



## SAFETY DATA SHEET (1907/2006)

00000267493

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### NMP N-METHYL PYRROLINE

## 1. Exposure scenario's

Exposure scenarios have been calculated using EasyTRA 4.2.0. EasyTRA uses algorithms on the basis of the latest versions of the ECHA REACH Guidance chapters R12 (as of March 2010), R14, R15, and R16 (as of October 2012) and EUSES®.

### Details on used Targeted Risk Assessment:

Exposure assessment in EasyTRA follows a tiered approach, offering increasingly sophisticated refinements at later tiers to adapt the scenarios to real-life situations.

## 1.1 General information

In the chemical safety assessment performed according to Article 14(3) in connection with Annex I section 3 (Environmental Hazard Assessment) and section 4 (PBT/ vPvB Assessment) no hazard was identified for the environmental compartments water, sediment and soil. Therefore, according to REACH Annex I (5.0) an exposure estimation is not necessary. Consequently, all identified uses of the substance are assessed as safe for the environmental compartments water, sediment and soil.

In the chemical safety assessment performed according to Article 14(3) in connection with Annex I section 2 (Hazard assessment for physico-chemical properties) no hazard was identified. Consequently, all identified uses of the substance are assessed as safe related to the physico-chemical properties.

## 1.2 Reference values used for the quantitative risk assessment

Table 1. Reference values (DNEL / PNEC)

Route / Compartment	Value
<b>Human health</b>	
Worker - inhalation long-term systemic	14.4 mg/m <sup>3</sup>
Worker - dermal long-term systemic	4.8 mg/kg bw/day
Worker - inhalation long-term local	40 mg/m <sup>3</sup>
<b>Environment</b>	
STP	10 mg/L
Man via environment	0.850 mg/kg bw/day

Table 2. Physical/chemical properties

Property	Value
Molecular weight	99.131 g/mol
Vapour pressure	32 Pa
Water solubility	1.00E6 mg/L
logKow	-4.60E-1
Biodegradability	readily biodegradable

## 1.3 Overview of exposure scenarios

The format of this CSR follows the current ECHA template for CSRs.

Table 3. Overview on exposure scenarios and coverage of substance life cycle

Section	Short description of exposure scenario (ES#)	Resulting life cycle stage					Sector of use (SU)	Process Category (PROC)	Product Category (PC)	Article Category (AC)	Environmental Release Category (ERC)	
		Manufacture	Formulation	End use								Service life (for articles)
				Industrial	Professionals	Consumer						
9.1	Manufacture of substance (M1)	-										
9.2	Formulation of preparations (F1)		x	x			3	3, 4, 5		2		
9.3	Charging and discharging (F2)		x	x			3	8A, 8B, 9		2		
9.4	Use in industrial chemical processes (IW1)			x			3	1, 2, 3, 4		4		
6	Use in laboratories, industrial (IW2)			x			3	15		4		
7	Use in Construction Chemicals, industrial (Use in Wire Coatings) (IW3)			x			3	2, 8B, 10, 13		4		
8	Use in Coatings (paint, ink, toners, adhesives) (IW4)			x			3	7, 10, 13		4		
9	Use in Cleaning Agents (IW5)			x			3	7, 10, 13		4		
10	Use in Functional Fluids (IW6)			x			3	17, 18		4		
9.10	Charging and discharging of substances and mixtures, industrial (IW7)			x			3	8A, 8B, 9, 15		4		

## 2. Scenario 1: Manufacture of substance (M1)

Not applicable, this registration concerns only substance imported into the EU.

### 3. Scenario 2: Formulation of preparations (F1)

This scenario is described by the following combinations of use descriptors. The corresponding contributing scenarios are described in the respective subchapters. An overall exposure scenario may be described by a number of contributing scenarios which may be subdivided into environmental exposure, worker exposure and consumer exposure.

The corresponding release to the environment, exposure of workers and consumers resulting from these contributing scenarios is summarized in chapter 10.2 ff.

Table 4. Description of ES 2

<b>Free short title</b>	Formulation of preparations (F1)
<b>Systematic title based on use descriptor</b>	ERC 2; PROC 3, 4, 5
<b>Name of contributing environmental scenario and corresponding ERC</b>	ERC 2 Formulation of preparations
<b>Name(s) of contributing worker scenarios and corresponding PROCs</b>	<p>PROC 3 - Use in closed batch process (synthesis or formulation)</p> <p>a. &lt; 40°C - Low Fugacity / Dustiness</p> <p>b. 61-127°C – Medium Fugacity / Dustiness</p> <p>PROC 4 - Use in batch and other process (synthesis) where opportunity for exposure arises</p> <p>PROC 5 - Mixing or blending in batch processes (multistage and/or significant contact)</p> <p>a. &lt; 40°C - Low Fugacity / Dustiness</p> <p>b. 61-127°C – Medium Fugacity / Dustiness</p>

#### 3.1 Contributing Scenario (1) controlling environmental exposure for ERC 2

As no environmental hazard was identified no environmental-related exposure assessment and risk characterization was performed.

#### 3.2 Contributing Scenario (2) controlling industrial worker exposure for PROC 3-a

<b>Name of contributing scenario</b>	3 - Use in closed batch process (synthesis or formulation)
Scenario subtitle	< 40°C – Low Fugacity / Dustiness
Exposure type	Inhalation: Long-term systemic & local Dermal: Long-term systemic
<b>Qualitative Risk Assessment</b>	
General	In case of potential exposure: Use suitable chemically resistant gloves.
Eyes	In case of potential exposure: Use suitable eye protection.
<b>Product characteristics</b>	
Physical state	liquid
Concentration in substance	>25%
Fugacity / Dustiness	low
<b>Frequency and duration of use</b>	
Duration of activity	>4 hours (default)
Frequency of use	5 days / week

<b>Human factors not influenced by risk management</b>	
Exposed skin surface	240 cm <sup>2</sup>
<b>Other given operational conditions affecting workers exposure</b>	
Location	indoors
Ventilation	good (30%)
Domain	industrial
<b>Technical conditions and measures to control dispersion and exposure</b>	
Local exhaust ventilation	no
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
Protective gloves	No
Respiratory protection	no

### 3.3 Contributing Scenario (3) controlling industrial worker exposure for PROC 3-b

<b>Name of contributing scenario</b>	3 - Use in closed batch process (synthesis or formulation)
Scenario subtitle	61-127°C – Medium Fugacity / Dustiness
Exposure type	Inhalation: Long-term systemic & local Dermal: Long-term systemic
<b>Qualitative Risk Assessment</b>	
General	In case of potential exposure: Use suitable chemically resistant gloves.
Eyes	In case of potential exposure: Use suitable eye protection.
<b>Product characteristics</b>	
Physical state	liquid
Concentration in substance	>25%
Process temperature	100 °C
Fugacity / Dustiness	medium
<b>Frequency and duration of use</b>	
Duration of activity	>4 hours (default)
Frequency of use	5 days / week
<b>Human factors not influenced by risk management</b>	
Exposed skin surface	240 cm <sup>2</sup>
<b>Other given operational conditions affecting workers exposure</b>	
Location	indoors
Domain	industrial
<b>Technical conditions and measures to control dispersion and exposure</b>	
Local exhaust ventilation	yes (inhalation 90 %)
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
Protective gloves	Gloves APF 5 80 %
Respiratory protection	no

### 3.4 Contributing Scenario (4) controlling industrial worker exposure for PROC 4

Name of contributing scenario	4 - Use in batch and other process (synthesis) where opportunity for exposure arises
Exposure type	Inhalation: Long-term systemic & local Dermal: Long-term systemic
<b>Qualitative Risk Assessment</b>	
General	In case of potential exposure: Use suitable chemically resistant gloves.
Eyes	In case of potential exposure: Use suitable eye protection.
<b>Product characteristics</b>	
Physical state	liquid
Concentration in substance	>25%
Fugacity / Dustiness	low
<b>Frequency and duration of use</b>	
Duration of activity	>4 hours (default)
Frequency of use	5 days / week
<b>Human factors not influenced by risk management</b>	
Exposed skin surface	480 cm <sup>2</sup>
<b>Other given operational conditions affecting workers exposure</b>	
Location	indoors
Ventilation	enhanced (70%)
Domain	industrial
<b>Technical conditions and measures to control dispersion and exposure</b>	
Local exhaust ventilation	no
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
Protective gloves	Gloves APF 5 80 %
Respiratory protection	no

### 3.5 Contributing Scenario (5) controlling industrial worker exposure for PROC 5-a

Name of contributing scenario	5 - Mixing or blending in batch processes (multistage and/or significant contact)
Scenario subtitle	< 40°C – Low Fugacity / Dustiness
Exposure type	Inhalation: Long-term systemic & local Dermal: Long-term systemic
<b>Qualitative Risk Assessment</b>	
Eyes	Use suitable eye protection.
<b>Product characteristics</b>	
Physical state	liquid
Concentration in substance	>25%
Fugacity / Dustiness	low
<b>Frequency and duration of use</b>	
Duration of activity	>4 hours (default)

Frequency of use	5 days / week
<b>Human factors not influenced by risk management</b>	
Exposed skin surface	480 cm <sup>2</sup>
<b>Other given operational conditions affecting workers exposure</b>	
Location	indoors
Ventilation	enhanced (70%)
Domain	industrial
<b>Technical conditions and measures to control dispersion and exposure</b>	
Local exhaust ventilation	no
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
Protective gloves	Gloves APF 10 90 %
Respiratory protection	no

### 3.6 Contributing Scenario (6) controlling industrial worker exposure for PROC 5-b

<b>Name of contributing scenario</b>	5 - Mixing or blending in batch processes (multistage and/or significant contact)
Scenario subtitle	61-127°C
Exposure type	Inhalation: Long-term systemic & local Dermal: Long-term systemic
<b>Qualitative Risk Assessment</b>	
Eyes	Use suitable eye protection.
<b>Product characteristics</b>	
Physical state	liquid
Concentration in substance	>25%
Process temperature	100 °C
Fugacity / Dustiness	medium
<b>Frequency and duration of use</b>	
Duration of activity	1 - 4 hours
Frequency of use	5 days / week
<b>Human factors not influenced by risk management</b>	
Exposed skin surface	480 cm <sup>2</sup>
<b>Other given operational conditions affecting workers exposure</b>	
Location	indoors
Ventilation	good (30%)
Domain	industrial
<b>Technical conditions and measures to control dispersion and exposure</b>	
Local exhaust ventilation	yes (inhalation 90 %)
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
Protective gloves	Gloves APF 10 90 %
Respiratory protection	no

## 4. Scenario 3: Charging and discharging (F2)

This scenario is described by the following combinations of use descriptors. The corresponding contributing scenarios are described in the respective subchapters.

An overall exposure scenario may be described by a number of contributing scenarios which may be subdivided into environmental exposure, worker exposure and consumer exposure.

The following scenarios contribute to the scenario *Charging and discharging*.

The corresponding release to the environment, exposure of workers and consumers resulting from these contributing scenarios is summarized in chapter 10.3 ff.

Table 5. Description of ES 3

Free short title	Charging and discharging (F2)
Systematic title based on use descriptor	ERC 2; PROC 8B, 9, 15, 8A
Name of contributing environmental scenario and corresponding ERC	ERC 2 Formulation of preparations
Name(s) of contributing worker scenarios and corresponding PROCs	<p>PROC 8a - Transfer of chemicals from/to vessels/ large containers at non-dedicated facilities:</p> <ul style="list-style-type: none"> <li>a. Daily duration: max. 1h at <math>T \leq 40^{\circ}\text{C}</math></li> <li>b. Daily duration: max. 4h + Enhanced ventilation</li> <li>c. Daily duration: max. 1h at <math>T=61-127^{\circ}\text{C}</math></li> <li>d. Daily duration: &gt; 4h at <math>T \leq 40^{\circ}\text{C} + \text{LEV}</math></li> </ul> <p>PROC 8b - Transfer of chemicals from/to vessels/ large containers at dedicated facilities</p> <ul style="list-style-type: none"> <li>a. Daily duration: max. 4h at <math>T \leq 40^{\circ}\text{C}</math></li> <li>b. Daily duration: max. 1h at <math>T=61-127^{\circ}\text{C}</math></li> <li>c. Daily duration: max. 4h + LEV at <math>T=61-127^{\circ}\text{C}</math></li> <li>d. Outdoors</li> </ul> <p>PROC 9 - Transfer of chemicals into small containers (dedicated filling line)</p> <ul style="list-style-type: none"> <li>a. Daily duration: &gt; 4h at <math>T \leq 40^{\circ}\text{C}</math></li> <li>b. Daily duration: 1-4h at <math>T=61-127^{\circ}\text{C}</math></li> <li>c. Outdoors</li> </ul> <p>PROC 15 - Use of laboratory reagents in small scale laboratories</p>

### 4.1 Contributing Scenario (1) controlling environmental exposure for ERC 2

As no environmental hazard was identified no environmental-related exposure assessment and risk characterization was performed.

### 4.2 Contributing Scenario (2) controlling industrial worker exposure for PROC 8A-a

Name of contributing scenario	8a - Transfer of chemicals from/to vessels/ large containers at non dedicated facilities
Scenario subtitle	Daily duration: max. 1h at $T \leq 40^{\circ}\text{C}$
Exposure type	Inhalation: Long-term systemic & local Dermal: Long-term systemic
<b>Qualitative Risk Assessment</b>	
Eyes	Use suitable eye protection.
<b>Product characteristics</b>	

Physical state	liquid
Concentration in substance	100 %
Fugacity / Dustiness	low
<b>Frequency and duration of use</b>	
Duration of activity	15 mins to 1 hour
Frequency of use	5 days / week
<b>Human factors not influenced by risk management</b>	
Exposed skin surface	960 cm <sup>2</sup>
<b>Other given operational conditions affecting workers exposure</b>	
Location	indoors
Ventilation	enhanced (70%)
Domain	industrial
<b>Technical conditions and measures to control dispersion and exposure</b>	
Local exhaust ventilation	no
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
Protective gloves	Gloves APF 10 90 %
Respiratory protection	no

#### 4.3 Contributing Scenario (3) controlling industrial worker exposure for PROC 8A-b

<b>Name of contributing scenario</b>	8a - Transfer of chemicals from/to vessels/ large containers at non dedicated facilities
Scenario subtitle	Daily duration: max. 4h + Enhanced ventilation
Exposure type	Inhalation: Long-term systemic & local Dermal: Long-term systemic
<b>Qualitative Risk Assessment</b>	
Eyes	Use suitable eye protection.
<b>Product characteristics</b>	
Physical state	liquid
Concentration in substance	100 %
Fugacity / Dustiness	low
<b>Frequency and duration of use</b>	
Duration of activity	1 - 4 hours
Frequency of use	5 days / week
<b>Human factors not influenced by risk management</b>	
Exposed skin surface	960 cm <sup>2</sup>
<b>Other given operational conditions affecting workers exposure</b>	
Location	indoors
Ventilation	enhanced (70%)
Domain	industrial
<b>Technical conditions and measures to control dispersion and exposure</b>	
Local exhaust ventilation	no



<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
Protective gloves	Gloves APF 10 90 %
Respiratory protection	no

#### 4.4 Contributing Scenario (4) controlling industrial worker exposure for PROC 8A-c

<b>Name of contributing scenario</b>	8a - Transfer of chemicals from/to vessels/ large containers at non dedicated facilities
Scenario subtitle	Daily duration: max. 1h at T=61-127°C
Exposure type	Inhalation: Long-term systemic & local Dermal: Long-term systemic
<b>Qualitative Risk Assessment</b>	
Eyes	Use suitable eye protection.
<b>Product characteristics</b>	
Physical state	liquid
Concentration in substance	100 %
Process temperature	100 °C
Fugacity / Dustiness	medium
<b>Frequency and duration of use</b>	
Duration of activity	15 mins to 1 hour
Frequency of use	5 days / week
<b>Human factors not influenced by risk management</b>	
Exposed skin surface	960 cm <sup>2</sup>
<b>Other given operational conditions affecting workers exposure</b>	
Location	indoors
Domain	industrial
<b>Technical conditions and measures to control dispersion and exposure</b>	
Local exhaust ventilation	yes (inhalation 90 %)
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
Protective gloves	Gloves APF 10 90 %
Respiratory protection	no

#### 4.5 Contributing Scenario (5) controlling industrial worker exposure for PROC 8A-d

<b>Name of contributing scenario</b>	8a - Transfer of chemicals from/to vessels/ large containers at non dedicated facilities
Scenario subtitle	Daily duration: > 4h at T≤ 40°C+ LEV
Exposure type	Inhalation: Long-term systemic & local Dermal: Long-term systemic
<b>Qualitative Risk Assessment</b>	
Eyes	Use suitable eye protection.
<b>Product characteristics</b>	
Physical state	liquid

Concentration in substance	100 %
Fugacity / Dustiness	low
<b>Frequency and duration of use</b>	
Duration of activity	>4 hours (default)
Frequency of use	5 days / week
<b>Human factors not influenced by risk management</b>	
Exposed skin surface	960 cm <sup>2</sup>
<b>Other given operational conditions affecting workers exposure</b>	
Location	indoors
Domain	industrial
<b>Technical conditions and measures to control dispersion and exposure</b>	
Local exhaust ventilation	yes (inhalation 90 %)
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
Protective gloves	Gloves APF 10 90 %
Respiratory protection	no

#### 4.6 Contributing Scenario (6) controlling industrial worker exposure for PROC 8B-a

<b>Name of contributing scenario</b>	8b - Transfer of chemicals from/to vessels/ large containers at dedicated facilities
Scenario subtitle	Daily duration: max. 4h at T ≤ 40°C – Low Fugacity / Dustiness
Exposure type	Inhalation: Long-term systemic & local Dermal: Long-term systemic
<b>Qualitative Risk Assessment</b>	
General	Provide a good standard of general ventilation (not less than 3 - 5 air changes per hour) Alternatively: Ensure operation is undertaken outdoors.
Eyes	Use suitable eye protection.
<b>Product characteristics</b>	
Physical state	liquid
Concentration in substance	100 %
Fugacity / Dustiness	low
<b>Frequency and duration of use</b>	
Duration of activity	>4 hours (default)
Frequency of use	5 days / week
<b>Human factors not influenced by risk management</b>	
Exposed skin surface	960 cm <sup>2</sup>
<b>Other given operational conditions affecting workers exposure</b>	
Location	indoors
Ventilation	enhanced (70%)
Domain	industrial

<b>Technical conditions and measures to control dispersion and exposure</b>	
Local exhaust ventilation	no
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
Protective gloves	Gloves APF 10 90 %
Respiratory protection	no

#### 4.7 Contributing Scenario (7) controlling industrial worker exposure for PROC 8B-b

<b>Name of contributing scenario</b>	8b - Transfer of chemicals from/to vessels/ large containers at dedicated facilities
Scenario subtitle	Daily duration: max. 1h at T=61-127°C
Exposure type	Inhalation: Long-term systemic & local Dermal: Long-term systemic
<b>Qualitative Risk Assessment</b>	
Eyes	Use suitable eye protection.
<b>Product characteristics</b>	
Physical state	liquid
Concentration in substance	100 %
Process temperature	100 °C
Fugacity / Dustiness	medium
<b>Frequency and duration of use</b>	
Duration of activity	15 mins to 1 hour
Frequency of use	5 days / week
<b>Human factors not influenced by risk management</b>	
Exposed skin surface	960 cm <sup>2</sup>
<b>Other given operational conditions affecting workers exposure</b>	
Location	indoors
Ventilation	enhanced (70%)
Domain	industrial
<b>Technical conditions and measures to control dispersion and exposure</b>	
Local exhaust ventilation	no
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
Protective gloves	Gloves APF 10 90 %
Respiratory protection	no

#### 4.8 Contributing Scenario (8) controlling industrial worker exposure for PROC 8B-c

<b>Name of contributing scenario</b>	8b - Transfer of chemicals from/to vessels/ large containers at dedicated facilities
Scenario subtitle	Daily duration: max. 4h + LEV at T=61-127°C
Exposure type	Inhalation: Long-term systemic & local Dermal: Long-term systemic
<b>Qualitative Risk Assessment</b>	
Eyes	Use suitable eye protection.

<b>Product characteristics</b>	
Physical state	liquid
Concentration in substance	100 %
Process temperature	100 °C
Fugacity / Dustiness	medium
<b>Frequency and duration of use</b>	
Duration of activity	>4 hours (default)
Frequency of use	5 days / week
<b>Human factors not influenced by risk management</b>	
Exposed skin surface	960 cm <sup>2</sup>
<b>Other given operational conditions affecting workers exposure</b>	
Location	indoors
Domain	industrial
<b>Technical conditions and measures to control dispersion and exposure</b>	
Local exhaust ventilation	yes (inhalation 95 %)
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
Protective gloves	Gloves APF 10 90 %
Respiratory protection	no

#### 4.9 Contributing Scenario (9) controlling industrial worker exposure for PROC 8B-d

<b>Name of contributing scenario</b>	8b - Transfer of chemicals from/to vessels/ large containers at dedicated facilities
Scenario subtitle	Outdoors
Exposure type	Inhalation: Long-term systemic & local Dermal: Long-term systemic
<b>Qualitative Risk Assessment</b>	
General	Provide a good standard of general ventilation (not less than 3 - 5 air changes per hour) Alternatively: Ensure operation is undertaken outdoors.
Eyes	Use suitable eye protection.
<b>Product characteristics</b>	
Physical state	liquid
Concentration in substance	>25%
Fugacity / Dustiness	low
<b>Frequency and duration of use</b>	
Duration of activity	1 - 4 hours
Frequency of use	5 days / week
<b>Human factors not influenced by risk management</b>	
Exposed skin surface	960 cm <sup>2</sup>
<b>Other given operational conditions affecting workers exposure</b>	
Location	outdoors (30%)

Domain	industrial
<b>Technical conditions and measures to control dispersion and exposure</b>	
Local exhaust ventilation	no
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
Protective gloves	Gloves APF 10 90 %
Respiratory protection	no

#### 4.10 Contributing Scenario (10) controlling industrial worker exposure for PROC 9-a

<b>Name of contributing scenario</b>	9 - Transfer of chemicals into small containers (dedicated filling line)
Scenario subtitle	Daily duration: > 4h at T ≤ 40°C
Exposure type	Inhalation: Long-term systemic & local Dermal: Long-term systemic
<b>Qualitative Risk Assessment</b>	
General	Provide a good standard of general ventilation (not less than 3 - 5 air changes per hour) Alternatively: Ensure operation is undertaken outdoors.
Eyes	Use suitable eye protection.
<b>Product characteristics</b>	
Physical state	liquid
Concentration in substance	100 %
Fugacity / Dustiness	low
<b>Frequency and duration of use</b>	
Duration of activity	>4 hours (default)
Frequency of use	5 days / week
<b>Human factors not influenced by risk management</b>	
Exposed skin surface	480 cm <sup>2</sup>
<b>Other given operational conditions affecting workers exposure</b>	
Location	indoors
Ventilation	enhanced (70%)
Domain	industrial
<b>Technical conditions and measures to control dispersion and exposure</b>	
Local exhaust ventilation	no
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
Protective gloves	Gloves APF 5 80 %
Respiratory protection	no

#### 4.11 Contributing Scenario (11) controlling industrial worker exposure for PROC 9-b

<b>Name of contributing scenario</b>	9 - Transfer of chemicals into small containers (dedicated filling line)
Scenario subtitle	Daily duration: 1-4h at T=61-127°C

Exposure type	Inhalation: Long-term systemic & local Dermal: Long-term systemic
<b>Qualitative Risk Assessment</b>	
Eyes	Use suitable eye protection.
<b>Product characteristics</b>	
Physical state	liquid
Concentration in substance	100 %
Process temperature	100 °C
Fugacity / Dustiness	medium
<b>Frequency and duration of use</b>	
Duration of activity	1 - 4 hours
Frequency of use	5 days / week
<b>Human factors not influenced by risk management</b>	
Exposed skin surface	480 cm <sup>2</sup>
<b>Other given operational conditions affecting workers exposure</b>	
Location	indoors
Ventilation	good (30%)
Domain	industrial
<b>Technical conditions and measures to control dispersion and exposure</b>	
Local exhaust ventilation	yes (inhalation 90 %)
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
Protective gloves	Gloves APF 5 80 %
Respiratory protection	no

#### 4.12 Contributing Scenario (12) controlling industrial worker exposure for PROC 9-c

<b>Name of contributing scenario</b>	9 - Transfer of chemicals into small containers (dedicated filling line)
Scenario subtitle	Outdoors
Exposure type	Inhalation: Long-term systemic & local Dermal: Long-term systemic
<b>Qualitative Risk Assessment</b>	
General	Provide a good standard of general ventilation (not less than 3 - 5 air changes per hour) Alternatively: Ensure operation is undertaken outdoors.
Eyes	Use suitable eye protection.
<b>Product characteristics</b>	
Physical state	liquid
Concentration in substance	100 %
Fugacity / Dustiness	low
<b>Frequency and duration of use</b>	
Duration of activity	1 - 4 hours

Frequency of use	5 days / week
<b>Human factors not influenced by risk management</b>	
Exposed skin surface	480 cm <sup>2</sup>
<b>Other given operational conditions affecting workers exposure</b>	
Location	outdoors (30%)
Domain	industrial
<b>Technical conditions and measures to control dispersion and exposure</b>	
Local exhaust ventilation	no
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
Protective gloves	Gloves APF 5 80 %
Respiratory protection	no

#### 4.13 Contributing Scenario (13) controlling industrial worker exposure for PROC 15

<b>Name of contributing scenario</b>	15 - Use of laboratory reagents in small scale laboratories
Exposure type	Inhalation: Long-term systemic & local Dermal: Long-term systemic
<b>Qualitative Risk Assessment</b>	
General	Provide a good standard of general ventilation (not less than 3 - 5 air changes per hour) Alternatively: Ensure operation is undertaken outdoors.
Eyes	Use suitable eye protection.
<b>Product characteristics</b>	
Physical state	liquid
Concentration in substance	100 %
Fugacity / Dustiness	low
<b>Frequency and duration of use</b>	
Duration of activity	>4 hours (default)
Frequency of use	5 days / week
<b>Human factors not influenced by risk management</b>	
Exposed skin surface	240 cm <sup>2</sup>
<b>Other given operational conditions affecting workers exposure</b>	
Location	indoors
Domain	industrial
<b>Technical conditions and measures to control dispersion and exposure</b>	
Local exhaust ventilation	yes (inhalation 90 %)
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
Protective gloves	Gloves APF 5 80 %
Respiratory protection	no

## 5. Scenario 4: Use in industrial chemical processes (IW1)

This scenario is described by the following combinations of use descriptors. The corresponding contributing scenarios are described in the respective subchapters.

An overall exposure scenario may be described by a number of contributing scenarios which may be subdivided into environmental exposure, worker exposure and consumer exposure.

The following scenarios contribute to the scenario *Use in industrial chemical processes*.

The corresponding release to the environment, exposure of workers and consumers resulting from these contributing scenarios is summarized in chapter 10.4 ff.

Table 6. Description of ES 4

Free short title	Use in industrial chemical processes (IW1)
Systematic title based on use descriptor	ERC 4; PROC 1, 2, 3, 4
Name of contributing environmental scenario and corresponding ERC	ERC 4 Industrial use of processing aids
Name(s) of contributing worker scenarios and corresponding PROCs	<p>PROC 1 - Use in closed process, no likelihood of exposure</p> <p>a. Daily duration: &gt; 4h at <math>T \leq 40^{\circ}\text{C}</math></p> <p>b. Daily duration: &gt; 4h at <math>T &gt; 127^{\circ}\text{C}</math></p> <p>PROC 2 - Use in closed, continuous process with occasional controlled exposure</p> <p>a. Daily duration: &gt; 4h at <math>T \leq 40^{\circ}\text{C}</math></p> <p>b. Daily duration: &gt; 4h at <math>T &gt; 127^{\circ}\text{C}</math></p> <p>PROC 3 - Use in closed batch process (synthesis or formulation)</p> <p>a. Daily duration: &gt; 4h at <math>T \leq 40^{\circ}\text{C}</math></p> <p>b. Daily duration: &gt; 4h at <math>T &gt; 127^{\circ}\text{C}</math></p> <p>c. Outdoors</p> <p>PROC 4 - Use in batch and other process (synthesis) where opportunity for exposure arises</p> <p>a. Daily duration: &gt; 4h at <math>T \leq 40^{\circ}\text{C}</math></p> <p>b. Daily duration: &gt; 4h at <math>T &gt; 127^{\circ}\text{C}</math></p>

### 5.1 Contributing Scenario (1) controlling environmental exposure for ERC 4

As no environmental hazard was identified no environmental-related exposure assessment and risk characterization was performed.

### 5.2 Contributing Scenario (2) controlling industrial worker exposure for PROC 1-a

Name of contributing scenario	1 - Use in closed process, no likelihood of exposure
Scenario subtitle	Daily duration: > 4h at $T \leq 40^{\circ}\text{C}$
Exposure type	Inhalation: Long-term systemic & local Dermal: Long-term systemic
<b>Product characteristics</b>	
Physical state	liquid
Concentration in substance	100 %
Fugacity / Dustiness	low
<b>Frequency and duration of use</b>	
Duration of activity	>4 hours (default)



Frequency of use	5 days / week
<b>Human factors not influenced by risk management</b>	
Exposed skin surface	240 cm <sup>2</sup>
<b>Other given operational conditions affecting workers exposure</b>	
Location	indoors
Domain	industrial
<b>Technical conditions and measures to control dispersion and exposure</b>	
Local exhaust ventilation	no
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
Protective gloves	No
Respiratory protection	no

### 5.3 Contributing Scenario (3) controlling industrial worker exposure for PROC 1-b

<b>Name of contributing scenario</b>	1 - Use in closed process, no likelihood of exposure
Scenario subtitle	Daily duration: > 4h at T > 127°C
Exposure type	Inhalation: Long-term systemic & local Dermal: Long-term systemic
<b>Product characteristics</b>	
Physical state	liquid
Concentration in substance	100 %
Process temperature	140 °C
Fugacity / Dustiness	high
<b>Frequency and duration of use</b>	
Duration of activity	>4 hours (default)
Frequency of use	5 days / week
<b>Human factors not influenced by risk management</b>	
Exposed skin surface	240 cm <sup>2</sup>
<b>Other given operational conditions affecting workers exposure</b>	
Location	indoors
Domain	industrial
<b>Technical conditions and measures to control dispersion and exposure</b>	
Local exhaust ventilation	no
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
Protective gloves	No
Respiratory protection	no

### 5.4 Contributing Scenario (4) controlling industrial worker exposure for PROC 2-a

<b>Name of contributing scenario</b>	2 - Use in closed, continuous process with occasional controlled exposure
Scenario subtitle	Daily duration: > 4h at T ≤ 40°C
Exposure type	Inhalation: Long-term systemic & local Dermal: Long-term systemic

<b>Qualitative Risk Assessment</b>	
General	In case of potential exposure: Use suitable chemically resistant gloves.
Eyes	Use suitable eye protection.
<b>Product characteristics</b>	
Physical state	liquid
Concentration in substance	100 %
Fugacity / Dustiness	low
<b>Frequency and duration of use</b>	
Duration of activity	>4 hours (default)
Frequency of use	5 days / week
<b>Human factors not influenced by risk management</b>	
Exposed skin surface	480 cm <sup>2</sup>
<b>Other given operational conditions affecting workers exposure</b>	
Location	indoors
Domain	industrial
<b>Technical conditions and measures to control dispersion and exposure</b>	
Local exhaust ventilation	no
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
Protective gloves	No
Respiratory protection	no

### 5.5 Contributing Scenario (5) controlling industrial worker exposure for PROC 2-b

<b>Name of contributing scenario</b>	2 - Use in closed, continuous process with occasional controlled exposure
Scenario subtitle	Daily duration: > 4h at T > 127°C
Exposure type	Inhalation: Long-term systemic & local Dermal: Long-term systemic
<b>Qualitative Risk Assessment</b>	
Eyes	Use suitable eye protection.
<b>Product characteristics</b>	
Physical state	liquid
Concentration in substance	100 %
Process temperature	140 °C
Fugacity / Dustiness	high
<b>Frequency and duration of use</b>	
Duration of activity	>4 hours (default)
Frequency of use	5 days / week
<b>Human factors not influenced by risk management</b>	
Exposed skin surface	480 cm <sup>2</sup>
<b>Other given operational conditions affecting workers exposure</b>	

Location	indoors
Domain	industrial
<b>Technical conditions and measures to control dispersion and exposure</b>	
Local exhaust ventilation	no
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
Protective gloves	Gloves APF 5 80 %
Respiratory protection	90 %

### 5.6 Contributing Scenario (6) controlling industrial worker exposure for PROC 3-a

<b>Name of contributing scenario</b>	3 - Use in closed batch process (synthesis or formulation)
Scenario subtitle	Daily duration: > 4h at T ≤ 40°C
Exposure type	Inhalation: Long-term systemic & local Dermal: Long-term systemic
<b>Qualitative Risk Assessment</b>	
General	In case of potential exposure: Use suitable chemically resistant gloves.
Eyes	In case of potential exposure: Use suitable eye protection.
<b>Product characteristics</b>	
Physical state	liquid
Concentration in substance	100 %
Fugacity / Dustiness	low
<b>Frequency and duration of use</b>	
Duration of activity	>4 hours (default)
Frequency of use	5 days / week
<b>Human factors not influenced by risk management</b>	
Exposed skin surface	240 cm <sup>2</sup>
<b>Other given operational conditions affecting workers exposure</b>	
Location	indoors
Ventilation	good (30%)
Domain	industrial
<b>Technical conditions and measures to control dispersion and exposure</b>	
Local exhaust ventilation	no
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
Protective gloves	No
Respiratory protection	no

### 5.7 Contributing Scenario (7) controlling industrial worker exposure for PROC 3-b

<b>Name of contributing scenario</b>	3 - Use in closed batch process (synthesis or formulation)
Scenario subtitle	Daily duration: > 4h at T > 127°C
Exposure type	Inhalation: Long-term systemic & local Dermal: Long-term systemic

<b>Qualitative Risk Assessment</b>	
General	In case of potential exposure: Use suitable chemically resistant gloves.
Eyes	In case of potential exposure: Use suitable eye protection.
<b>Product characteristics</b>	
Physical state	liquid
Concentration in substance	100 %
Process temperature	140 °C
Fugacity / Dustiness	high
<b>Frequency and duration of use</b>	
Duration of activity	1 - 4 hours
Frequency of use	5 days / week
<b>Human factors not influenced by risk management</b>	
Exposed skin surface	240 cm <sup>2</sup>
<b>Other given operational conditions affecting workers exposure</b>	
Location	indoors
Ventilation	good (30%)
Domain	industrial
<b>Technical conditions and measures to control dispersion and exposure</b>	
Local exhaust ventilation	yes (inhalation 90 %)
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
Protective gloves	Gloves APF 5 80 %
Respiratory protection	no

### 5.8 Contributing Scenario (8) controlling industrial worker exposure for PROC 3-c

<b>Name of contributing scenario</b>	3 - Use in closed batch process (synthesis or formulation)
Scenario subtitle	Outdoors
Exposure type	Inhalation: Long-term systemic & local Dermal: Long-term systemic
<b>Qualitative Risk Assessment</b>	
General	In case of potential exposure: Use suitable chemically resistant gloves.
Eyes	In case of potential exposure: Use suitable eye protection.
<b>Product characteristics</b>	
Physical state	liquid
Concentration in substance	5-25%
Fugacity / Dustiness	low
<b>Frequency and duration of use</b>	
Duration of activity	>4 hours (default)
Frequency of use	5 days / week

<b>Human factors not influenced by risk management</b>	
Exposed skin surface	240 cm <sup>2</sup>
<b>Other given operational conditions affecting workers exposure</b>	
Location	outdoors (30%)
Domain	industrial
<b>Technical conditions and measures to control dispersion and exposure</b>	
Local exhaust ventilation	no
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
Protective gloves	Gloves APF 5 80 %
Respiratory protection	no

### 5.9 Contributing Scenario (9) controlling industrial worker exposure for PROC 4-a

<b>Name of contributing scenario</b>	4 - Use in batch and other process (synthesis) where opportunity for exposure arises
Scenario subtitle	Daily duration: > 4h at T ≤ 40°C
Exposure type	Inhalation: Long-term systemic & local Dermal: Long-term systemic
<b>Qualitative Risk Assessment</b>	
General	In case of potential exposure: Use suitable chemically resistant gloves.
Eyes	In case of potential exposure: Use suitable eye protection.
<b>Product characteristics</b>	
Physical state	liquid
Concentration in substance	100 %
Fugacity / Dustiness	low
<b>Frequency and duration of use</b>	
Duration of activity	>4 hours (default)
Frequency of use	5 days / week
<b>Human factors not influenced by risk management</b>	
Exposed skin surface	480 cm <sup>2</sup>
<b>Other given operational conditions affecting workers exposure</b>	
Location	indoors
Ventilation	enhanced (70%)
Domain	industrial
<b>Technical conditions and measures to control dispersion and exposure</b>	
Local exhaust ventilation	no
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
Protective gloves	Gloves APF 5 80 %
Respiratory protection	no

## 5.10 Contributing Scenario (10) controlling industrial worker exposure for PROC 4-b

Name of contributing scenario	4 - Use in batch and other process (synthesis) where opportunity for exposure arises
Scenario subtitle	Daily duration: > 4h at T > 127°C
Exposure type	Inhalation: Long-term systemic & local Dermal: Long-term systemic
<b>Product characteristics</b>	
Physical state	liquid
Concentration in substance	100 %
Process temperature	140 °C
Fugacity / Dustiness	high
<b>Frequency and duration of use</b>	
Duration of activity	less than 15 mins
Frequency of use	5 days / week
<b>Human factors not influenced by risk management</b>	
Exposed skin surface	480 cm <sup>2</sup>
<b>Other given operational conditions affecting workers exposure</b>	
Location	indoors
Ventilation	enhanced (70%)
Domain	industrial
<b>Technical conditions and measures to control dispersion and exposure</b>	
Local exhaust ventilation	no
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
Protective gloves	Gloves APF 5 80 %
Respiratory protection	90 %

## 6 Scenario 5: Use in laboratories, industrial (IW2)

This scenario is described by the following combinations of use descriptors. The corresponding contributing scenarios are described in the respective subchapters. An overall exposure scenario may be described by a number of contributing scenarios which may be subdivided into environmental exposure, worker exposure and consumer exposure.

The corresponding release to the environment, exposure of workers and consumers resulting from these contributing scenarios is summarized in chapter 10.5 ff.

Table 7. Description of ES 5

<b>Free short title</b>	Use in laboratories, industrial (IW2)
<b>Systematic title based on use descriptor</b>	ERC 4; PROC 15
<b>Name of contributing environmental scenario and corresponding ERC</b>	ERC 4 Industrial use of processing aids
<b>Name(s) of contributing worker scenarios and corresponding PROCs</b>	PROC 15 - Use of laboratory reagents in small scale laboratories

### 6.1 Contributing Scenario (1) controlling environmental exposure for ERC 4

As no environmental hazard was identified no environmental-related exposure assessment and risk characterization was performed.

## 6.2 Contributing Scenario (2) controlling industrial worker exposure for PROC 15

<b>Name of contributing scenario</b>	15 - Use of laboratory reagents in small scale laboratories
Exposure type	Inhalation: Long-term systemic & local Dermal: Long-term systemic
<b>Qualitative Risk Assessment</b>	
General	In case of potential exposure: Use suitable chemically resistant gloves.
Eyes	Use suitable eye protection.
<b>Product characteristics</b>	
Physical state	liquid
Concentration in substance	100 %
Fugacity / Dustiness	low
<b>Frequency and duration of use</b>	
Duration of activity	>4 hours (default)
Frequency of use	5 days / week
<b>Human factors not influenced by risk management</b>	
Exposed skin surface	240 cm <sup>2</sup>
<b>Other given operational conditions affecting workers exposure</b>	
Location	indoors
Domain	industrial
<b>Technical conditions and measures to control dispersion and exposure</b>	
Local exhaust ventilation	yes (inhalation 90 %)
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
Protective gloves	Gloves APF 5 80 %
Respiratory protection	no

## 7 Scenario 6: Use in Construction Chemicals, industrial (IW3)

This scenario is described by the following combinations of use descriptors. The corresponding contributing scenarios are described in the respective subchapters. An overall exposure scenario may be described by a number of contributing scenarios which may be subdivided into environmental exposure, worker exposure and consumer exposure. The following scenarios contribute to the scenario *Use in Wire Coatings*.

The corresponding release to the environment, exposure of workers and consumers resulting from these contributing scenarios is summarized in chapter 10.6 ff.

Table 8. Description of ES 6

Free short title	Use in Construction Chemicals (IW3)
Systematic title based on use descriptor	ERC 4; PROC 2, 8B, 10, 13
Name of contributing environmental scenario and corresponding ERC	ERC 4 Industrial use of processing aids
Name(s) of contributing worker scenarios and corresponding PROCs	<p>PROC 2 - Use in closed, continuous process with occasional controlled exposure</p> <p>PROC 8b - Transfer of chemicals from/to vessels/ large containers at dedicated facilities</p> <p>PROC 10 - Roller application or brushing</p> <p>a. Daily duration max. 1h</p> <p>b. Daily duration &gt; 4h + 90% resp.prot.</p> <p>PROC 13 - Treatment of articles by dipping and pouring</p> <p>a. Daily duration max. 4h</p> <p>b. Daily duration &gt; 4h + 90% resp.prot.</p>

### 7.1 Contributing Scenario (1) controlling environmental exposure for ERC 4

As no environmental hazard was identified no environmental-related exposure assessment and risk characterization was performed.

### 7.2 Contributing Scenario (2) controlling industrial worker exposure for PROC 2

Name of contributing scenario	2 - Use in closed, continuous process with occasional controlled exposure
Exposure type	Inhalation: Long-term systemic & local Dermal: Long-term systemic
<b>Qualitative Risk Assessment</b>	
General	Ensure doors and windows are opened (general ventilation). Ensure that the task is not carried out overhead. Ensure that the direction of airflow is clearly away from the worker. Ensure that the worker is situated in a open or closed cabin.
Eyes	Use suitable eye protection.
<b>Product characteristics</b>	
Physical state	liquid
Concentration in substance	>25%
Fugacity / Dustiness	low
<b>Frequency and duration of use</b>	
Duration of activity	>4 hours (default)
Frequency of use	5 days / week



<b>Human factors not influenced by risk management</b>	
Exposed skin surface	480 cm <sup>2</sup>
<b>Other given operational conditions affecting workers exposure</b>	
Location	indoors
Domain	industrial
<b>Technical conditions and measures to control dispersion and exposure</b>	
Local exhaust ventilation	no
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
Protective gloves	No
Respiratory protection	no

### 7.3 Contributing Scenario (3) controlling industrial worker exposure for PROC 8B

<b>Name of contributing scenario</b>	8b - Transfer of chemicals from/to vessels/ large containers at dedicated facilities
Exposure type	Inhalation: Long-term systemic & local Dermal: Long-term systemic
<b>Qualitative Risk Assessment</b>	
Eyes	Use suitable eye protection.
<b>Product characteristics</b>	
Physical state	liquid
Concentration in substance	>25%
Fugacity / Dustiness	low
<b>Frequency and duration of use</b>	
Duration of activity	>4 hours (default)
Frequency of use	5 days / week
<b>Human factors not influenced by risk management</b>	
Exposed skin surface	960 cm <sup>2</sup>
<b>Other given operational conditions affecting workers exposure</b>	
Location	indoors
Ventilation	enhanced (70%)
Domain	industrial
<b>Technical conditions and measures to control dispersion and exposure</b>	
Local exhaust ventilation	no
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
Protective gloves	Gloves APF 10 90 %
Respiratory protection	no

### 7.4 Contributing Scenario (4) controlling industrial worker exposure for PROC 10-a

<b>Name of contributing scenario</b>	10 - Roller application or brushing
Scenario subtitle	Daily duration max. 1h
Exposure type	Inhalation: Long-term systemic & local Dermal: Long-term systemic

<b>Qualitative Risk Assessment</b>	
Eyes	Use suitable eye protection.
<b>Product characteristics</b>	
Physical state	liquid
Concentration in substance	>25%
Fugacity / Dustiness	low
<b>Frequency and duration of use</b>	
Duration of activity	15 mins to 1 hour
Frequency of use	5 days / week
<b>Human factors not influenced by risk management</b>	
Exposed skin surface	960 cm <sup>2</sup>
<b>Other given operational conditions affecting workers exposure</b>	
Location	indoors
Ventilation	enhanced (70%)
Domain	industrial
<b>Technical conditions and measures to control dispersion and exposure</b>	
Local exhaust ventilation	no
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
Protective gloves	Gloves APF 10 90 %
Respiratory protection	no

### 7.5 Contributing Scenario (5) controlling industrial worker exposure for PROC 10

<b>Name of contributing scenario</b>	10 - Roller application or brushing
Scenario subtitle	Daily duration > 4h + 90% resp.prot.
Exposure type	Inhalation: Long-term systemic & local Dermal: Long-term systemic
<b>Qualitative Risk Assessment</b>	
Eyes	Use suitable eye protection.
<b>Product characteristics</b>	
Physical state	liquid
Concentration in substance	>25%
Fugacity / Dustiness	low
<b>Frequency and duration of use</b>	
Duration of activity	>4 hours (default)
Frequency of use	5 days / week
<b>Human factors not influenced by risk management</b>	
Exposed skin surface	960 cm <sup>2</sup>
<b>Other given operational conditions affecting workers exposure</b>	
Location	indoors
Domain	industrial

<b>Technical conditions and measures to control dispersion and exposure</b>	
Local exhaust ventilation	no
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
Protective gloves	Gloves APF 10 90 %
Respiratory protection	90 %

### 7.6 Contributing Scenario (6) controlling industrial worker exposure for PROC 13-a

<b>Name of contributing scenario</b>	13 - Treatment of articles by dipping and pouring
Scenario subtitle	Daily duration max. 4h
Exposure type	Inhalation: Long-term systemic & local Dermal: Long-term systemic
<b>Qualitative Risk Assessment</b>	
Eyes	Use suitable eye protection.
<b>Product characteristics</b>	
Physical state	liquid
Concentration in substance	>25%
Fugacity / Dustiness	low
<b>Frequency and duration of use</b>	
Duration of activity	1 - 4 hours
Frequency of use	5 days / week
<b>Human factors not influenced by risk management</b>	
Exposed skin surface	480 cm <sup>2</sup>
<b>Other given operational conditions affecting workers exposure</b>	
Location	indoors
Ventilation	enhanced (70%)
Domain	industrial
<b>Technical conditions and measures to control dispersion and exposure</b>	
Local exhaust ventilation	no
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
Protective gloves	Gloves APF 20 95 %
Respiratory protection	no

### 7.7 Contributing Scenario (7) controlling industrial worker exposure for PROC 13-b

<b>Name of contributing scenario</b>	13 - Treatment of articles by dipping and pouring
Scenario subtitle	Daily duration > 4h + 90% resp.prot.
Exposure type	Inhalation: Long-term systemic & local Dermal: Long-term systemic
<b>Qualitative Risk Assessment</b>	
Eyes	Use suitable eye protection.
<b>Product characteristics</b>	
Physical state	liquid
Concentration in substance	>25%

Fugacity / Dustiness	low
<b>Frequency and duration of use</b>	
Duration of activity	>4 hours (default)
Frequency of use	5 days / week
<b>Human factors not influenced by risk management</b>	
Exposed skin surface	480 cm <sup>2</sup>
<b>Other given operational conditions affecting workers exposure</b>	
Location	indoors
Ventilation	enhanced (70%)
Domain	industrial
<b>Technical conditions and measures to control dispersion and exposure</b>	
Local exhaust ventilation	no
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
Protective gloves	Gloves APF 10 90 %
Respiratory protection	90 %

## 8. Scenario 7: Use in Coatings (paint, ink, toners, adhesives) (IW4)

This scenario is described by the following combinations of use descriptors. The corresponding contributing scenarios are described in the respective subchapters. An overall exposure scenario may be described by a number of contributing scenarios which may be subdivided into environmental exposure, worker exposure and consumer exposure.

The corresponding release to the environment, exposure of workers and consumers resulting from these contributing scenarios is summarized in chapter 10.7 ff.

Table 9. Description of ES 7

<b>Free short title</b>	Use in Coatings (paint, ink, toners, adhesives) (IW4)
<b>Systematic title based on use descriptor</b>	ERC 4; PROC 10, 13, 7
<b>Name of contributing environmental scenario and corresponding ERC</b>	ERC 4 Industrial use of processing aids
<b>Name(s) of contributing worker scenarios and corresponding PROCs</b>	PROC 7 - Industrial spraying PROC 10 - Roller application or brushing PROC 13 - Treatment of articles by dipping and pouring a. Daily duration: > 4h at T ≤ 40°C b. Daily duration: 1-4h at T= 61-127°C

### 8.1 Contributing Scenario (1) controlling environmental exposure for ERC 4

As no environmental hazard was identified no environmental-related exposure assessment and risk characterization was performed.

### 8.2 Contributing Scenario (2) controlling industrial worker exposure for PROC 7

<b>Name of contributing scenario</b>	7 - Industrial spraying
Scenario subtitle	Cabin

Exposure type	Inhalation: Long-term systemic & local Dermal: Long-term systemic
<b>Qualitative Risk Assessment</b>	
General	Ensure doors and windows are opened (general ventilation). Ensure that the task is not carried out overhead. Ensure that the direction of airflow is clearly away from the worker. Ensure that the worker is situated in a open or closed cabin.
Eyes	Use suitable eye protection.
<b>Product characteristics</b>	
Physical state	liquid
Concentration in substance	>25%
Fugacity / Dustiness	low
<b>Frequency and duration of use</b>	
Duration of activity	>4 hours (default)
Frequency of use	5 days / week
<b>Human factors not influenced by risk management</b>	
Exposed skin surface	1,500 cm <sup>2</sup>
<b>Other given operational conditions affecting workers exposure</b>	
Location	indoors
Ventilation	enhanced (70%)
Domain	industrial
<b>Technical conditions and measures to control dispersion and exposure</b>	
Local exhaust ventilation	yes (inhalation 95 %)
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
Protective gloves	Gloves APF 20 95 %
Respiratory protection	no
Use of external/measured value inhalation Liquids ≥ 50 %	ART vers 1.5:(75th percentile): duration 480 min., substance product type: liquids, room temperature, near field spraying, moderate application rate (0.3-3 l/min), only horizontal or downward spray direction, process not fully enclosed, general housekeeping practices in place, work are indoors, large workroom only, fixed captured hood (90% reduction), ventilation rate: 10 air changes, no localized controls
Use of external/measured value inhalation Liquids < 50%	ART vers 1.5:(75th percentile): duration 480 min., substance product type: liquids (0-50%), room temperature, far field spraying, moderate application rate (0.3-3 l/min), surface spraying of liquids, spray direction in any direction, spraying with high compressed air, process fully enclosed, medium level containment, (99% reduction), no localized controls, complete segregation without ventilation (70% reduction), complete enclosure without ventilation (70% reduction), no restriction on general ventilation characteristics, work are indoors, large workroom

### 8.3 Contributing Scenario (3) controlling industrial worker exposure for PROC 10

Name of contributing scenario	10 - Roller application or brushing
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Exposure type	Inhalation: Long-term systemic & local Dermal: Long-term systemic
<b>Qualitative Risk Assessment</b>	
Eyes	Use suitable eye protection.
<b>Product characteristics</b>	
Physical state	liquid
Concentration in substance	>25%
Fugacity / Dustiness	low
<b>Frequency and duration of use</b>	
Duration of activity	>4 hours (default)
Frequency of use	5 days / week
<b>Human factors not influenced by risk management</b>	
Exposed skin surface	960 cm <sup>2</sup>
<b>Other given operational conditions affecting workers exposure</b>	
Location	indoors
Domain	industrial
<b>Technical conditions and measures to control dispersion and exposure</b>	
Local exhaust ventilation	yes (inhalation 90 %)
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
Protective gloves	Gloves APF 20 95 %
Respiratory protection	no

#### 8.4 Contributing Scenario (4) controlling industrial worker exposure for PROC 13-a

<b>Name of contributing scenario</b>	13 - Treatment of articles by dipping and pouring
Scenario subtitle	Daily duration: > 4h at T ≤ 40°C
Exposure type	Inhalation: Long-term systemic & local Dermal: Long-term systemic
<b>Qualitative Risk Assessment</b>	
Eyes	Use suitable eye protection.
<b>Product characteristics</b>	
Physical state	liquid
Concentration in substance	>25%
Fugacity / Dustiness	low
<b>Frequency and duration of use</b>	
Duration of activity	>4 hours (default)
Frequency of use	5 days / week
<b>Human factors not influenced by risk management</b>	
Exposed skin surface	480 cm <sup>2</sup>
<b>Other given operational conditions affecting workers exposure</b>	
Location	indoors
Domain	industrial

<b>Technical conditions and measures to control dispersion and exposure</b>	
Local exhaust ventilation	yes (inhalation 90 %)
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
Protective gloves	Gloves APF 5 80 %
Respiratory protection	no

### 8.5 Contributing Scenario (5) controlling industrial worker exposure for PROC 13-b

<b>Name of contributing scenario</b>	13 - Treatment of articles by dipping and pouring
Scenario subtitle	Daily duration max. 4h – T= 61-127°C
Exposure type	Inhalation: Long-term systemic & local Dermal: Long-term systemic
<b>Qualitative Risk Assessment</b>	
Eyes	Use suitable eye protection.
<b>Product characteristics</b>	
Physical state	liquid
Concentration in substance	>25%
Process temperature	100 °C
Fugacity / Dustiness	medium
<b>Frequency and duration of use</b>	
Duration of activity	1 - 4 hours
Frequency of use	5 days / week
<b>Human factors not influenced by risk management</b>	
Exposed skin surface	480 cm <sup>2</sup>
<b>Other given operational conditions affecting workers exposure</b>	
Location	indoors
Ventilation	good (30%)
Domain	industrial
<b>Technical conditions and measures to control dispersion and exposure</b>	
Local exhaust ventilation	yes (inhalation 90 %)
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
Protective gloves	Gloves APF 10 90 %
Respiratory protection	no

## 9. Scenario 8: Use in Cleaning Agents (IW5)

This scenario is described by the following combinations of use descriptors. The corresponding contributing scenarios are described in the respective subchapters. An overall exposure scenario may be described by a number of contributing scenarios which may be subdivided into environmental exposure, worker exposure and consumer exposure.

The corresponding release to the environment, exposure of workers and consumers resulting from these contributing scenarios is summarized in chapter 10.8 ff.

Table 10. Description of ES 8

Free short title	Use in Cleaning Agents (08)
Systematic title based on use descriptor	ERC 4; PROC 7, 10, 13
Name of contributing environmental scenario and corresponding ERC	ERC 4 Industrial use of processing aids
Name(s) of contributing worker scenarios and corresponding PROCs	PROC 7 - Industrial spraying <ul style="list-style-type: none"> <li>a. Daily duration: &gt; 4h at <math>T \leq 40^{\circ}\text{C} + \text{LEV}</math></li> <li>b. Cabin</li> </ul> PROC 10 - Roller application or brushing  PROC 13 - Treatment of articles by dipping and pouring <ul style="list-style-type: none"> <li>a. Daily duration: &gt; 4h at <math>T \leq 40^{\circ}\text{C} + \text{LEV}</math></li> <li>b. Daily duration: max. 4h at <math>T &gt; 127^{\circ}\text{C}</math></li> </ul>

### 9.1 Contributing Scenario (1) controlling environmental exposure for ERC 4

As no environmental hazard was identified no environmental-related exposure assessment and risk characterization was performed.

### 9.2 Contributing Scenario (2) controlling industrial worker exposure for PROC 7-a

Name of contributing scenario	7 - Industrial spraying
Scenario subtitle	Daily duration: > 4h at $T \leq 40^{\circ}\text{C} + \text{LEV}$
Exposure type	Inhalation: Long-term systemic & local Dermal: Long-term systemic
<b>Qualitative Risk Assessment</b>	
General	Ensure doors and windows are opened (general ventilation). Ensure that the task is not carried out overhead. Ensure that the direction of airflow is clearly away from the worker.
Eyes	Use suitable eye protection.
<b>Product characteristics</b>	
Physical state	liquid
Concentration in substance	>25%
Fugacity / Dustiness	low
<b>Frequency and duration of use</b>	
Duration of activity	>4 hours (default)
Frequency of use	5 days / week
<b>Human factors not influenced by risk management</b>	
Exposed skin surface	1,500 cm <sup>2</sup>
<b>Other given operational conditions affecting workers exposure</b>	



Location	indoors
Domain	industrial
<b>Technical conditions and measures to control dispersion and exposure</b>	
Local exhaust ventilation	yes (inhalation 95 %)
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
Protective gloves	Gloves APF 20 95 %
Respiratory protection	no
Use of external/measured value inhalation	ART vers 1.5:(75th percentile): duration 480 min., substance product type: liquids (0-50%), room temperature, near field spraying, moderate application rate (0.3-3 l/min), only horizontal or downward spray direction, spraying with high compressed air, process not fully enclosed, general housekeeping practices in place, effective housekeeping practices in place: no, work area indoors, large workroom only, fixed captured hood (90% reduction), ventilation rate: 10 air changes, no localized controls

### 9.3 Contributing Scenario (3) controlling industrial worker exposure for PROC 7-b

<b>Name of contributing scenario</b>	7 - Industrial spraying
Scenario subtitle	Cabin
Exposure type	Inhalation: Long-term systemic & local Dermal: Long-term systemic
<b>Qualitative Risk Assessment</b>	
General	Ensure doors and windows are opened (general ventilation). Ensure that the task is not carried out overhead. Ensure that the direction of airflow is clearly away from the worker. Ensure that the worker is situated in a open or closed cabin.
Eyes	Use suitable eye protection.
<b>Product characteristics</b>	
Physical state	liquid
Concentration in substance	>25%
Fugacity / Dustiness	low
<b>Frequency and duration of use</b>	
Duration of activity	>4 hours (default)
Frequency of use	5 days / week
<b>Human factors not influenced by risk management</b>	
Exposed skin surface	1,500 cm <sup>2</sup>
<b>Other given operational conditions affecting workers exposure</b>	
Location	indoors
Ventilation	enhanced (70%)
Domain	industrial
<b>Technical conditions and measures to control dispersion and exposure</b>	
Local exhaust ventilation	yes (inhalation 95 %)

<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
Protective gloves	Gloves APF 20 95 %
Respiratory protection	no
Use of external/measured value inhalation	ART vers 1.5:(75th percentile): duration 480 min., substance product type: liquids (0-50%), room temperature, far field spraying, moderate application rate (0.3-3 l/min), surface spraying of liquids, spray direction in any direction, spraying with high compressed air, process fully enclosed, medium level containment, (99% reduction), no localized controls, complete segregation without ventilation (70% reduction), complete enclosure without ventilation (70% reduction), no restriction on general ventilation characteristics, work are indoors, large workroom

#### **9.4 Contributing Scenario (4) controlling industrial worker exposure for PROC 10**

<b>Name of contributing scenario</b>	10 - Roller application or brushing
Exposure type	Inhalation: Long-term systemic & local Dermal: Long-term systemic
<b>Qualitative Risk Assessment</b>	
General	Alternatively: Wear suitable respiratory protection.
Eyes	Use suitable eye protection.
<b>Product characteristics</b>	
Physical state	liquid
Concentration in substance	>25%
Fugacity / Dustiness	low
<b>Frequency and duration of use</b>	
Duration of activity	>4 hours (default)
Frequency of use	5 days / week
<b>Human factors not influenced by risk management</b>	
Exposed skin surface	960 cm <sup>2</sup>
<b>Other given operational conditions affecting workers exposure</b>	
Location	indoors
Domain	industrial
<b>Technical conditions and measures to control dispersion and exposure</b>	
Local exhaust ventilation	yes (inhalation 90 %)
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
Protective gloves	Gloves APF 10 90 %
Respiratory protection	no

#### **9.5 Contributing Scenario (5) controlling industrial worker exposure for PROC 13-a**

<b>Name of contributing scenario</b>	13 - Treatment of articles by dipping and pouring
Exposure type	Inhalation: Long-term systemic & local Dermal: Long-term systemic
<b>Qualitative Risk Assessment</b>	

General	Alternatively: Wear suitable respiratory protection. Wear suitable working clothes.
Eyes	Use suitable eye protection.
<b>Product characteristics</b>	
Physical state	liquid
Concentration in substance	>25%
Fugacity / Dustiness	low
<b>Frequency and duration of use</b>	
Duration of activity	>4 hours (default)
Frequency of use	5 days / week
<b>Human factors not influenced by risk management</b>	
Exposed skin surface	480 cm <sup>2</sup>
<b>Other given operational conditions affecting workers exposure</b>	
Location	indoors
Domain	industrial
<b>Technical conditions and measures to control dispersion and exposure</b>	
Local exhaust ventilation	yes (inhalation 90 %)
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
Protective gloves	Gloves APF 10 90 %
Respiratory protection	no

### 9.6 Contributing Scenario (6) controlling industrial worker exposure for PROC 13-b

<b>Name of contributing scenario</b>	13 - Treatment of articles by dipping and pouring
Scenario subtitle	Daily duration: max. 4h at T > 127°C
Exposure type	Inhalation: Long-term systemic & local Dermal: Long-term systemic
<b>Qualitative Risk Assessment</b>	
Eyes	Use suitable eye protection.
<b>Product characteristics</b>	
Physical state	liquid
Concentration in substance	>25%
Process temperature	140 °C
Fugacity / Dustiness	high
<b>Frequency and duration of use</b>	
Duration of activity	1 - 4 hours
Frequency of use	5 days / week
<b>Human factors not influenced by risk management</b>	
Exposed skin surface	480 cm <sup>2</sup>
<b>Other given operational conditions affecting workers exposure</b>	
Location	indoors

Domain	industrial
<b>Technical conditions and measures to control dispersion and exposure</b>	
Local exhaust ventilation	yes (inhalation 90 %)
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
Protective gloves	Gloves APF 10 90 %
Respiratory protection	90 %

## 10. Scenario 9: Use in Functional Fluids (IW6)

This scenario is described by the following combinations of use descriptors. The corresponding contributing scenarios are described in the respective subchapters. An overall exposure scenario may be described by a number of contributing scenarios which may be subdivided into environmental exposure, worker exposure and consumer exposure.

The corresponding release to the environment, exposure of workers and consumers resulting from these contributing scenarios is summarized in chapter 10.9 ff.

Table 11. Description of ES 9

<b>Free short title</b>	Use in Functional Fluids (09)
<b>Systematic title based on use descriptor</b>	ERC 4; PROC 17, 18
<b>Name of contributing environmental scenario and corresponding ERC</b>	ERC 4 Industrial use of processing aids
<b>Name(s) of contributing worker scenarios and corresponding PROCs</b>	PROC 17 - Lubrication at high energy conditions and in partly open process PROC 18 - Greasing at high energy conditions

### 10.1 Contributing Scenario (1) controlling environmental exposure for ERC 4

As no environmental hazard was identified no environmental-related exposure assessment and risk characterization was performed.

### 10.2 Contributing Scenario (2) controlling industrial worker exposure for PROC 17

<b>Name of contributing scenario</b>	17 - Lubrication at high energy conditions and in partly open process
Exposure type	Inhalation: Long-term systemic & local Dermal: Long-term systemic
<b>Qualitative Risk Assessment</b>	
Eyes	Use suitable eye protection.
<b>Product characteristics</b>	
Physical state	liquid
Concentration in substance	>25%
Fugacity / Dustiness	low
<b>Frequency and duration of use</b>	
Duration of activity	>4 hours (default)
Frequency of use	5 days / week
<b>Human factors not influenced by risk management</b>	
Exposed skin surface	960 cm <sup>2</sup>
<b>Other given operational conditions affecting workers exposure</b>	
Location	indoors

Domain	industrial
<b>Technical conditions and measures to control dispersion and exposure</b>	
Local exhaust ventilation	yes (inhalation 90 %)
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
Protective gloves	Gloves APF 20 95 %
Respiratory protection	no

### 10.3 Contributing Scenario (3) controlling industrial worker exposure for PROC 18

<b>Name of contributing scenario</b>	18 - Greasing at high energy conditions
Exposure type	Inhalation: Long-term systemic & local Dermal: Long-term systemic
<b>Qualitative Risk Assessment</b>	
Eyes	Use suitable eye protection.
<b>Product characteristics</b>	
Physical state	liquid
Concentration in substance	>25%
Fugacity / Dustiness	low
<b>Frequency and duration of use</b>	
Duration of activity	>4 hours (default)
Frequency of use	5 days / week
<b>Human factors not influenced by risk management</b>	
Exposed skin surface	960 cm <sup>2</sup>
<b>Other given operational conditions affecting workers exposure</b>	
Location	indoors
Domain	industrial
<b>Technical conditions and measures to control dispersion and exposure</b>	
Local exhaust ventilation	yes (inhalation 90 %)
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
Protective gloves	Gloves APF 10 90 %
Respiratory protection	no

### Table of Changes

Version	Changes	Date
1	First edition	2012-07-16
2	Format change	2013-07-03
3	<ul style="list-style-type: none"> <li>• DNELs for long-term exposure have been amended, and risks have been re-assessed</li> <li>• Professional uses have been omitted and are no longer supported.</li> <li>• Contributing scenarios based on the PROC's have been restructured to improve readability.</li> </ul>	2018-10-17