be avoided, see section 10.

7.3 Specific end use(s)

Industry solution
For further information contact supplier.

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Occupational exposure limit values

No	Substance name	CAS no.		EC no.	
1	**tetrachloroethylene**	**127-18-4**		**204-825-9**	
	2017/164/EU				
	Tetrachloroethylene				
	WEL short-term (15 min reference period)	275	mg/m³	40	ppm
	WEL long-term (8-hr TWA reference period)	138	mg/m³	20	ppm
	Skin resorption / sensibilisation	skin			
	List of approved workplace exposure limits (WELs) / EH40				
	Tetrachloroethylene				
	WEL short-term (15 min reference period)	275	mg/m³	40	ppm
	WEL long-term (8-hr TWA reference period)	138	mg/m³	20	ppm
	Comments	Sk			

DNEL, DMEL and PNEC values

DNEL values (worker)

No	Substance name			CAS / EC no	
	Route of exposure	Exposure time	Effect	Value	
1	**tetrachloroethylene**			**127-18-4** **204-825-9**	
	dermal	Long term (chronic)	systemic	39.40	mg/kg/day
	inhalative	Long term (chronic)	systemic	138.00	mg/m³
	inhalative	Short term (acut)	systemic	275.00	mg/m³

DNEL value (consumer)

No	Substance name			CAS / EC no	
	Route of exposure	Exposure time	Effect	Value	
1	**tetrachloroethylene**			**127-18-4** **204-825-9**	
	oral	Long term (chronic)	systemic	1.30	mg/kg/day
	dermal	Long term (chronic)	systemic	23.00	mg/kg/day
	inhalative	Long term (chronic)	systemic	34.50	mg/m³
	inhalative	Short term (acut)	systemic	138.00	mg/m³

PNEC values

No	Substance name		CAS / EC no	
	ecological compartment	Type	Value	
1	**tetrachloroethylene**		**127-18-4** **204-825-9**	
	water	fresh water	0.051	mg/L
	water	marine water	0.005	mg/L
	water	fresh water sediment	0.903	mg/kg
	with reference to: dry weight			
	water	marine water sediment	0.09	mg/kg
	with reference to: dry weight			
	soil	-	0.01	mg/kg
	with reference to: dry weight			
	sewage treatment plant	-	11.20	mg/L

8.2 Exposure controls

Appropriate engineering controls
Provide adequate ventilation. Where reasonably practicable this should be achieved by the use of local exhaust ventilation and good general extraction. If these are not sufficient to maintain concentrations of particulates and solvent vapour below the OEL (=Occupational Exposure Limit), suitable respiratory protection must be worn.

Personal protective equipment

Respiratory protection
If workplace exposure limits are exceeded, a respiration protection approved for this particular job must be worn. In case of aerosol and mist formation, take appropriate measures for breathing protection in the event workplace threshold values are not specified. Filter A or environment-independent breathing apparatus.

Eye / face protection
Tightly fitting safety glasses (EN 166).

Hand protection
Sufficient protection is given wearing suitable protective gloves checked according to i.e. EN 374, in the event of risk of skin contact with the product. Before use, the protective gloves should be tested in any case for its specific work-station suitability (i.e. mechanical resistance, product compatibility and antistatic properties). Adhere to the manufacturer's instructions and information relating to the use, storage, care and replacement of protective gloves. Protective gloves shall be replaced immediately when physically damaged or worn. Design operations thus to avoid permanent use of protective gloves.

Appropriate Material	ethyl vinyl alcohol laminate (EVAL)		
Appropriate Material	polyvinyl alcohol		
Appropriate Material	viton		
Appropriate Material	In case of short-term contact / splash protection:		
Material thickness	>	0.35	mm
Breakthrough time	>	60	min
Appropriate Material	In case of longer-term contact:		
Material thickness	>	0.35	mm
Breakthrough time	>	240	min

Other
Chemical-resistant work clothes.

Environmental exposure controls
No data available.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

State of aggregation
liquid

Form
Liquid

Colour
colourless

Odour
characteristic

pH value
No data available

Boiling point / boiling range			
Value		121	°C
Source	supplier		

Melting point/freezing point			
Value		-22	°C
Source	supplier		

Decomposition temperature			
Value	>	140	°C
Source	supplier		

Flash point	
Method	ASTM D 56
Source	supplier
Comments	non-flammable

Ignition temperature
No data available

Auto-ignition temperature	
Source	supplier
Comments	Product is not selfigniting.

Oxidising properties
not oxidizing

Explosive properties
The product does not have explosive properties.

Flammability
No data available

Lower explosion limit
No data available

Upper explosion limit
No data available

Vapour pressure			
Value		1.73	kPa
Reference temperature		20	°C
Source	supplier		

Relative vapour density		
Value	5.76	
Source	supplier	

Relative density	
Value	1.619

Reference temperature	25	°C
Source	supplier	

Density
No data available

Solubility in water		
Value	0.015	%
Reference temperature	25	°C
Source	supplier	

Solubility
No data available

Partition coefficient n-octanol/water (log value)			
No	**Substance name**	**CAS no.**	**EC no.**
1	**tetrachloroethylene**	**127-18-4**	**204-825-9**

log Pow	2.53	
Reference temperature	23	°C
Source	ECHA	

Kinematic viscosity		
Value	0.52	mm²/s
Reference temperature	25	°C
Type	kinematic	
Source	supplier	

Particle characteristics
No data available

9.2 Other information

Other information
No data available.

SECTION 10: Stability and reactivity

10.1 Reactivity
No data available.

10.2 Chemical stability
Stable under recommended storage and handling conditions (See section 7).

10.3 Possibility of hazardous reactions
Dangerous reactions are not to be expected when handling product according to its intended use.

10.4 Conditions to avoid
Hazard of decomposition at higher temperatures. Heat, naked flames and other ignition sources. Protect from sun.

10.5 Incompatible materials
strong bases; strong oxidizing agents; reactive metals (i.e. sodium, calcium, zinc etc.); Earth alkali metals; Alkali metals; Avoid unintentional contact with: Amines

10.6 Hazardous decomposition products
Phosgene; Hydrogen chloride (HCl); Chlorine; Traces of: Polychlorinated dioxins and furans (PCDD, PCDF); Explosive dichloroacetylene is formed at low pyrolysis temperatures.

SECTION 11: Toxicological information

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

Acute oral toxicity			
No	**Substance name**	**CAS no.**	**EC no.**
1	**tetrachloroethylene**	**127-18-4**	**204-825-9**

LD50	3005	mg/kg bodyweight
Species	rat	

Method	OECD 401
Source	ECHA

Acute dermal toxicity			
No	**Substance name**	**CAS no.**	**EC no.**
1	**tetrachloroethylene**	**127-18-4**	**204-825-9**

LD50	>	10000	mg/kg bodyweight
Species	rabbit		
Source	supplier		

Acute inhalational toxicity			
No	**Substance name**	**CAS no.**	**EC no.**
1	**tetrachloroethylene**	**127-18-4**	**204-825-9**

LC50		21	mg/l
Duration of exposure		4	h
State of aggregation	Vapour		
Species	rat		
Source	ECHA		

Skin corrosion/irritation			
No	**Substance name**	**CAS no.**	**EC no.**
1	**tetrachloroethylene**	**127-18-4**	**204-825-9**

Species	rabbit
Method	OECD 404
Source	ECHA
Evaluation	irritant

Serious eye damage/irritation
No data available

Respiratory or skin sensitisation			
No	**Substance name**	**CAS no.**	**EC no.**
1	**tetrachloroethylene**	**127-18-4**	**204-825-9**

Route of exposure	Skin
Species	mouse
Method	OECD 429
Source	ECHA
Evaluation	sensitizing

Germ cell mutagenicity			
No	**Substance name**	**CAS no.**	**EC no.**
1	**tetrachloroethylene**	**127-18-4**	**204-825-9**

Method	OECD 473
Source	ECHA
Evaluation/classification	Based on available data, the classification criteria are not met.

Reproduction toxicity			
No	**Substance name**	**CAS no.**	**EC no.**
1	**tetrachloroethylene**	**127-18-4**	**204-825-9**

Method	EPA OTS 798.4700
Source	ECHA
Evaluation/classification	Based on available data, the classification criteria are not met.
Method	OECD 414
Source	ECHA
Evaluation/classification	Based on available data, the classification criteria are not met.

Carcinogenicity			
No	**Substance name**	**CAS no.**	**EC no.**
1	**tetrachloroethylene**	**127-18-4**	**204-825-9**

Method	OECD 451
Source	ECHA
Evaluation/classification	Based on available data, the classification criteria are met.

STOT - single exposure

No data available

STOT - repeated exposure
No data available

Aspiration hazard
No data available

11.2 Information on other hazards

Endocrine disrupting properties
No data available.

Other information
No data available.

SECTION 12: Ecological information

12.1 Toxicity

Toxicity to fish (acute)
No data available

Toxicity to fish (chronic)
No data available

Toxicity to Daphnia (acute)			
No	**Substance name**	**CAS no.**	**EC no.**
1	**tetrachloroethylene**	**127-18-4**	**204-825-9**

EC50		8.5	mg/l
Duration of exposure		48	h
Species	Daphnia magna		
Method	ASTM 1980		
Source	ECHA		

Toxicity to Daphnia (chronic)			
No	**Substance name**	**CAS no.**	**EC no.**
1	**tetrachloroethylene**	**127-18-4**	**204-825-9**

NOEC		510	µg/l
Duration of exposure		28	day(s)
Species	Daphnia magna		
Method	ASTM Draft No. 4		
Source	ECHA		

Toxicity to algae (acute)
No data available

Toxicity to algae (chronic)
No data available

Bacteria toxicity
No data available

12.2 Persistence and degradability

Biodegradability			
No	**Substance name**	**CAS no.**	**EC no.**
1	**tetrachloroethylene**	**127-18-4**	**204-825-9**

Type	aerobic biodegradation		
Value		0	%
Duration		21	day(s)
Method	closed bottle test		
Source	ECHA		

12.3 Bioaccumulative potential

Partition coefficient n-octanol/water (log value)			
No	**Substance name**	**CAS no.**	**EC no.**

1	tetrachloroethylene	127-18-4	204-825-9
log Pow		2.53	
Reference temperature		23	°C
Source		ECHA	

12.4 Mobility in soil

Mobility in soil			
No	**Substance name**	**CAS no.**	**EC no.**
1	**tetrachloroethylene**	**127-18-4**	**204-825-9**
Source		supplier	
Evaluation/classification		high potential for mobility in soil (pOC: 50 - 150). partition coefficient (Koc): 141 (estimated)	

12.5 Results of PBT and vPvB assessment

Results of PBT and vPvB assessment	
PBT assessment	The product is not considered to be a PBT.
vPvB assessment	The product is not considered to be a vPvB.

12.6 Endocrine disrupting properties

No data available.

12.7 Other adverse effects

No data available.

12.8 Other information

Other information
Product is not allowed to discharge into aquatic environment, drains or sewage treatment plants.

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product

Disposal of the product should be carried out in accordance with all applicable regulations following consultation with the responsible local authority and the disposal company in an authorised and suitable disposal facility.
Allocation of a waste code number, according to the European Waste Catalogue, should be carried out in agreement with the regional waste disposal company.

Packaging

Residues must be removed from packaging and when emptied completely disposed of in accordance with the regulations for waste removal. Incompletely emptied packaging must be disposed of in the form of disposal specified by the regional disposer.

SECTION 14: Transport information

14.1 Transport ADR/RID/ADN

Class	6.1
Classification code	T1
Packing group	III
Hazard identification no.	60
UN number	UN1897
Proper shipping name	TETRACHLOROETHYLENE
Tunnel restriction code	E
Label	6.1
Environmentally hazardous substance mark	Symbol "fish and tree"

14.2 Transport IMDG

Class	6.1
Packing group	III
UN number	UN1897
Proper shipping name	TETRACHLOROETHYLENE
EmS	F-A, S-A

Marine Pollutant (according Index IMDG Code)	P
Label	6.1
Marine pollutant mark	Symbol "fish and tree"

14.3 Transport ICAO-TI / IATA

Class	6.1
Packing group	III
UN number	UN1897
Proper shipping name	Tetrachloroethylene
Label	6.1

14.4 Other information

No data available.

14.5 Environmental hazards

Information on environmental hazards, if relevant, please see 14.1 - 14.3.

14.6 Special precautions for user

No data available.

14.7 Maritime transport in bulk according to IMO instruments

Not relevant

SECTION 15: Regulatory information

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

EU regulations

Regulation (EC) No 1907/2006 (REACH) Annex XIV (List of substances subject to authorisation)
According to the data available and/or specifications supplied by upstream suppliers, this product does not contain any substances considered as substances requiring authorisation as listed on Annex XIV of the REACH regulation (EC) 1907/2006.

REACH candidate list of substances of very high concern (SVHC) for authorisation
According to available data and the information provided by preliminary suppliers, the product does not contain substances that are considered substances meeting the criteria for inclusion in annex XIV (List of Substances Subject to Authorisation) as laid down in Article 57 and article 59 of REACH (EC) 1907/2006.

Regulation (EC) No 1907/2006 (REACH) Annex XVII: RESTRICTIONS ON THE MANUFACTURE, PLACING ON THE MARKET AND USE OF CERTAIN DANGEROUS SUBSTANCES, MIXTURES AND ARTICLES	
The product is considered being subject to REACH regulation (EC) 1907/2006 annex XVII.	No 3, 75

Directive 2012/18/EU on the control of major-accident hazards involving dangerous substances	
This product is subject to Part I of Annex I, risk category:	E2

Directive 2010/75/EU on industrial emissions (integrated pollution prevention and control)	
VOC content	100.00 %

Other regulations
Adhere to the national sanitary and occupational safety regulations when using this product.

15.2 Chemical safety assessment

A chemical safety assessment has been carried out for this substance.

SECTION 16: Other information

Further information

™*Trademark of The Dow Chemical Company

Sources of key data used to compile the data sheet:

Regulation (EC) No 1907/2006 (REACH), 1272/2008 (CLP) as amended in each case.
Directives 2000/39/EC, 2006/15/EC, 2009/161/EU, (EU) 2017/164.
National Threshold Limit Values of the corresponding countries as amended in each case.
Transport regulations according to ADR, RID, IMDG, IATA as amended in each case.

The data sources used to determine physical, toxic and ecotoxic data, are indicated directly in the corresponding section.

List of existing exposition scenarios

ES001	Formulation and (re)packing of substance and mixtures - industrial use
ES002	used for cleaning textiles - industrial use
ES003	Use in Textiles - professional use

Creation of the safety data sheet

UMCO GmbH - D-21107 Hamburg, Georg-Wilhelm-Strasse 187, Tel.: +49(40)555 546 300, Fax: +49(40)555 546 357, e-mail: umco@umco.de

This information is based on our present knowledge and experience.
The safety data sheet describes products with a view to safety requirements.
It does not however, constitute a guarantee for any specific product properties and shall not establish a legally valid contractual relationship.

Alterations/supplements:
Alterations to the previous edition are marked in the left-hand margin.

Prod-ID 723284

SECTION 1: Title and scope of exposure scenario (ES)

1.1 Title exposure scenario (ES)

ES1 Formulation and (re)packing of substance and mixtures - industrial use

1.2 Scope of exposure scenario (ES)

ES Type	Worker Exposure Scenario for substance/mixture
Life cycle stage	Formulation

Product identifier

Trade name	DOWPER™* Pure Power Perchloroethylene

Use descriptors

Sector of use (SU)		
Category	Code	Use description
Main user group	SU3	Industrial uses
Environmental release category (ERC)		
Category	Code	Use description
Environmental release category (ERC)	ERC2	Formulation of preparations
Specific Environmental Release Category (SpERC)	ESVOC 4	ESVOC SpERC 2.2.v1

Process category (PROC)		
Category	Code	Use description
Process category (PROC)	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)
	PROC4	Use in batch and other process (synthesis) where opportunity for exposure arises
	PROC8a	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities
	PROC8b	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
	PROC9	Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
	PROC15	Use as laboratory reagent

SECTION 2: Operational conditions (OC) and risk management measures (RMM) controlling exposure towards environment and men

2.1 Product characteristics

State of aggregation		
liquid		
Reference temperature	25	°C

Vapour pressure		
Value	1.73	kPa
Reference temperature	20	°C
Source	supplier	

Other information
The efficiency of a risk management measure is a theoretical value. The efficiency describes to which extend (in percent) the calculated exposure can be diminished by applying a certain measure. If the described operational conditions and risk management measures are fulfilled by a downstream user, the efficiency as highlighted in the ES can be applied. A downstream user might check whether the efficiency of the LEV or general ventilation corresponds to his site.
For further instructions related to "Personal protective equipment" please refer to section 8 of the Safety Data Sheet.

2.2 Contributing scenario controlling environmental exposure

Affected environmental release category (ERC)		
Category	Code	Use description
Environmental release category (ERC)	ERC2	Formulation of preparations
Specific Environmental Release Category (SpERC)	ESVOC 4	ESVOC SpERC 2.2.v1

Operational conditions controlling environmental exposure

daily quantity used on site			
	ERC2		
Value	5000 kg/d		

Emission conditions			
	ERC2		
Type of emission	Continuous release		
Duration of emission	60 days/year		

Risk management measures (RMM) controlling environmental exposure

Technical measures and efficiency of the risk managment measures (in exposure calculation model)		
ERC2	Measures	Waste gas treatment by filters or equal measures.
	Efficiency (%)	98.5

Organisational measures
No special measures are required.

Measures related to wastewater treatment and efficiency of the risk managment measures (in exposure calculation model)
No special measures are required.

Measures related to waste treatment
For further instructions related to waste management please refer to section 13 of the Safety Data Sheet.

Further measures	
ERC2	Consider SpERC Fact-Sheet

2.3 Contributing scenario controlling worker exposure

Affected process category (PROC)		
Category	Code	Use description
Process category (PROC)	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)
	PROC4	Use in batch and other process (synthesis) where opportunity for exposure arises
	PROC8a	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities
	PROC8b	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
	PROC9	Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
	PROC15	Use as laboratory reagent

Operational conditions controlling worker exposure

Concentration of substance						
	PROC1		PROC2		PROC3	
Value	≤ 100	%	≤ 100	%	≤ 100	%
	PROC4		PROC8a		PROC8b	
Value	≤ 100	%	≤ 100	%	≤ 100	%
	PROC9		PROC15			
Value	≤ 100	%	≤ 100	%		

Use conditions						
	PROC1		PROC2		PROC3	
Duration of use	≤ 8	hours/day	≤ 8	hours/day	≤ 8	hours/day
	PROC4		PROC8a		PROC8b	
Duration of use	≤ 8	hours/day	≤ 8	hours/day	≤ 8	hours/day
	PROC9		PROC15			
Duration of use	≤ 8	hours/day	≤ 8	hours/day		

Further operational conditions	
PROC1	Assumes a good basic standard of occupational hygiene is implemented.
PROC2	Assumes a good basic standard of occupational hygiene is implemented.
PROC3	Assumes a good basic standard of occupational hygiene is implemented.
PROC4	Assumes a good basic standard of occupational hygiene is implemented.
PROC8a	Assumes a good basic standard of occupational hygiene is implemented.
PROC8b	Assumes a good basic standard of occupational hygiene is implemented.
PROC9	Assumes a good basic standard of occupational hygiene is implemented.
PROC15	Assumes a good basic standard of occupational hygiene is implemented.

Risk management measures (RMM) controlling worker exposure

Technical measures and efficiency of the risk managment measures (in exposure calculation model)		
PROC1	Measures	Handle substance within a closed system
PROC2	Measures	Handle substance within a closed system
PROC3	Measures	Handle substance within a closed system
	Measures	Provide a good standard of generell ventilation (3 to 5 air changes per hour).
PROC4	Measures	Provide a good standard of controlled ventilation (5 to 10 air changes per hour).
PROC8a	Measures	Handle only at a place with local exhaust system (or another appropriate exhaust).
	Measures	Provide extract ventilation to points where emissions occur.
PROC8b	Measures	Provide a good standard of controlled ventilation (5 to 10 air changes per hour).
PROC9	Measures	Handle only at a place with local exhaust system (or another appropriate exhaust).
PROC15	Measures	Handle substance within a closed system

Organisational measures
No special measures are required.

Personal protective equipment and efficiency of the risk managment measures (in exposure calculation model)

Eye / face protection		
PROC1	Measures	Wear suitable eye protection if exposure to the eyes may be possible.
PROC2	Measures	Wear suitable eye protection if exposure to the eyes may be possible.
PROC3	Measures	Wear suitable eye protection if exposure to the eyes may be possible.
PROC4	Measures	Wear suitable eye protection if exposure to the eyes may be possible.
PROC8a	Measures	Wear suitable eye protection if exposure to the eyes may be possible.
PROC8b	Measures	Wear suitable eye protection if exposure to the eyes may be possible.
PROC9	Measures	Wear suitable eye protection if exposure to the eyes may be possible.
PROC15	Measures	Wear suitable eye protection if exposure to the eyes may be possible.

Hand protection		
PROC1	Measures	Wear suitable gloves tested to EN374.
PROC2	Measures	Wear suitable gloves tested to EN374.
PROC3	Measures	Wear suitable gloves tested to EN374.
PROC4	Measures	Wear suitable gloves tested to EN374.
PROC8a	Measures	Wear suitable gloves tested to EN374.
PROC8b	Measures	Wear suitable gloves tested to EN374.
PROC9	Measures	Wear suitable gloves tested to EN374.
PROC15	Measures	Wear suitable gloves tested to EN374.

Other		
PROC1	Measures	Wear standard work clothes.
PROC2	Measures	Wear standard work clothes.
PROC3	Measures	Wear standard work clothes.
PROC4	Measures	Wear standard work clothes.
PROC8a	Measures	Wear standard work clothes.
PROC8b	Measures	Wear standard work clothes.
PROC9	Measures	Wear standard work clothes.
PROC15	Measures	Wear standard work clothes.

SECTION 3: Exposure estimation and reference to sources

3.1 Advice

The Risk Characterization Ratio (RCR) is the quotient of predicted human/environmental exposure and the related DNEL/PNEC. Exposure is calculated based on exposure models as stated below. If RCR ≤ 1 a use is considered as safe under operational conditions and risk management measures as specified in the exposure szenario.

For DNEL/PNEC values please refer to section 8 of the safety data sheet.

3.2 Exposure estimation - Environment

Affected environmental release category (ERC)		
Category	Code	Use description
Environmental release category (ERC)	ERC2	Formulation of preparations
Specific Environmental Release Category (SpERC)	ESVOC 4	ESVOC SpERC 2.2.v1

Used exposure estimation model for calculation of environmental exposure	
Used exposure estimation model	ECETOC TRA SpERC based exposure assessment.
Link to exposure estimation tool	ECETOC: http://www.ecetoc.org/tra
Other information	For this exposure assessment the exposure model has been modified.

Risk characterisation ratio (RCR)			
	ERC2		
Freshwater	0.490		
Freshwater sediment	0.860		
Seawater	0.490		
Marine sediment	0.490		
Soil	0.490		
Risc determining compartment	Freshwater sediment		

3.3 Exposure estimation - Worker

Affected process category (PROC)		
Category	Code	Use description
Process category (PROC)	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)
	PROC4	Use in batch and other process (synthesis) where opportunity for exposure arises
	PROC8a	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities
	PROC8b	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
	PROC9	Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
	PROC15	Use as laboratory reagent

Used exposure estimation model for calculation of worker exposure	
Used exposure estimation model	ECETOC TRA Version 2
Link to exposure estimation tool	ECETOC: http://www.ecetoc.org/tra

Risk characterisation ratio (RCR)				
	Exposure estimation	**inhalative**	**dermal**	**total**
PROC1	Long-term systemic	0.001	0.001	0.002
PROC2	Long-term systemic	0.250	0.007	0.257
PROC3	Long-term systemic	0.350	0.004	0.354
PROC4	Long-term systemic	0.300	0.035	0.335
PROC8a	Long-term systemic	0.250	0.070	0.320
PROC8b	Long-term systemic	0.375	0.070	0.445
PROC9	Long-term systemic	0.250	0.035	0.285
PROC15	Long-term systemic	0.350	0.002	0.352

SECTION 4: Guidance to DU to evaluate whether he works inside the boundaries set by the ES

4.1 Recommendations and advice

Recommendations and general advice

If a downstream user uses the substance/preparation differently than stated in the ES (different operational conditions and/or risk management measures), he has the possibility to vary certain parameters of the exposure assessment. With the help of easy calculations he can check whether he still operates under safe circumstances. This process is called Scaling.

- For additional instructions relating to adaptation of conditions of use in view of a scaling, pls. see the “ECHA Guidance for downstream users” http://echa.europa.eu/regulations/reach/downstream-users

Scaling advice

Type of ventilation

If the type of ventilation at the use site of a downstream user (DU) differs from the instructions in the ES, a linear correlation between the RCR (Inhalation) and the type of ventilation exists. Following scaling factors (f) apply: General ventilation (< 3 air changes per hour) =1; good general ventilation (3 to 5 air changes per hour, corresponds to outdoor use) = 0,7; enhanced general ventilation (> 5 air changes per hour) = 0,3.
RCR (DU) = f(DU) * RCR (as stated in ES) / f (type of ventilation stated in ES)
In the same manner a scaling for the efficiency of the local extract ventilation (LEV) can by applied.

Duration of use

If the duration of the use by a worker at a downstream user (DU) site differs from the instructions in the ES, a linear correlation between the RCR (Inhalation) and the duration of use exist. Following scaling factors (f) apply: duration > 4 hours/day = 1; duration: 1-4 hours/day = 0,6; duration: 15 min/day – 1 hour/day = 0,2; duration < 15 min/day = 0,1.
RCR (DU) = f(DU) * RCR (as stated in ES) / f (duration in ES)

Concentration of the substance in the product

If the downstream user (DU) uses the substance in a different concentration than the one stated in the ES, a linear correlation between the RCR (Inhalation)and the RCR (dermal) and the concentration exists. Following scaling factors (f) apply: Concentration >25% =1; concentration >= 5% = 0,6; concentration >= 1% = 0,2; concentration < 1% = 0,1.
RCR (DU) = f(DU) * RCR (as stated in ES) / f (concentration in ES).

4.2 Exposure estimation - Environment

Used exposure estimation model for calculation of environmental exposure	
Used exposure estimation model	ECETOC TRA SpERC based exposure assessment.
Link to exposure estimation tool	ECETOC: http://www.ecetoc.org/tra
Other information	For this exposure assessment the exposure model has been modified.

Further input parameters used for environmental exposure estimation			
	ERC2		
Freshwater dilution factor	10		
Marine water dilution factor	100		
Emission factor air	0.00015		

4.3 Exposure estimation - Worker

Used exposure estimation model for calculation of worker exposure	
Used exposure estimation model	ECETOC TRA Version 2
Link to exposure estimation tool	ECETOC: http://www.ecetoc.org/tra

Trade name: DOWPER™* Pure Power Perchloroethylene

Current version : 1.1.1, issued: 02.02.2023 **Replaced version:** 1.1.0, issued: 10.01.2023 **Region:** GB

SECTION 1: Title and scope of exposure scenario (ES)

1.1 Title exposure scenario (ES)

ES2 used for cleaning textiles - industrial use

1.2 Scope of exposure scenario (ES)

ES Type	Worker Exposure Scenario for substance/mixture
Life cycle stage	Industrial end use

Product identifier

Trade name	DOWPER™* Pure Power Perchloroethylene

Use descriptors

Sector of use (SU)		
Category	Code	Use description
Main user group	SU3	Industrial uses
Environmental release category (ERC)		
Category	Code	Use description
Environmental release category (ERC)	ERC4	Industrial use of processing aids in processes and products, not becoming part of articles

Process category (PROC)		
Category	Code	Use description
Process category (PROC)	PROC2	Use in closed, continuous process with occasional controlled exposure
	PROC4	Use in batch and other process (synthesis) where opportunity for exposure arises
	PROC6	Calendering operations
	PROC8a	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities
	PROC8b	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities

SECTION 2: Operational conditions (OC) and risk management measures (RMM) controlling exposure towards environment and men

2.1 Product characteristics

State of aggregation		
liquid		
Reference temperature	25	°C

Vapour pressure		
Value	1.73	kPa
Reference temperature	20	°C
Source	supplier	

Other information
The efficiency of a risk management measure is a theoretical value. The efficiency describes to which extend (in percent) the calculated exposure can be diminished by applying a certain measure. If the described operational conditions and risk management measures are fulfilled by a downstream user, the efficiency as highlighted in the ES can be applied. A downstream user might check whether the efficiency of the LEV or general ventilation corresponds to his site.
For further instructions related to "Personal protective equipment" please refer to section 8 of the Safety Data Sheet.

2.2 Contributing scenario controlling environmental exposure

Affected environmental release category (ERC)		
Category	Code	Use description
Environmental release category (ERC)	ERC4	Industrial use of processing aids in processes and products, not becoming part of articles

Operational conditions controlling environmental exposure

daily quantity used on site			
	ERC4		
Value	71.33 kg/d		

Emission conditions			
	ERC4		
Type of emission	Continuous release		
Duration of emission	300 days/year		

Risk management measures (RMM) controlling environmental exposure

Technical measures and efficiency of the risk managment measures (in exposure calculation model)		
ERC4	Measures	Waste gas treatment by filters or equal measures.
	Efficiency (%)	99.9

Organisational measures
No special measures are required.

Measures related to wastewater treatment and efficiency of the risk managment measures (in exposure calculation model)		
ERC4	Measures	On-site waste water treatment required.
	Efficiency (%)	99.9
	Measures	Ensure all waste water is collected and treated via a WWTP.
	Efficiency (%)	92.6

Measures related to waste treatment
For further instructions related to waste management please refer to section 13 of the Safety Data Sheet.

2.3 Contributing scenario controlling worker exposure

Affected process category (PROC)		
Category	Code	Use description
Process category (PROC)	PROC2	Use in closed, continuous process with occasional controlled exposure
	PROC4	Use in batch and other process (synthesis) where opportunity for exposure arises
	PROC6	Calendering operations
	PROC8a	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities
	PROC8b	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities

Operational conditions controlling worker exposure

Concentration of substance						
	PROC2		PROC4		PROC6	
Value	≤ 100	%	≤ 100	%	≤ 100	%
	PROC8a		PROC8b			
Value	≤ 100	%	≤ 100	%		

Use conditions						
	PROC2		PROC4		PROC6	
Duration of use	≤ 8	hours/day	≤ 8	hours/day	≤ 8	hours/day
	PROC8a		PROC8b			
Duration of use	≤ 8	hours/day	≤ 1	hours/day		

Further operational conditions	
PROC2	Assumes a good basic standard of occupational hygiene is implemented.
PROC4	Assumes a good basic standard of occupational hygiene is implemented.
PROC6	Assumes a good basic standard of occupational hygiene is implemented.
PROC8a	Assumes a good basic standard of occupational hygiene is implemented.
PROC8b	Assumes a good basic standard of occupational hygiene is implemented.

Risk management measures (RMM) controlling worker exposure

Technical measures and efficiency of the risk managment measures (in exposure calculation model)		
PROC4	Measures	Provide a good standard of generell ventilation (3 to 5 air changes per hour).
PROC6	Measures	Provide extract ventilation to points where emissions occur.

Organisational measures	
PROC8a	Clear transfer lines prior to de-coupling.
PROC8b	Avoid carrying out activities involving exposure for more than 1 hour.

Personal protective equipment and efficiency of the risk managment measures (in exposure calculation model)

Eye / face protection		
PROC2	Measures	Wear suitable eye protection if exposure to the eyes may be possible.
PROC4	Measures	Wear suitable eye protection if exposure to the eyes may be possible.
PROC6	Measures	Wear suitable eye protection if exposure to the eyes may be possible.
PROC8a	Measures	Wear suitable eye protection if exposure to the eyes may be possible.
PROC8b	Measures	Wear suitable eye protection if exposure to the eyes may be possible.

Hand protection		
PROC2	Measures	Wear suitable gloves tested to EN374.
PROC4	Measures	Wear suitable gloves tested to EN374.
PROC6	Measures	Wear suitable gloves tested to EN374.
PROC8a	Measures	Wear suitable gloves tested to EN374.
PROC8b	Measures	Wear suitable gloves tested to EN374.

Other		
PROC2	Measures	Wear standard work clothes.
PROC4	Measures	Wear standard work clothes.
PROC6	Measures	Wear standard work clothes.
PROC8a	Measures	Wear standard work clothes.
PROC8b	Measures	Wear standard work clothes.

SECTION 3: Exposure estimation and reference to sources

3.1 Advice

The Risk Characterization Ratio (RCR) is the quotient of predicted human/environmental exposure and the related DNEL/PNEC. Exposure is calculated based on exposure models as stated below. If RCR ≤ 1 a use is considered as safe under operational conditions and risk management measures as specified in the exposure szenario.

For DNEL/PNEC values please refer to section 8 of the safety data sheet.

3.2 Exposure estimation - Environment

Affected environmental release category (ERC)		
Category	Code	Use description
Environmental release category (ERC)	ERC4	Industrial use of processing aids in processes and products, not becoming part of articles

Used exposure estimation model for calculation of environmental exposure	
Used exposure estimation model	ECETOC TRA
Link to exposure estimation tool	ECETOC: http://www.ecetoc.org/tra

Risk characterisation ratio (RCR)			
	ERC4		
Freshwater	0.001		
Freshwater sediment	0.333		
Seawater	0.001		
Marine sediment	0.001		
Soil	0.001		
Risc determining compartment	Freshwater sediment		

3.3 Exposure estimation - Worker

Affected process category (PROC)		
Category	Code	Use description
Process category (PROC)	PROC2	Use in closed, continuous process with occasional controlled exposure
	PROC4	Use in batch and other process (synthesis) where opportunity for exposure arises
	PROC6	Calendering operations
	PROC8a	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities
	PROC8b	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities

Used exposure estimation model for calculation of worker exposure	
Used exposure estimation model	ECETOC TRA
Link to exposure estimation tool	ECETOC: http://www.ecetoc.org/tra

Risk characterisation ratio (RCR)				
	Exposure estimation	**inhalative**	**dermal**	**total**
PROC2	Long-term systemic	0.500	0.030	0.530
PROC4	Long-term systemic	0.700	0.170	0.817
PROC6	Long-term systemic	0.250	0.010	0.260
PROC8a	Long-term systemic	0.500	0.350	0.850
PROC8b	Long-term systemic	0.080	0.170	0.250

SECTION 4: Guidance to DU to evaluate whether he works inside the boundaries set by the ES

4.1 Recommendations and advice

Recommendations and general advice

If a downstream user uses the substance/preparation differently than stated in the ES (different operational conditions and/or risk management measures), he has the possibility to vary certain parameters of the exposure assessment. With the help of easy calculations he can check whether he still operates under safe circumstances. This process is called Scaling.

- For additional instructions relating to adaptation of conditions of use in view of a scaling, pls. see the “ECHA Guidance for downstream users” http://echa.europa.eu/regulations/reach/downstream-users

Scaling advice

Type of ventilation
If the type of ventilation at the use site of a downstream user (DU) differs from the instructions in the ES, a linear correlation between the RCR (Inhalation) and the type of ventilation exists. Following scaling factors (f) apply: General ventilation (< 3 air changes per hour) =1; good general ventilation (3 to 5 air changes per hour, corresponds to outdoor use) = 0,7; enhanced general ventilation (> 5 air changes per hour) = 0,3.
RCR (DU) = f(DU) * RCR (as stated in ES) / f (type of ventilation stated in ES)
In the same manner a scaling for the efficiency of the local extract ventilation (LEV) can by applied.

Duration of use
If the duration of the use by a worker at a downstream user (DU) site differs from the instructions in the ES, a linear correlation between the RCR (Inhalation) and the duration of use exist. Following scaling factors (f) apply: duration > 4 hours/day = 1; duration: 1-4 hours/day = 0,6; duration: 15 min/day – 1 hour/day = 0,2; duration < 15 min/day = 0,1.
RCR (DU) = f(DU) * RCR (as stated in ES) / f (duration in ES)

Concentration of the substance in the product
If the downstream user (DU) uses the substance in a different concentration than the one stated in the ES, a linear correlation between the RCR (Inhalation)and the RCR (dermal) and the concentration exists. Following scaling factors (f) apply: Concentration >25% =1; concentration >= 5% = 0,6; concentration >= 1% = 0,2; concentration < 1% = 0,1.
RCR (DU) = f(DU) * RCR (as stated in ES) / f (concentration in ES).

4.2 Exposure estimation - Environment

Used exposure estimation model for calculation of environmental exposure	
Used exposure estimation model	ECETOC TRA
Link to exposure estimation tool	ECETOC: http://www.ecetoc.org/tra

Further input parameters used for environmental exposure estimation			
	ERC4		
Sludge treatment	No application of sludge to soil.		
Effluent discharge volume of STP	≥ 2000 m³/d		
Freshwater dilution factor	10		
Marine water dilution factor	100		

4.3 Exposure estimation - Worker

Used exposure estimation model for calculation of worker exposure	
Used exposure estimation model	ECETOC TRA
Link to exposure estimation tool	ECETOC: http://www.ecetoc.org/tra

SECTION 1: Title and scope of exposure scenario (ES)

1.1 Title exposure scenario (ES)

ES3 Use in Textiles - professional use

1.2 Scope of exposure scenario (ES)

ES Type	Worker Exposure Scenario for substance/mixture
Life cycle stage	Professional end use

Product identifier

Trade name	DOWPER™* Pure Power Perchloroethylene

Use descriptors

Sector of use (SU)		
Category	Code	Use description
Main user group	SU22	Professional uses
Environmental release category (ERC)		
Category	Code	Use description
Environmental release category (ERC)	ERC8a	Wide dispersive indoor use of processing aids in open systems
	ERC8d	Wide dispersive outdoor use of processing aids in open systems
Process category (PROC)		
Category	Code	Use description
Process category (PROC)	PROC2	Use in closed, continuous process with occasional controlled exposure
	PROC4	Use in batch and other process (synthesis) where opportunity for exposure arises
	PROC8a	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities
	PROC8b	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities

SECTION 2: Operational conditions (OC) and risk management measures (RMM) controlling exposure towards environment and men

2.1 Product characteristics

State of aggregation		
liquid		
Reference temperature	25	°C

Vapour pressure		
Value	1.73	kPa
Reference temperature	20	°C
Source	supplier	

Other information
The efficiency of a risk management measure is a theoretical value. The efficiency describes to which extend (in percent) the calculated exposure can be diminished by applying a certain measure. If the described operational conditions and risk management measures are fulfilled by a downstream user, the efficiency as highlighted in the ES can be applied. A downstream user might check whether the efficiency of the LEV or general ventilation corresponds to his site.
For further instructions related to "Personal protective equipment" please refer to section 8 of the Safety Data Sheet.

2.2 Contributing scenario controlling environmental exposure

Affected environmental release category (ERC)		
Category	Code	Use description
Environmental release category (ERC)	ERC8a	Wide dispersive indoor use of processing aids in open systems
	ERC8d	Wide dispersive outdoor use of processing aids in open systems

Operational conditions controlling environmental exposure

Emission conditions			
	ERC8a, ERC8d		
Type of emission	Continuous release		
Duration of emission	365 days/year		

Risk management measures (RMM) controlling environmental exposure

Technical measures and efficiency of the risk managment measures (in exposure calculation model)
No special measures are required.

Organisational measures
No special measures are required.

Measures related to wastewater treatment and efficiency of the risk managment measures (in exposure calculation model)		
ERC8a, ERC8d	Measures	Ensure all waste water is collected and treated via a WWTP.
	Efficiency (%)	92.6

Measures related to waste treatment
For further instructions related to waste management please refer to section 13 of the Safety Data Sheet.

2.3 Contributing scenario controlling worker exposure

Affected process category (PROC)		
Category	Code	Use description
Process category (PROC)	PROC2	Use in closed, continuous process with occasional controlled exposure
	PROC4	Use in batch and other process (synthesis) where opportunity for exposure arises
	PROC8a	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities
	PROC8b	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities

Operational conditions controlling worker exposure

Concentration of substance			
	PROC2	PROC4	PROC8a
Value	≤ 100 %	≤ 100 %	≤ 100 %
	PROC8b		
Value	≤ 100 %		

Use conditions			
	PROC2	PROC4	PROC8a
Duration of use	≤ 8 hours/day	≤ 1 hours/day	≤ 8 hours/day
	PROC8b		
Duration of use	≤ 8 hours/day		

Further operational conditions	
PROC2	Assumes a good basic standard of occupational hygiene is implemented.
PROC4	Assumes a good basic standard of occupational hygiene is implemented.
PROC8a	Assumes a good basic standard of occupational hygiene is implemented.
PROC8b	Assumes a good basic standard of occupational hygiene is implemented.

Risk management measures (RMM) controlling worker exposure

Technical measures and efficiency of the risk managment measures (in exposure calculation model)		
PROC2	Measures	Provide a good standard of generell ventilation (3 to 5 air changes per hour).
PROC8a	Measures	Provide a good standard of generell ventilation (3 to 5 air changes per hour).
PROC8b	Measures	Handle only at a place with local exhaust system (or another appropriate exhaust).

Organisational measures	
PROC4	Avoid carrying out activities involving exposure for more than 1 hour.
PROC8a	Clear transfer lines prior to de-coupling.

Personal protective equipment and efficiency of the risk managment measures (in exposure calculation model)

Eye / face protection		
PROC2	Measures	Wear suitable eye protection if exposure to the eyes may be possible.
PROC4	Measures	Wear suitable eye protection if exposure to the eyes may be possible.
PROC8a	Measures	Wear suitable eye protection if exposure to the eyes may be possible.
PROC8b	Measures	Wear suitable eye protection if exposure to the eyes may be possible.

Hand protection		
PROC2	Measures	Wear suitable gloves tested to EN374.
PROC4	Measures	Wear suitable gloves tested to EN374.
PROC8a	Measures	Wear suitable gloves tested to EN374.
PROC8b	Measures	Wear suitable gloves tested to EN374.

Other		
PROC2	Measures	Wear standard work clothes.
PROC4	Measures	Wear standard work clothes.
PROC8a	Measures	Wear standard work clothes.
PROC8b	Measures	Wear standard work clothes.

SECTION 3: Exposure estimation and reference to sources

3.1 Advice

The Risk Characterization Ratio (RCR) is the quotient of predicted human/environmental exposure and the related DNEL/PNEC. Exposure is calculated based on exposure models as stated below. If RCR ≤ 1 a use is considered as safe under operational conditions and risk management measures as specified in the exposure szenario.

For DNEL/PNEC values please refer to section 8 of the safety data sheet.

3.2 Exposure estimation - Environment

Affected environmental release category (ERC)		
Category	Code	Use description
Environmental release category (ERC)	ERC8a	Wide dispersive indoor use of processing aids in open systems
	ERC8d	Wide dispersive outdoor use of processing aids in open systems

Used exposure estimation model for calculation of environmental exposure	
Used exposure estimation model	ECETOC TRA
Link to exposure estimation tool	ECETOC: http://www.ecetoc.org/tra

Risk characterisation ratio (RCR)			
	ERC8a, ERC8d		
Freshwater	0.001		
Freshwater sediment	0.333		
Seawater	0.001		
Marine sediment	0.001		
Soil	0.001		
Risc determining compartment	Freshwater sediment		

3.3 Exposure estimation - Worker

Affected process category (PROC)		
Category	Code	Use description
Process category (PROC)	PROC2	Use in closed, continuous process with occasional controlled exposure
	PROC4	Use in batch and other process (synthesis) where opportunity for exposure arises
	PROC8a	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities
	PROC8b	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities

Used exposure estimation model for calculation of worker exposure	
Used exposure estimation model	ECETOC TRA Version 2
Link to exposure estimation tool	ECETOC: http://www.ecetoc.org/tra

Risk characterisation ratio (RCR)				
	Exposure estimation	**inhalative**	**dermal**	**total**
PROC2	Long-term systemic	0.700	0.030	0.730
PROC4	Long-term systemic	0.500	0.170	0.670
PROC8a	Long-term systemic	0.700	0.070	0.770
PROC8b	Long-term systemic	0.250	0.170	0.420

SECTION 4: Guidance to DU to evaluate whether he works inside the boundaries set by the ES

4.1 Recommendations and advice

Recommendations and general advice

If a downstream user uses the substance/preparation differently than stated in the ES (different operational conditions and/or risk management measures), he has the possibility to vary certain parameters of the exposure assessment. With the help of easy calculations he can check whether he still operates under safe circumstances. This process is called Scaling.

- For additional instructions relating to adaptation of conditions of use in view of a scaling, pls. see the “ECHA Guidance for downstream users” http://echa.europa.eu/regulations/reach/downstream-users

Scaling advice

Type of ventilation

If the type of ventilation at the use site of a downstream user (DU) differs from the instructions in the ES, a linear correlation between the RCR (Inhalation) and the type of ventilation exists. Following scaling factors (f) apply: General ventilation (< 3 air changes per hour) =1; good general ventilation (3 to 5 air changes per hour, corresponds to outdoor use) = 0,7; enhanced general ventilation (> 5 air changes per hour) = 0,3.

RCR (DU) = f(DU) * RCR (as stated in ES) / f (type of ventilation stated in ES)

In the same manner a scaling for the efficiency of the local extract ventilation (LEV) can by applied.

Duration of use

If the duration of the use by a worker at a downstream user (DU) site differs from the instructions in the ES, a linear correlation between the RCR (Inhalation) and the duration of use exist. Following scaling factors (f) apply: duration > 4 hours/day = 1; duration: 1-4 hours/day = 0,6; duration: 15 min/day – 1 hour/day = 0,2; duration < 15 min/day = 0,1.

RCR (DU) = f(DU) * RCR (as stated in ES) / f (duration in ES)

Concentration of the substance in the product
If the downstream user (DU) uses the substance in a different concentration than the one stated in the ES, a linear correlation between the RCR (Inhalation)and the RCR (dermal) and the concentration exists. Following scaling factors (f) apply: Concentration >25% =1; concentration >= 5% = 0,6; concentration >= 1% = 0,2; concentration < 1% = 0,1. RCR (DU) = f(DU) * RCR (as stated in ES) / f (concentration in ES).

4.2 Exposure estimation - Environment

Used exposure estimation model for calculation of environmental exposure	
Used exposure estimation model	ECETOC TRA
Link to exposure estimation tool	ECETOC: http://www.ecetoc.org/tra

Further input parameters used for environmental exposure estimation			
	ERC8a, ERC8d		
Effluent discharge volume of STP	≥ 2000 m³/d		
Freshwater dilution factor	10		
Marine water dilution factor	100		

4.3 Exposure estimation - Worker

Used exposure estimation model for calculation of worker exposure	
Used exposure estimation model	ECETOC TRA Version 2
Link to exposure estimation tool	ECETOC: http://www.ecetoc.org/tra