

# SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006



## Viton™ VTR-1043 fluoroelastomer

Version	Revision Date:	SDS Number:	Date of last issue: 10.09.2020
4.4	01.04.2021	1334183-00039	Date of first issue: 27.02.2017

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

#### 1.1 Product identifier

Trade name : Viton™ VTR-1043 fluoroelastomer

SDS-Identcode : 130000036251

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

Use of the Sub-stance/Mixture : Manufacture of rubber products

#### 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

+(44)-870-8200418 (CHEMTREC - Recommended)

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### SECTION 2: Hazards identification

#### 2.1 Classification of the substance or mixture

##### Classification (REGULATION (EC) No 1272/2008)

Long-term (chronic) aquatic hazard, Category 3 : H412: Harmful to aquatic life with long lasting effects.

#### 2.2 Label elements

##### Labelling (REGULATION (EC) No 1272/2008)

Hazard statements : H412 Harmful to aquatic life with long lasting effects.

Precautionary statements : **Prevention:**  
P273 Avoid release to the environment.

#### 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.

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### SECTION 3: Composition/information on ingredients

#### 3.2 Mixtures

##### Components

Chemical name	CAS-No. EC-No. Index-No. Registration number	Classification	Concentration (% w/w)
4,4'-(Hexafluoroisopropylidene)diphenol	1478-61-1 216-036-7 01-2120762844-45-0004	Eye Dam. 1; H318 Repr. 1B; H360 STOT RE 2; H373 (Prostate, Seminal vesicle) Aquatic Chronic 1; H410  M-Factor (Chronic aquatic toxicity): 1	$\geq 0.3 - < 1$
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  01-2120763412-59-0000	Repr. 1B; H360 STOT RE 2; H373 (Seminal vesicle, Prostate) Aquatic Acute 1; H400 Aquatic Chronic 1; H410  M-Factor (Acute aquatic toxicity): 1 M-Factor (Chronic aquatic toxicity): 10	$\geq 0.3 - < 1$
Sulpholane	126-33-0 204-783-1 016-031-00-8 01-2119565139-32	Acute Tox. 4; H302 Repr. 1B; H360	$\geq 0.3 - < 1$

##### Alternative CAS Numbers for some regions

Chemical name	Alternative CAS Number(s)
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)	75768-65-9, 1478-61-1

For explanation of abbreviations see section 16.

### SECTION 4: First aid measures

#### 4.1 Description of first aid measures

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Protection of first-aiders	:	No special precautions are necessary for first aid responders.
If inhaled	:	If inhaled, remove to fresh air. Get medical attention if symptoms occur.
In case of skin contact	:	Wash with water and soap as a precaution. Get medical attention if symptoms occur.
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 if symptoms occur. Rinse mouth thoroughly with water.

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

None known.

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

Treatment	:	Treat symptomatically and supportively.
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## SECTION 5: Firefighting measures

### 5.1 Extinguishing media

Suitable extinguishing media	:	Water spray Alcohol-resistant foam Carbon dioxide (CO <sub>2</sub> ) 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	:	Carbon oxides Fluorine compounds

### 5.3 Advice for firefighters

Special protective equipment for firefighters	:	Wear self-contained breathing apparatus for firefighting if necessary. 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 so. Evacuate area.

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### SECTION 6: Accidental release measures

#### 6.1 Personal precautions, protective equipment and emergency procedures

Personal precautions : 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 : Use only with adequate ventilation.

Advice on safe handling : Handle in accordance with good industrial hygiene and safety practice, based on the results of the workplace exposure assessment  
Take care to prevent spills, waste and minimize release to the 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 in accordance with the particular national regulations.

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Advice on common storage : No special restrictions on storage with other products.

### 7.3 Specific end use(s)

Specific use(s) : No data available

## SECTION 8: Exposure controls/personal protection

### 8.1 Control parameters

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
4,4'-(Hexafluoroisopropylidene)diphenol	Workers	Inhalation	Long-term systemic effects	0.118 mg/m3
	Workers	Skin contact	Long-term systemic effects	0.033 mg/kg bw/day
	Consumers	Inhalation	Long-term systemic effects	0.029 mg/m3
	Consumers	Dermal	Long-term systemic effects	0.017 mg/kg bw/day
	Consumers	Oral	Long-term systemic effects	0.017 mg/kg bw/day
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
Sulpholane	Workers	Inhalation	Long-term systemic effects	9 mg/m3
	Workers	Skin contact	Long-term systemic effects	7.8 mg/kg bw/day

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

Substance name	Environmental Compartment	Value
4,4'-(Hexafluoroisopropylidene)diphenol	Freshwater - intermittent	0.027 mg/l
	Fresh water	0.00522 mg/l

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	Fresh water sediment	1.21 mg/kg dry weight (d.w.)
	Marine water - intermittent	0.027 mg/l
	Marine water	0.000522 mg/l
	Marine sediment	0.121 mg/kg dry weight (d.w.)
	Sewage treatment plant	4.787 mg/l
	Soil	0.239 mg/kg dry weight (d.w.)
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)	Freshwater - intermittent	0.0045 mg/l
	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
Sulpholane	Fresh water	0.1 mg/l
	Marine water	0.01 mg/l
	Intermittent use/release	1 mg/l
	Sewage treatment plant	100 mg/l
	Fresh water sediment	0.39 mg/kg
	Marine sediment	0.039 mg/kg
	Soil	0.02 mg/kg

### 8.2 Exposure controls

#### Engineering measures

Ensure adequate ventilation, especially in confined areas.  
Minimize workplace exposure concentrations.

#### Personal protective equipment

Eye protection : Wear the following personal protective equipment:  
Safety glasses  
Equipment should conform to BS EN 166

Hand protection  
Material : Nitrile rubber  
Glove thickness : 0.38 mm  
Wearing time : 480 min

Remarks : Choose gloves to protect hands against chemicals depending

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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	:	Skin should be washed after contact.
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 BS EN 14387
Filter type	:	Combined particulates, acidic gas/vapour and organic vapour type (AE-P)

### SECTION 9: Physical and chemical properties

#### 9.1 Information on basic physical and chemical properties

Appearance	:	sheets
Colour	:	white, off-white
Odour	:	odourless
Odour Threshold	:	No data available
pH	:	No data available
Melting point/freezing point	:	No data available
Initial boiling point and boiling range	:	No data available
Flash point	:	Not applicable
Evaporation rate	:	Not applicable
Flammability (solid, gas)	:	No data available
Upper explosion limit / Upper flammability limit	:	No data available
Lower explosion limit / Lower flammability limit	:	No data available
Vapour pressure	:	Not applicable
Relative vapour density	:	Not applicable

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Density	:	1.75 - 1.90 g/cm <sup>3</sup>
Solubility(ies)	:	
Water solubility	:	insoluble
Partition coefficient: n-octanol/water	:	Not applicable
Auto-ignition temperature	:	No data available
Decomposition temperature	:	No data available
Viscosity	:	
Viscosity, kinematic	:	Not applicable
Explosive properties	:	Not explosive
Oxidizing properties	:	The substance or mixture is not classified as oxidizing.

### 9.2 Other information

Particle size	:	No data available
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## 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.
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### 10.4 Conditions to avoid

Conditions to avoid	:	None known.
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### 10.5 Incompatible materials

Materials to avoid	:	None.
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### 10.6 Hazardous decomposition products

No hazardous decomposition products are known.

## SECTION 11: Toxicological information

### 11.1 Information on toxicological effects

Information on likely routes of exposure	:	Skin contact Ingestion Eye contact
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### Acute toxicity

Not classified based on available information.

### Product:

Acute oral toxicity : Assessment: The substance or mixture has no acute oral toxicity

### Components:

#### 4,4'-(Hexafluoroisopropylidene)diphenol:

Acute oral toxicity : LD50 (Rat): > 2,000 mg/kg  
Method: OECD Test Guideline 423  
Assessment: The substance or mixture has no acute oral toxicity

Acute dermal toxicity : LD50 (Rat): > 2,000 mg/kg  
Method: OECD Test Guideline 402  
Assessment: The substance or mixture has no acute dermal toxicity

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

### Sulpholane:

Acute oral toxicity : LD50 (Rat): 2,000 - 2,500 mg/kg

Acute inhalation toxicity : LC50 (Rat): 12 mg/l  
Exposure time: 4 h  
Test atmosphere: dust/mist

Acute dermal toxicity : LD50 (Rat): > 2,000 mg/kg  
Method: Directive 67/548/EEC, Annex V, B.3.

### Skin corrosion/irritation

Not classified based on available information.

### Components:

#### 4,4'-(Hexafluoroisopropylidene)diphenol:

Species : Rabbit  
Method : OECD Test Guideline 404  
Result : No skin irritation

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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

### Sulpholane:

Species	:	Rabbit
Result	:	No skin irritation

### Serious eye damage/eye irritation

Not classified based on available information.

### Product:

Result	:	No eye irritation
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### Components:

#### 4,4'-(Hexafluoroisopropylidene)diphenol:

Species	:	Rabbit
Method	:	OECD Test Guideline 405
Result	:	Irreversible effects on the eye

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

### Sulpholane:

Species	:	Rabbit
Result	:	No eye irritation

### Respiratory or skin sensitisation

#### Skin sensitisation

Not classified based on available information.

#### Respiratory sensitisation

Not classified based on available information.

### Components:

#### 4,4'-(Hexafluoroisopropylidene)diphenol:

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Test Type	: Maximisation Test
Exposure routes	: Skin contact
Species	: Guinea pig
Method	: OECD Test Guideline 406
Result	: negative

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)

:

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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### Sulpholane:

Test Type	: Freund's complete adjuvant test
Exposure routes	: Skin contact
Species	: Guinea pig
Result	: negative

### Germ cell mutagenicity

Not classified based on available information.

### Components:

#### 4,4'-(Hexafluoroisopropylidene)diphenol:

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: OPPTS 870.5300
Result: equivocal

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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)

:

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.

### **Sulpholane:**

Genotoxicity in vitro : Test Type: Chromosome aberration test in vitro  
Method: OECD Test Guideline 471  
Result: negative

Test Type: In vitro sister chromatid exchange assay in mammalian cells  
Result: negative

Test Type: Bacterial reverse mutation assay (AMES)  
Result: negative

### **Carcinogenicity**

Not classified based on available information.

### **Reproductive toxicity**

Not classified based on available information.

### **Product:**

Reproductive toxicity - Assessment : No toxicity to reproduction

### **Components:**

#### **4,4'-(Hexafluoroisopropylidene)diphenol:**

Effects on fertility : Test Type: Reproduction/Developmental toxicity screening test  
Species: Rat  
Application Route: Ingestion  
Method: OECD Test Guideline 422  
Result: positive

Effects on foetal development : Test Type: Reproduction/Developmental toxicity screening test  
Species: Rat  
Application Route: Ingestion

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Method: OECD Test Guideline 422  
Result: negative

Reproductive toxicity - Assessment : Clear evidence of adverse effects on sexual function and fertility, and/or on development, based on animal experiments

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)

:  
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

### Sulpholane:

Effects on foetal development : Test Type: Embryo-foetal development  
Species: Rat  
Application Route: Ingestion  
Method: OECD Test Guideline 414  
Result: positive

Reproductive toxicity - Assessment : Clear evidence of adverse effects on sexual function and fertility, and/or on development, based on animal experiments

### STOT - single exposure

Not classified based on available information.

### STOT - repeated exposure

Not classified based on available information.

### Product:

Assessment : The substance or mixture is not classified as specific target organ toxicant, repeated exposure.

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### Components:

#### **4,4'-(Hexafluoroisopropylidene)diphenol:**

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

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.

#### **Sulpholane:**

Assessment	: No significant health effects observed in animals at concentrations of 1 mg/l/6h/d or less.
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### **Repeated dose toxicity**

### Components:

#### **4,4'-(Hexafluoroisopropylidene)diphenol:**

Species	: Rat, male and female
NOAEL	: 10 mg/kg
LOAEL	: 30 mg/kg
Application Route	: Ingestion
Exposure time	: 28 Days
Method	: OECD Test Guideline 407

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

#### **Sulpholane:**

Species	: Rat
NOAEL	: 200 mg/kg

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Application Route	: Ingestion
Exposure time	: 28 Days
Species	: Guinea pig
NOAEL	: 0.159 mg/l
LOAEL	: 0.2 mg/l
Application Route	: inhalation (dust/mist/fume)
Exposure time	: 90 - 110 Days

### Aspiration toxicity

Not classified based on available information.

### Further information

#### Product:

Remarks : According to data on similar materials, and from modeling assessment, the product is not considered to require classification as dangerous to health.

## SECTION 12: Ecological information

### 12.1 Toxicity

#### Product:

#### Ecotoxicology Assessment

Acute aquatic toxicity : This product has no known ecotoxicological effects.

Chronic aquatic toxicity : Harmful to aquatic life with long lasting effects.

#### Components:

#### 4,4'-(Hexafluoroisopropylidene)diphenol:

Toxicity to fish : LC50 (Danio rerio (zebra fish)): 4.2 mg/l  
Exposure time: 48 h  
Method: OECD Test Guideline 215

Toxicity to daphnia and other : EC50 (Daphnia magna (Water flea)): 2.7 mg/l  
aquatic invertebrates  
Exposure time: 48 h  
Method: OECD Test Guideline 202

Toxicity to algae/aquatic : ErC50 (Desmodesmus subspicatus (green algae)): 3 mg/l  
plants  
Exposure time: 72 h  
Method: OECD Test Guideline 201

NOEC (Pseudokirchneriella subcapitata (green algae)): 0.052 mg/l  
Exposure time: 3 d  
Method: OECD Test Guideline 201

Toxicity to fish (Chronic tox- : NOEC: 0.125 mg/l  
icity)  
Exposure time: 120 d

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Species: Danio rerio (zebra fish)  
Method: No data available

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOEC: 0.23 mg/l  
Exposure time: 21 d  
Species: Daphnia magna (Water flea)  
Method: OECD Test Guideline 211

M-Factor (Chronic aquatic toxicity) : 1

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

### Sulpholane:

Toxicity to fish : LC50 (Oryzias latipes (Orange-red killifish)): > 100 mg/l  
Exposure time: 96 h  
Method: OECD Test Guideline 203

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 852 mg/l  
Exposure time: 48 h  
Method: OECD Test Guideline 202

Toxicity to algae/aquatic plants : EC50 (Pseudokirchneriella subcapitata (green algae)): > 1,000 mg/l  
Exposure time: 72 h



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Method: OECD Test Guideline 201

NOEC (Pseudokirchneriella subcapitata (green algae)): 556 mg/l

Exposure time: 72 h

Method: OECD Test Guideline 201

Toxicity to microorganisms : NOEC : 100 mg/l  
Exposure time: 14 d

### 12.2 Persistence and degradability

#### Components:

##### **4,4'-(Hexafluoroisopropylidene)diphenol:**

Biodegradability : Result: Not readily biodegradable.  
Method: OECD Test Guideline 301B

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

##### **Sulpholane:**

Biodegradability : Result: Not readily biodegradable.  
Biodegradation: 10.1 %  
Exposure time: 14 d  
Method: OECD Test Guideline 301C

### 12.3 Bioaccumulative potential

#### Components:

##### **4,4'-(Hexafluoroisopropylidene)diphenol:**

Bioaccumulation : Species: Zebrafish  
Bioconcentration factor (BCF): 9.8  
Method: OECD Test Guideline 305

Partition coefficient: n-octanol/water : log Pow: 2.79

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)

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

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octanol/water

### Sulpholane:

Bioaccumulation : Species: Cyprinus carpio (Carp)  
Bioconcentration factor (BCF): < 13

Partition coefficient: n-octanol/water : log Pow: < 0

### 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 Other adverse effects

#### Product:

Endocrine disrupting potential : 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 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.  
Waste codes should be assigned by the user, preferably in discussion with the waste disposal authorities.

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

Not regulated as a dangerous good

### 14.2 UN proper shipping name

Not regulated as a dangerous good

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### 14.3 Transport hazard class(es)

Not regulated as a dangerous good

### 14.4 Packing group

Not regulated as a dangerous good

### 14.5 Environmental hazards

Not regulated as a dangerous good

### 14.6 Special precautions for user

Not applicable

### 14.7 Transport in bulk according to Annex II of Marpol and the IBC Code

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, preparations and articles (Annex XVII) : Conditions of restriction for the following entries should be considered:  
Cadmium (Number on list 72, 28)  
Nickel (Number on list 27)

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

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

Regulation (EC) No 1005/2009 on substances that deplete the ozone layer : Not applicable

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

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

Seveso III: Directive 2012/18/EU of the European Parliament and of the Council on the control of major-accident hazards involving dangerous substances.  
Not applicable

### 15.2 Chemical safety assessment

A Chemical Safety Assessment has not been carried out.

## SECTION 16: Other information

Other information : Viton™ and any associated logos are trademarks or copyrights of The Chemours Company FC, LLC.  
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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.

Items where changes have been made to the previous version are highlighted in the body of this document by two vertical lines.

### Full text of H-Statements

H302	: Harmful if swallowed.
H318	: Causes serious eye damage.
H360	: May damage fertility or the unborn child.
H373	: May cause damage to organs through prolonged or repeated exposure.
H400	: Very toxic to aquatic life.
H410	: Very toxic to aquatic life with long lasting effects.

### Full text of other abbreviations

Acute Tox.	: Acute toxicity
Aquatic Acute	: Short-term (acute) aquatic hazard
Aquatic Chronic	: Long-term (chronic) aquatic hazard
Eye Dam.	: Serious eye damage
Repr.	: Reproductive toxicity
STOT RE	: Specific target organ toxicity - repeated exposure

ADN - European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways; ADR - European Agreement concerning the International Carriage of Dangerous Goods by Road; AIIIC - 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 associated 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 sub-

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stance; 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; 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/>

### Classification of the mixture:

Aquatic Chronic 3 H412

### Classification procedure:

Based on product data or assessment

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
ES 1	Industrial use; Formulation [mixing] of preparations and/ or re-packaging (excluding alloys); Processing aid - Polymerisation.
ES 2	Industrial use; Processing aid - Polymerisation.

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### ES 1: Industrial use; Formulation [mixing] of preparations and/ or re-packaging (excluding alloys); Processing aid - Polymerisation.

#### 1.1. Title section

<b>Exposure Scenario name</b>	: Formulation [mixing] of preparations and/ or re-packaging (excluding alloys), Processing aid - Polymerisation
<b>Structured Short Title</b>	: Industrial use; Formulation [mixing] of preparations and/ or re-packaging (excluding alloys); Processing aid - Polymerisation.

Environment		
CS 1	Formulation [mixing] of preparations and/ or re-packaging (excluding alloys)	ERC2, ERC3
Worker		
CS 2	Formulation	PROC4
CS 3	Use in polymer production, Mixing, Batch process	PROC5
CS 4	Material transfers, Dedicated facility	PROC8b
CS 5	Material transfers, Small package filling	PROC9
CS 6	Laboratory activities	PROC15

#### 1.2. Conditions of use affecting exposure

##### 1.2.1. Control of environmental exposure: Formulation into mixture (ERC2) / Formulation into solid matrix (ERC3)

Amount used (or contained in articles), frequency and duration of use/exposure	
Annual amount per site	: 100 tonnes/year
Daily amount per site	: 20 tonnes/day
Fraction of EU tonnage used in region	: 1
Technical and organisational conditions and measures	
Reuse material in process Process designed to minimize releases to wastewater. No discharge of substance into waste water Process designed to minimize releases to air. Suitable technique(s) to limit releases to air: Filtration	

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Process designed to minimize releases to soil.  
Site should have a spill plan to ensure that adequate safeguards are in place to minimize the impact of episodic releases.

Process with efficient use of raw materials.

### Conditions and measures related to sewage treatment plant

STP type	:	Sewage treatment plant used
STP sludge treatment	:	Sludge assumed to be spread to agricultural land.
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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### 1.2.2. Control of worker exposure: Chemical production where opportunity for exposure arises (PROC4)

#### Product (article) characteristics

Covers concentrations up to 10 %

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

Duration	:	Covers daily exposures up to 8 hours
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#### Technical and organisational conditions and measures

Supervision in place to check that the risk management measures in place are being used correctly and operation conditions followed.  
Minimise exposure using measures such as closed systems, dedicated facilities and suitable general/local exhaust ventilation.

Provide a basic standard of general ventilation (1 to 3 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.  
Inhalation - minimum efficiency of 95 %  
Use eye protection according to EN 166.



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When there is a potential for exposure:  
Wear suitable respiratory protection.  
Inhalation - minimum efficiency of 90 %

### Other conditions affecting workers exposure

Indoor or outdoor use : Indoor use

Temperature : < 40 °C

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

#### Product (article) characteristics

Covers concentrations up to 10 %

Physical form of product : solid

#### 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

Supervision in place to check that the risk management measures in place are being used correctly and operation conditions followed.

Minimise exposure using measures such as closed systems, dedicated facilities and suitable general/local exhaust ventilation.

Provide a basic standard of general ventilation (1 to 3 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.

Inhalation - minimum efficiency of 95 %

Use eye protection according to EN 166.

### Other conditions affecting workers exposure

Indoor or outdoor use : Indoor use

Temperature : < 40 °C

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

#### Product (article) characteristics

Covers concentrations up to 100 %

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Physical form of product	: Solid, medium dustiness
<b>Amount used (or contained in articles), frequency and duration of use/exposure</b>	
Duration	: Covers daily exposures up to 8 hours
<b>Technical and organisational conditions and measures</b>	
Supervision in place to check that the risk management measures in place are being used correctly and operation conditions followed. Minimise exposure using measures such as closed systems, dedicated facilities and suitable general/local exhaust ventilation. Provide a basic standard of general ventilation (1 to 3 air changes per hour).	
Local exhaust ventilation Inhalation - minimum efficiency of 90 %	
Transfer via enclosed lines.	
Assumes a good basic standard of occupational hygiene is implemented	
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Inhalation - minimum efficiency of 95 %	
Use eye protection according to EN 166.	
When there is a potential for exposure: Wear suitable respiratory protection. Inhalation - minimum efficiency of 90 %	
<b>Other conditions affecting workers exposure</b>	
Indoor or outdoor use	: Indoor use
Temperature	: < 40 °C

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

<b>Product (article) characteristics</b>	
Covers concentrations up to 100 %	
Physical form of product	: Solid, medium dustiness
<b>Amount used (or contained in articles), frequency and duration of use/exposure</b>	
Use frequency	: 2 hours/day
<b>Technical and organisational conditions and measures</b>	
Supervision in place to check that the risk management measures in place are being used correctly and operation conditions followed.	

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Minimise exposure using measures such as closed systems, dedicated facilities and suitable general/local exhaust ventilation. Provide a basic standard of general ventilation (1 to 3 air changes per hour).
Local exhaust ventilation
Handle substance within a predominantly closed system provided with extract ventilation.
Assumes a good basic standard of occupational hygiene is implemented
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.
Inhalation - minimum efficiency of 95 %
Use eye protection according to EN 166.
When there is a potential for exposure: Wear suitable respiratory protection.
<b>Other conditions affecting workers exposure</b>
Indoor or outdoor use : Indoor use
Temperature : < 40 °C

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

<b>Product (article) characteristics</b>
Covers concentrations up to 100 %
Physical form of product : Solid, medium dustiness
<b>Amount used (or contained in articles), frequency and duration of use/exposure</b>
Duration : Covers daily exposures up to 8 hours
<b>Technical and organisational conditions and measures</b>
Supervision in place to check that the risk management measures in place are being used correctly and operation conditions followed. Minimise exposure using measures such as closed systems, dedicated facilities and suitable general/local exhaust ventilation.
Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Inhalation - minimum efficiency of 30 %
Local exhaust ventilation Dermal - minimum efficiency of 90 % Inhalation - minimum efficiency of 90 %
Assumes a good basic standard of occupational hygiene is implemented
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.

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Inhalation - minimum efficiency of 95 %	
Use eye protection according to EN 166.	
<b>Other conditions affecting workers exposure</b>	
Indoor or outdoor use	: Indoor use
Temperature	: < 40 °C

### 1.3. Exposure estimation and reference to its source

#### 1.3.1. Environmental release and exposure: Formulation into mixture (ERC2) / Formulation into solid matrix (ERC3)

Protection Target	Exposure estimate	RCR
Freshwater	0.000779 mg/L (EUSES)	0.149
Freshwater sediment	0.181 mg/kg dry weight (EUSES)	0.15
Marine water	< 0.000078 mg/L (EUSES)	0.149
Marine sediment	0.018 mg/kg dry weight (EUSES)	0.15
Sewage treatment plant	0.00781 mg/L (EUSES)	< 0.01
Agricultural soil	0.087 mg/kg dry weight (EUSES)	0.365
Man via environment - Inhalation	< 0.0000001 mg/m <sup>3</sup> (EUSES)	< 0.01
Man via environment - Oral	0.000477 mg/kg bw/day (EUSES)	0.029

#### 1.3.2. Worker exposure: Chemical production where opportunity for exposure arises (PROC4)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	< 0.01 mg/m <sup>3</sup> (ART v1.5)	0.08
dermal	systemic	long-term	< 0.003 mg/kg bw/day (RISKOFDERM v2.1)	0.07

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

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	0.02 mg/m <sup>3</sup> (ART v1.5)	0.2

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dermal	systemic	long-term	0.005 mg/kg bw/day (RISKOFDERM v2.1)	0.2
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### 1.3.4. 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	0.009 mg/m <sup>3</sup> (ART v1.5)	0.08
dermal	systemic	long-term	0.005 mg/kg bw/day (RISKOFDERM v2.1)	0.15

### 1.3.5. 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	0.007 mg/m <sup>3</sup> (ART v1.5)	0.06
dermal	systemic	long-term	0.005 mg/kg bw/day (RISKOFDERM v2.1)	0.15

### 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 <sup>3</sup> (ECETOC TRA worker v3)	0.297
dermal	systemic	long-term	< 0.002 mg/kg bw/day (ECETOC TRA worker v3)	0.051

## 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](mailto:sds-support@chemours.com).

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### ES 2: Industrial use; Processing aid - Polymerisation.

#### 2.1. Title section

<b>Exposure Scenario name</b>	: Processing aid - Polymerisation
<b>Structured Short Title</b>	: Industrial use; Processing aid - Polymerisation.

Environment		
<b>CS 1</b>	<b>Industrial, Processing aid - Polymerisation</b>	ERC6d
Worker		
<b>CS 2</b>	<b>Use in polymer production</b>	PROC4
<b>CS 3</b>	<b>Use in polymer production, Mixing, Batch process</b>	PROC5
<b>CS 4</b>	<b>Material transfers, Non-dedicated facility</b>	PROC8a
<b>CS 5</b>	<b>Material transfers, Dedicated facility</b>	PROC8b
<b>CS 6</b>	<b>Laboratory activities</b>	PROC15
<b>CS 7</b>	<b>Loading and unloading, Manual</b>	PROC21

#### 2.2. Conditions of use affecting exposure

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

Amount used (or contained in articles), frequency and duration of use/exposure	
Annual amount per site	: 100 tonnes/year
Daily amount per site	: 20 tonnes/day
Fraction of EU tonnage used in re- gion	: 1
Technical and organisational conditions and measures	
Reuse material in process Process designed to minimize releases to wastewater. No discharge of substance into waste water Process designed to minimize releases to air. Suitable technique(s) to limit releases to air: Filtration Process designed to minimize releases to soil. Site should have a spill plan to ensure that adequate safeguards are in place to minimize the impact of	

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episodic releases.	
Process with efficient use of raw materials.	
<b>Conditions and measures related to sewage treatment plant</b>	
STP type	: Sewage treatment plant used
STP sludge treatment	: Sludge assumed to be spread to agricultural land.
STP effluent	: 2,000 m3/d
<b>Conditions and measures related to treatment of waste (including article waste)</b>	
Waste treatment	: Contain and dispose of waste according to local regulations.
<b>Other conditions affecting environmental exposure</b>	
Receiving surface water flow	: 18,000 m3/d

### 2.2.2. Control of worker exposure: Chemical production where opportunity for exposure arises (PROC4)

<b>Product (article) characteristics</b>	
Covers concentrations up to 10 %	
Physical form of product	: solid
<b>Amount used (or contained in articles), frequency and duration of use/exposure</b>	
Duration	: Covers daily exposures up to 8 hours
<b>Technical and organisational conditions and measures</b>	
Supervision in place to check that the risk management measures in place are being used correctly and operation conditions followed. Minimise exposure using measures such as closed systems, dedicated facilities and suitable general/local exhaust ventilation. Provide a basic standard of general ventilation (1 to 3 air changes per hour). Local exhaust ventilation	
Assumes a good basic standard of occupational hygiene is implemented	
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Inhalation - minimum efficiency of 95 % Use eye protection according to EN 166.	
<b>Other conditions affecting workers exposure</b>	

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Indoor or outdoor use	: Indoor use
Temperature	: < 40 °C

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

<b>Product (article) characteristics</b>
Covers concentrations up to 10 %
Physical form of product : solid
<b>Amount used (or contained in articles), frequency and duration of use/exposure</b>
Duration : Covers daily exposures up to 8 hours
<b>Technical and organisational conditions and measures</b>
Supervision in place to check that the risk management measures in place are being used correctly and operation conditions followed. Minimise exposure using measures such as closed systems, dedicated facilities and suitable general/local exhaust ventilation. Provide a basic standard of general ventilation (1 to 3 air changes per hour). Local exhaust ventilation
Assumes a good basic standard of occupational hygiene is implemented
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Inhalation - minimum efficiency of 95 % Use eye protection according to EN 166.
<b>Other conditions affecting workers exposure</b>
Indoor or outdoor use : Indoor use
Temperature : < 40 °C

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

<b>Product (article) characteristics</b>
Covers concentrations up to 10 %
Physical form of product : solid
<b>Amount used (or contained in articles), frequency and duration of use/exposure</b>
Duration : Covers daily exposures up to 8 hours



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Technical and organisational conditions and measures	
Supervision in place to check that the risk management measures in place are being used correctly and operation conditions followed. Minimise exposure using measures such as closed systems, dedicated facilities and suitable general/local exhaust ventilation. Provide a basic standard of general ventilation (1 to 3 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. Inhalation - minimum efficiency of 95 % Use eye protection according to EN 166.	
Other conditions affecting workers exposure	
Indoor or outdoor use	: Indoor use
Temperature	: < 40 °C

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

Product (article) characteristics	
Covers concentrations up to 10 %	
Physical form of product	: solid
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	
Supervision in place to check that the risk management measures in place are being used correctly and operation conditions followed. Minimise exposure using measures such as closed systems, dedicated facilities and suitable general/local exhaust ventilation. Provide a basic standard of general ventilation (1 to 3 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. Inhalation - minimum efficiency of 95 % Use eye protection according to EN 166.	

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Other conditions affecting workers exposure	
Indoor or outdoor use	: Indoor use
Temperature	: < 40 °C

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

Product (article) characteristics
Covers concentrations up to 10 %
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
Supervision in place to check that the risk management measures in place are being used correctly and operation conditions followed. Minimise exposure using measures such as closed systems, dedicated facilities and suitable general/local exhaust ventilation.
Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Inhalation - minimum efficiency of 30 %
Local exhaust 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 specific activity training. Inhalation - minimum efficiency of 95 %
Use eye protection according to EN 166.
Other conditions affecting workers exposure
Indoor or outdoor use : Indoor use
Temperature : < 40 °C

### 2.2.7. 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 0.5 %

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Physical form of product	: Solid, low dustiness
<b>Amount used (or contained in articles), frequency and duration of use/exposure</b>	
Duration	: Covers daily exposures up to 8 hours
<b>Technical and organisational conditions and measures</b>	
Supervision in place to check that the risk management measures in place are being used correctly and operation conditions followed. Minimise exposure using measures such as closed systems, dedicated facilities and suitable general/local exhaust ventilation.	
Provide a basic standard of general ventilation (1 to 3 air changes per hour).	
Local exhaust ventilation Inhalation - minimum efficiency of 90 %	
Assumes a good basic standard of occupational hygiene is implemented	
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Inhalation - minimum efficiency of 95 %	
Use eye protection according to EN 166.	
<b>Other conditions affecting workers exposure</b>	
Indoor or outdoor use	: Indoor use
Temperature	: < 40 °C

### 2.3. Exposure estimation and reference to its source

#### 2.3.1. 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	0.000779 mg/L (EUSES)	0.149
Freshwater sediment	0.181 mg/kg dry weight (EUSES)	0.15
Marine water	< 0.000078 mg/L (EUSES)	0.149
Marine sediment	0.018 mg/kg dry weight (EUSES)	0.15
Sewage treatment plant	0.00781 mg/L (EUSES)	< 0.01
Agricultural soil	0.087 mg/kg dry weight (EUSES)	0.365
Man via environment - Inhalation	< 0.0000001 mg/m <sup>3</sup> (EUSES)	< 0.01
Man via environment - Oral	0.000477 mg/kg bw/day (EUSES)	0.029

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### 2.3.2. Worker exposure: Chemical production where opportunity for exposure arises (PROC4)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	< 0.01 mg/m <sup>3</sup> (ART v1.5)	0.08
dermal	systemic	long-term	< 0.001 mg/kg bw/day (RISKOFDERM v2.1)	0.004

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

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	< 0.002 mg/m <sup>3</sup> (ART v1.5)	0.01
dermal	systemic	long-term	0.005 mg/kg bw/day (RISKOFDERM v2.1)	0.15

### 2.3.4. 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	< 0.001 mg/m <sup>3</sup> (ART v1.5)	< 0.001
dermal	systemic	long-term	0.003 mg/kg bw/day (RISKOFDERM v2.1)	0.09

### 2.3.5. 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 <sup>3</sup> (ART v1.5)	< 0.001
dermal	systemic	long-term	0.003 mg/kg bw/day (RISKOFDERM v2.1)	0.09

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### 2.3.6. Worker exposure: Use as laboratory reagent (PROC15)

Exposure route	Health effect	Exposure indicator	Exposure estimate	RCR
inhalative	systemic	long-term	0.021 mg/m <sup>3</sup> (ECETOC TRA worker v3)	0.178
dermal	systemic	long-term	0.01 mg/kg bw/day (ECETOC TRA worker v3)	0.306

### 2.3.7. 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 <sup>3</sup> (ECETOC TRA worker v3)	0.085
dermal	systemic	long-term	0.014 mg/kg bw/day (ECETOC TRA worker v3)	0.425

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

For further information, please contact [sds-support@chemours.com](mailto:sds-support@chemours.com).