

# LCID Example 4 - Introduction

## 1) Purpose of the example

This real-life example exemplifies that an eSDS author can be confronted with the obstacle that the identified Lead Components might not share all uses and that the style of the incoming ES can also differ considerably.

The decision if information on safe use is given as an annex or embedded in the main body is made based on the classification of the mixture. This mixture is classified for systemic effects which often leads to more variability in OCs and RMMs which can be addressed by annexing exposure scenarios for the substances in the mixture. The LCID methodology is used to reduce the number of substance exposure scenarios. This mixture is intended to be used for both formulating another mixture or industrial end use. While annexing substance exposure scenarios will be a most welcome approach if the next actor in the supply chain is a formulator it will be more challenging for the end user as he will have to consolidate the information for his specific workplace situation.

## 2) Mixture description

### a) Information on the mixture

<b>Composition:</b>	Glycerol, propoxylated $\geq 25$ - $< 50\%$ Reaction products of phosphoryl trichloride and 2-methyloxirane $\geq 5$ - $< 10\%$ Polyether based on aromatic amine $\geq 5$ - $< 10\%$ N,N-dimethylcyclohexylamine $\geq 0,3$ - $1\%$ Non-hazardous others $\geq 30$ - $< 65\%$
<b>Classification of the mixture:</b>	H302
<b>Use of the mixture:</b>	Polyol components for the production of polyurethanes

### b) Hazardous substances entering in the composition of the mixture

Substance	DNEL(s) (systemic-LT) Lowest PNEC(s) [other limit values]	CLP classification
<b>Glycerol, propoxylated</b>	not available	Acute Tox. 4 Oral H302
<b>Reaction products of phosphoryl trichloride and 2-methyloxirane</b>	DNEL inhalation: $8,2 \text{ mg/m}^3$ DNEL dermal: $2,91 \text{ mg/kg bw/day}$ PNEC marine water: $0,032 \text{ mg/l}$ PNEC freshwater: $0,32 \text{ mg/l}$ PNEC sediment (freshwater): $11,5 \text{ mg/kg dry weight}$ PNEC sediment (marine water): $1,15 \text{ mg/kg dry weight}$ soil: $0,34 \text{ mg/kg dry weight}$ STP: $19,1 \text{ mg/l}$	Acute Tox. 4 Oral H302, Aquatic Chronic 3 H412
<b>Polyether based on aromatic amine</b>	DNEL inhalation: $3,9 \text{ mg/m}^3$ DNEL dermal: $7,0 \text{ mg/kg bw/day}$ PNEC marine water: $0,002 \text{ mg/l}$ PNEC freshwater: $0,02 \text{ mg/l}$ PNEC sediment (freshwater): $0,02$	Acute Tox. 4 Oral H302 Eye Irrit. 2 H319

	mg/kg dry weight PNEC sediment (marine water): 0,002 mg/kg dry weight soil: 0,00588 mg/kg dry weight STP: 100 mg/l	
<b>N,N-dimethylcyclohexylamine</b>	DNEL inhalation: 35 mg/m <sup>3</sup> DNEL dermal: not available PNEC marine water: 0,0002 mg/l PNEC freshwater: 0,002 mg/l intermittent release: 0,02 mg/l PNEC sediment (freshwater): 0,0211 mg/kg dry weight PNEC sediment (marine water): 0,00211 mg/kg dry weight soil: 0,00305 mg/kg dry weight STP: 20,6 mg/l	Flam. Liq. 3 H226 Acute Tox. 3 Dermal H311 Acute Tox. 3 Inhalative H331 Acute Tox. 3 Oral H301 Skin Corr. 1 B H314 Eye Dam. 1 H318 Aquatic Chronic 3 H412

### 3) Outcome of the LCID methodology

<b>Lead Component, dermal</b>	Reaction products of phosphoryl trichloride and 2-methyloxirane
<b>Lead Component, inhalation</b>	Polyether based on aromatic amine

As no toxicological data on the mixture itself is available, information on the Lead Components will be used. Scenarios covering safety to the environment or local effects human health are not warranted as the mixture is not classified for environmental hazards or local effects human health. Safe use information referring to human health hazards – systemic effects – is needed as the mixture is classified for a systemic toxicity endpoint.

### 4) Operation conditions (OC) and risk management measures (RMM) associated to Priority Substances, Lead Components and components driving local effects for the selected use of the mixture

Both Lead Components (Polyether based on aromatic amine, Reaction products of phosphoryl trichloride and 2-methyloxirane) have multiple ES registered – only the ES for industrial end use are provided as examples.

The lifecycle stage therefore is “industrial uses”. Please note that the main user group for both Lead Components in this example is “SU3” that is obsolete in the current Use Descriptor Guideline and had not been translated in the incoming ES. It might be an option to remedy this shortcoming when authoring the eSDS.

In an “ideal REACH world” incoming information (like ES) would share uniform wording (like ECom Phrases) and always follow the most up to date guidance. In this real-life example the author of the eSDS had to deal with the situation that the style of the ES provided for the Lead Components differed. This information was arranged in the company specific layout before even applying the LCID methodology – without any change of information or wording. Any shortcomings of the incoming information (e.g. no indication of effectiveness for LEV) will obviously be transferred to Safe Use Information for the mixture.

Further, the description of ES titles differed considerably (and is not aligned with the ENES recommendation on structured short titles). While polyether based on aromatic amine has only one single scenario titled “Industrial End Use”, four scenarios describing various industrial uses (all

relevant for the company's customers) are provided for Reaction products of phosphoryl trichloride and 2-methyloxirane. All substance ES are communicated along the supply chain. A downstream formulator might decide himself which information is relevant for his customers or potentially calculate different Lead Components for his formulation and will therefore profit from this relatively low level of consolidation when preparing his own mixtures SDS. A customer with one specific end use will pick each Lead Components scenario relevant for his process.

#### ES polyether based on aromatic amine:

- i) Industrial End Use  
PROC1, PROC2, PROC3, PROC4, PROC5, PROC7, PROC8a, PROC8b, PROC9, PROC10, PROC13, PROC14, PROC15, PROC21

#### ES Reaction products of phosphoryl trichloride and 2-methyloxirane

- ii) Use of coatings, adhesives, sealants and elastomers (CASE): Industrial  
PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9, PROC13, PROC15, PC1, PC9a, PC32
- iii) Use in flexible foam: Industrial  
PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9, PROC15, PROC21, PC32
- iv) Foam granules and rebound PUR Foam: Industrial  
PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9, PROC15, PROC21, PC32
- v) Use in rigid foam: Industrial  
PROC1, PROC2, PROC3, PROC4, PROC5, PROC7, PROC8a, PROC8b, PROC9, PROC15, PROC21, PC32

## **5) Consolidated OC/RMM for inclusion in the mixture safety data sheet**

As polyether based on aromatic amine has no PROC 6 this will not apply to the mixture containing both. This PROC is therefore not communicated along the supply chain. Instead a consolidated PROC table is prepared.

- PROC1: Use in closed process, no likelihood of exposure
- PROC2: Use in closed, continuous process with occasional controlled exposure
- PROC3: Use in closed batch process (synthesis or formulation)
- PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises
- PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/ or significant contact)
- PROC7: Industrial spraying
- PROC8a: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities
- PROC8b: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities
- PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
- PROC10: Roller application or brushing
- PROC13: Treatment of articles by dipping and pouring
- PROC14: Production of preparations or articles by tableting, compression, extrusion, pelletisation
- PROC15: Laboratory use
- PROC21: Low energy manipulation of substances bound in materials and/ or articles

# Example 4 - Safety Data Sheet content

## Extract of relevant safe use information derived by application of the LCID methodology

### 1.1 Product identifier

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

**Use:**

Polyol components for the production of polyurethanes

For details of the identified uses according to REACH-Regulation (EU) No. 1907/2006 refer to the annex of this safety data sheet.

### 1.3 Details of the supplier of the safety data sheet

Mixtures TF

Tel.: XX

Email: ProductSafety@TF.com

### 1.4 Emergency telephone number

XX

## SECTION 2: Hazards identification

### 2.1 Classification of the substance or mixture

Acute toxicity, Oral, Category 4 (H302)

### 2.2 Label elements



Warning

**Hazardous components which must be listed on the label**

Glycerol, propoxylated

Reaction products of phosphoryl trichloride and 2-methyloxirane

polyether based on aromatic amine

N,N-dimethylcyclohexylamine

**Hazard statements:**

H302 Harmful if swallowed.

**Precautionary statements:**

P264 Wash skin thoroughly after handling.

P270 Do not eat, drink or smoke when using this product.

P301 + P312 + P330 IF SWALLOWED: Call a POISON CENTER/doctor if you feel unwell. Rinse mouth.

P501 Dispose of contents/ container to an approved waste disposal plant.

### 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.

**SECTION 3: Composition/information on ingredients**

**Type of product:** Mixture

**3.2 Mixtures**

Polyol mixture

**Hazardous components**

Glycerol, propoxylated

Concentration [wt.-%]:  $\geq 25$  -  $< 50$

CAS-No.: 25791-96-2

Classification (1272/2008/CE): Acute Tox. 4 Oral H302

ATE (oral): 500 mg/kg

Reaction products of phosphoryl trichloride and 2-methyloxirane

Concentration [wt.-%]:  $\geq 5$  -  $< 10$

EC-No.: 807-935-0

REACH Registration Number: 01-2119486772-26

CAS-No.: 1244733-77-4

Classification (1272/2008/CE): Acute Tox. 4 Oral H302 Aquatic Chronic 3 H412

ATE (oral): 632 mg/kg

polyether based on aromatic amine

Concentration [wt.-%]:  $\geq 5$  -  $< 10$

EC-No.: 614-144-2

REACH Registration Number: 01-2119462836-28-0001

CAS-No.: 67800-94-6

Classification (1272/2008/CE): Acute Tox. 4 Oral H302 Eye Irrit. 2 H319

ATE (oral): 1.400 mg/kg

N,N-dimethylcyclohexylamine

Concentration [wt.-%]:  $\geq 0,3$  -  $< 1$

EC-No.: 202-715-5

REACH Registration Number: 01-2119533030-60

CAS-No.: 98-94-2

Classification (1272/2008/CE): Flam. Liq. 3 H226 Acute Tox. 3 Oral H301 Acute Tox. 3 Inhalative H331

Acute Tox. 3 Dermal H311 Skin Corr. 1B H314 Eye Dam. 1 H318 Aquatic Chronic 3 H412

ATE (oral): 272 mg/kg

ATE (dermal): 380 mg/kg

ATE (inhalation, vapour): 3 mg/l

**Candidate List of Substances of Very High Concern for Authorisation**

This product contains no substances of very high concern in concentrations where an information obligation applies (REACH Regulation (EC) No. 1907/2006, Article 59).

**SECTION 4: First aid measures****SECTION 5: Firefighting measures****SECTION 6: Accidental release measures****SECTION 7: Handling and storage****7.1 Precautions for safe handling**

General conditions of use are further specified in the annex according to REACH-Regulation (EU) No. 1907/2006.

Ensure adequate ventilation and, if necessary, exhaust ventilation when handling or transferring the product. Keep away from fire, sparks and heated surfaces.

Handle in accordance with good industrial hygiene and safety practice. Avoid contact with skin and eyes.

In all workplaces or parts of the plant where high concentrations of aerosols and/or vapors may be generated (e.g. during pressure release, mold venting or when cleaning mixing heads with an air blast), appropriately located exhaust ventilation must be provided in such a way that the WEL is not exceeded.

The air should be drawn away from the personnel handling the product. The efficiency of the exhaust equipment should be periodically checked.

Precautions should generally be taken against electrostatic charges according to the equipment used and the way the product is handled and packaged.

Protection against fire and explosion: The vapors are heavier than air and may form explosive mixtures with air. Ensure proper ventilation and extraction, including at floor level.

Keep away from foodstuffs, drinks and tobacco. Wash hands before breaks and at the end of workday. Keep working clothes separately. Change contaminated or soaked clothing immediately.

## 7.2 Conditions for safe storage, including any incompatibilities

Keep containers tightly closed in a cool, well-ventilated place.

Further specific information see our "Technical Information"

Storage class (TRGS 510) : 10: Combustible liquids

## 7.3 Specific end use(s)

For details of the identified uses according to REACH-Regulation (EU) No. 1907/2006 refer to the annex of this safety data sheet.

## SECTION 8: Exposure controls/personal protection

Risk management measures are further specified in the annex according to REACH-Regulation (EU) No. 1907/2006.

### 8.1 Control parameters

No information on Exposure Limit Values necessary according to EC directive 2006/121/EG

For technical protective measures to limit exposure see also Section 7 "Handling and storage".

### Derived No Effect Level (DNEL)

#### Glycerol, propoxylated

Value type	Route of exposure	Health Effects	Value	Remarks
				Not required

#### Reaction products of phosphoryl trichloride and 2-methyloxirane

Value type	Route of exposure	Health Effects	Value	Remarks
Workers	Inhalation	Long-term systemic effects	8,2 mg/m <sup>3</sup>	
Workers	Inhalation	Acute systemic effects	22,6 mg/m <sup>3</sup>	
Workers	Dermal	Long-term systemic effects	2,91 mg/kg bw/day	
Consumers	Inhalation	Long-term systemic effects	1,45 mg/m <sup>3</sup>	
Consumers	Inhalation	Acute systemic effects	5,6 mg/m <sup>3</sup>	

Consumers	Dermal	Long-term systemic effects	1,04 mg/kg bw/day	
Consumers	Oral	Long-term systemic effects	0,52 mg/kg bw/day	
Consumers	Oral	Acute systemic effects	2 mg/kg bw/day	

**polyether based on aromatic amine**

Value type	Route of exposure	Health Effects	Value	Remarks
Workers	Inhalation	Long-term systemic effects	3,9 mg/m3	Most sensitive endpoint: Repeated dose toxicity
Workers	Inhalation	Acute systemic effects		Not relevant
Workers	Inhalation	Long-term local effects		Not relevant
Workers	Inhalation	Acute local effects		Not relevant
Workers	Dermal	Long-term systemic effects	7,0 mg/kg bw/day	Most sensitive endpoint: Repeated dose toxicity
Workers	Dermal	Acute systemic effects		Not relevant
Workers	Dermal	Long-term local effects		Not relevant
Workers	Dermal	Acute local effects		Not relevant
Consumers	Inhalation	Long-term systemic effects	1,2 mg/m3	Most sensitive endpoint: Repeated dose toxicity
Consumers	Inhalation	Acute systemic effects		Not relevant
Consumers	Inhalation	Long-term local effects		Not relevant
Consumers	Inhalation	Acute local effects		Not relevant
Consumers	Dermal	Long-term systemic effects	4,2 mg/kg bw/day	Most sensitive endpoint: Repeated dose toxicity
Consumers	Dermal	Acute systemic effects		Not relevant
Consumers	Dermal	Long-term local effects		Not relevant
Consumers	Dermal	Acute local effects		Not relevant
Consumers	Oral	Long-term systemic effects	0,33 mg/kg bw/day	Most sensitive endpoint: Repeated dose toxicity
Consumers	Oral	Acute systemic effects		Not relevant

**N,N-dimethylcyclohexylamine**

Value type	Route of exposure	Health Effects	Value	Remarks
Workers	Inhalation	Long-term local effects	35 mg/m3	
Workers	Inhalation	Acute local effects	35 mg/m3	

**Predicted No Effect Concentration (PNEC)****Glycerol, propoxylated**

Compartment	Value	Remarks
		Not required

**Reaction products of phosphoryl trichloride and 2-methyloxirane**

Fresh water	0,32 mg/l	
Fresh water sediment	11,5 mg/kg dry weight	
Marine water	0,032 mg/l	
Marine sediment	1,15 mg/kg dry weight	
Sewage treatment plant	19,1 mg/l	
Soil	0,34 mg/kg dry weight	
Oral	11,6 mg/kg	
Intermittent use/release	0,51 mg/l	

**polyether based on aromatic amine**

Compartment	Value	Remarks
Fresh water	0,02 mg/l	
Fresh water sediment	0,02 mg/kg	dry weight
Marine water	0,002 mg/l	
Marine sediment	0,002 mg/kg	dry weight
Sewage treatment plant	100 mg/l	
Soil	0,00588 mg/kg	dry weight
Oral		Not relevant
Intermittent use/release	2,81 mg/l	

**N,N-dimethylcyclohexylamine**

Compartment	Value	Remarks
Fresh water	0,002 mg/l	
Fresh water sediment	0,0211 mg/kg	dry weight
Marine water	0,0002 mg/l	
Marine sediment	0,00211 mg/kg	dry weight
Sewage treatment plant	20,6 mg/l	
Soil	0,00305 mg/kg	dry weight
Oral		no data available
Intermittent use/release	0,02 mg/l	

**8.2 Exposure controls****Respiratory protection**

Unless the product is entirely enclosed, do not handle it until you have studied the respiratory precautions issued by the appropriate authority or accident prevention association. At substantial vapor concentrations respirators must be used. Put on full-mask respirator with filter type ABEK.

If applicable, further recommendations regarding respiratory protection can be found in the annex.

**Hand protection**

Conditionally suitable materials for protective gloves; EN 374:

Nitrile rubber - NBR ( $\geq 0.35$  mm)

Breakthrough time not tested; dispose of immediately after contamination.

**Eye protection**

Wear eye/face protection.

**Skin and body protection**

Wear suitable protective clothing.

Safety precautions for handling freshly molded polyurethane parts: see section 16



**SECTION 9: Physical and chemical properties****SECTION 10: Stability and reactivity****SECTION 11: Toxicological information**

Toxicological studies on the product are not yet available.

**SECTION 12: Ecological information****SECTION 13: Disposal considerations****SECTION 14: Transport information****SECTION 15: Regulatory information****15.2 Chemical Safety Assessment****A Chemical Safety Assessment has been carried out for:**

Reaction products of phosphoryl trichloride and 2-methyloxirane

polyether based on aromatic amine

N,N-dimethylcyclohexylamine

**SECTION 16: Other information**

## Annex - Exposure Scenario

### Annex

The operational conditions and the implementation of Risk Management Measures (RMM) are dependent on the following priority-/lead substances for the respective exposure routes:

**Lead substance(s), aquatic environment:**

Not relevant

**Lead substance(s), ozone layer:**

Not relevant

**Lead substance(s), Inhalation:**

polyether based on aromatic amine

**Lead substance(s), Dermal:**

Reaction products of phosphoryl trichloride and 2-methyloxirane

**Lead substance(s), Oral:**

polyether based on aromatic amine

**Local effects, Skin:**

Not relevant

**Local effects, Inhalation:**

Not relevant

**Local effects, Eyes:**

Not relevant

### Exposure Scenario

Number	Title
ES1	Formulation or re-packing
ES2	Use at industrial sites
ES3	Widespread use by professional workers

[... Exposure Scenarios ES1 and ES3 are not shown in this example ...]

### ES2: Use at industrial sites

#### 2.1. Title section

<b>Exposure Scenario name</b>	: End Use
<b>Structured Short Title</b>	: Use at industrial sites

Worker		
<b>CS1</b>	<b>Rigid foam</b> [Reaction products of phosphoryl trichloride and 2-methyloxirane]	PROC1
<b>CS2</b>	<b>Flexible foam</b> [Reaction products of phosphoryl trichloride and 2-methyloxirane]	PROC1
<b>CS3</b>	<b>Foam granules and rebound PUR Foam</b> [Reaction products of phosphoryl trichloride and 2-methyloxirane]	PROC1

<b>CS4</b>	<b>Use of coatings, adhesives, sealants and elastomers</b> [Reaction products of phosphoryl trichloride and 2-methyloxirane]	PROC1
<b>CS5</b>	<b>End Use</b> [polyether based on aromatic amine]	PROC1, PROC3, PROC15
<b>CS6</b>	<b>End Use</b> [polyether based on aromatic amine]	PROC2
<b>CS7</b>	<b>Rigid foam</b> [Reaction products of phosphoryl trichloride and 2-methyloxirane]	PROC2, PROC3
<b>CS8</b>	<b>Flexible foam</b> [Reaction products of phosphoryl trichloride and 2-methyloxirane]	PROC2, PROC3
<b>CS9</b>	<b>Foam granules and rebound PUR Foam</b> [Reaction products of phosphoryl trichloride and 2-methyloxirane]	PROC2, PROC3
<b>CS10</b>	<b>Use of coatings, adhesives, sealants and elastomers</b> [Reaction products of phosphoryl trichloride and 2-methyloxirane]	PROC2, PROC3
<b>CS11</b>	<b>Rigid foam</b> [Reaction products of phosphoryl trichloride and 2-methyloxirane]	PROC4, PROC5
<b>CS12</b>	<b>Flexible foam</b> [Reaction products of phosphoryl trichloride and 2-methyloxirane]	PROC4, PROC5, PROC8a, PROC9
<b>CS13</b>	<b>Foam granules and rebound PUR Foam</b> [Reaction products of phosphoryl trichloride and 2-methyloxirane]	PROC4, PROC5, PROC8a, PROC9
<b>CS14</b>	<b>Use of coatings, adhesives, sealants and elastomers</b> [Reaction products of phosphoryl trichloride and 2-methyloxirane]	PROC4, PROC5, PROC8a, PROC9
<b>CS15</b>	<b>End Use</b> [polyether based on aromatic amine]	PROC4, PROC8b, PROC9
<b>CS16</b>	<b>End Use</b> [polyether based on aromatic amine]	PROC5, PROC8a, PROC13
<b>CS17</b>	<b>End Use</b> [polyether based on aromatic amine]	PROC7
<b>CS18</b>	<b>Rigid foam</b> [Reaction products of phosphoryl trichloride and 2-methyloxirane]	PROC7
<b>CS19</b>	<b>Rigid foam</b> [Reaction products of phosphoryl trichloride and 2-methyloxirane]	PROC8b
<b>CS20</b>	<b>Flexible foam</b> [Reaction products of phosphoryl trichloride and 2-methyloxirane]	PROC8b
<b>CS21</b>	<b>Foam granules and rebound PUR Foam</b> [Reaction products of phosphoryl trichloride and 2-methyloxirane]	PROC8b
<b>CS22</b>	<b>Use of coatings, adhesives, sealants and elastomers</b> [Reaction products of phosphoryl trichloride and 2-methyloxirane]	PROC8b
<b>CS23</b>	<b>Rigid foam</b> [Reaction products of phosphoryl trichloride and 2-methyloxirane]	PROC8a, PROC9

<b>CS24</b>	<b>Use of coatings, adhesives, sealants and elastomers</b> [Reaction products of phosphoryl trichloride and 2-methyloxirane]	PROC13
<b>CS25</b>	<b>Rigid foam</b> [Reaction products of phosphoryl trichloride and 2-methyloxirane]	PROC15
<b>CS26</b>	<b>Flexible foam</b> [Reaction products of phosphoryl trichloride and 2-methyloxirane]	PROC15
<b>CS27</b>	<b>Foam granules and rebound PUR Foam</b> [Reaction products of phosphoryl trichloride and 2-methyloxirane]	PROC15
<b>CS28</b>	<b>Use of coatings, adhesives, sealants and elastomers</b> [Reaction products of phosphoryl trichloride and 2-methyloxirane]	PROC15
<b>CS29</b>	<b>End Use</b> [polyether based on aromatic amine]	PROC21
<b>CS30</b>	<b>Rigid foam</b> [Reaction products of phosphoryl trichloride and 2-methyloxirane]	PROC21
<b>CS31</b>	<b>Flexible foam</b> [Reaction products of phosphoryl trichloride and 2-methyloxirane]	PROC21
<b>CS32</b>	<b>Foam granules and rebound PUR Foam</b> [Reaction products of phosphoryl trichloride and 2-methyloxirane]	PROC21

## 2.2. Conditions of use affecting exposure

### 2.2.1. Control of worker exposure: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions (PROC1) [Reaction products of phosphoryl trichloride and 2-methyloxirane]

Product (article) characteristics	
Concentration of the Substance in Mixture/Article	: ≤ 25%
Physical form of product	: Liquid
Process Temperature	: ≤ 40 °C
Amount used, frequency and duration of use (or from service life)	
Duration of the activity	: ≤ 8 hours/day
Technical and organisational conditions and measures	
Only appropriately trained and authorized personnel is allowed to handle the substance. Substance-handling processes shall be well documented and supervised. Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.	
Provide a basic standard of general ventilation (1 to 3 air changes per hour).	
Conditions and measures related to personal protection, hygiene and health evaluation	
Wear suitable protective clothing.	
On possible contact with the product (sampling, product leakage):	

Wear protective gloves/ protective clothing/ eye protection/ face protection.  
Wear suitable respiratory protection.

#### Other conditions affecting workers exposure

Indoor or outdoor use : Indoor use

### 2.2.2. Control of worker exposure: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions (PROC1) [Reaction products of phosphoryl trichloride and 2-methyloxirane]

Product (article) characteristics	
Concentration of the Substance in Mixture/Article	: <= 25%
Physical form of product	: Liquid
Process Temperature	: <= 40 °C
Amount used, frequency and duration of use (or from service life)	
Duration of the activity	: <= 8 hours/day
Technical and organisational conditions and measures	
Only appropriately trained and authorized personnel is allowed to handle the substance. Substance-handling processes shall be well documented and supervised. Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.	
Provide a basic standard of general ventilation (1 to 3 air changes per hour).	
Conditions and measures related to personal protection, hygiene and health evaluation	
Wear suitable protective clothing.	
On possible contact with the product (sampling, product leakage): Wear protective gloves/ protective clothing/ eye protection/ face protection. Wear suitable respiratory protection.	
Other conditions affecting workers exposure	
Indoor or outdoor use	: Indoor use

### 2.2.3. Control of worker exposure: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions (PROC1) [Reaction products of phosphoryl trichloride and 2-methyloxirane]

Product (article) characteristics	
Concentration of the Substance in Mixture/Article	: <= 25%
Physical form of product	: Liquid
Process Temperature	: <= 40 °C
Amount used, frequency and duration of use (or from service life)	
Duration of the activity	: <= 8 hours/day
Technical and organisational conditions and measures	

Only appropriately trained and authorized personnel is allowed to handle the substance. Substance-handling processes shall be well documented and supervised. Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.
Provide a basic standard of general ventilation (1 to 3 air changes per hour).
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>
Wear suitable protective clothing.
On possible contact with the product (sampling, product leakage): Wear protective gloves/ protective clothing/ eye protection/ face protection. Wear suitable respiratory protection.
<b>Other conditions affecting workers exposure</b>
Indoor or outdoor use : Indoor use

**2.2.4. Control of worker exposure: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions (PROC1)  
[Reaction products of phosphoryl trichloride and 2-methyloxirane]**

<b>Product (article) characteristics</b>
Concentration of the Substance in Mixture/Article : <= 25%
Physical form of product : Liquid
Process Temperature : <= 40 °C
<b>Amount used, frequency and duration of use (or from service life)</b>
Duration of the activity : <= 8 hours/day
<b>Technical and organisational conditions and measures</b>
Only appropriately trained and authorized personnel is allowed to handle the substance. Substance-handling processes shall be well documented and supervised. Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.
Provide a basic standard of general ventilation (1 to 3 air changes per hour).
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>
Wear suitable protective clothing.
On possible contact with the product (sampling, product leakage): Wear protective gloves/ protective clothing/ eye protection/ face protection. Wear suitable respiratory protection.
<b>Other conditions affecting workers exposure</b>
Indoor or outdoor use : Indoor use

**2.2.5. Control of worker exposure: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions (PROC1) /  
Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition (PROC3) / Use as laboratory reagent (PROC15)  
[polyether based on aromatic amine]**

<b>Product (article) characteristics</b>	
Remarks	: Concentration of the Substance in Mixture/Article, Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical form of product	: Liquid
Physical form of product	: Substance of unknown or variable composition, complex reaction products or biological material (UVCB)
<b>Amount used, frequency and duration of use (or from service life)</b>	
Exposure duration	: 8 hours/day
<b>Technical and organisational conditions and measures</b>	
All contributing scenarios at product temperatures ABOVE 83.3 °C: Provide extraction ventilation at points where emissions occur.	
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
Wear suitable gloves tested to EN374. Wear suitable eye protection if exposure to the eyes may be possible, e.g. due to splashing, working overhead or when the face of the worker needs to be close to the source.	
All contributing scenarios at product temperatures ABOVE 83.3 °C: If above technical/organisational control measures are not feasible, then adopt following PPE: Wear a respirator conforming to EN140 with Type A filter or better. OR: Demonstrate, e.g. by workplace monitoring, that exposures are below the relevant worker DNEL values for acute and long-term.	
<b>Other conditions affecting workers exposure</b>	
Indoor or outdoor use	: Covers indoor and outdoor use.

**2.2.6. Control of worker exposure: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions (PROC2)**

**[polyether based on aromatic amine]**

<b>Product (article) characteristics</b>	
Remarks	: Concentration of the Substance in Mixture/Article, Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical form of product	: Liquid
Physical form of product	: Substance of unknown or variable composition, complex reaction products or biological material (UVCB)
<b>Amount used, frequency and duration of use (or from service life)</b>	
Exposure duration	: 8 hours/day
<b>Technical and organisational conditions and measures</b>	
All contributing scenarios at product temperatures ABOVE 83.3 °C: Provide extraction ventilation at points where emissions occur.	
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
Wear suitable gloves tested to EN374.	

Wear suitable eye protection if exposure to the eyes may be possible, e.g. due to splashing, working overhead or when the face of the worker needs to be close to the source.	
All contributing scenarios at product temperatures ABOVE 83.3 °C: If above technical/organisational control measures are not feasible, then adopt following PPE: Wear a respirator conforming to EN140 with Type A filter or better. OR: Demonstrate, e.g. by workplace monitoring, that exposures are below the relevant worker DNEL values for acute and long-term.	
<b>Other conditions affecting workers exposure</b>	
Indoor or outdoor use	: Covers indoor and outdoor use.

**2.2.7. Control of worker exposure: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions (PROC2) / Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition (PROC3) [Reaction products of phosphoryl trichloride and 2-methyloxirane]**

<b>Product (article) characteristics</b>	
Concentration of the Substance in Mixture/Article	: <= 25%
Physical form of product	: Liquid
Process Temperature	: <= 40 °C
<b>Amount used, frequency and duration of use (or from service life)</b>	
Duration of the activity	: <= 8 hours/day
<b>Technical and organisational conditions and measures</b>	
Only appropriately trained and authorized personnel is allowed to handle the substance. Substance-handling processes shall be well documented and supervised. Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.	
Provide a basic standard of general ventilation (1 to 3 air changes per hour).	
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
Wear suitable protective clothing. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Dermal - minimum efficiency of 90 %	
On possible contact with the product (sampling, product leakage): Wear protective gloves/ protective clothing/ eye protection/ face protection. Wear suitable respiratory protection.	
<b>Other conditions affecting workers exposure</b>	
Indoor or outdoor use	: Indoor use

**2.2.8. Control of worker exposure: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions (PROC2) / Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition (PROC3) [Reaction products of phosphoryl trichloride and 2-methyloxirane]**

<b>Product (article) characteristics</b>	
Concentration of the Substance in	: <= 25%



Mixture/Article	
Physical form of product	: Liquid
Process Temperature	: <= 40 °C
<b>Amount used, frequency and duration of use (or from service life)</b>	
Duration of the activity	: <= 8 hours/day
<b>Technical and organisational conditions and measures</b>	
Only appropriately trained and authorized personnel is allowed to handle the substance. Substance-handling processes shall be well documented and supervised. Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.	
Provide a basic standard of general ventilation (1 to 3 air changes per hour).	
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
Wear suitable protective clothing. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Dermal - minimum efficiency of 90 %	
On possible contact with the product (sampling, product leakage): Wear protective gloves/ protective clothing/ eye protection/ face protection. Wear suitable respiratory protection.	
<b>Other conditions affecting workers exposure</b>	
Indoor or outdoor use	: Indoor use

**2.2.9. Control of worker exposure: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions (PROC2) / Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition (PROC3) [Reaction products of phosphoryl trichloride and 2-methyloxirane]**

<b>Product (article) characteristics</b>	
Concentration of the Substance in Mixture/Article	: <= 25%
Physical form of product	: Liquid
Process Temperature	: <= 40 °C
<b>Amount used, frequency and duration of use (or from service life)</b>	
Duration of the activity	: <= 8 hours/day
<b>Technical and organisational conditions and measures</b>	
Only appropriately trained and authorized personnel is allowed to handle the substance. Substance-handling processes shall be well documented and supervised. Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.	
Provide a basic standard of general ventilation (1 to 3 air changes per hour).	
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
Wear suitable protective clothing. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Dermal - minimum efficiency of 90 %	

On possible contact with the product (sampling, product leakage):  
 Wear protective gloves/ protective clothing/ eye protection/ face protection.  
 Wear suitable respiratory protection.

#### Other conditions affecting workers exposure

Indoor or outdoor use : Indoor use

### 2.2.10. Control of worker exposure: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions (PROC2) / Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition (PROC3) [Reaction products of phosphoryl trichloride and 2-methyloxirane]

#### Product (article) characteristics

Concentration of the Substance in Mixture/Article :  $\leq 25\%$

Physical form of product : Liquid

Process Temperature :  $\leq 40\text{ }^{\circ}\text{C}$

#### Amount used, frequency and duration of use (or from service life)

Duration of the activity :  $\leq 8$  hours/day

#### Technical and organisational conditions and measures

Only appropriately trained and authorized personnel is allowed to handle the substance.  
 Substance-handling processes shall be well documented and supervised.  
 Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.

Provide a basic standard of general ventilation (1 to 3 air changes per hour).

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

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

On possible contact with the product (sampling, product leakage):  
 Wear protective gloves/ protective clothing/ eye protection/ face protection.  
 Wear suitable respiratory protection.

#### Other conditions affecting workers exposure

Indoor or outdoor use : Indoor use

### 2.2.11. Control of worker exposure: Chemical production where opportunity for exposure arises (PROC4) / Mixing or blending in batch processes (PROC5) [Reaction products of phosphoryl trichloride and 2-methyloxirane]

#### Product (article) characteristics

Concentration of the Substance in Mixture/Article :  $\leq 25\%$

Physical form of product : Liquid

Process Temperature :  $\leq 40\text{ }^{\circ}\text{C}$

#### Amount used, frequency and duration of use (or from service life)

Duration of the activity	: <= 8 hours/day
<b>Technical and organisational conditions and measures</b>	
Only appropriately trained and authorized personnel is allowed to handle the substance. Substance-handling processes shall be well documented and supervised. Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.	
Provide a basic standard of general ventilation (1 to 3 air changes per hour).	
Local exhaust ventilation Inhalation - minimum efficiency of 90 %	
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
Wear suitable protective clothing. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Dermal - minimum efficiency of 90 %	
On possible contact with the product (sampling, product leakage): Wear protective gloves/ protective clothing/ eye protection/ face protection. Wear suitable respiratory protection.	
<b>Other conditions affecting workers exposure</b>	
Indoor or outdoor use	: Indoor use

**2.2.12. Control of worker exposure: Chemical production where opportunity for exposure arises (PROC4) / Mixing or blending in batch processes (PROC5) / Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a) / Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9)  
[Reaction products of phosphoryl trichloride and 2-methyloxirane]**

<b>Product (article) characteristics</b>	
Concentration of the Substance in Mixture/Article	: <= 25%
Physical form of product	: Liquid
Process Temperature	: <= 40 °C
<b>Amount used, frequency and duration of use (or from service life)</b>	
Duration of the activity	: <= 8 hours/day
<b>Technical and organisational conditions and measures</b>	
Only appropriately trained and authorized personnel is allowed to handle the substance. Substance-handling processes shall be well documented and supervised. Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.	
Provide a basic standard of general ventilation (1 to 3 air changes per hour).	
Local exhaust ventilation Inhalation - minimum efficiency of 90 %	
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
Wear suitable protective clothing. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Dermal - minimum efficiency of 90 %	
On possible contact with the product (sampling, product leakage):	

Wear protective gloves/ protective clothing/ eye protection/ face protection. Wear suitable respiratory protection.	
<b>Other conditions affecting workers exposure</b>	
Indoor or outdoor use	: Indoor use

**2.2.13. Control of worker exposure: Chemical production where opportunity for exposure arises (PROC4) / Mixing or blending in batch processes (PROC5) / Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a) / Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9)  
[Reaction products of phosphoryl trichloride and 2-methyloxirane]**

<b>Product (article) characteristics</b>	
Concentration of the Substance in Mixture/Article	: <= 25%
Physical form of product	: Liquid
Process Temperature	: <= 40 °C
<b>Amount used, frequency and duration of use (or from service life)</b>	
Duration of the activity	: <= 8 hours/day
<b>Technical and organisational conditions and measures</b>	
Only appropriately trained and authorized personnel is allowed to handle the substance. Substance-handling processes shall be well documented and supervised. Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.	
Provide a basic standard of general ventilation (1 to 3 air changes per hour).	
Local exhaust ventilation Inhalation - minimum efficiency of 90 %	
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
Wear suitable protective clothing. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Dermal - minimum efficiency of 90 %	
On possible contact with the product (sampling, product leakage): Wear protective gloves/ protective clothing/ eye protection/ face protection. Wear suitable respiratory protection.	
<b>Other conditions affecting workers exposure</b>	
Indoor or outdoor use	: Indoor use

**2.2.14. Control of worker exposure: Chemical production where opportunity for exposure arises (PROC4) / Mixing or blending in batch processes (PROC5) / Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a) / Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9)  
[Reaction products of phosphoryl trichloride and 2-methyloxirane]**

<b>Product (article) characteristics</b>	
Concentration of the Substance in Mixture/Article	: <= 25%
Physical form of product	: Liquid

Process Temperature	: <= 40 °C
<b>Amount used, frequency and duration of use (or from service life)</b>	
Duration of the activity	: <= 8 hours/day
<b>Technical and organisational conditions and measures</b>	
Only appropriately trained and authorized personnel is allowed to handle the substance. Substance-handling processes shall be well documented and supervised. Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.	
Provide a basic standard of general ventilation (1 to 3 air changes per hour).	
Local exhaust ventilation Inhalation - minimum efficiency of 90 %	
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
Wear suitable protective clothing. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Dermal - minimum efficiency of 90 %	
On possible contact with the product (sampling, product leakage): Wear protective gloves/ protective clothing/ eye protection/ face protection. Wear suitable respiratory protection.	
<b>Other conditions affecting workers exposure</b>	
Indoor or outdoor use	: Indoor use

**2.2.15. Control of worker exposure: Chemical production where opportunity for exposure arises (PROC4) / Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b) / Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9)**  
**[polyether based on aromatic amine]**

<b>Product (article) characteristics</b>	
Remarks	: Concentration of the Substance in Mixture/Article, Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical form of product	: Liquid
Physical form of product	: Substance of unknown or variable composition, complex reaction products or biological material (UVCB)
<b>Amount used, frequency and duration of use (or from service life)</b>	
Exposure duration	: 8 hours/day
<b>Technical and organisational conditions and measures</b>	
All contributing scenarios at product temperatures ABOVE 83.3 °C: Provide extraction ventilation at points where emissions occur.	
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
Wear suitable gloves tested to EN374. Wear suitable eye protection if exposure to the eyes may be possible, e.g. due to splashing, working overhead or when the face of the worker needs to be close to the source.	
All contributing scenarios at product temperatures ABOVE 83.3 °C:	

If above technical/organisational control measures are not feasible, then adopt following PPE:  
 Wear a respirator conforming to EN140 with Type A filter or better.  
 OR: Demonstrate, e.g. by workplace monitoring, that exposures are below the relevant worker DNEL values for acute and long-term.

#### Other conditions affecting workers exposure

Indoor or outdoor use : Covers indoor and outdoor use.

### 2.2.16. Control of worker exposure: Mixing or blending in batch processes (PROC5) / Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a) / Treatment of articles by dipping and pouring (PROC13) [polyether based on aromatic amine]

#### Product (article) characteristics

Remarks : Concentration of the Substance in Mixture/Article, Covers the percentage of the substance in the product up to 100 % (unless stated differently).

Physical form of product : Liquid

Physical form of product : Substance of unknown or variable composition, complex reaction products or biological material (UVCB)

#### Amount used, frequency and duration of use (or from service life)

Exposure duration : 8 hours/day

#### Technical and organisational conditions and measures

All contributing scenarios at product temperatures ABOVE 83.3 °C:  
 Provide extraction ventilation at points where emissions occur.

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

Wear suitable gloves tested to EN374.  
 Wear suitable eye protection if exposure to the eyes may be possible, e.g. due to splashing, working overhead or when the face of the worker needs to be close to the source.

All contributing scenarios at product temperatures ABOVE 83.3 °C:  
 If above technical/organisational control measures are not feasible, then adopt following PPE:  
 Wear a respirator conforming to EN140 with Type A filter or better.  
 OR: Demonstrate, e.g. by workplace monitoring, that exposures are below the relevant worker DNEL values for acute and long-term.

#### Other conditions affecting workers exposure

Indoor or outdoor use : Covers indoor and outdoor use.

### 2.2.17. Control of worker exposure: Industrial spraying (PROC7) [polyether based on aromatic amine]

#### Product (article) characteristics

Concentration of the Substance in Mixture/Article : <= 50%

Physical form of product : Liquid

Physical form of product : Substance of unknown or variable composition, complex reaction products or biological material (UVCB)

<b>Amount used, frequency and duration of use (or from service life)</b>	
Exposure duration	: 8 hours/day
<b>Technical and organisational conditions and measures</b>	
All contributing scenarios at product temperatures ABOVE 83.3 °C: Provide extraction ventilation at points where emissions occur.	
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
Wear suitable gloves tested to EN374. Wear suitable eye protection if exposure to the eyes may be possible, e.g. due to splashing, working overhead or when the face of the worker needs to be close to the source.	
All contributing scenarios at product temperatures ABOVE 83.3 °C: If above technical/organisational control measures are not feasible, then adopt following PPE: Wear a respirator conforming to EN140 with Type A filter or better. OR: Demonstrate, e.g. by workplace monitoring, that exposures are below the relevant worker DNEL values for acute and long-term.	
<b>Other conditions affecting workers exposure</b>	
Indoor or outdoor use	: Covers indoor and outdoor use.

**2.2.18. Control of worker exposure: Industrial spraying (PROC7)**  
**[Reaction products of phosphoryl trichloride and 2-methyloxirane]**

<b>Product (article) characteristics</b>	
Concentration of the Substance in Mixture/Article	: <= 25%
Physical form of product	: Liquid
Process Temperature	: <= 40 °C
<b>Amount used, frequency and duration of use (or from service life)</b>	
Duration of the activity	: <= 8 hours/day
<b>Technical and organisational conditions and measures</b>	
Only appropriately trained and authorized personnel is allowed to handle the substance. Substance-handling processes shall be well documented and supervised. Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.	
Provide a basic standard of general ventilation (1 to 3 air changes per hour).	
Local exhaust ventilation Inhalation - minimum efficiency of 95 %	
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
Wear suitable protective clothing. 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 95 %	
On possible contact with the product (sampling, product leakage): Wear protective gloves/ protective clothing/ eye protection/ face protection. Wear suitable respiratory protection.	

Other conditions affecting workers exposure	
Indoor or outdoor use	: Indoor use

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

[Reaction products of phosphoryl trichloride and 2-methyloxirane]

Product (article) characteristics	
Concentration of the Substance in Mixture/Article	: <= 25%
Physical form of product	: Liquid
Process Temperature	: <= 40 °C
Amount used, frequency and duration of use (or from service life)	
Duration of the activity	: <= 8 hours/day
Technical and organisational conditions and measures	
Only appropriately trained and authorized personnel is allowed to handle the substance. Substance-handling processes shall be well documented and supervised. Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.	
Provide a basic standard of general ventilation (1 to 3 air changes per hour).	
Local exhaust ventilation Inhalation - minimum efficiency of 95 %	
Conditions and measures related to personal protection, hygiene and health evaluation	
Wear suitable protective clothing. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Dermal - minimum efficiency of 90 %	
On possible contact with the product (sampling, product leakage): Wear protective gloves/ protective clothing/ eye protection/ face protection. Wear suitable respiratory protection.	
Other conditions affecting workers exposure	
Indoor or outdoor use	: Indoor use

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

[Reaction products of phosphoryl trichloride and 2-methyloxirane]

Product (article) characteristics	
Concentration of the Substance in Mixture/Article	: <= 25%
Physical form of product	: Liquid
Process Temperature	: <= 40 °C
Amount used, frequency and duration of use (or from service life)	
Duration of the activity	: <= 8 hours/day



<b>Technical and organisational conditions and measures</b>	
Only appropriately trained and authorized personnel is allowed to handle the substance. Substance-handling processes shall be well documented and supervised. Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.	
Provide a basic standard of general ventilation (1 to 3 air changes per hour).	
Local exhaust ventilation Inhalation - minimum efficiency of 95 %	
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
Wear suitable protective clothing. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Dermal - minimum efficiency of 90 %	
On possible contact with the product (sampling, product leakage): Wear protective gloves/ protective clothing/ eye protection/ face protection. Wear suitable respiratory protection.	
<b>Other conditions affecting workers exposure</b>	
Indoor or outdoor use	: Indoor use

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

[Reaction products of phosphoryl trichloride and 2-methyloxirane]

<b>Product (article) characteristics</b>	
Concentration of the Substance in Mixture/Article	: <= 25%
Physical form of product	: Liquid
Process Temperature	: <= 40 °C
<b>Amount used, frequency and duration of use (or from service life)</b>	
Duration of the activity	: <= 8 hours/day
<b>Technical and organisational conditions and measures</b>	
Only appropriately trained and authorized personnel is allowed to handle the substance. Substance-handling processes shall be well documented and supervised. Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.	
Provide a basic standard of general ventilation (1 to 3 air changes per hour).	
Local exhaust ventilation Inhalation - minimum efficiency of 95 %	
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
Wear suitable protective clothing. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Dermal - minimum efficiency of 90 %	
On possible contact with the product (sampling, product leakage): Wear protective gloves/ protective clothing/ eye protection/ face protection. Wear suitable respiratory protection.	

Other conditions affecting workers exposure	
Indoor or outdoor use	: Indoor use

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

[Reaction products of phosphoryl trichloride and 2-methyloxirane]

Product (article) characteristics	
Concentration of the Substance in Mixture/Article	: <= 25%
Physical form of product	: Liquid
Process Temperature	: <= 40 °C
Amount used, frequency and duration of use (or from service life)	
Duration of the activity	: <= 8 hours/day
Technical and organisational conditions and measures	
Only appropriately trained and authorized personnel is allowed to handle the substance. Substance-handling processes shall be well documented and supervised. Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.	
Provide a basic standard of general ventilation (1 to 3 air changes per hour).	
Local exhaust ventilation Inhalation - minimum efficiency of 95 %	
Conditions and measures related to personal protection, hygiene and health evaluation	
Wear suitable protective clothing. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Dermal - minimum efficiency of 90 %	
On possible contact with the product (sampling, product leakage): Wear protective gloves/ protective clothing/ eye protection/ face protection. Wear suitable respiratory protection.	
Other conditions affecting workers exposure	
Indoor or outdoor use	: Indoor use

#### 2.2.23. Control of worker exposure: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a) / Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9)

[Reaction products of phosphoryl trichloride and 2-methyloxirane]

Product (article) characteristics	
Concentration of the Substance in Mixture/Article	: <= 25%
Physical form of product	: Liquid
Process Temperature	: <= 40 °C
Amount used, frequency and duration of use (or from service life)	
Duration of the activity	: <= 8 hours/day

<b>Technical and organisational conditions and measures</b>	
Only appropriately trained and authorized personnel is allowed to handle the substance. Substance-handling processes shall be well documented and supervised. Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.	
Provide a basic standard of general ventilation (1 to 3 air changes per hour).	
Local exhaust ventilation Inhalation - minimum efficiency of 90 %	
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
Wear suitable protective clothing. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Dermal - minimum efficiency of 90 %	
On possible contact with the product (sampling, product leakage): Wear protective gloves/ protective clothing/ eye protection/ face protection. Wear suitable respiratory protection.	
<b>Other conditions affecting workers exposure</b>	
Indoor or outdoor use	: Indoor use

#### 2.2.24. Control of worker exposure: Treatment of articles by dipping and pouring (PROC13) [Reaction products of phosphoryl trichloride and 2-methyloxirane]

<b>Product (article) characteristics</b>	
Concentration of the Substance in Mixture/Article	: <= 25%
Physical form of product	: Liquid
Process Temperature	: <= 40 °C
<b>Amount used, frequency and duration of use (or from service life)</b>	
Duration of the activity	: <= 8 hours/day
<b>Technical and organisational conditions and measures</b>	
Only appropriately trained and authorized personnel is allowed to handle the substance. Substance-handling processes shall be well documented and supervised. Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.	
Provide a basic standard of general ventilation (1 to 3 air changes per hour).	
Local exhaust ventilation Inhalation - minimum efficiency of 90 %	
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
Wear suitable protective clothing. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Dermal - minimum efficiency of 90 %	
On possible contact with the product (sampling, product leakage): Wear protective gloves/ protective clothing/ eye protection/ face protection. Wear suitable respiratory protection.	
<b>Other conditions affecting workers exposure</b>	

Indoor or outdoor use	: Indoor use
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**2.2.25. Control of worker exposure: Use as laboratory reagent (PROC15)**  
**[Reaction products of phosphoryl trichloride and 2-methyloxirane]**

Product (article) characteristics	
Concentration of the Substance in Mixture/Article	: <= 100%
Physical form of product	: Liquid
Process Temperature	: <= 40 °C
Amount used, frequency and duration of use (or from service life)	
Duration of the activity	: <= 8 hours/day
Technical and organisational conditions and measures	
Only appropriately trained and authorized personnel is allowed to handle the substance. Substance-handling processes shall be well documented and supervised. Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.	
Provide a basic standard of general ventilation (1 to 3 air changes per hour).	
Conditions and measures related to personal protection, hygiene and health evaluation	
Wear suitable protective clothing. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Dermal - minimum efficiency of 90 %	
On possible contact with the product (sampling, product leakage): Wear protective gloves/ protective clothing/ eye protection/ face protection. Wear suitable respiratory protection.	
Other conditions affecting workers exposure	
Indoor or outdoor use	: Indoor use

**2.2.26. Control of worker exposure: Use as laboratory reagent (PROC15)**  
**[Reaction products of phosphoryl trichloride and 2-methyloxirane]**

Product (article) characteristics	
Concentration of the Substance in Mixture/Article	: <= 100%
Physical form of product	: Liquid
Process Temperature	: <= 40 °C
Amount used, frequency and duration of use (or from service life)	
Duration of the activity	: <= 8 hours/day
Technical and organisational conditions and measures	
Only appropriately trained and authorized personnel is allowed to handle the substance. Substance-handling processes shall be well documented and supervised. Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.	

Provide a basic standard of general ventilation (1 to 3 air changes per hour).	
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
Wear suitable protective clothing. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Dermal - minimum efficiency of 90 %	
On possible contact with the product (sampling, product leakage): Wear protective gloves/ protective clothing/ eye protection/ face protection. Wear suitable respiratory protection.	
<b>Other conditions affecting workers exposure</b>	
Indoor or outdoor use	: Indoor use

**2.2.27. Control of worker exposure: Use as laboratory reagent (PROC15)**  
**[Reaction products of phosphoryl trichloride and 2-methyloxirane]**

<b>Product (article) characteristics</b>	
Concentration of the Substance in Mixture/Article	: <= 100%
Physical form of product	: Liquid
Process Temperature	: <= 40 °C
<b>Amount used, frequency and duration of use (or from service life)</b>	
Duration of the activity	: <= 8 hours/day
<b>Technical and organisational conditions and measures</b>	
Only appropriately trained and authorized personnel is allowed to handle the substance. Substance-handling processes shall be well documented and supervised. Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.	
Provide a basic standard of general ventilation (1 to 3 air changes per hour).	
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
Wear suitable protective clothing. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Dermal - minimum efficiency of 90 %	
On possible contact with the product (sampling, product leakage): Wear protective gloves/ protective clothing/ eye protection/ face protection. Wear suitable respiratory protection.	
<b>Other conditions affecting workers exposure</b>	
Indoor or outdoor use	: Indoor use

**2.2.28. Control of worker exposure: Use as laboratory reagent (PROC15)**  
**[Reaction products of phosphoryl trichloride and 2-methyloxirane]**

<b>Product (article) characteristics</b>	
Concentration of the Substance in Mixture/Article	: <= 100%
Physical form of product	: Liquid

Process Temperature	: <= 40 °C
<b>Amount used, frequency and duration of use (or from service life)</b>	
Duration of the activity	: <= 8 hours/day
<b>Technical and organisational conditions and measures</b>	
Only appropriately trained and authorized personnel is allowed to handle the substance. Substance-handling processes shall be well documented and supervised. Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.	
Provide a basic standard of general ventilation (1 to 3 air changes per hour).	
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
Wear suitable protective clothing. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Dermal - minimum efficiency of 90 %	
On possible contact with the product (sampling, product leakage): Wear protective gloves/ protective clothing/ eye protection/ face protection. Wear suitable respiratory protection.	
<b>Other conditions affecting workers exposure</b>	
Indoor or outdoor use	: Indoor use

**2.2.29. Control of worker exposure: Low energy manipulation and handling of substances bound in/on materials and/or articles (PROC21)**  
**[polyether based on aromatic amine]**

<b>Product (article) characteristics</b>	
Remarks	: Concentration of the Substance in Mixture/Article, Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical form of product	: solid for PROC 21 as bound in articles
Physical form of product	: Substance of unknown or variable composition, complex reaction products or biological material (UVCB)
<b>Amount used, frequency and duration of use (or from service life)</b>	
Exposure duration	: 8 hours/day
<b>Technical and organisational conditions and measures</b>	
All contributing scenarios at product temperatures ABOVE 83.3 °C: Provide extraction ventilation at points where emissions occur.	
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
Wear suitable gloves tested to EN374. Wear suitable eye protection if exposure to the eyes may be possible, e.g. due to splashing, working overhead or when the face of the worker needs to be close to the source.	
All contributing scenarios at product temperatures ABOVE 83.3 °C: If above technical/organisational control measures are not feasible, then adopt following PPE: Wear a respirator conforming to EN140 with Type A filter or better. OR: Demonstrate, e.g. by workplace monitoring, that exposures are below the relevant worker DNEL values for acute and long-term.	

Other conditions affecting workers exposure	
Indoor or outdoor use	: Covers indoor and outdoor use.

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

[Reaction products of phosphoryl trichloride and 2-methyloxirane]

Product (article) characteristics	
Concentration of the Substance in Mixture/Article	: <= 25%
Physical form of product	: Solid, medium dustiness, Substance is securely encapsulated in matrix.
Process Temperature	: <= 40 °C
Amount used, frequency and duration of use (or from service life)	
Duration of the activity	: <= 8 hours/day
Technical and organisational conditions and measures	
Only appropriately trained and authorized personnel is allowed to handle the substance. Substance-handling processes shall be well documented and supervised. Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.	
Provide a basic standard of general ventilation (1 to 3 air changes per hour).	
Conditions and measures related to personal protection, hygiene and health evaluation	
Wear suitable protective clothing. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Dermal - minimum efficiency of 90 %	
On possible contact with the product (sampling, product leakage): Wear protective gloves/ protective clothing/ eye protection/ face protection. Wear suitable respiratory protection.	
Other conditions affecting workers exposure	
Indoor or outdoor use	: Indoor use

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

[Reaction products of phosphoryl trichloride and 2-methyloxirane]

Product (article) characteristics	
Concentration of the Substance in Mixture/Article	: <= 25%
Physical form of product	: Solid, medium dustiness, Substance is securely encapsulated in matrix.
Process Temperature	: <= 40 °C
Amount used, frequency and duration of use (or from service life)	
Duration of the activity	: <= 8 hours/day

Technical and organisational conditions and measures	
Only appropriately trained and authorized personnel is allowed to handle the substance. Substance-handling processes shall be well documented and supervised. Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.	
Provide a basic standard of general ventilation (1 to 3 air changes per hour).	
Conditions and measures related to personal protection, hygiene and health evaluation	
Wear suitable protective clothing. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Dermal - minimum efficiency of 90 %	
On possible contact with the product (sampling, product leakage): Wear protective gloves/ protective clothing/ eye protection/ face protection. Wear suitable respiratory protection.	
Other conditions affecting workers exposure	
Indoor or outdoor use	: Indoor use

**2.2.32. Control of worker exposure: Low energy manipulation and handling of substances bound in/on materials and/or articles (PROC21)**  
**[Reaction products of phosphoryl trichloride and 2-methyloxirane]**

Product (article) characteristics	
Concentration of the Substance in Mixture/Article	: <= 25%
Physical form of product	: Solid, very high dustiness, Substance is securely encapsulated in matrix.
Process Temperature	: <= 40 °C
Amount used, frequency and duration of use (or from service life)	
Duration of the activity	: <= 8 hours/day
Technical and organisational conditions and measures	
Only appropriately trained and authorized personnel is allowed to handle the substance. Substance-handling processes shall be well documented and supervised. Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.	
Provide a basic standard of general ventilation (1 to 3 air changes per hour).	
Local exhaust ventilation Inhalation - minimum efficiency of 90 %	
Conditions and measures related to personal protection, hygiene and health evaluation	
Wear suitable protective clothing. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Dermal - minimum efficiency of 90 %	
On possible contact with the product (sampling, product leakage): Wear protective gloves/ protective clothing/ eye protection/ face protection. Wear suitable respiratory protection.	
Other conditions affecting workers exposure	



Indoor or outdoor use	: Indoor use
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### 2.3. Exposure estimation and reference to its source

#### 2.3.1. Worker exposure: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions (PROC1) [Reaction products of phosphoryl trichloride and 2-methyloxirane]

Exposure route	Exposure level	RCR	Remarks
combined routes, systemic,	(CHESAR, v3.3)	< 1	

##### Additional information on exposure estimation

Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR ≤ 1).

#### 2.3.2. Worker exposure: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions (PROC1) [Reaction products of phosphoryl trichloride and 2-methyloxirane]

Exposure route	Exposure level	RCR	Remarks
combined routes, systemic,	(CHESAR, v3.3)	< 1	

##### Additional information on exposure estimation

Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR ≤ 1).

#### 2.3.3. Worker exposure: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions (PROC1) [Reaction products of phosphoryl trichloride and 2-methyloxirane]

Exposure route	Exposure level	RCR	Remarks
combined routes, systemic,	(CHESAR, v3.3)	< 1	

##### Additional information on exposure estimation

Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR ≤ 1).

#### 2.3.4. Worker exposure: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions (PROC1) [Reaction products of phosphoryl trichloride and 2-methyloxirane]

Exposure route	Exposure level	RCR	Remarks
combined routes, systemic,	(CHESAR, v3.3)	< 1	

##### Additional information on exposure estimation

Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR ≤ 1).

#### 2.3.5. Worker exposure: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions (PROC1) / Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition (PROC3) / Use as laboratory reagent (PROC15) [polyether based on aromatic amine]

Exposure route	Exposure level	RCR	Remarks
long term, inhalation,	1,85 mg/m <sup>3</sup> (*)	0,47	
long term, dermal,	0,34 mg/kg body weight/day (ECETOC TRA)	0,05	

**Additional information on exposure estimation**

\*For inhalation exposure the saturated vapour pressure was used for all PROCs.

Based on the applied RMMs the risk towards humans and the environment is sufficiently controlled (RCR ≤ 1).

**2.3.6. Worker exposure: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions (PROC2) [polyether based on aromatic amine]**

Exposure route	Exposure level	RCR	Remarks
long term, inhalation,	1,85 mg/m <sup>3</sup> (*)	0,47	
long term, dermal,	1,37 mg/kg body weight/day (ECETOC TRA)	0,20	

**Additional information on exposure estimation**

\*For inhalation exposure the saturated vapour pressure was used for all PROCs.

Based on the applied RMMs the risk towards humans and the environment is sufficiently controlled (RCR ≤ 1).

**2.3.7. Worker exposure: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions (PROC2) / Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition (PROC3) [Reaction products of phosphoryl trichloride and 2-methyloxirane]**

Exposure route	Exposure level	RCR	Remarks
combined routes, systemic,	(CHESAR, v3.3)	< 1	

**Additional information on exposure estimation**

Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR ≤ 1).

**2.3.8. Worker exposure: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions (PROC2) / Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition (PROC3) [Reaction products of phosphoryl trichloride and 2-methyloxirane]**

Exposure route	Exposure level	RCR	Remarks
combined routes, systemic,	(CHESAR, v3.3)	< 1	

**Additional information on exposure estimation**

Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR ≤ 1).

**2.3.9. Worker exposure: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions (PROC2) /**

**Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition (PROC3)**  
**[Reaction products of phosphoryl trichloride and 2-methyloxirane]**

Exposure route	Exposure level	RCR	Remarks
combined routes, systemic,	(CHESAR, v3.3)	< 1	

**Additional information on exposure estimation**

Based on the applied RMMs the risk towards humans is sufficiently controlled ( $RCR \leq 1$ ).

**2.3.10. Worker exposure: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions (PROC2) / Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition (PROC3)**  
**[Reaction products of phosphoryl trichloride and 2-methyloxirane]**

Exposure route	Exposure level	RCR	Remarks
combined routes, systemic,	(CHESAR, v3.3)	< 1	

**Additional information on exposure estimation**

Based on the applied RMMs the risk towards humans is sufficiently controlled ( $RCR \leq 1$ ).

**2.3.11. Worker exposure: Chemical production where opportunity for exposure arises (PROC4) / Mixing or blending in batch processes (PROC5)**  
**[Reaction products of phosphoryl trichloride and 2-methyloxirane]**

Exposure route	Exposure level	RCR	Remarks
combined routes, systemic,	(CHESAR, v3.3)	< 1	

**Additional information on exposure estimation**

Based on the applied RMMs the risk towards humans is sufficiently controlled ( $RCR \leq 1$ ).

**2.3.12. Worker exposure: Chemical production where opportunity for exposure arises (PROC4) / Mixing or blending in batch processes (PROC5) / Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a) / Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9)**  
**[Reaction products of phosphoryl trichloride and 2-methyloxirane]**

Exposure route	Exposure level	RCR	Remarks
combined routes, systemic,	(CHESAR, v3.3)	< 1	

**Additional information on exposure estimation**

Based on the applied RMMs the risk towards humans is sufficiently controlled ( $RCR \leq 1$ ).

**2.3.13. Worker exposure: Chemical production where opportunity for exposure arises (PROC4) / Mixing or blending in batch processes (PROC5) / Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a) / Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9)**  
**[Reaction products of phosphoryl trichloride and 2-methyloxirane]**

Exposure route	Exposure level	RCR	Remarks
combined routes,	(CHESAR, v3.3)	< 1	

systemic,			
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**Additional information on exposure estimation**

Based on the applied RMMs the risk towards humans is sufficiently controlled ( $RCR \leq 1$ ).

**2.3.14. Worker exposure: Chemical production where opportunity for exposure arises (PROC4) / Mixing or blending in batch processes (PROC5) / Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a) / Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9)**  
**[Reaction products of phosphoryl trichloride and 2-methyloxirane]**

Exposure route	Exposure level	RCR	Remarks
combined routes, systemic,	(CHESAR, v3.3)	< 1	

**Additional information on exposure estimation**

Based on the applied RMMs the risk towards humans is sufficiently controlled ( $RCR \leq 1$ ).

**2.3.15. Worker exposure: Chemical production where opportunity for exposure arises (PROC4) / Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b) / Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9)**  
**[polyether based on aromatic amine]**

Exposure route	Exposure level	RCR	Remarks
long term, inhalation,	1,85 mg/m <sup>3</sup> (*)	0,47	
long term, dermal,	1,37 mg/kg body weight/day (ECETOC TRA)	0,20	Gloves

**Additional information on exposure estimation**

\*For inhalation exposure the saturated vapour pressure was used for all PROCs.

Based on the applied RMMs the risk towards humans and the environment is sufficiently controlled ( $RCR \leq 1$ ).

**2.3.16. Worker exposure: Mixing or blending in batch processes (PROC5) / Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a) / Treatment of articles by dipping and pouring (PROC13)**  
**[polyether based on aromatic amine]**

Exposure route	Exposure level	RCR	Remarks
long term, inhalation,	1,85 mg/m <sup>3</sup> (*)	0,47	
long term, dermal,	2,74 mg/kg body weight/day (ECETOC TRA)	0,40	Gloves

**Additional information on exposure estimation**

\*For inhalation exposure the saturated vapour pressure was used for all PROCs.

Based on the applied RMMs the risk towards humans and the environment is sufficiently controlled ( $RCR \leq 1$ ).

**2.3.17. Worker exposure: Industrial spraying (PROC7)**  
**[polyether based on aromatic amine]**

Exposure route	Exposure level	RCR	Remarks
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long term, inhalation,	0,87 mg/m <sup>3</sup> (Measured value)	0,22	
long term, dermal,	4,29 mg/kg body weight/day (ECETOC TRA)	0,61	Gloves

**Additional information on exposure estimation**

For PROCs 7 and 10 a read-across was done using measured occupational hygiene data of MDI inhalation exposure during spraying

Based on the applied RMMs the risk towards humans and the environment is sufficiently controlled (RCR ≤ 1).

**2.3.18. Worker exposure: Industrial spraying (PROC7)**

[Reaction products of phosphoryl trichloride and 2-methyloxirane]

Exposure route	Exposure level	RCR	Remarks
combined routes, systemic,	(CHESAR, v3.3)	< 1	

**Additional information on exposure estimation**

Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR ≤ 1).

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

[Reaction products of phosphoryl trichloride and 2-methyloxirane]

Exposure route	Exposure level	RCR	Remarks
combined routes, systemic,	(CHESAR, v3.3)	< 1	

**Additional information on exposure estimation**

Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR ≤ 1).

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

[Reaction products of phosphoryl trichloride and 2-methyloxirane]

Exposure route	Exposure level	RCR	Remarks
combined routes, systemic,	(CHESAR, v3.3)	< 1	

**Additional information on exposure estimation**

Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR ≤ 1).

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

[Reaction products of phosphoryl trichloride and 2-methyloxirane]

Exposure route	Exposure level	RCR	Remarks
combined routes, systemic,	(CHESAR, v3.3)	< 1	

**Additional information on exposure estimation**

Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR ≤ 1).

**2.3.22. Worker exposure: Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b)****[Reaction products of phosphoryl trichloride and 2-methyloxirane]**

Exposure route	Exposure level	RCR	Remarks
combined routes, systemic,	(CHESAR, v3.3)	< 1	

**Additional information on exposure estimation**

Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR ≤ 1).

**2.3.23. Worker exposure: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a) / Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9)****[Reaction products of phosphoryl trichloride and 2-methyloxirane]**

Exposure route	Exposure level	RCR	Remarks
combined routes, systemic,	(CHESAR, v3.3)	< 1	

**Additional information on exposure estimation**

Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR ≤ 1).

**2.3.24. Worker exposure: Treatment of articles by dipping and pouring (PROC13)****[Reaction products of phosphoryl trichloride and 2-methyloxirane]**

Exposure route	Exposure level	RCR	Remarks
combined routes, systemic,	(CHESAR, v3.3)	< 1	

**Additional information on exposure estimation**

Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR ≤ 1).

**2.3.25. Worker exposure: Use as laboratory reagent (PROC15)****[Reaction products of phosphoryl trichloride and 2-methyloxirane]**

Exposure route	Exposure level	RCR	Remarks
combined routes, systemic,	(CHESAR, v3.3)	< 1	

**Additional information on exposure estimation**

Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR ≤ 1).

**2.3.26. Worker exposure: Use as laboratory reagent (PROC15)****[Reaction products of phosphoryl trichloride and 2-methyloxirane]**

Exposure route	Exposure level	RCR	Remarks
combined routes, systemic,	(CHESAR, v3.3)	< 1	

**Additional information on exposure estimation**

Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR ≤ 1).

**2.3.27. Worker exposure: Use as laboratory reagent (PROC15)**  
**[Reaction products of phosphoryl trichloride and 2-methyloxirane]**

Exposure route	Exposure level	RCR	Remarks
combined routes, systemic,	(CHESAR, v3.3)	< 1	

**Additional information on exposure estimation**

Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR ≤ 1).

**2.3.28. Worker exposure: Use as laboratory reagent (PROC15)**  
**[Reaction products of phosphoryl trichloride and 2-methyloxirane]**

Exposure route	Exposure level	RCR	Remarks
combined routes, systemic,	(CHESAR, v3.3)	< 1	

**Additional information on exposure estimation**

Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR ≤ 1).

**2.3.29. Worker exposure: Low energy manipulation and handling of substances bound in/on materials and/or articles (PROC21)**  
**[polyether based on aromatic amine]**

Exposure route	Exposure level	RCR	Remarks
long term, inhalation,	1,85 mg/m <sup>3</sup> (*)	0,47	
long term, dermal,	2,83 mg/kg body weight/day (ECETOC TRA)	0,40	

**Additional information on exposure estimation**

\*For inhalation exposure the saturated vapour pressure was used for all PROCs.

Based on the applied RMMs the risk towards humans and the environment is sufficiently controlled (RCR ≤ 1).

**2.3.30. Worker exposure: Low energy manipulation and handling of substances bound in/on materials and/or articles (PROC21)**  
**[Reaction products of phosphoryl trichloride and 2-methyloxirane]**

Exposure route	Exposure level	RCR	Remarks
combined routes, systemic,	(ECETOC TRA, v3.1)	< 1	

**Additional information on exposure estimation**

Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR ≤ 1).

**2.3.31. Worker exposure: Low energy manipulation and handling of substances bound in/on materials and/or articles (PROC21)**  
**[Reaction products of phosphoryl trichloride and 2-methyloxirane]**

Exposure route	Exposure level	RCR	Remarks
combined routes, systemic,	(ECETOC TRA, v3.1)	< 1	

**Additional information on exposure estimation**

Based on the applied RMMs the risk towards humans is sufficiently controlled ( $RCR \leq 1$ ).

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

**[Reaction products of phosphoryl trichloride and 2-methyloxirane]**

Exposure route	Exposure level	RCR	Remarks
combined routes, systemic,	(ECETOC TRA, v3.1)	< 1	

**Additional information on exposure estimation**

Based on the applied RMMs the risk towards humans is sufficiently controlled ( $RCR \leq 1$ ).

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

The risk management measures given in this exposure scenario apply to the specified substance in a concentration as indicated in the scenario. The concentration of the substance in the product may differ. A downstream user should evaluate if the risk management measures may be adapted accordingly. Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

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