

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006, as amended by
Commission Regulation (EU) 2020/878



VC-50

Version	Revision Date:	SDS Number:	Date of last issue: 25.06.2024
13.0	22.08.2024	1328311-00050	Date of first issue: 27.02.2017

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

1.1 Product identifier

Trade name	:	VC-50
SDS-Identcode	:	130000001245
REACH Registration Number	:	01-2120763412-59-0000
Substance name	:	Reaction mass of 4,4'-[2,2,2-trifluoro-1-(trifluoromethyl)ethylidene]diphenol and benzyltri-phenylphosphonium, salt with 4,4'-[2,2,2-trifluoro-1-(trifluoromethyl)ethylidene]bis[phenol] (1:1)

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

Use of the Sub-stance/Mixture	:	Manufacture of rubber products Formulation [mixing] of preparations and/ or re-packaging (excluding alloys)
Recommended restrictions on use	:	Not applicable

1.3 Details of the supplier of the safety data sheet

Company	:	Chemours Netherlands B.V. Baanhoekweg 22 3313 LA Dordrecht Netherlands
Telephone	:	+31-(0)-78-630-1011
Telefax	:	+31-78-6163737
E-mail address of person responsible for the SDS	:	sds-support@chemours.com

1.4 Emergency telephone number

+(353)-19014670 (CHEMTREC - Recommended) ; +353-(01) 809 2166 (Poison Information Center of Ireland)

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Classification (REGULATION (EC) No 1272/2008)

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Reproductive toxicity, Category 1B	H360: May damage fertility or the unborn child.
Specific target organ toxicity - repeated exposure, Category 2, Seminal vesicle, Prostate	H373: May cause damage to organs through prolonged or repeated exposure.
Short-term (acute) aquatic hazard, Category 1	H400: Very toxic to aquatic life.
Long-term (chronic) aquatic hazard, Category 1	H410: Very toxic to aquatic life with long lasting effects.

2.2 Label elements

Labelling (REGULATION (EC) No 1272/2008)

Hazard pictograms :



Signal word : Danger

Hazard statements :

H360	May damage fertility or the unborn child.
H373	May cause damage to organs (Seminal vesicle, Prostate) through prolonged or repeated exposure.
H410	Very toxic 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/ protective clothing/ eye protection/ face protection.

Response:

P308 + P313	IF exposed or concerned: Get medical advice/ attention.
P391	Collect spillage.

Storage:

P405	Store locked up.
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2.3 Other hazards

This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

Ecological information: The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

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Toxicological information: The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

SECTION 3: Composition/information on ingredients

3.1 Substances

Substance name : Reaction mass of 4,4'-[2,2,2-trifluoro-1-(trifluoromethyl)ethylidene]diphenol and benzyltriphenylphosphonium, salt with 4,4'-[2,2,2-trifluoro-1-(trifluoromethyl)ethylidene]bis[phenol] (1:1)

Components

Chemical name	CAS-No. EC-No.	Concentration (%) w/w)	M-Factor, SCL, ATE
Reaction mass of 4,4'-[2,2,2-trifluoro-1-(trifluoromethyl)ethylidene]diphenol and benzyltriphenylphosphonium, salt with 4,4'-[2,2,2-trifluoro-1-(trifluoromethyl)ethylidene]bis[phenol] (1:1)	Not Assigned	>= 90 - <= 100	M-Factor (Acute aquatic toxicity): 1 M-Factor (Chronic aquatic toxicity): 10
2,4'-Trifluoro-1-(trifluoromethyl)ethylidene diphenol	131306-85-9	>= 0.25 - < 0.3	M-Factor (Chronic aquatic toxicity): 1

SECTION 4: First aid measures

4.1 Description of first aid measures

General advice : In the case of accident or if you feel unwell, seek medical advice immediately.
When symptoms persist or in all cases of doubt seek medical advice.

Protection of first-aiders : First Aid responders should pay attention to self-protection, and use the recommended personal protective equipment when the potential for exposure exists (see section 8).

If inhaled : If inhaled, remove to fresh air.
Get medical attention.

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- | | | |
|-------------------------|---|---|
| In case of skin contact | : | In case of contact, immediately flush skin with soap and plenty of water.
Remove contaminated clothing and shoes.
Get medical attention.
Wash clothing before reuse.
Thoroughly clean shoes before reuse. |
| In case of eye contact | : | Flush eyes with water as a precaution.
Get medical attention if irritation develops and persists. |
| If swallowed | : | If swallowed, DO NOT induce vomiting.
Get medical attention.
Rinse mouth thoroughly with water. |

4.2 Most important symptoms and effects, both acute and delayed

- | | | |
|-------|---|---|
| Risks | : | May damage fertility or the unborn child.
May cause damage to organs through prolonged or repeated exposure. |
|-------|---|---|

4.3 Indication of any immediate medical attention and special treatment needed

- | | | |
|-----------|---|---|
| Treatment | : | Treat symptomatically and supportively. |
|-----------|---|---|

SECTION 5: Firefighting measures

5.1 Extinguishing media

- | | | |
|--------------------------------|---|--|
| Suitable extinguishing media | : | Water spray
Alcohol-resistant foam
Carbon dioxide (CO ₂)
Dry chemical |
| Unsuitable extinguishing media | : | None known. |

5.2 Special hazards arising from the substance or mixture

- | | | |
|---------------------------------------|---|--|
| Specific hazards during fire-fighting | : | Exposure to combustion products may be a hazard to health. |
| Hazardous combustion products | : | Metal oxides
Chlorine compounds |

5.3 Advice for firefighters

- | | | |
|---|---|---|
| Special protective equipment for firefighters | : | In the event of fire, wear self-contained breathing apparatus.
Use personal protective equipment. |
| Specific extinguishing methods | : | Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
Use water spray to cool unopened containers.
Remove undamaged containers from fire area if it is safe to do |

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so.
Evacuate area.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Personal precautions : Use personal protective equipment.
Follow safe handling advice (see section 7) and personal protective equipment recommendations (see section 8).

6.2 Environmental precautions

Environmental precautions : Avoid release to the environment.
Prevent further leakage or spillage if safe to do so.
Retain and dispose of contaminated wash water.
Local authorities should be advised if significant spillages cannot be contained.

6.3 Methods and material for containment and cleaning up

Methods for cleaning up : Sweep up or vacuum up spillage and collect in suitable container for disposal.
Local or national regulations may apply to releases and disposal of this material, as well as those materials and items employed in the cleanup of releases. You will need to determine which regulations are applicable.
Sections 13 and 15 of this SDS provide information regarding certain local or national requirements.

6.4 Reference to other sections

See sections: 7, 8, 11, 12 and 13.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Technical measures : See Engineering measures under EXPOSURE CONTROLS/PERSONAL PROTECTION section.

Local/Total ventilation : If sufficient ventilation is unavailable, use with local exhaust ventilation.

Advice on safe handling : Do not get on skin or clothing.
Do not breathe dust, fume, gas, mist, vapours or spray.
Do not swallow.
Avoid contact with eyes.
Handle in accordance with good industrial hygiene and safety practice, based on the results of the workplace exposure assessment
Keep container tightly closed.
Take care to prevent spills, waste and minimize release to the

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environment.

Hygiene measures : If exposure to chemical is likely during typical use, provide eye flushing systems and safety showers close to the working place. When using do not eat, drink or smoke. Wash contaminated clothing before re-use.

7.2 Conditions for safe storage, including any incompatibilities

Requirements for storage areas and containers : Keep in properly labelled containers. Store locked up. Keep tightly closed. Store in accordance with the particular national regulations.

Advice on common storage : Do not store with the following product types:
Self-reactive substances and mixtures
Organic peroxides
Explosives

7.3 Specific end use(s)

Specific use(s) : No data available

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Occupational Exposure Limits

Contains no substances with occupational exposure limit values.

Derived No Effect Level (DNEL) according to Regulation (EC) No. 1907/2006

Substance name	End Use	Exposure routes	Potential health effects	Value
Reaction mass of 4,4'-[2,2,2-trifluoro-1-(trifluoromethyl)ethylidene]diphenol and benzyltriphenylphosphonium, salt with 4,4'-[2,2,2-trifluoro-1-(trifluoromethyl)ethylidene]bis[phenol] (1:1)	Workers	Inhalation	Long-term systemic effects	0.118 mg/m3
	Workers	Skin contact	Long-term systemic effects	0.033 mg/kg bw/day
Sodium chloride	Workers	Inhalation	Long-term systemic effects	2068.62 mg/m3
	Workers	Inhalation	Acute systemic effects	2068.62 mg/m3

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	Workers	Skin contact	Long-term systemic effects	295.52 mg/kg bw/day
	Workers	Skin contact	Acute systemic effects	295.52 mg/kg bw/day
	Consumers	Inhalation	Long-term systemic effects	443.28 mg/m3
	Consumers	Inhalation	Acute systemic effects	443.28 mg/m3
	Consumers	Skin contact	Long-term systemic effects	126.65 mg/kg bw/day
	Consumers	Skin contact	Acute systemic effects	126.65 mg/kg bw/day
	Consumers	Ingestion	Long-term systemic effects	126.65 mg/kg bw/day
	Consumers	Ingestion	Acute systemic effects	126.65 mg/kg bw/day

Predicted No Effect Concentration (PNEC) according to Regulation (EC) No. 1907/2006

Substance name	Environmental Compartment	Value
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	Marine sediment	0.033 mg/kg dry weight (d.w.)
	Fresh water sediment	0.328 mg/kg dry weight (d.w.)
	Sewage treatment plant	10 mg/l
	Soil	0.065 mg/kg dry weight (d.w.)
	Fresh water	0.00045 mg/l
	Marine water	0.000045 mg/l
Sodium chloride	Fresh water	5 mg/l
	Sewage treatment plant	500 mg/l
	Soil	4.86 mg/kg dry weight (d.w.)

8.2 Exposure controls

Engineering measures

Minimize workplace exposure concentrations.
If sufficient ventilation is unavailable, use with local exhaust ventilation.

Personal protective equipment

Eye/face protection : Wear the following personal protective equipment:
Safety glasses
Equipment should conform to I.S. EN 166

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Hand protection	
Material	: Nitrile rubber
Glove thickness	: 0.38 mm
Remarks	: Choose gloves to protect hands against chemicals depending on the concentration and quantity of the hazardous substance and specific to place of work. For special applications, we recommend clarifying the resistance to chemicals of the aforementioned protective gloves with the glove manufacturer. Wash hands before breaks and at the end of workday. Breakthrough time is not determined for the product. Change gloves often!
Skin and body protection	: Select appropriate protective clothing based on chemical resistance data and an assessment of the local exposure potential. Skin contact must be avoided by using impervious protective clothing (gloves, aprons, boots, etc).
Respiratory protection	: If adequate local exhaust ventilation is not available or exposure assessment demonstrates exposures outside the recommended guidelines, use respiratory protection. Equipment should conform to I.S. EN 143
Filter type	: Particulates type (P)

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Physical state	: pellets
Colour	: pink, dark violet
Odour	: odourless
Odour Threshold	: No data available
Melting point/freezing point	: No data available
Initial boiling point and boiling range	: No data available
Flammability (solid, gas)	: No data available

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Upper explosion limit / Upper flammability limit : No data available

Lower explosion limit / Lower flammability limit : No data available

Flash point : Not applicable

Auto-ignition temperature : No data available

Decomposition temperature : No data available

pH : No data available

Viscosity
Viscosity, kinematic : Not applicable

Solubility(ies)
Water solubility : slightly soluble

Partition coefficient: n-octanol/water : Not applicable

Vapour pressure : Not applicable

Density : 1.38 g/cm³

Relative vapour density : Not applicable

Particle characteristics
Particle size : No data available

9.2 Other information

Explosives : Not explosive

Oxidizing properties : The substance or mixture is not classified as oxidizing.

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Evaporation rate : Not applicable

SECTION 10: Stability and reactivity

10.1 Reactivity

Not classified as a reactivity hazard.

10.2 Chemical stability

Stable under normal conditions.

10.3 Possibility of hazardous reactions

Hazardous reactions : None known.

10.4 Conditions to avoid

Conditions to avoid : None known.

10.5 Incompatible materials

Materials to avoid : None.

10.6 Hazardous decomposition products

No hazardous decomposition products are known.

SECTION 11: Toxicological information

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

Information on likely routes of exposure : Skin contact
Ingestion
Eye contact

Acute toxicity

Not classified based on available information.

Components:

Reaction mass of 4,4'-[2,2,2-trifluoro-1-(trifluoromethyl)ethylidene]diphenol and benzyltriphenylphosphonium, salt with 4,4'-[2,2,2-trifluoro-1-(trifluoromethyl)ethylidene]bis[phenol] (1:1)

:

Acute oral toxicity : LD50 (Rat): > 2,000 mg/kg
Method: OECD Test Guideline 425
Assessment: The substance or mixture has no acute oral toxicity

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2,4'-Trifluoro-1-(trifluoromethyl)ethylidene diphenol:

Acute oral toxicity	: LD50 (Rat): > 2,000 mg/kg Remarks: Based on data from similar materials
Acute dermal toxicity	: LD50 (Rat): > 2,000 mg/kg Method: OECD Test Guideline 402 Remarks: Based on data from similar materials

Skin corrosion/irritation

Not classified based on available information.

Components:

Reaction mass of 4,4'-[2,2,2-trifluoro-1-(trifluoromethyl)ethylidene]diphenol and benzyltri-phenylphosphonium, salt with 4,4'-[2,2,2-trifluoro-1-(trifluoromethyl)ethylidene]bis[phenol] (1:1)

:

Species	: Not tested on animals
Method	: OECD Test Guideline 439
Result	: No skin irritation

2,4'-Trifluoro-1-(trifluoromethyl)ethylidene diphenol:

Species	: Rabbit
Method	: OECD Test Guideline 404
Result	: No skin irritation
Remarks	: Based on data from similar materials

Serious eye damage/eye irritation

Not classified based on available information.

Components:

Reaction mass of 4,4'-[2,2,2-trifluoro-1-(trifluoromethyl)ethylidene]diphenol and benzyltri-phenylphosphonium, salt with 4,4'-[2,2,2-trifluoro-1-(trifluoromethyl)ethylidene]bis[phenol] (1:1)

:

Species	: In Vitro - Bovine
Method	: OECD Test Guideline 437
Result	: No eye irritation

2,4'-Trifluoro-1-(trifluoromethyl)ethylidene diphenol:

Species	: Rabbit
Method	: OECD Test Guideline 405
Result	: Irreversible effects on the eye
Remarks	: Based on data from similar materials

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Respiratory or skin sensitisation

Skin sensitisation

Not classified based on available information.

Respiratory sensitisation

Not classified based on available information.

Components:

Reaction mass of 4,4'-[2,2,2-trifluoro-1-(trifluoromethyl)ethylidene]diphenol and benzyltri-phenylphosphonium, salt with 4,4'-[2,2,2-trifluoro-1-(trifluoromethyl)ethylidene]bis[phenol] (1:1)

:

Test Type	: Direct Peptide Reactivity Assay (DPRA)
Exposure routes	: Skin contact
Species	: Not tested on animals
Method	: OECD Test Guideline 442C
Result	: equivocal

Test Type	: KeratinoSens assay
Exposure routes	: Skin contact
Species	: Not tested on animals
Method	: OECD Test Guideline 442D
Result	: positive

Test Type	: Maximisation Test
Exposure routes	: Skin contact
Species	: Guinea pig
Method	: OECD Test Guideline 406
Result	: negative
Remarks	: Based on data from similar materials

Assessment	: Does not cause skin sensitisation.
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2,4'-Trifluoro-1-(trifluoromethyl)ethylidene diphenol:

Test Type	: Maximisation Test
Exposure routes	: Skin contact
Species	: Guinea pig
Method	: OECD Test Guideline 406
Result	: negative
Remarks	: Based on data from similar materials

Germ cell mutagenicity

Not classified based on available information.

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Components:

Reaction mass of 4,4'-[2,2,2-trifluoro-1-(trifluoromethyl)ethylidene]diphenol and benzyltri-phenylphosphonium, salt with 4,4'-[2,2,2-trifluoro-1-(trifluoromethyl)ethylidene]bis[phenol] (1:1)

:

Genotoxicity in vitro	:	Test Type: Bacterial reverse mutation assay (AMES)
		Method: OECD Test Guideline 471
		Result: negative
		Test Type: In vitro mammalian cell gene mutation test
		Method: OECD Test Guideline 476
		Result: negative
Germ cell mutagenicity- Assessment	:	Weight of evidence does not support classification as a germ cell mutagen.

Carcinogenicity

Not classified based on available information.

Reproductive toxicity

May damage fertility or the unborn child.

Components:

Reaction mass of 4,4'-[2,2,2-trifluoro-1-(trifluoromethyl)ethylidene]diphenol and benzyltri-phenylphosphonium, salt with 4,4'-[2,2,2-trifluoro-1-(trifluoromethyl)ethylidene]bis[phenol] (1:1)

:

Effects on fertility	:	Test Type: Combined repeated dose toxicity study with the reproduction/developmental toxicity screening test
		Species: Rat
		Application Route: Ingestion
		Method: OECD Test Guideline 422
		Result: positive
		Remarks: Based on data from similar materials
Effects on foetal development	:	Test Type: Combined repeated dose toxicity study with the reproduction/developmental toxicity screening test
		Species: Rat
		Application Route: Ingestion
		Method: OECD Test Guideline 422
		Result: negative
		Remarks: Based on data from similar materials
Reproductive toxicity - Assessment	:	Clear evidence of adverse effects on sexual function and fertility, and/or on development, based on animal experiments

2,4'-Trifluoro-1-(trifluoromethyl)ethylidene diphenol:

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Effects on fertility	: Test Type: Combined repeated dose toxicity study with the reproduction/developmental toxicity screening test Species: Rat Application Route: Ingestion Method: OECD Test Guideline 422 Result: positive Remarks: Based on data from similar materials
Reproductive toxicity - Assessment	: Clear evidence of adverse effects on sexual function and fertility, based on animal experiments.

STOT - single exposure

Not classified based on available information.

STOT - repeated exposure

May cause damage to organs (Seminal vesicle, Prostate) through prolonged or repeated exposure.

Components:

Reaction mass of 4,4'-[2,2,2-trifluoro-1-(trifluoromethyl)ethylidene]diphenol and benzyltriphenylphosphonium, salt with 4,4'-[2,2,2-trifluoro-1-(trifluoromethyl)ethylidene]bis[phenol] (1:1)

:	
Exposure routes	: Ingestion
Target Organs	: Seminal vesicle, Prostate
Assessment	: Shown to produce significant health effects in animals at concentrations of >10 to 100 mg/kg bw.

Repeated dose toxicity

Components:

Reaction mass of 4,4'-[2,2,2-trifluoro-1-(trifluoromethyl)ethylidene]diphenol and benzyltriphenylphosphonium, salt with 4,4'-[2,2,2-trifluoro-1-(trifluoromethyl)ethylidene]bis[phenol] (1:1)

:	
Species	: Rat, male and female
NOAEL	: 10 mg/kg
LOAEL	: 100 mg/kg
Application Route	: Ingestion
Exposure time	: 28 Days
Method	: OECD Test Guideline 407
Remarks	: Based on data from similar materials

Aspiration toxicity

Not classified based on available information.

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11.2 Information on other hazards

Endocrine disrupting properties

Product:

Assessment : The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

SECTION 12: Ecological information

12.1 Toxicity

Components:

Reaction mass of 4,4'-[2,2,2-trifluoro-1-(trifluoromethyl)ethylidene]diphenol and benzyltriphenylphosphonium, salt with 4,4'-[2,2,2-trifluoro-1-(trifluoromethyl)ethylidene]bis[phenol] (1:1)

:

Toxicity to fish	:	LC50 (Pimephales promelas (fathead minnow)): 1.2 mg/l Exposure time: 96 h Method: OECD Test Guideline 203
Toxicity to daphnia and other aquatic invertebrates	:	EC50 (Daphnia magna (Water flea)): 0.79 mg/l Exposure time: 48 h Method: OECD Test Guideline 202
Toxicity to algae/aquatic plants	:	ErC50 (Raphidocelis subcapitata (freshwater green alga)): 0.45 mg/l Exposure time: 72 h Method: OECD Test Guideline 201 NOEC (Raphidocelis subcapitata (freshwater green alga)): 0.0087 mg/l Exposure time: 72 h Method: OECD Test Guideline 201
M-Factor (Acute aquatic toxicity)	:	1
M-Factor (Chronic aquatic toxicity)	:	10

2.4'-Trifluoro-1-(trifluoromethyl)ethylidene diphenol:

Toxicity to daphnia and other aquatic invertebrates	:	EC50 (Daphnia magna (Water flea)): > 1 - 10 mg/l Exposure time: 48 h Remarks: Based on data from similar materials
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Toxicity to algae/aquatic plants	: ErC50 (Pseudokirchneriella subcapitata (green algae)): > 0.1 - 1 mg/l Exposure time: 72 h Method: OECD Test Guideline 201 Remarks: Based on data from similar materials NOEC (Pseudokirchneriella subcapitata (green algae)): > 0.01 - 0.1 mg/l Exposure time: 72 h Method: OECD Test Guideline 201 Remarks: Based on data from similar materials
Toxicity to microorganisms	: EC10 (activated sludge): > 10 - 100 mg/l Exposure time: 3 h Method: OECD Test Guideline 209 Remarks: Based on data from similar materials
Toxicity to fish (Chronic toxicity)	: NOEC: > 0.1 - 1 mg/l Exposure time: 120 d Species: Danio rerio (zebra fish) Remarks: Based on data from similar materials
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	: NOEC: > 0.1 - 1 mg/l Exposure time: 21 d Species: Daphnia magna (Water flea) Remarks: Based on data from similar materials
M-Factor (Chronic aquatic toxicity)	: 1

12.2 Persistence and degradability

Components:

Reaction mass of 4,4'-[2,2,2-trifluoro-1-(trifluoromethyl)ethylidene]diphenol and benzyltriphenylphosphonium, salt with 4,4'-[2,2,2-trifluoro-1-(trifluoromethyl)ethylidene]bis[phenol] (1:1)

:

Biodegradability	: Result: Not readily biodegradable. Method: OECD Test Guideline 301B
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2,4'-Trifluoro-1-(trifluoromethyl)ethylidene diphenol:

Biodegradability	: Result: Not readily biodegradable. Method: OECD Test Guideline 301B Remarks: Based on data from similar materials
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12.3 Bioaccumulative potential

Components:

Reaction mass of 4,4'-[2,2,2-trifluoro-1-(trifluoromethyl)ethylidene]diphenol and benzyltri-phenylphosphonium, salt with 4,4'-[2,2,2-trifluoro-1-(trifluoromethyl)ethylidene]bis[phenol] (1:1)

:

Partition coefficient: n-
octanol/water : log Pow: 2.28

2,4'-Trifluoro-1-(trifluoromethyl)ethylidene diphenol:

Bioaccumulation : Species: Danio rerio (zebra fish)
Bioconcentration factor (BCF): < 500
Method: OECD Test Guideline 305
Remarks: Based on data from similar materials

Partition coefficient: n-
octanol/water : log Pow: < 4

12.4 Mobility in soil

No data available

12.5 Results of PBT and vPvB assessment

Product:

Assessment : This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

12.6 Endocrine disrupting properties

Product:

Assessment : The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

12.7 Other adverse effects

No data available

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product : Dispose of in accordance with local regulations.
According to the European Waste Catalogue, Waste Codes are not product specific, but application specific.

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Waste codes should be assigned by the user, preferably in discussion with the waste disposal authorities.
Do not dispose of waste into sewer.

Contaminated packaging : Empty containers should be taken to an approved waste handling site for recycling or disposal.
If not otherwise specified: Dispose of as unused product.

SECTION 14: Transport information

14.1 UN number or ID number

ADN	:	UN 3077
ADR	:	UN 3077
RID	:	UN 3077
IMDG	:	UN 3077
IATA	:	UN 3077

14.2 UN proper shipping name

ADN	:	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S.
		(4,4'-(Hexafluoroisopropylidene)diphenol, 2,4'-Trifluoro-1-(trifluoromethyl)ethylidene diphenol)
ADR	:	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S.
		(4,4'-(Hexafluoroisopropylidene)diphenol, 2,4'-Trifluoro-1-(trifluoromethyl)ethylidene diphenol)
RID	:	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S.
		(4,4'-(Hexafluoroisopropylidene)diphenol, 2,4'-Trifluoro-1-(trifluoromethyl)ethylidene diphenol)
IMDG	:	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S.
		(4,4'-(Hexafluoroisopropylidene)diphenol, 2,4'-Trifluoro-1-(trifluoromethyl)ethylidene diphenol)
IATA	:	Environmentally hazardous substance, solid, n.o.s.
		(4,4'-(Hexafluoroisopropylidene)diphenol, 2,4'-Trifluoro-1-(trifluoromethyl)ethylidene diphenol)

14.3 Transport hazard class(es)

	Class	Subsidiary risks
ADN	:	9
ADR	:	9
RID	:	9
IMDG	:	9

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IATA : 9

14.4 Packing group

ADN

Packing group : III
Classification Code : M7
Hazard Identification Number : 90
Labels : 9

ADR

Packing group : III
Classification Code : M7
Hazard Identification Number : 90
Labels : 9
Tunnel restriction code : (-)

RID

Packing group : III
Classification Code : M7
Hazard Identification Number : 90
Labels : 9

IMDG

Packing group : III
Labels : 9
EmS Code : F-A, S-F

IATA (Cargo)

Packing instruction (cargo aircraft) : 956
Packing instruction (LQ) : Y956
Packing group : III
Labels : Miscellaneous

IATA (Passenger)

Packing instruction (passenger aircraft) : 956
Packing instruction (LQ) : Y956
Packing group : III
Labels : Miscellaneous

14.5 Environmental hazards

ADN

Environmentally hazardous : yes

ADR

Environmentally hazardous : yes

RID

Environmentally hazardous : yes

IMDG

Marine pollutant : yes

IATA (Passenger)

Environmentally hazardous : yes

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IATA (Cargo)

Environmentally hazardous : yes

14.6 Special precautions for user

The transport classification(s) provided herein are for informational purposes only, and solely based upon the properties of the unpackaged material as it is described within this Safety Data Sheet. Transportation classifications may vary by mode of transportation, package sizes, and variations in regional or country regulations.

14.7 Maritime transport in bulk according to IMO instruments

Remarks : Not applicable for product as supplied.

SECTION 15: Regulatory information

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

REACH - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles (Annex XVII) : Conditions of restriction for the following entries should be considered:
Number on list 23: Cadmium

Number on list 27: Nickel

Number on list 72: Cadmium

REACH - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles (Annex XVII)

Number on list 75: If you intend to use this product as tattoo ink, please contact your vendor.

Substance(s) or mixture(s) are listed here according to their appearance in the regulation, irrespective of their use/purpose or the conditions of the restriction. Please refer to the conditions in corresponding Regulation to determine whether an entry is applicable to the placing on the market or not.

REACH - Candidate List of Substances of Very High Concern for Authorisation (Article 59). : Not applicable

Regulation (EC) on substances that deplete the ozone layer : Not applicable

Regulation (EU) 2019/1021 on persistent organic pollutants (recast) : Not applicable

Regulation (EU) No 649/2012 of the European Parliament and the Council concerning the export and import : Not applicable

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of dangerous chemicals

REACH - List of substances subject to authorisation : Not applicable
(Annex XIV)

Seveso III: Directive 2012/18/EU of the European Parliament and of the Council on the control of major-accident hazards involving dangerous substances.

E1	ENVIRONMENTAL HAZARDS	Quantity 1 100 t	Quantity 2 200 t
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Other regulations:

Take note of Directive 92/85/EEC regarding maternity protection or stricter national regulations, where applicable.

Take note of Directive 94/33/EC on the protection of young people at work or stricter national regulations, where applicable.

15.2 Chemical safety assessment

A Chemical Safety Assessment has been carried out for this substance.

SECTION 16: Other information

Other information : Chemours™ and the Chemours Logo are trademarks of The Chemours Company.
Before use read Chemours safety information.
For further information contact the local Chemours office or nominated distributors.
Do not use or resell Chemours™ materials in medical applications involving implantation in the human body or contact with internal body fluids or tissues unless agreed to by Seller in a written agreement covering such use. For further information, please contact your Chemours representative.

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Full text of other abbreviations

ADN - European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways; ADR - Agreement concerning the International Carriage of Dangerous Goods by Road; AIIC - Australian Inventory of Industrial Chemicals; ASTM - American Society for the Testing of Materials; bw - Body weight; CLP - Classification Labelling Packaging Regulation; Regulation (EC) No 1272/2008; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DSL - Domestic Substances List (Canada); ECHA - European Chemicals Agency; EC-Number - European Community number; ECx - Concentration associated with x% response; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration as-

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sociated with x% growth rate response; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; n.o.s. - Not Otherwise Specified; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RID - Regulations concerning the International Carriage of Dangerous Goods by Rail; SADT - Self-Accelerating Decomposition Temperature; SDS - Safety Data Sheet; SVHC - Substance of Very High Concern; TCSI - Taiwan Chemical Substance Inventory; TECI - Thailand Existing Chemicals Inventory; TRGS - Technical Rule for Hazardous Substances; TSCA - Toxic Substances Control Act (United States); UN - United Nations; vPvB - Very Persistent and Very Bioaccumulative

Further information

Sources of key data used to compile the Safety Data Sheet : Internal technical data, data from raw material SDSs, OECD eChem Portal search results and European Chemicals Agency, <http://echa.europa.eu/>

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The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and shall not be considered a warranty or quality specification of any type. The information provided relates only to the specific material identified at the top of this SDS and may not be valid when the SDS material is used in combination with any other materials or in any process, unless specified in the text. Material users should review the information and recommendations in the specific context of their intended manner of handling, use, processing and storage, including an assessment of the appropriateness of the SDS material in the user's end product, if applicable.

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Annex: Exposure Scenarios

Table of Contents

Number	Title
ES1	Industrial use; Formulation [mixing] of preparations and/ or re-packaging (excluding alloys); Large user.
ES2	Industrial use; Formulation [mixing] of preparations and/ or re-packaging (excluding alloys); Small user.
ES3	Industrial use; Processing aid - Polymerisation.

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ES 1: Industrial use; Formulation [mixing] of preparations and/ or re-packaging (excluding alloys); Large user.

1.1. Title section

Exposure Scenario name	: Formulation [mixing] of preparations and/ or re-packaging (excluding alloys), Large user
Structured Short Title	: Industrial use; Formulation [mixing] of preparations and/ or re-packaging (excluding alloys); Large user.

Environment		
CS 1	Formulation [mixing] of preparations and/ or re-packaging (excluding alloys), Large user	ERC3
Worker		
CS 2	Material transfers, Dedicated facility	PROC8b
CS 3	Material transfers, Small scale	PROC9
CS 4	Use in polymer production, Mixing, Batch process	PROC5
CS 5	Formulation of preparations	PROC14
CS 6	Laboratory activities	PROC15

1.2. Conditions of use affecting exposure

1.2.1. Control of environmental exposure: Formulation into solid matrix (ERC3)

Product (article) characteristics	
Covers concentrations up to 100 %	
Physical form of product	: solid
Amount used (or contained in articles), frequency and duration of use/exposure	
Annual amount per site	: 43 tonnes/year
Daily amount per site	: 130 kg/day
Emission days	: 330
Release fraction to wastewater from process Worst case assumption 0.02 %	
Release fraction to air from process Worst case assumption 0.1 %	

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Technical and organisational conditions and measures	
Process designed to minimize releases to wastewater. Process designed to minimize releases to air. Soil emission controls are not applicable as there is no direct release to soil.	
Conditions and measures related to sewage treatment plant	
STP type	: Sewage treatment plant used
STP sludge treatment	: No application of sewage sludge to soil
STP effluent	: 6,000 m3/d
Conditions and measures related to treatment of waste (including article waste)	
Waste treatment	: Contain and dispose of waste according to local regulations.
Other conditions affecting environmental exposure	
Receiving surface water flow	: 6,000,000 m3/d

1.2.2. Control of worker exposure: Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b)

Product (article) characteristics	
Covers concentrations up to 100 %	
Physical form of product	: Solid, medium dustiness
Amount used (or contained in articles), frequency and duration of use/exposure	
Duration	: Covers daily exposures up to 8 hours
Technical and organisational conditions and measures	
Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Local exhaust ventilation	
Transfer via enclosed lines.	
Assumes a good basic standard of occupational hygiene is implemented	
Conditions and measures related to personal protection, hygiene and health evaluation	
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Dermal - minimum efficiency of 95 %	
Wear suitable respiratory protection. Inhalation - minimum efficiency of 90 %	

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Other conditions affecting workers exposure
Indoor or outdoor use : Indoor use
Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply
Use suitable eye protection.

1.2.3. Control of worker exposure: Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9)

Product (article) characteristics
Covers concentrations up to 100 %
Physical form of product : Solid, medium dustiness
Amount used (or contained in articles), frequency and duration of use/exposure
Duration : Covers daily exposures up to 8 hours
Technical and organisational conditions and measures
Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Local exhaust ventilation
Transfer via enclosed lines.
Assumes a good basic standard of occupational hygiene is implemented
Conditions and measures related to personal protection, hygiene and health evaluation
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Dermal - minimum efficiency of 95 %
Wear suitable respiratory protection. Inhalation - minimum efficiency of 90 %
Other conditions affecting workers exposure
Indoor or outdoor use : Indoor use
Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply
Use suitable eye protection.

1.2.4. Control of worker exposure: Mixing or blending in batch processes (PROC5)

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Product (article) characteristics	
Covers concentrations up to 100 %	
Physical form of product	: Solid, medium dustiness
Amount used (or contained in articles), frequency and duration of use/exposure	
Duration	: Avoid carrying out operation for more than 4 hours.
Technical and organisational conditions and measures	
Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Local exhaust ventilation	
Assumes a good basic standard of occupational hygiene is implemented	
Conditions and measures related to personal protection, hygiene and health evaluation	
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Dermal - minimum efficiency of 95 %	
Wear suitable respiratory protection. Inhalation - minimum efficiency of 90 %	
Other conditions affecting workers exposure	
Indoor or outdoor use	: Indoor use
Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply	
Use suitable eye protection.	

1.2.5. Control of worker exposure: Tableting, compression, extrusion, pelettisation, granulation (PROC14)

Product (article) characteristics	
Covers concentrations up to 5 %	
Physical form of product	: Solid, low dustiness
Amount used (or contained in articles), frequency and duration of use/exposure	
Duration	: Covers daily exposures up to 8 hours
Technical and organisational conditions and measures	
Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Local exhaust ventilation	

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Assumes a good basic standard of occupational hygiene is implemented	
Conditions and measures related to personal protection, hygiene and health evaluation	
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Dermal - minimum efficiency of 90 %	
Other conditions affecting workers exposure	
Indoor or outdoor use	: Indoor use

1.2.6. Control of worker exposure: Use as laboratory reagent (PROC15)

Product (article) characteristics	
Covers concentrations up to 100 %	
Physical form of product	: Solid, medium dustiness
Amount used (or contained in articles), frequency and duration of use/exposure	
Duration	: Covers daily exposures up to 8 hours
Technical and organisational conditions and measures	
Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).	
Handle in a fume cupboard or under extract ventilation. Inhalation - minimum efficiency of 90 %	
Assumes a good basic standard of occupational hygiene is implemented	
Conditions and measures related to personal protection, hygiene and health evaluation	
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Dermal - minimum efficiency of 90 %	
Other conditions affecting workers exposure	
Indoor or outdoor use	: Indoor use
Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply	
Use suitable eye protection.	

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1.3. Exposure estimation and reference to its source

1.3.1. Environmental release and exposure: Formulation into solid matrix (ERC3)

Protection Target	Exposure estimate	RCR
Freshwater	0.0000031 mg/L (ECETOC TRA)	0.006
Freshwater sediment	0.0022 mg/kg dry weight (ECETOC TRA)	0.006
Marine water	0.000001 mg/L (ECETOC TRA)	0.02
Marine sediment	0.00073 mg/kg dry weight (ECETOC TRA)	0.02
Sewage treatment plant	0.0023 mg/L (ECETOC TRA)	< 0.001
Agricultural soil	0.021 mg/kg dry weight (ECETOC TRA)	0.3
Man via environment - Oral	0.00044 mg/kg bw/day (ECETOC TRA)	0.02

1.3.2. Worker exposure: Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	< 0.004 mg/m ³ (ECETOC TRA worker v3)	0.03
dermal	systemic	long-term	< 0.004 mg/kg bw/day (ECETOC TRA worker v3)	0.10

1.3.3. Worker exposure: Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	< 0.004 mg/m ³ (ECETOC TRA worker v3)	0.03
dermal	systemic	long-term	< 0.004 mg/kg bw/day (ECETOC TRA worker v3)	0.10

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1.3.4. Worker exposure: Mixing or blending in batch processes (PROC5)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	0.021 mg/m ³ (ECETOC TRA worker v3)	0.18
dermal	systemic	long-term	0.007 mg/kg bw/day (ECETOC TRA worker v3)	0.21

1.3.5. Worker exposure: Tableting, compression, extrusion, pelettisation, granulation (PROC14)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	< 0.002 mg/m ³ (ECETOC TRA worker v3)	0.012
dermal	systemic	long-term	< 0.001 mg/kg bw/day (ECETOC TRA worker v3)	0.021

1.3.6. Worker exposure: Use as laboratory reagent (PROC15)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	0.035 mg/m ³ (ECETOC TRA worker v3)	0.30
dermal	systemic	long-term	< 0.001 mg/kg bw/day (ECETOC TRA worker v3)	0.01

1.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

For further information, please contact sds-support@chemours.com.

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ES 2: Industrial use; Formulation [mixing] of preparations and/ or re-packaging (excluding alloys); Small user.

2.1. Title section

Exposure Scenario name	: Formulation [mixing] of preparations and/ or re-packaging (excluding alloys), Small user
Structured Short Title	: Industrial use; Formulation [mixing] of preparations and/ or re-packaging (excluding alloys); Small user.

Environment		
CS 1	Formulation [mixing] of preparations and/ or re-packaging (excluding alloys), Small scale	ERC3
Worker		
CS 2	Material transfers, Non-dedicated facility	PROC8a
CS 3	Material transfers, Dedicated facility	PROC8b
CS 4	Material transfers, Small scale	PROC9
CS 5	Use in polymer production, Mixing, Batch process	PROC5
CS 6	Formulation of preparations	PROC14
CS 7	Laboratory activities	PROC15

2.2. Conditions of use affecting exposure

2.2.1. Control of environmental exposure: Formulation into solid matrix (ERC3)

Product (article) characteristics	
Covers concentrations up to 100 %	
Physical form of product	: solid
Amount used (or contained in articles), frequency and duration of use/exposure	
Annual amount per site	: 0.5 tonnes/year
Daily amount per site	: 25 kg/day
Emission days	: 20
Release fraction to wastewater from process	
Worst case assumption 0.02 %	

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Release fraction to air from process

Worst case assumption 0.1 %

Technical and organisational conditions and measures

Process designed to minimize releases to wastewater.
Process designed to minimize releases to air.
Soil emission controls are not applicable as there is no direct release to soil.

Conditions and measures related to sewage treatment plant

STP type	:	Sewage treatment plant used
STP sludge treatment	:	No application of sewage sludge to soil
STP effluent	:	2,000 m3/d

Conditions and measures related to treatment of waste (including article waste)

Waste treatment	:	Contain and dispose of waste according to local regulations.
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Other conditions affecting environmental exposure

Receiving surface water flow	:	18,000 m3/d
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2.2.2. Control of worker exposure: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a)

Product (article) characteristics

Covers concentrations up to 100 %

Physical form of product	:	Solid, medium dustiness
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Amount used (or contained in articles), frequency and duration of use/exposure

Duration	:	Avoid carrying out operation for more than 4 hours.
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Technical and organisational conditions and measures

Local exhaust ventilation

Transfer via enclosed lines.

Assumes a good basic standard of occupational hygiene is implemented

Conditions and measures related to personal protection, hygiene and health evaluation

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.
Dermal - minimum efficiency of 95 %

Wear suitable respiratory protection.

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Inhalation - minimum efficiency of 90 %
Other conditions affecting workers exposure
Indoor or outdoor use : Indoor use
Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply
Use suitable eye protection.

2.2.3. Control of worker exposure: Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b)

Product (article) characteristics
Covers concentrations up to 100 %
Physical form of product : Solid, medium dustiness
Amount used (or contained in articles), frequency and duration of use/exposure
Duration : Avoid carrying out operation for more than 4 hours.
Technical and organisational conditions and measures
Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Local exhaust ventilation
Transfer via enclosed lines.
Assumes a good basic standard of occupational hygiene is implemented
Conditions and measures related to personal protection, hygiene and health evaluation
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Dermal - minimum efficiency of 95 %
Wear suitable respiratory protection. Inhalation - minimum efficiency of 90 %
Other conditions affecting workers exposure
Indoor or outdoor use : Indoor use
Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply
Use suitable eye protection.

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2.2.4. Control of worker exposure: Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9)

Product (article) characteristics	
Covers concentrations up to 100 %	
Physical form of product	: Solid, medium dustiness
Amount used (or contained in articles), frequency and duration of use/exposure	
Duration	: Covers daily exposures up to 8 hours
Technical and organisational conditions and measures	
Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Local exhaust ventilation	
Transfer via enclosed lines.	
Assumes a good basic standard of occupational hygiene is implemented	
Conditions and measures related to personal protection, hygiene and health evaluation	
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Dermal - minimum efficiency of 95 %	
Wear suitable respiratory protection. Inhalation - minimum efficiency of 90 %	
Other conditions affecting workers exposure	
Indoor or outdoor use	: Indoor use
Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply	
Use suitable eye protection.	

2.2.5. Control of worker exposure: Mixing or blending in batch processes (PROC5)

Product (article) characteristics	
Covers concentrations up to 100 %	
Physical form of product	: Solid, medium dustiness
Amount used (or contained in articles), frequency and duration of use/exposure	
Duration	: Avoid carrying out operation for more than 4 hours.

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Technical and organisational conditions and measures
Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Local exhaust ventilation
Assumes a good basic standard of occupational hygiene is implemented
Conditions and measures related to personal protection, hygiene and health evaluation
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Dermal - minimum efficiency of 95 %
Wear suitable respiratory protection. Inhalation - minimum efficiency of 90 %
Other conditions affecting workers exposure
Indoor or outdoor use : Indoor use
Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply
Use suitable eye protection.

2.2.6. Control of worker exposure: Tableting, compression, extrusion, pelettisation, granulation (PROC14)

Product (article) characteristics
Covers concentrations up to 5 %
Physical form of product : Solid, low dustiness
Amount used (or contained in articles), frequency and duration of use/exposure
Duration : Covers daily exposures up to 8 hours
Technical and organisational conditions and measures
Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Assumes a good basic standard of occupational hygiene is implemented
Conditions and measures related to personal protection, hygiene and health evaluation
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Dermal - minimum efficiency of 90 %
Other conditions affecting workers exposure
Indoor or outdoor use : Indoor use

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2.2.7. Control of worker exposure: Use as laboratory reagent (PROC15)

Product (article) characteristics	
Covers concentrations up to 100 %	
Physical form of product	: Solid, medium dustiness
Amount used (or contained in articles), frequency and duration of use/exposure	
Duration	: Covers daily exposures up to 8 hours
Technical and organisational conditions and measures	
Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).	
Handle in a fume cupboard or under extract ventilation. Inhalation - minimum efficiency of 90 %	
Assumes a good basic standard of occupational hygiene is implemented	
Conditions and measures related to personal protection, hygiene and health evaluation	
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Dermal - minimum efficiency of 90 %	
Other conditions affecting workers exposure	
Indoor or outdoor use	: Indoor use
Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply	
Use suitable eye protection.	

2.3. Exposure estimation and reference to its source

2.3.1. Environmental release and exposure: Formulation into solid matrix (ERC3)

Protection Target	Exposure estimate	RCR
Freshwater	0.00014 mg/L (ECETOC TRA)	0.3
Freshwater sediment	0.098 mg/kg dry weight (ECETOC TRA)	0.3
Marine water	0.000025 mg/L (ECETOC TRA)	0.6
Marine sediment	0.018 mg/kg dry weight (ECETOC TRA)	0.6

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Sewage treatment plant	0.0014 mg/L (ECETOC TRA)	< 0.001
Agricultural soil	0.0475 mg/kg dry weight (ECETOC TRA)	0.73
Man via environment - Oral	0.000044 mg/kg bw/day (ECETOC TRA)	0.002

2.3.2. Worker exposure: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	0.03 mg/m ³ (ECETOC TRA worker v3)	0.25
dermal	systemic	long-term	0.007 mg/kg bw/day (ECETOC TRA worker v3)	0.21

2.3.3. Worker exposure: Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	0.053 mg/m ³ (ECETOC TRA worker v3)	0.44
dermal	systemic	long-term	< 0.004 mg/kg bw/day (ECETOC TRA worker v3)	0.10

2.3.4. Worker exposure: Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	0.035 mg/m ³ (ECETOC TRA worker v3)	0.30
dermal	systemic	long-term	< 0.004 mg/kg bw/day (ECETOC TRA worker v3)	0.10

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2.3.5. Worker exposure: Mixing or blending in batch processes (PROC5)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	0.003 mg/m ³ (ECETOC TRA worker v3)	0.03
dermal	systemic	long-term	0.004 mg/kg bw/day (ECETOC TRA worker v3)	0.13

2.3.6. Worker exposure: Tableting, compression, extrusion, pelettisation, granulation (PROC14)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	0.014 mg/m ³ (ECETOC TRA worker v3)	0.12
dermal	systemic	long-term	0.007 mg/kg bw/day (ECETOC TRA worker v3)	0.21

2.3.7. Worker exposure: Use as laboratory reagent (PROC15)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	0.01 mg/m ³ (ECETOC TRA worker v3)	0.084
dermal	systemic	long-term	< 0.001 mg/kg bw/day (ECETOC TRA worker v3)	0.01

2.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

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ES 3: Industrial use; Processing aid - Polymerisation.

3.1. Title section

Exposure Scenario name	: Use in rubber production and processing
Structured Short Title	: Industrial use; Processing aid - Polymerisation.

Environment		
CS 1	Use in rubber production and processing	ERC6d
Worker		
CS 2	Use in polymer production, Mixing, Batch process	PROC5
CS 3	Material transfers, Non-dedicated facility	PROC8a
CS 4	Material transfers, Dedicated facility	PROC8b
CS 5	Pressing uncured rubber blanks, Curing chemical	PROC14
CS 6	Laboratory activities	PROC15
CS 7	Loading and unloading, Manual	PROC21

3.2. Conditions of use affecting exposure

3.2.1. Control of environmental exposure: Use of reactive process regulators in polymerisation processes at industrial site (inclusion or not into/onto article) (ERC6d)

Product (article) characteristics	
Covers concentrations up to 4 %	
Physical form of product	: Solid, low dustiness
Amount used (or contained in articles), frequency and duration of use/exposure	
Annual amount per site	: 5 tonnes/year
Daily amount per site	: 23 kg/day
Emission days	: 220
Release fraction to wastewater from process	
Worst case assumption 0.02 %	
Release fraction to air from process	
Worst case assumption 0.1 %	

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Technical and organisational conditions and measures	
Process designed to minimize releases to wastewater. Process designed to minimize releases to air. Soil emission controls are not applicable as there is no direct release to soil.	
Conditions and measures related to sewage treatment plant	
STP type	: Sewage treatment plant used
STP effluent	: 2,000 m3/d
Conditions and measures related to treatment of waste (including article waste)	
Waste treatment	: Contain and dispose of waste according to local regulations.
Other conditions affecting environmental exposure	
Receiving surface water flow	: 18,000 m3/d

3.2.2. Control of worker exposure: Mixing or blending in batch processes (PROC5)

Product (article) characteristics	
Covers concentrations up to 5 %	
Physical form of product	: Solid, low dustiness
Amount used (or contained in articles), frequency and duration of use/exposure	
Duration	: Covers daily exposures up to 8 hours
Technical and organisational conditions and measures	
Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Local exhaust ventilation	
Assumes a good basic standard of occupational hygiene is implemented	
Conditions and measures related to personal protection, hygiene and health evaluation	
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Dermal - minimum efficiency of 90 %	
Other conditions affecting workers exposure	
Indoor or outdoor use	: Indoor use

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3.2.3. Control of worker exposure: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a)

Product (article) characteristics	
Covers concentrations up to 5 %	
Physical form of product	: Solid, low dustiness
Amount used (or contained in articles), frequency and duration of use/exposure	
Duration	: Covers daily exposures up to 8 hours
Technical and organisational conditions and measures	
Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).	
Assumes a good basic standard of occupational hygiene is implemented	
Conditions and measures related to personal protection, hygiene and health evaluation	
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Dermal - minimum efficiency of 95 %	
Other conditions affecting workers exposure	
Indoor or outdoor use	: Indoor use

3.2.4. Control of worker exposure: Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b)

Product (article) characteristics	
Covers concentrations up to 5 %	
Physical form of product	: Solid, low dustiness
Amount used (or contained in articles), frequency and duration of use/exposure	
Duration	: Covers daily exposures up to 8 hours
Technical and organisational conditions and measures	
Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Local exhaust ventilation	
Transfer via enclosed lines.	
Assumes a good basic standard of occupational hygiene is implemented	

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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 'basic' employee training.
Dermal - minimum efficiency of 90 %

Other conditions affecting workers exposure

Indoor or outdoor use : Indoor use

3.2.5. Control of worker exposure: Tableting, compression, extrusion, pelettisation, granulation (PROC14)

Product (article) characteristics

Covers concentrations up to 5 %

Physical form of product : Solid, low dustiness

Amount used (or contained in articles), frequency and duration of use/exposure

Duration : Covers daily exposures up to 8 hours

Technical and organisational conditions and measures

Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).
Local exhaust ventilation

Assumes a good basic standard of occupational hygiene is implemented

Conditions and measures related to personal protection, hygiene and health evaluation

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
Dermal - minimum efficiency of 90 %

Other conditions affecting workers exposure

Indoor or outdoor use : Indoor use

3.2.6. Control of worker exposure: Use as laboratory reagent (PROC15)

Product (article) characteristics

Covers concentrations up to 5 %

Physical form of product : Solid, low dustiness

Amount used (or contained in articles), frequency and duration of use/exposure

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Duration	: Covers daily exposures up to 8 hours
Technical and organisational conditions and measures	
Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).	
Assumes a good basic standard of occupational hygiene is implemented	
Conditions and measures related to personal protection, hygiene and health evaluation	
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Dermal - minimum efficiency of 90 %	
Other conditions affecting workers exposure	
Indoor or outdoor use	: Indoor use

3.2.7. Control of worker exposure: Low energy manipulation and handling of substances bound in/on materials and/or articles (PROC21)

Product (article) characteristics	
Covers concentrations up to 1 %	
Physical form of product	: Solid, low dustiness
Amount used (or contained in articles), frequency and duration of use/exposure	
Duration	: Covers daily exposures up to 8 hours
Technical and organisational conditions and measures	
Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Local exhaust ventilation	
Assumes a good basic standard of occupational hygiene is implemented	
Conditions and measures related to personal protection, hygiene and health evaluation	
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Dermal - minimum efficiency of 90 %	
Other conditions affecting workers exposure	
Indoor or outdoor use	: Indoor use

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3.3. Exposure estimation and reference to its source

3.3.1. Environmental release and exposure: Use of reactive process regulators in polymerisation processes at industrial site (inclusion or not into/onto article) (ERC6d)

Protection Target	Exposure estimate	RCR
Freshwater	0.0012 mg/L (ECETOC TRA)	0.3
Freshwater sediment	0.09 mg/kg dry weight (ECETOC TRA)	0.3
Marine water	0.000023 mg/L (ECETOC TRA)	0.5
Marine sediment	0.017 mg/kg dry weight (ECETOC TRA)	0.5
Sewage treatment plant	0.0012 mg/L (ECETOC TRA)	< 0.001
Agricultural soil	0.045 mg/kg dry weight (ECETOC TRA)	0.7
Man via environment - Oral	0.000086 mg/kg bw/day (ECETOC TRA)	0.002

3.3.2. Worker exposure: Mixing or blending in batch processes (PROC5)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	0.007 mg/m ³ (ECETOC TRA worker v3)	0.06
dermal	systemic	long-term	0.03 mg/kg bw/day (ECETOC TRA worker v3)	0.83

3.3.3. Worker exposure: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	< 0.007 mg/m ³ (ECETOC TRA worker v3)	0.058
dermal	systemic	long-term	0.013 mg/kg bw/day (ECETOC TRA worker v3)	0.39

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3.3.4. Worker exposure: Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	0.001 mg/m ³ (ECETOC TRA worker v3)	0.008
dermal	systemic	long-term	< 0.002 mg/kg bw/day (ECETOC TRA worker v3)	0.039

3.3.5. Worker exposure: Tableting, compression, extrusion, pelettisation, granulation (PROC14)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	0.002 mg/m ³ (ECETOC TRA worker v3)	0.017
dermal	systemic	long-term	0.007 mg/kg bw/day (ECETOC TRA worker v3)	0.21

3.3.6. Worker exposure: Use as laboratory reagent (PROC15)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	0.014 mg/m ³ (ECETOC TRA worker v3)	0.12
dermal	systemic	long-term	0.007 mg/kg bw/day (ECETOC TRA worker v3)	0.21

3.3.7. Worker exposure: Low energy manipulation and handling of substances bound in/on materials and/or articles (PROC21)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	0.01 mg/m ³ (ECETOC TRA worker v3)	0.08
dermal	systemic	long-term	0.03 mg/kg bw/day (ECETOC TRA)	0.86

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3.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

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