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1. Overview of exposure scenarios

ES#	Exposure scenario (ES) name and related environmental contributing scenarios
ES1 (F)	Formulation of agrochemical products
	- Formulation of agrochemicals - environmental contributing scenario (ERC 2)
	- Environmental contributing scenario [edit] (ERC 2)
ES2 (PW)	Use as a co-formulant in plant protection products, spray applications by professionals
	- Use as a co-formulant in plant protection products, spray applications by professionals (ERC 8d)
ES3 (PW)	Use as a co-formulant in plant protection products, seed and granular applications by professionals
	- Use as a co-formulant in plant protection products, seed and granular applications by professionals (ERC 8d)
ES4 (C)	Use as a co-formulant in plant protection products, spray applications by consumers
	- Use as a co-formulant in plant protection products, spray applications by consumers (ERC 8d)
ES5 (C)	Use as a co-formulant in plant protection products, seed and granular applications by consumers
	- Use as a co-formulant in plant protection products, seed and granular applications by consumers (ERC 8d)
ES6 (F)	Formulation of cleaners
	- Environmental contributing scenario formulation of cleaners (1) (ERC 2)
	- Environmental contributing scenario formulation of cleaners (2) (ERC 2)
ES7 (IS)	Use at industrial site of special cleaners
	- Use at industrial site of special cleaners (ERC 4)
ES8 (PW)	Professional use of cleaning products
	- Professional use of cleaning products (ERC 8d)
ES9 (C)	Consumer use of cleaning products
	- Consumer use of cleaning products (ERC 8d)
ES10 (F)	Formulation of cosmetics
	- Environmental contributing scenario for large scale formulation of low viscosity liquids (ERC 2)
	- Environmental contributing scenario for small scale formulation of low viscosity liquids (ERC 2)
	- Environmental contributing scenario of formulation of cosmetic products involving cleaning (ERC 2)
ES11 (PW)	Professional use of cosmetics
	- Professional use of cosmetics (ERC 8a)
ES12 (C)	Consumer Use of hair care products
	- Consumer Use of hair care products (ERC 8a)
ES13 (F)	Formulation of waterborne coatings, pigments & adhesives
	- Formulation of waterborne coatings, pigments & adhesives (ERC 2)
ES14 (IS)	Use at industrial site of waterborne coatings, pigments or adhesives
	- Use at industrial site of waterborne coatings, pigments or adhesives (ERC 5)
ES15 (PW)	Use of waterborne coatings, pigments or adhesives by professional worker
	- Use of waterborne coatings, pigments or adhesives by professional workers (ERC 8f)
ES16 (C)	Consumer use of waterborne coatings, pigments or adhesives
	- Consumer use of waterborne coatings, pigments or adhesives (ERC 8f)
ES17 (IS)	Manufacture of General Rubber Goods
	- Use at industrial site [edit] (ERC 6d)
ES18 (SL)	Service life (consumers) of rubber goods including tyres
	- Service life (consumers) of rubber goods (ERC 10b)

F= Formulation; IW= Industrial use (workers); PW= Professional use (workers); C= Consumer use; SL=Service life

2. Exposure scenario 1: Formulation or re-packing - Formulation of agrochemical products

2.1 Short description

Environment contributing scenario(s):		
CS 1	Formulation of agrochemicals - environmental contributing scenario	ERC 2
CS 2	Environmental contributing scenario [edit]	ERC 2
Worker contributing scenario(s):		
CS 3	Batch wise processing in closed systems with occasional sampling.	PROC 3
CS 4	Controlled batch wise mixing or blending of formulations.	PROC 5
CS 5	Bulk transfer of formulations at dedicated facilities.	PROC 8b
CS 6	Smaller scale transfer of formulations at dedicated facilities.	PROC 9

2.2 Env CS 1: Formulation of agrochemicals - environmental contributing scenario (ERC 2)

2.2.1 Definition

Batch wise processing in closed systems with only occasional and controlled exposure. Releases to the wastewater can be the result of cleaning of mixing vessels, tubing, production/packaging lines with water. As a worst case scenario, spent cleaning water is considered to be discharged to the wastewater.

2.2.2 Conditions of use

Amount used, frequency and duration of use (or from service life)
<ul style="list-style-type: none"> Annual use amount at site: ≤ 5.0 tonnes/year Percentage of EU tonnage used at regional scale: = 100.0 % Daily use amount at site: ≤ 0.04 tonnes/day <p><i>The number of emission days for use in agrochemical formulations have been set at ≥ 125 per year.</i></p>
Technical and organisational conditions and measures
<ul style="list-style-type: none"> Equipment cleaning: Equipment cleaning with minimized emissions to wastewater
Conditions and measures related to biological sewage treatment plant
<ul style="list-style-type: none"> Application of the STP sludge on agricultural soil: No Biological STP: Site specific [Effectiveness Water: 88.52%] Discharge rate of STP: ≥ 2000 m³/day
Conditions and measures related to external treatment of waste (including article waste)
<ul style="list-style-type: none"> Particular considerations on the waste treatment operations: No (low amount)
Other conditions affecting environmental exposure
<ul style="list-style-type: none"> Receiving surface water flow rate: ≥ 18000 m³/day

2.2.3 Releases

Release	Release estimation method	Explanations
Water	Estimated release factor	<p>Release factor before on site RMM: 0.5% Release factor after on site RMM: 0.5% Local release rate: 0.2 kg/day Explanation:</p>

Release	Release estimation method	Explanations
		Releases to the wastewater are considered to be the result of cleaning of process systems. The spent cleaning water is discharged to the wastewater with a minimum of 250 days per year.
Air	Estimated release factor	Release factor before on site RMM: 0% Release factor after on site RMM: 0% Local release rate: 0 kg/day Explanation: Based on the properties and application of the substance in formulation of agrochemicals, no significant release is expected by air.
Non agricultural soil	Estimated release factor	Release factor after on site RMM: 0.025% Explanation: Although no significant release to soil compartments are expected for the process of formulation of agrochemicals, a worst case release of 5% of the release factor for waste water is applied.

2.3 Worker CS 3: Batch wise processing in closed systems with occasional sampling. (PROC 3)

2.3.1 Definition

Batch wise processing where only shortly controlled exposure may occur to the respective mixtures or formulations.

2.3.2 Conditions of use

Product (Article) characteristics
<ul style="list-style-type: none"> Physical form of the used product: Liquid Percentage (w/w) of substance in mixture/article: <= 100.0 %
Amount used (or contained in articles), frequency and duration of use/exposure
<ul style="list-style-type: none"> Duration of activity: <= 8.0 h/day
Technical and organisational conditions and measures
<ul style="list-style-type: none"> Local exhaust ventilation: No [Effectiveness Inhalation: 0%, Dermal: 0%] <i>It is advisory but not mandatory to apply LEV at the sites of any process steps where exposure may occur.</i> General ventilation: Good general ventilation (3-5 air changes per hour) [Effectiveness Inhalation: 30%] Occupational Health and Safety Management System: Advanced Closed batch process with occasional controlled exposure
Conditions and measures related to personal protection, hygiene and health evaluation
<ul style="list-style-type: none"> Dermal protection: No [Effectiveness Dermal: 0%] <i>Wearing gloves is advisory but not mandatory to achieve sufficient safety.</i> Respiratory Protection: No [Effectiveness Inhalation: 0%] In case of potential risk of exposure of the eyes: wear safety goggles.
Other conditions affecting workers exposure
<ul style="list-style-type: none"> Skin surface potentially exposed: One hand face only (240 cm²) Operating temperature: <= 40.0 °C Place of use: Indoor

2.4 Worker CS 5: Bulk transfer of formulations at dedicated facilities. (PROC 8b)

2.4.1 Definition

Dedicated transfer of bulk amounts to system vessels for formulation purposes with possible but controlled exposure.

2.4.2 Conditions of use

Product (Article) characteristics
<ul style="list-style-type: none"> Physical form of the used product: Liquid Percentage (w/w) of substance in mixture/article: <= 25.0 %
Amount used (or contained in articles), frequency and duration of use/exposure
<ul style="list-style-type: none"> Duration of activity: <= 8.0 h/day
Technical and organisational conditions and measures
<ul style="list-style-type: none"> Local exhaust ventilation: No [Effectiveness Inhalation: 0%, Dermal: 0%] General ventilation: Good general ventilation (3-5 air changes per hour) [Effectiveness Inhalation: 30%] Occupational Health and Safety Management System: Advanced
Conditions and measures related to personal protection, hygiene and health evaluation
<ul style="list-style-type: none"> Dermal protection: Yes (Chemically resistant gloves conforming to EN374 with basic employee training) and (other) appropriate dermal protection [Effectiveness Dermal: 90%] <i>Wearing gloves as specified is mandatory to achieve sufficient safety.</i> Respiratory Protection: No [Effectiveness Inhalation: 0%] In case of potential risk of exposure of the eyes: wear safety goggles.
Other conditions affecting workers exposure
<ul style="list-style-type: none"> Skin surface potentially exposed: Two hands (960 cm²) Operating temperature: <= 40.0 °C Place of use: Indoor

2.5 Worker CS 6: Smaller scale transfer of formulations at dedicated facilities. (PROC 9)

2.5.1 Definition

Dedicated transfer of formulations containing the substance to smaller containers with possible but controlled exposure.

2.5.2 Conditions of use

Product (Article) characteristics
<ul style="list-style-type: none"> Physical form of the used product: Liquid Percentage (w/w) of substance in mixture/article: <= 25.0 %
Amount used (or contained in articles), frequency and duration of use/exposure
<ul style="list-style-type: none"> Duration of activity: <= 8.0 h/day
Technical and organisational conditions and measures
<ul style="list-style-type: none"> Local exhaust ventilation: No [Effectiveness Inhalation: 0%, Dermal: 0%] General ventilation: Good general ventilation (3-5 air changes per hour) [Effectiveness Inhalation: 30%] Occupational Health and Safety Management System: Advanced
Conditions and measures related to personal protection, hygiene and health evaluation
<ul style="list-style-type: none"> Dermal protection: Yes (Chemically resistant gloves conforming to EN374 with basic employee training) and (other) appropriate dermal protection [Effectiveness Dermal: 90%] <i>Wearing gloves as specified is mandatory to achieve sufficient safety.</i> Respiratory Protection: No [Effectiveness Inhalation: 0%] In case of potential risk of exposure of the eyes: wear safety goggles.
Other conditions affecting workers exposure
<ul style="list-style-type: none"> Skin surface potentially exposed: Two hands face (480 cm²) Operating temperature: <= 40.0 °C Place of use: Indoor

3. Exposure scenario 2: Widespread use by professional workers - Use as a co-formulant in plant protection products, spray applications by professionals

3.1 Short description

Sector of use: SU 1: Agriculture, forestry, fishery

Environment contributing scenario(s):

CS 1	Use as a co-formulant in plant protection products, spray applications by professionals	ERC 8d, ERC 8a
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3.2 Env CS 1: Use as a co-formulant in plant protection products, spray applications by professionals (ERC 8d)

3.2.1 Conditions of use

Amount used, frequency and duration of use (or from service life)
<ul style="list-style-type: none"> Percentage of EU tonnage used at regional scale: = 10.0 % Daily local widespread use amount: <= 0.0000055 tonnes/day
Conditions and measures related to biological sewage treatment plant
<ul style="list-style-type: none"> Biological STP: Standard [Effectiveness Water: 88.52%]
Conditions and measures related to external treatment of waste (including article waste)
<ul style="list-style-type: none"> Particular considerations on the waste treatment operations: No (low risk)
Other conditions affecting environmental exposure
<ul style="list-style-type: none"> Type of process: Spray application of plant protection products

3.2.2 Releases

The releases have been estimated on the basis of SPERC ECPA SPERC 8d.2.v2 : Spray application of plant protection products containing co-formulants (indoor or outdoor)_professional use [ECPA SpERC 8d.2.v2 – VP 0.001 - 0.01: Spray application of plant protection products containing co-formulants (indoors or outdoors). Vapour pressure = 0.001 - 0.01 Pa].

Description of activities/processes covered by the SPERC

Covers the indoor and outdoor spray application of substances as co-formulants in plant protection products by professional users. Farmers are considered professional users.

The SPERC considers direct emissions to soil and/or air, which for wide dispersive uses are considered only at the regional scale in the existing exposure estimation framework (as described in ECHA R.16 and implemented in the ECETOC TRA).

The SPERCs are not intended to provide a definitive estimate of environmental exposure at the local scale.

Product/substance domain: Plant protection products, co-formulants, spray, professional use

Local releases to the environment

Release	Explanations
Water	<p>Release factor: 0%</p> <p>Local release rate: 0 kg/day</p> <p>Explanation: Plant protection products approvals under 91/414/EEC (now Regulation (EC) 1107/2009) include specific labeling instructions designed to prevent emission to wastewater/water. Therefore, no direct emission to surface water or waste water is expected.</p>
Air	<p>Release factor: 50%</p> <p>Local release rate: - kg/day</p>

Release	Explanations
	<p>Explanation: For co-formulants included in spray formulations the fraction emitted to air during spraying is estimated on the basis of vapour pressure of the co-formulant. The emission fractions to air are taken from the pesticides field application module in USES 4.0 (RIVM, 2002). It is assumed that the release fractions do not account for re-volatilization from soil to air. It is expected that emission to air may be lower in indoor situations. However, it is assumed that these emission fractions apply for both indoor and outdoor use.</p>
Non agricultural soil	<p>Release factor: 50% Local release rate: - kg/day Explanation: For co-formulants included in spray formulations the dose which reaches the soil can be significantly reduced due to drift or volatilization of spray droplets. The emission fractions to air are taken from the pesticides field application module in USES 4.0 (RIVM, 2002) and the remaining fraction estimates emissions to soil. It is assumed that these emission fractions apply for both indoor and outdoor use.</p>

Releases to waste

Release factor to external waste: 0.01 %

Fraction becoming waste determined on basis of worst-case residue remaining in plastic pesticide container following manual triple rinsing or mechanical integrated pressure rinsing (< 0.01 %) (ECPA, 2007).

4. Exposure scenario 3: Widespread use by professional workers - Use by professional worker Use as a co-formulant in plant protection products, seed and granular applications by professionals

4.1 Short description

Environment contributing scenario(s):		
CS 1	Use as a co-formulant in plant protection products, seed and granular applications by professionals	ERC 8d, ERC 8a

4.2 Env CS 1: Use as a co-formulant in plant protection products, seed and granular applications by professionals (ERC 8d)

4.2.1 Conditions of use

Amount used, frequency and duration of use (or from service life)
<ul style="list-style-type: none"> Percentage of EU tonnage used at regional scale: = 10.0 % Daily local widespread use amount: <= 0.0000055 tonnes/day
Conditions and measures related to biological sewage treatment plant
<ul style="list-style-type: none"> Biological STP: Standard [Effectiveness Water: 88.52%]
Conditions and measures related to external treatment of waste (including article waste)
<ul style="list-style-type: none"> Particular considerations on the waste treatment operations: No (low risk)
Other conditions affecting environmental exposure
<ul style="list-style-type: none"> Type of process: Direct application of plant protection products (e.g. granules or treated seeds) to soil

4.2.2 Releases

The releases have been estimated on the basis of SPERC ECPA SPERC 8d.1.v2 : Direct application of plant protection products (granule or treated seeds) containing co-formulants to soil (indoor or outdoor)_professional use

(ECPA SpERC 8d.1.v2 : Direct application of plant protection products (granule or treated seeds) containing co-formulants to soil (indoor or outdoor); Covers the direct application to soil of substances as co-formulants in solid plant protection product formulations (e.g. granules, treated seeds) by consumers and professional users. Farmers are considered professional users. Substance Domain: ECPA SPERC 8d.1.v2: Use of solid plant protection product formulations (granules or treated seeds) The ECPA SPERCs provide release information based on substance characteristics and application method, which is only intended for use in estimating exposure at the regional scale, including humans via the environment and predators exposed via the food chain (secondary poisoning), where necessary. The ECPA SPERCs are not intended to facilitate estimation of direct exposure to environmental compartments at the local scale. For further details, please see the ECPA website. Formulation of crop protection products is not addressed by the ECPA SPERCs. The ECPA SPERCs are limited to estimating direct releases to soil and air at the regional scale (wide-dispersive use) and therefore do not cover the process of on-farm seed treatment by professional operators, which is considered to represent an 'industrial' use since the potential for environmental release is localised.)

Description of activities/processes covered by the SPERC

Covers the direct application to soil of substances as co-formulants in solid plant protection product formulations (e.g. granules, treated seeds) by professional users. Farmers are considered professional users. The SPERC considers direct emissions to soil which for wide dispersive uses are considered only at the regional scale in the existing exposure estimation framework. The SPERC is not intended to provide a definitive estimate of environmental exposure at the local scale.

Product/substance domain: Plant protection products, co-formulants, granules, seeds, professional use

Local releases to the environment

Release	Explanations
Water	<p>Release factor: 0%</p> <p>Local release rate: 0 kg/day</p> <p>Explanation: Plant protection products approvals under 91/414/EEC (now Regulation (EC) 1107/2009) include specific labeling instructions designed to prevent emission to wastewater/water. Therefore, no direct emission to surface water or waste water is expected.</p>
Air	<p>Release factor: 0%</p> <p>Local release rate: - kg/day</p> <p>Explanation: For co-formulants included in solid formulations (granules or treated seeds) the emission fraction to air is 0. This emission fraction applies to both indoor and outdoor use.</p>
Non agricultural soil	<p>Release factor: 100%</p> <p>Local release rate: - kg/day</p> <p>Explanation: For co-formulants included in solid formulations (granules or treated seeds) the emission fraction to soil is assumed to be 1. This emission fraction applies to both indoor and outdoor use.</p>

Releases to waste

Release factor to external waste: 0.01 %

Specific estimates of residues remaining in packaging for solid formulations (granules or treated seeds) are not available. Therefore, it is proposed to assume the default provided in the emission scenario document for plastic additives (OECD, 2009), which suggests that 0.01 % could be expected to remain in packaging and be sent to waste (for powders of particle size > 40 µm).

5. Exposure scenario 4: Consumer use - Use as a co-formulant in plant protection products, spray applications by consumers

5.1 Short description

Environment contributing scenario(s):	
CS 1	Use as a co-formulant in plant protection products, spray applications by consumers

5.2 Conditions of use

Amount used, frequency and duration of use (or from service life)
<ul style="list-style-type: none"> Percentage of EU tonnage used at regional scale: = 10.0 % Daily local widespread use amount: <= 0.0000014 tonnes/day
Conditions and measures related to external treatment of waste (including article waste)
<ul style="list-style-type: none"> Particular considerations on the waste treatment operations: No (low risk)
Other conditions affecting environmental exposure
<ul style="list-style-type: none"> Biological STP: Standard [Effectiveness Water: 88.52%] Type of process: Spray application of plant protection products

5.3 Releases

The releases have been estimated on the basis of SPERC ECPA SPERC 8d.2.v2: Spray application of plant protection products containing co-formulants (indoor or outdoor)_consumer use (ECPA SpERC 8d.2.v2 – VP 0.001 - 0.01: Spray application of plant protection products containing co-formulants (indoors or outdoors). Vapour pressure = 0.001 - 0.01 Pa)

Description of activities/processes covered by the SPERC

Covers the indoor and outdoor spray application of substances as co-formulants in plant protection products by consumers. The SPERC considers direct emissions to soil and/or air, which for wide dispersive uses are considered only at the regional scale in the existing exposure estimation framework (as described in ECHA R.16 and implemented in the ECETOC TRA). The SPERCs are not intended to provide a definitive estimate of environmental exposure at the local scale. Product/substance domain: Plant protection products, co-formulants, spray, consumer use.

Local releases to the environment

Release	Explanations
Water	<p>Release factor: 0%</p> <p>Local release rate: 0 kg/day</p> <p>Explanation: Plant protection products approvals under 91/414/EEC (now Regulation (EC) 1107/2009) include specific labeling instructions designed to prevent emission to wastewater/water. Therefore, no direct emission to surface water or waste water is expected.</p>
Air	<p>Release factor: 50%</p> <p>Local release rate: - kg/day</p> <p>Explanation: For co-formulants included in spray formulations the fraction emitted to air during spraying is estimated on the basis of vapour pressure of the co-formulant. The emission fractions to air are taken from the pesticides field application module in USES 4.0 (RIVM, 2002). It is assumed that the release fractions do not account for re-volatilization from soil to air. It is expected that emission to air may be lower in indoor situations. However, it is assumed that these emission fractions apply for both indoor and outdoor use.</p>
Non agricultural soil	<p>Release factor: 50%</p> <p>Local release rate: - kg/day</p> <p>Explanation:</p>

Release	Explanations
	For co-formulants included in spray formulations the dose which reaches the soil can be significantly reduced due to drift or volatilization of spray droplets. The emission fractions to air are taken from the pesticides field application module in USES 4.0 (RIVM, 2002) and the remaining fraction estimates emissions to soil. It is assumed that these emission fractions apply for both indoor and outdoor use.

Releases to waste

Release factor to external waste: 0.01 %

Fraction becoming waste determined on basis of worst-case residue remaining in plastic pesticide container following manual triple rinsing or mechanical integrated pressure rinsing (< 0.01 %) (ECPA, 2007).

6. Exposure scenario 5: Consumer use - Use as a co-formulant in plant protection products, seed and granular applications by consumers

6.1 Short description

Environment contributing scenario(s):		
CS 1	Use as a co-formulant in plant protection products, seed and granular applications by consumers	ERC 8d, ERC 8a

6.2 Conditions of use

Amount used, frequency and duration of use (or from service life)
<ul style="list-style-type: none"> Percentage of EU tonnage used at regional scale: = 10.0 % Daily local widespread use amount: <= 0.0000014 tonnes/day
Conditions and measures related to external treatment of waste (including article waste)
<ul style="list-style-type: none"> Particular considerations on the waste treatment operations: No (low risk)
Other conditions affecting environmental exposure
<ul style="list-style-type: none"> Biological STP: Standard [Effectiveness Water: 88.52%] Type of process: Direct application of plant protection products (e.g. granules or treated seeds) to soil

6.3 Releases

The releases have been estimated on the basis of SPERC ECPA SPERC 8d.1.v2: Direct application of plant protection products (granule or treated seeds) containing co-formulants to soil (indoor or outdoor)_consumer use (ECPA SpERC 8d.1.v2 : Direct application of plant protection products (granule or treated seeds) containing co-formulants to soil (indoor or outdoor));Covers the direct application to soil of substances as co-formulants in solid plant protection product formulations (e.g. granules, treated seeds) by consumers and professional users. Farmers are considered professional users. Substance Domain: ECPA SPERC 8d.1.v2: Use of solid plant protection product formulations (granules or treated seeds) The ECPA SPERCs provide release information based on substance characteristics and application method, which is only intended for use in estimating exposure at the regional scale, including humans via the environment and predators exposed via the food chain (secondary poisoning), where necessary. The ECPA SPERCs are not intended to facilitate estimation of direct exposure to environmental compartments.at the local scale. For further details, please see the ECPA website. Formulation of crop protection products is not addressed by the ECPA SPERCs. The ECPA SPERCs are limited to estimating direct releases to soil and air at the regional scale (wide-dispersive use) and therefore do not cover the process of on-farm seed treatment by professional operators, which is considered to represent an 'industrial' use since the potential for environmental release is localised).

Description of activities/processes covered by the SPERC

Covers the direct application to soil of substances as co-formulants in solid plant protection product formulations (e.g. granules, treated seeds) by consumers.

The SPERC considers direct emissions to soil which for wide dispersive uses are considered only at the regional scale in the existing exposure estimation framework. The SPERC is not intended to provide a definitive estimate of environmental exposure at the local scale.

Local releases to the environment

Release	Explanations
Water	<p>Release factor: 0%</p> <p>Local release rate: 0 kg/day</p> <p>Explanation: Plant protection products approvals under 91/414/EEC (now Regulation (EC) 1107/2009) include specific labeling instructions designed to prevent emission to wastewater/water. Therefore, no direct emission to surface water or waste water is expected.</p>
Air	<p>Release factor: 0%</p> <p>Local release rate: - kg/day</p> <p>Explanation: For co-formulants included in solid formulations (granules or treated seeds) the emission fraction to air is 0. This emission fraction applies to both indoor and outdoor use.</p>
Non agricultural soil	<p>Release factor: 100%</p> <p>Local release rate: - kg/day</p> <p>Explanation: For co-formulants included in solid formulations (granules or treated seeds) the emission fraction to soil is assumed to be 1. This emission fraction applies to both indoor and outdoor use.</p>

Releases to waste

Release factor to external waste: 0.01 %

Specific estimates of residues remaining in packaging for solid formulations (granules or treated seeds) are not available. Therefore, it is proposed to assume the default provided in the emission scenario document for plastic additives (OECD, 2009), which suggests that 0.01 % could be expected to remain in packaging and be sent to waste (for powders of particle size > 40 µm).

7. Exposure scenario 6: Formulation or re-packing - Formulation of cleaners

7.1 Short description

Environment contributing scenario(s):		
CS 1	Environmental contributing scenario formulation of cleaners (1)	ERC 2
CS 2	Environmental contributing scenario formulation of cleaners (2)	ERC 2
Worker contributing scenario(s):		
CS 3	Batch wise formulation of special cleaners	PROC 3
CS 4	Batch wise mixing process to produce special cleaners	PROC 5
CS 5	Non-dedicated transfer of special cleaners.	PROC 8a
CS 6	Dedicated transfer of substance or mixtures containing the substance.	PROC 8b
CS 7	Transfer of mixtures of formulations containing the substance to smaller containers at dedicated facilities	PROC 9
CS 8	Sample and quality checks at laboratory.	PROC 15

Includes formulation of hard surface cleaners and speciality cleaners. Approximately 2.5% of the total tonnage per year is used for cleaning products and the number of sites for formulation is < 10. Hence, the maximum tonnage formulated on one site is set at 2.5 t/y. The minimum number of emission days for such a site is set at 12 days per year, i.e. once a month.

7.2 Env CS 1: Environmental contributing scenario formulation of cleaners (1) (ERC 2)

7.2.1 Definition

Formulation of e.g. hard surface cleaners and speciality cleaners. As daily use amount, the indicative worst case value for the substance use rate per site (M_{sperc}) was selected. This scenario assumes daily release (working days). Hence, on a yearly basis the average emission period is assumed to be 250 days.

7.2.2 Conditions of use

Amount used, frequency and duration of use (or from service life)
<ul style="list-style-type: none"> Daily use amount at site: ≤ 0.01 tonnes/day <p><i>As daily use amount, the indicative worst case value for the substance use rate per site (M_{sperc}) was selected. M_{sperc} can be used by the registrant when starting the environmental assessment. The M_{sperc} values have been estimated in dependence of the size of the operation, the number of days emitting, and the concentration of the substance in a finished product (i.e. mixture). On a yearly basis the average emission period is 250 days. The actual releases may well be a minimum of 12 emission days per year (once per month). Risk assessment for such a low frequency should be based on the PNEC for intermittent release, which is 0.0089 mg/L.</i></p> <ul style="list-style-type: none"> Annual use amount at site: ≤ 2.5 tonnes/year Percentage of EU tonnage used at regional scale: = 100.0 %
Technical and organisational conditions and measures
<ul style="list-style-type: none"> Type of Process: Substance applied in aqueous process solution with negligible volatilization Process efficiency: Process with efficient use of raw materials. Indoor/outdoor use: Indoor use Equipment cleaning: Equipment cleaned with water, washing disposed of with wastewater.
Conditions and measures related to biological sewage treatment plant
<ul style="list-style-type: none"> Application of the STP sludge on agricultural soil: Yes Biological STP: Standard [Effectiveness Water: 88.52%] Discharge rate of STP: ≥ 2000 m³/day
Conditions and measures related to external treatment of waste (including article waste)
<ul style="list-style-type: none"> Particular considerations on the waste treatment operations: No (low risk)
Other conditions affecting environmental exposure
<ul style="list-style-type: none"> Receiving surface water flow rate: ≥ 18000 m³/day General good practice: Trained staff, spill protection including waste reuse

7.2.3 Releases

See 7.3.3.

7.3 Env CS 2: Environmental contributing scenario formulation of cleaners (2) (ERC 2)

7.3.1 Definition

Formulation of e.g. hard surface cleaners and speciality cleaners. This scenario assumes a monthly release at the site. Hence, on a yearly basis the total emission period is 12 days.

7.3.2 Conditions of use

Amount used, frequency and duration of use (or from service life)
<ul style="list-style-type: none"> Daily use amount at site: ≤ 0.01 tonnes/day <p><i>As daily use amount, the indicative worst case value for the substance use rate per site (M_{sperc}) was selected. M_{sperc} can be used by the registrant when starting the environmental assessment. The M_{sperc} values have been estimated in</i></p>

dependence of the size of the operation, the number of days emitting, and the concentration of the substance in a finished product (i.e. mixture). 250 emission days per year are assumed.

- Annual use amount at site: <= 2.5 tonnes/year
- Percentage of EU tonnage used at regional scale: = 100.0 %

Technical and organisational conditions and measures

- Type of Process: Substance applied in aqueous process solution with negligible volatilization
- Process efficiency: Process with efficient use of raw materials.
- Indoor/outdoor use: Indoor use
- Equipment cleaning: Equipment cleaned with water, washing disposed of with wastewater.

Conditions and measures related to biological sewage treatment plant

- Application of the STP sludge on agricultural soil: Yes
- Biological STP: Standard [Effectiveness Water: 88.52%]
- Discharge rate of STP: >= 2000 m3/day

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

- Particular considerations on the waste treatment operations: No (low risk)

Other conditions affecting environmental exposure

- Receiving surface water flow rate: >= 18000 m3/day
- General good practice: Trained staff, spill protection including waste reuse

7.3.3 Releases

The releases have been estimated on the basis of SPERC AISE 2.1i.v2: Industrial use in formulation of liquid cleaning and maintenance products: Low Viscosity (small scale) - (AISE 2.1i.v2: Formulation of liquid Detergents/ Maintenance Products: Low Viscosity (small scale);Formulation of liquid Detergents/ Maintenance Products: Low Viscosity (small scale)).

Description of activities/processes covered by the SPERC

This SPERC describes SPERC parameters relevant to the manufacturing of water-borne liquid cleaning and maintenance products. Losses from the processes constitute losses of raw materials, which for economic reasons have to be avoided. Formulation of preparations requires optimized use of raw materials for inclusion into products. Losses of raw materials via volatilization are negligible. Significant losses to the environment can be the result of cleaning of mixing vessels, tubing, production/packaging lines.

Low viscosity products include the following: floor cleaner, all purpose cleaner, bathroom cleaner, kitchen cleaner, window cleaner, liquid WC-rim. Typically, the viscosity of these products is not specified and not adjusted.

The SPERCs are relevant for operations which discharge their wastewater to treatment by a municipal sewage treatment plant.

The SPERCs cover small operations, which produce less than 1.000 tons of finished products per year, respectively.

Substance Domain: All

Local releases to the environment

Release	Explanations
Water	<p>Release factor: 0.2%</p> <p>Local release rate: 0.02 kg/day</p> <p>Explanation: Releases to the wastewater can be the result of cleaning of mixing vessels, tubing, production/packaging lines with water. The spent cleaning water is discharged to the wastewater. The numbers that are presented in this SPERC originate from the study by Royal Haskoning (2009) EU TGD 2003 Technical Guidance Document on Risk Assessment. Part II, Appendix1 A Table A2 (p 226) Franke et al., 1995 Ökobilanzierung- Sachbilanz für die Waschmittel-Konfektionierung Tenside Surf. Det, 32:(508-514) Royal Haskoning 2009 Review and evaluation of environmental emission scenarios for fragrance materials during compounding of perfume oils and formulation of consumer products (Research Institute for Fragrance Materials. Ref.:9S3975.01/R0007/Nijm, 2009).</p>
Air	<p>Release factor: 0%</p> <p>Local release rate: 0 kg/day</p>

Release	Explanations
	<p>Explanation: Releases of raw materials via volatilization are quantitatively very low. For that reason, the study by Royal Haskoning (2009) does not consider to establish release factors for the use of fragrance materials in the manufacturing of detergent products. For that reason, the release factor is set to zero. EU TGD 2003 Technical Guidance Document on Risk Assessment. Part II, Appendix1 A Table A2 (p 226) Franke et al., 1995 Ökobilanzierung- Sachbilanz für die Waschmittel-Konfektionierung Tenside Surf. Det, 32:(508-514) Royal Haskoning 2009 Review and evaluation of environmental emission scenarios for fragrance materials during compounding of perfume oils and formulation of consumer products (Research Institute for Fragrance Materials. Ref.:9S3975.01/R0007/Nijm, 2009).</p>
Non agricultural soil	<p>Release factor: 0% Local release rate: - kg/day Explanation: Must be avoided EU TGD 2003 Technical Guidance Document on Risk Assessment. Part II, Appendix1 A Table A2 (p 226) Franke et al., 1995 Ökobilanzierung- Sachbilanz für die Waschmittel-Konfektionierung Tenside Surf. Det, 32:(508-514) Royal Haskoning 2009 Review and evaluation of environmental emission scenarios for fragrance materials during compounding of perfume oils and formulation of consumer products (Research Institute for Fragrance Materials. Ref.:9S3975.01/R0007/Nijm, 2009).</p>

Releases to waste

Release factor to external waste: 0 %

Not relevant – no obligatory RMM which divert substances to waste.

EU TGD 2003 Technical Guidance Document on Risk Assessment. Part II, Appendix1 A Table A2 (p 226)

Franke et al., 1995 Ökobilanzierung- Sachbilanz für die Waschmittel-Konfektionierung Tenside Surf. Det, 32:(508-514)

Royal Haskoning 2009 Review and evaluation of environmental emission scenarios for fragrance materials during compounding of perfume oils and formulation of consumer products (Research Institute for Fragrance Materials. Ref.:9S3975.01/R0007/Nijm, 2009).

7.4 Worker CS 3: Batch wise formulation of special cleaners (PROC 3)

7.4.1 Definition

Batch wise processing with various constituents where only shortly controlled exposure may occur to the respective mixtures or formulations.

7.4.2 Conditions of use

Product (Article) characteristics
<ul style="list-style-type: none"> Physical form of the used product: Liquid Percentage (w/w) of substance in mixture/article: <= 100.0 %
Amount used (or contained in articles), frequency and duration of use/exposure
<ul style="list-style-type: none"> Duration of activity: <= 8.0 h/day
Technical and organisational conditions and measures
<ul style="list-style-type: none"> Local exhaust ventilation: No [Effectiveness Inhalation: 0%, Dermal: 0%] General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness Inhalation: 0%] Occupational Health and Safety Management System: Advanced Closed batch process with occasional controlled exposure
Conditions and measures related to personal protection, hygiene and health evaluation
<ul style="list-style-type: none"> Dermal protection: No [Effectiveness Dermal: 0%] <p><i>Wearing gloves is advisory but not mandatory to achieve sufficient safety.</i></p>

<ul style="list-style-type: none"> • Respiratory Protection: No [Effectiveness Inhalation: 0%] • In case of potential risk of exposure of the eyes: wear safety goggles.
Other conditions affecting workers exposure
<ul style="list-style-type: none"> • Skin surface potentially exposed: One hand face only (240 cm²) • Operating temperature: <= 40.0 °C • Place of use: Indoor

7.5 Worker CS 4: Batch wise mixing process to produce special cleaners (PROC 5)

7.5.1 Definition

Batch wise mixing where only controlled exposure may occur to the respective mixtures or formulations.

7.5.2 Conditions of use

Product (Article) characteristics
<ul style="list-style-type: none"> • Physical form of the used product: Liquid • Percentage (w/w) of substance in mixture/article: <= 5.0 %
Amount used (or contained in articles), frequency and duration of use/exposure
<ul style="list-style-type: none"> • Duration of activity: <= 8.0 h/day
Technical and organisational conditions and measures
<ul style="list-style-type: none"> • Local exhaust ventilation: No [Effectiveness Inhalation: 0%, Dermal: 0%] • General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness Inhalation: 0%] • Occupational Health and Safety Management System: Advanced
Conditions and measures related to personal protection, hygiene and health evaluation
<ul style="list-style-type: none"> • Dermal protection: Yes (Chemically resistant gloves conforming to EN374) and (other) appropriate dermal protection [Effectiveness Dermal: 80%] • Respiratory Protection: No [Effectiveness Inhalation: 0%] • In case of potential risk of exposure of the eyes: wear safety goggles.
Other conditions affecting workers exposure
<ul style="list-style-type: none"> • Skin surface potentially exposed: Two hands face (480 cm²) • Operating temperature: <= 40.0 °C • Place of use: Indoor

7.6 Worker CS 5: Non-dedicated transfer of special cleaners. (PROC 8a)

7.6.1 Definition

Non-dedicated transfer of bulk amounts to system vessels for formulation purposes with possible significant exposure.

7.6.2 Conditions of use

Product (Article) characteristics
<ul style="list-style-type: none"> • Physical form of the used product: Liquid • Percentage (w/w) of substance in mixture/article: <= 5.0 %
Amount used (or contained in articles), frequency and duration of use/exposure
<ul style="list-style-type: none"> • Duration of activity: <= 8.0 h/day
Technical and organisational conditions and measures

<ul style="list-style-type: none"> • Local exhaust ventilation: No [Effectiveness Inhalation: 0%, Dermal: 0%] • General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness Inhalation: 0%] • Occupational Health and Safety Management System: Advanced
Conditions and measures related to personal protection, hygiene and health evaluation
<ul style="list-style-type: none"> • Dermal protection: Yes (Chemically resistant gloves conforming to EN374) and (other) appropriate dermal protection [Effectiveness Dermal: 80%] • Respiratory Protection: No [Effectiveness Inhalation: 0%] • In case of potential risk of exposure of the eyes: wear safety goggles.
Other conditions affecting workers exposure
<ul style="list-style-type: none"> • Skin surface potentially exposed: Two hands (960 cm²) • Operating temperature: <= 40.0 °C • Place of use: Indoor

7.7 Worker CS 6: Dedicated transfer of substance or mixtures containing the substance. (PROC 8b)

7.7.3 Definition

Dedicated transfer of bulk amounts to system vessels for formulation purposes with possible but controlled exposure.

7.7.4 Conditions of use

Product (Article) characteristics
<ul style="list-style-type: none"> • Physical form of the used product: Liquid • Percentage (w/w) of substance in mixture/article: <= 5.0 %
Amount used (or contained in articles), frequency and duration of use/exposure
<ul style="list-style-type: none"> • Duration of activity: <= 8.0 h/day
Technical and organisational conditions and measures
<ul style="list-style-type: none"> • Local exhaust ventilation: No [Effectiveness Inhalation: 0%, Dermal: 0%] • General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness Inhalation: 0%] • Occupational Health and Safety Management System: Advanced
Conditions and measures related to personal protection, hygiene and health evaluation
<ul style="list-style-type: none"> • Dermal protection: Yes (Chemically resistant gloves conforming to EN374) and (other) appropriate dermal protection [Effectiveness Dermal: 80%] • Respiratory Protection: No [Effectiveness Inhalation: 0%] • In case of potential risk of exposure of the eyes: wear safety goggles.
Other conditions affecting workers exposure
<ul style="list-style-type: none"> • Skin surface potentially exposed: Two hands (960 cm²) • Operating temperature: <= 40.0 °C • Place of use: Indoor

7.8 Worker CS 7: Transfer of mixtures of formulations containing the substance to smaller containers at dedicated facilities (PROC 9)

7.8.5 Definition

Dedicated transfer of formulations containing the substance to smaller containers with possible but controlled exposure.

7.8.6 Conditions of use

Product (Article) characteristics
<ul style="list-style-type: none"> Physical form of the used product: Liquid Percentage (w/w) of substance in mixture/article: <= 5.0 %
Amount used (or contained in articles), frequency and duration of use/exposure
<ul style="list-style-type: none"> Duration of activity: <= 8.0 h/day
Technical and organisational conditions and measures
<ul style="list-style-type: none"> Local exhaust ventilation: No [Effectiveness Inhalation: 0%, Dermal: 0%] General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness Inhalation: 0%] Occupational Health and Safety Management System: Advanced
Conditions and measures related to personal protection, hygiene and health evaluation
<ul style="list-style-type: none"> Dermal protection: Yes (Chemically resistant gloves conforming to EN374) and (other) appropriate dermal protection [Effectiveness Dermal: 80%] Respiratory Protection: No [Effectiveness Inhalation: 0%] In case of potential risk of exposure of the eyes: wear safety goggles.
Other conditions affecting workers exposure
<ul style="list-style-type: none"> Skin surface potentially exposed: Two hands face (480 cm²) Operating temperature: <= 40.0 °C Place of use: Indoor

7.9 Worker CS 8: Sample and quality checks at laboratory. (PROC 15)

7.9.1 Definition

Checks on small samples from formulations containing the substance at the laboratory.

7.9.2 Conditions of use

Product (Article) characteristics
<ul style="list-style-type: none"> Physical form of the used product: Liquid Percentage (w/w) of substance in mixture/article: <= 5.0 %
Amount used (or contained in articles), frequency and duration of use/exposure
<ul style="list-style-type: none"> Duration of activity: <= 8.0 h/day
Technical and organisational conditions and measures
<ul style="list-style-type: none"> Local exhaust ventilation: No [Effectiveness Inhalation: 0%, Dermal: 0%] General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness Inhalation: 0%] Occupational Health and Safety Management System: Advanced
Conditions and measures related to personal protection, hygiene and health evaluation
<ul style="list-style-type: none"> Dermal protection: No [Effectiveness Dermal: 0%] Respiratory Protection: No [Effectiveness Inhalation: 0%] In case of potential risk of exposure of the eyes: wear safety goggles.
Other conditions affecting workers exposure
<ul style="list-style-type: none"> Skin surface potentially exposed: One hand face only (240 cm²) Operating temperature: <= 40.0 °C Place of use: Indoor

8. Exposure scenario 7: Use at industrial site of special cleaners

8.1 Short description

Sector of use: SU 15: Manufacture of fabricated metal products, except machinery and equipment; SU 16: Manufacture of computer, electronic and optical products, electrical equipment; SU 17: General manufacturing, e.g. machinery, equipment, vehicles, other transport equipment.

Environment contributing scenario(s):		
CS 1	Use at industrial site of special cleaners	ERC 4
Worker contributing scenario(s):		
CS 2	Batch wise formulation of cleaners with only incidental exposure	PROC 3
CS 3	Batch wise mixing of formulation with only incidental exposure.	PROC 5
CS 4	Transfer of substance in formulation only at non-dedicated facility.	PROC 8a
CS 5	Transfer of substance and substance containing formulations at dedicated facilities	PROC 8b
CS 6	Transfer of substance containing formulations to small containers at a dedicated filling line.	PROC 9
CS 7	Quality control of formulation samples at a laboratory.	PROC 15

8.2 Env CS 1: Use at industrial site of special cleaners (ERC 4)

8.2.1 Conditions of use

Amount used, frequency and duration of use (or from service life)
<ul style="list-style-type: none"> Annual use amount at site: <= 1.0 tonnes/year Percentage of EU tonnage used at regional scale: = 100.0 % Daily use amount at site: <= 0.005 tonnes/day <p><i>As default tonnage, the typical maximum site tonnage, based on sector knowledge was taken. The continuous release (M_{sp}perc) of cleaners is 4.5 kg/day: 220 emission days per year are assumed. Optional are intermittent releases with 20 days per year or 0.05 tonnes/day. The PNEC intermittent is 0.0086 mg/L.</i></p>
Conditions and measures related to biological sewage treatment plant
<ul style="list-style-type: none"> Application of the STP sludge on agricultural soil: Yes Biological STP: Standard [Effectiveness Water: 88.52%] Discharge rate of STP: >= 2000 m³/day
Conditions and measures related to external treatment of waste (including article waste)
<ul style="list-style-type: none"> Particular considerations on the waste treatment operations: No (low concentration)
Other conditions affecting environmental exposure
<ul style="list-style-type: none"> Receiving surface water flow rate: >= 18000 m³/day

8.2.2 Releases

Local releases to the environment

Release	Release estimation method	Explanations
Water	Estimated release factor	<p>Release factor before on site RMM: 1% Release factor after on site RMM: 1% Local release rate: 0.05 kg/day Explanation: Industrial applications of water borne processing aids can typically be described as follows. The application fluid is kept in a reservoir. It is pumped to dedicated</p>

Release	Release estimation method	Explanations
		<p>machine(s) in order to be applied to the substrate or it is kept in a bath. This type of application includes vehicle cleaning, metal working fluids, etc. With each piece of substrate a fraction of the application fluid is carried-over from the treatment bath. Via a sequence of rinsing steps this fraction of the application fluid is continuously emitted to the wastewater. The reservoir is continuously replenished. The application fluid in the reservoir can be disposed off periodically. On-site pre-treatment before disposal to the wastewater is recommended. As a result, constituents of the application fluid are removed during the on-site treatment according to the efficiency of the selected emission reduction. Allowing degradation in the periods between release, up to 90% of the substance is expected to have been degraded. In addition, raw materials may be recovered. The choice of suitable emission reduction (or RMM) technology depends on the process.</p> <p>In addition, the process can be closed with regards to emissions to the environment. Spent application fluid is not released to the environment. It is disposed of periodically as waste (with or without prior treatment). This type of application includes several surface finishing, water conditioning etc. applications. No emissions to the wastewater occur. The local waste handling regulations have to be followed. Additional instructions for handling waste may be included in the safety data sheet.</p>
Air	Estimated release factor	<p>Release factor before on site RMM: 0.1% Release factor after on site RMM: 0.1% Local release rate: 5E-3 kg/day</p>
Non agricultural soil	Estimated release factor	<p>Release factor after on site RMM: 0.01%</p>

Releases to waste

Release factor to external waste: 10 %

Water-borne processing aids are disposed off quantitatively to the process wastewater. Releases to waste do not occur during normal operation.

8.3 Worker CS 2: Batch wise formulation of cleaners with only incidental exposure (PROC 3)

8.3.1 Definition

Batch wise processing where only shortly controlled exposure may occur to the respective mixtures or formulations.

8.3.2 Conditions of use

Product (Article) characteristics
<ul style="list-style-type: none"> • Physical form of the used product: Liquid • Percentage (w/w) of substance in mixture/article: <= 5.0 %
Amount used (or contained in articles), frequency and duration of use/exposure
<ul style="list-style-type: none"> • Duration of activity: <= 8.0 h/day
Technical and organisational conditions and measures
<ul style="list-style-type: none"> • Local exhaust ventilation: No [Effectiveness Inhalation: 0%, Dermal: 0%] • General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness Inhalation: 0%] • Occupational Health and Safety Management System: Advanced • Closed batch process with occasional controlled exposure

Conditions and measures related to personal protection, hygiene and health evaluation
<ul style="list-style-type: none"> • Dermal protection: No [Effectiveness Dermal: 0%] <i>Wearing gloves is advisory but not mandatory to achieve sufficient safety.</i> • Respiratory Protection: No [Effectiveness Inhalation: 0%] • In case of potential risk of exposure of the eyes: wear safety goggles.
Other conditions affecting workers exposure
<ul style="list-style-type: none"> • Skin surface potentially exposed: One hand face only (240 cm²) • Operating temperature: ≤ 40.0 °C • Place of use: Indoor

8.4 Worker CS 3: Batch wise mixing of formulation with only incidental exposure. (PROC 5)

8.4.1 Definition

Batch wise mixing where only controlled exposure may occur to the respective mixtures or formulations.

8.4.2 Conditions of use

Product (Article) characteristics
<ul style="list-style-type: none"> • Physical form of the used product: Liquid • Percentage (w/w) of substance in mixture/article: ≤ 5.0 %
Amount used (or contained in articles), frequency and duration of use/exposure
<ul style="list-style-type: none"> • Duration of activity: ≤ 8.0 h/day
Technical and organisational conditions and measures
<ul style="list-style-type: none"> • Local exhaust ventilation: No [Effectiveness Inhalation: 0%, Dermal: 0%] • General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness Inhalation: 0%] • Occupational Health and Safety Management System: Advanced
Conditions and measures related to personal protection, hygiene and health evaluation
<ul style="list-style-type: none"> • Dermal protection: Yes (Chemically resistant gloves conforming to EN374) and (other) appropriate dermal protection [Effectiveness Dermal: 80%] • Respiratory Protection: No [Effectiveness Inhalation: 0%] • In case of potential risk of exposure of the eyes: wear safety goggles.
Other conditions affecting workers exposure
<ul style="list-style-type: none"> • Skin surface potentially exposed: Two hands face (480 cm²) • Operating temperature: ≤ 40.0 °C • Place of use: Indoor

8.5 Worker CS 4: Transfer of substance in formulation only at non-dedicated facility. (PROC 8a)

8.5.1 Definition

Non-dedicated transfer of bulk amounts to system vessels for formulation purposes with possible significant exposure.

8.5.2 Conditions of use

Product (Article) characteristics
<ul style="list-style-type: none"> • Physical form of the used product: Liquid • Percentage (w/w) of substance in mixture/article: ≤ 5.0 %
Amount used (or contained in articles), frequency and duration of use/exposure

• Duration of activity: <= 8.0 h/day
Technical and organisational conditions and measures
<ul style="list-style-type: none"> • Local exhaust ventilation: No [Effectiveness Inhalation: 0%, Dermal: 0%] • General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness Inhalation: 0%] • Occupational Health and Safety Management System: Advanced
Conditions and measures related to personal protection, hygiene and health evaluation
<ul style="list-style-type: none"> • Dermal protection: Yes (Chemically resistant gloves conforming to EN374) and (other) appropriate dermal protection [Effectiveness Dermal: 80%] <i>Wearing gloves is mandatory to achieve sufficient safety.</i> • Respiratory Protection: No [Effectiveness Inhalation: 0%] • In case of potential risk of exposure of the eyes: wear safety goggles.
Other conditions affecting workers exposure
<ul style="list-style-type: none"> • Skin surface potentially exposed: Two hands (960 cm²) • Operating temperature: <= 40.0 °C • Place of use: Indoor

8.6 Worker CS 5: Transfer of substance and substance containing formulations at dedicated facilities (PROC 8b)

8.6.1 Definition

Dedicated transfer of bulk amounts to system vessels for formulation purposes with possible but controlled exposure.

8.6.2 Conditions of use

Product (Article) characteristics
<ul style="list-style-type: none"> • Physical form of the used product: Liquid • Percentage (w/w) of substance in mixture/article: <= 5.0 %
Amount used (or contained in articles), frequency and duration of use/exposure
• Duration of activity: <= 8.0 h/day
Technical and organisational conditions and measures
<ul style="list-style-type: none"> • Local exhaust ventilation: No [Effectiveness Inhalation: 0%, Dermal: 0%] • General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness Inhalation: 0%] • Occupational Health and Safety Management System: Advanced
Conditions and measures related to personal protection, hygiene and health evaluation
<ul style="list-style-type: none"> • Dermal protection: Yes (Chemically resistant gloves conforming to EN374) and (other) appropriate dermal protection [Effectiveness Dermal: 80%] <i>Wearing gloves is mandatory to achieve sufficient safety.</i> • Respiratory Protection: No [Effectiveness Inhalation: 0%] • In case of potential risk of exposure of the eyes: wear safety goggles.
Other conditions affecting workers exposure
<ul style="list-style-type: none"> • Skin surface potentially exposed: Two hands (960 cm²) • Operating temperature: <= 40.0 °C • Place of use: Indoor

8.7 Worker CS 6: Transfer of substance containing formulations to small containers at a dedicated filling line. (PROC 9)

8.7.1 Definition

Dedicated transfer of formulations containing the substance to smaller containers with possible but controlled exposure.

8.7.2 Conditions of use

Product (Article) characteristics
<ul style="list-style-type: none"> Physical form of the used product: Liquid Percentage (w/w) of substance in mixture/article: <= 5.0 %
Amount used (or contained in articles), frequency and duration of use/exposure
<ul style="list-style-type: none"> Duration of activity: <= 8.0 h/day
Technical and organisational conditions and measures
<ul style="list-style-type: none"> Local exhaust ventilation: No [Effectiveness Inhalation: 0%, Dermal: 0%] General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness Inhalation: 0%] Occupational Health and Safety Management System: Advanced
Conditions and measures related to personal protection, hygiene and health evaluation
<ul style="list-style-type: none"> Dermal protection: Yes (Chemically resistant gloves conforming to EN374) and (other) appropriate dermal protection [Effectiveness Dermal: 80%] <i>Wearing gloves is advisory but not mandatory to achieve sufficient safety.</i> Respiratory Protection: No [Effectiveness Inhalation: 0%] In case of potential risk of exposure of the eyes: wear safety goggles.
Other conditions affecting workers exposure
<ul style="list-style-type: none"> Skin surface potentially exposed: Two hands face (480 cm²) Operating temperature: <= 40.0 °C Place of use: Indoor

8.8 Worker CS 7: Quality control of formulation samples at a laboratory. (PROC 15)

8.8.1 Definition

Checks on small samples from formulations containing the substance at the laboratory.

8.8.2 Conditions of use

Product (Article) characteristics
<ul style="list-style-type: none"> Physical form of the used product: Liquid Percentage (w/w) of substance in mixture/article: <= 5.0 %
Amount used (or contained in articles), frequency and duration of use/exposure
<ul style="list-style-type: none"> Duration of activity: <= 8.0 h/day
Technical and organisational conditions and measures
<ul style="list-style-type: none"> Local exhaust ventilation: No [Effectiveness Inhalation: 0%, Dermal: 0%] General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness Inhalation: 0%] Occupational Health and Safety Management System: Advanced
Conditions and measures related to personal protection, hygiene and health evaluation
<ul style="list-style-type: none"> Dermal protection: No [Effectiveness Dermal: 0%] Respiratory Protection: No [Effectiveness Inhalation: 0%] In case of potential risk of exposure of the eyes: wear safety goggles.
Other conditions affecting workers exposure
<ul style="list-style-type: none"> Skin surface potentially exposed: One hand face only (240 cm²) Operating temperature: <= 40.0 °C Place of use: Indoor

9. Exposure scenario 8: Widespread use by professional workers - Professional use of cleaning products

9.1 Short description

Environment contributing scenario(s):		
CS 1	Professional use of cleaning products	ERC 8d, ERC 8a
Worker contributing scenario(s):		
CS 2	Transfer of cleaning products by professional worker	PROC 8a
CS 3	Professional use of cleaning products by brushing	PROC 10
CS 4	Professional use of cleaning products by spraying	PROC 11
CS 5	Professional use of cleaning products by dipping or pouring	PROC 13

9.2 Env CS 1: Professional use of cleaning products (ERC 8d)

9.2.1 Conditions of use

Amount used, frequency and duration of use (or from service life)
<ul style="list-style-type: none"> Percentage of EU tonnage used at regional scale: = 10.0 % Daily local widespread use amount: <= 0.00000055 tonnes/day
Conditions and measures related to biological sewage treatment plant
<ul style="list-style-type: none"> Biological STP: Standard [Effectiveness Water: 88.52%]
Conditions and measures related to external treatment of waste (including article waste)
<ul style="list-style-type: none"> Particular considerations on the waste treatment operations: No (low risk)

9.2.2 Releases

Local releases to the environment

Release	Release estimation method	Explanations
Water	ERC based	Release factor before on site RMM: 100% Release factor after on site RMM: 100% Local release rate: 5.5E-4 kg/day
Air	ERC based	Release factor before on site RMM: 100% Release factor after on site RMM: 100%
Non agricultural soil	ERC based	Release factor after on site RMM: 20%

9.3 Worker CS 2: Transfer of cleaning products by professional worker (PROC 8a)

9.3.1 Definition

Non-dedicated transfer of bulk amounts to system vessels for formulation purposes with possible significant exposure.

9.3.2 Conditions of use

Product (Article) characteristics
<ul style="list-style-type: none"> Physical form of the used product: Liquid Percentage (w/w) of substance in mixture/article: <= 5.0 %

Amount used (or contained in articles), frequency and duration of use/exposure
• Duration of activity: <= 8.0 h/day
Technical and organisational conditions and measures
• Local exhaust ventilation: No [Effectiveness Inhalation: 0%, Dermal: 0%] • General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness Inhalation: 0%] • Occupational Health and Safety Management System: Basic
Conditions and measures related to personal protection, hygiene and health evaluation
• Dermal protection: Yes (Chemically resistant gloves conforming to EN374) and (other) appropriate dermal protection [Effectiveness Dermal: 80%] • Respiratory Protection: No [Effectiveness Inhalation: 0%] • In case of potential risk of exposure of the eyes: wear safety goggles.
Other conditions affecting workers exposure
• Skin surface potentially exposed: Two hands (960 cm ²) • Operating temperature: <= 40.0 °C • Place of use: Indoor

9.4 Worker CS 3: Professional use of cleaning products by brushing (PROC 10)

9.4.1 Definition

Professional use by handling formulations containing the substance diluted in water with possible exposure to relatively low concentrations ($\leq 1\%$).

9.4.2 Conditions of use

Product (Article) characteristics
• Physical form of the used product: Liquid • Percentage (w/w) of substance in mixture/article: <= 1.0 % <i>Original cleaner is diluted by at least 10 times prior to use.</i>
Amount used (or contained in articles), frequency and duration of use/exposure
• Duration of activity: <= 1.0 h/day
Technical and organisational conditions and measures
• Local exhaust ventilation: No [Effectiveness Inhalation: 0%, Dermal: 0%] • General ventilation: Good general ventilation (3-5 air changes per hour) [Effectiveness Inhalation: 30%] • Occupational Health and Safety Management System: Basic
Conditions and measures related to personal protection, hygiene and health evaluation
• Dermal protection: Yes (Chemically resistant gloves conforming to EN374) and (other) appropriate dermal protection [Effectiveness Dermal: 80%] • Respiratory Protection: No [Effectiveness Inhalation: 0%] • In case of potential risk of exposure of the eyes: wear safety goggles.
Other conditions affecting workers exposure
• Skin surface potentially exposed: Two hands (960 cm ²) • Operating temperature: <= 40.0 °C • Place of use: Indoor

9.5 Worker CS 4: Professional use of cleaning products by spraying (PROC 11)

9.5.1 Definition

Professional use by handling formulations containing the substance diluted in water with possible exposure to relatively low concentrations (< 1%).

9.5.2 Conditions of use

Product (article) characteristics
<ul style="list-style-type: none"> Concentration of substance in mixture: <1% <i>Original cleaner is diluted by at least 10 times prior to use.</i>
Amount used (or contained in articles), frequency and duration of use/exposure
<ul style="list-style-type: none"> Duration of activity: ≤ 1 hour
Technical and organisational conditions and measures
<ul style="list-style-type: none"> General ventilation: Good general ventilation (3-5 air changes per hour) General ventilation: No general ventilation
<ul style="list-style-type: none"> Containment: No
<ul style="list-style-type: none"> Local exhaust ventilation: no [Effectiveness Inhal: 0%]
<ul style="list-style-type: none"> Occupational Health and Safety Management System: Basic
Conditions and measures related to personal protection, hygiene and health evaluation
<ul style="list-style-type: none"> Dermal Protection: Yes (chemically resistant gloves conforming to EN374 with basic employee training) [Effectiveness Dermal: 90%]
<ul style="list-style-type: none"> Respiratory Protection: No protection In case of potential risk of exposure of the eyes: wear safety goggles.
Other conditions affecting workers exposure
<ul style="list-style-type: none"> Place of use: Indoor
<ul style="list-style-type: none"> Process temperature (for liquid): ≤ 40 °C
<ul style="list-style-type: none"> Skin surface potentially exposed: Two hands and upper wrists (1500 cm²)

9.6 Worker CS 5: Professional use of cleaning products by dipping or pouring (PROC 13)

9.6.1 Definition

Use of cleaners at the level of dipping or pouring with possible significant exposure

9.6.2 Conditions of use

Product (Article) characteristics
<ul style="list-style-type: none"> Physical form of the used product: Liquid Percentage (w/w) of substance in mixture/article: ≤ 1.0 % <i>Original cleaner is diluted by at least 10 times prior to use.</i>
Amount used (or contained in articles), frequency and duration of use/exposure
<ul style="list-style-type: none"> Duration of activity: ≤ 8.0 h/day
Technical and organisational conditions and measures
<ul style="list-style-type: none"> Local exhaust ventilation: No [Effectiveness Inhalation: 0%, Dermal: 0%] General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness Inhalation: 0%] Occupational Health and Safety Management System: Basic

Conditions and measures related to personal protection, hygiene and health evaluation
<ul style="list-style-type: none"> • Dermal protection: Yes (Chemically resistant gloves conforming to EN374) and (other) appropriate dermal protection [Effectiveness Dermal: 80%] • Respiratory Protection: No [Effectiveness Inhalation: 0%] • In case of potential risk of exposure of the eyes: wear safety goggles.
Other conditions affecting workers exposure
<ul style="list-style-type: none"> • Skin surface potentially exposed: Two hands face (480 cm²) • Operating temperature: <= 40.0 °C • Place of use: Indoor

10. Exposure scenario 9: Consumer use - Consumer use of cleaning products

10.1 Short description

Environment contributing scenario(s):		
CS 1	Consumer use of cleaning products	ERC 8d, ERC 8a
Consumer contributing scenario(s):		
CS 2	Consumer contributing scenario for the use of cleaning agents	PC 35

10.2 Env CS 1: Consumer use of cleaning products (ERC 8d)

10.2.1 Definition

Release related with manual use by consumers of cleaning products to municipal sewage treatment plants.

10.2.2 Conditions of use

Amount used, frequency and duration of use (or from service life)
<ul style="list-style-type: none"> • Percentage of EU tonnage used at regional scale: = 10.0 % • Daily local widespread use amount: <= 0.00000028 tonnes/day
Conditions and measures related to external treatment of waste (including article waste)
• Particular considerations on the waste treatment operations: No (low risk)
Other conditions affecting environmental exposure
• Biological STP: Standard [Effectiveness Water: 88.52%]

10.2.3 Releases

Local releases to the environment

Release	Release estimation method	Explanations
Water	ERC based	Release factor before on site RMM: 100% Release factor after on site RMM: 100% Local release rate: 2.75E-4 kg/day
Air	ERC based	Release factor before on site RMM: 100% Release factor after on site RMM: 100%
Non agricultural soil	ERC based	Release factor after on site RMM: 20%

10.3 Cons CS 2: Consumer contributing scenario for the use of cleaning agents (PC 35)

10.3.1 Definition

Manual use of cleaning products with relatively small concentrations of substance ($\leq 0.1\%$).

10.3.2 Conditions of use

Product (article) characteristics
<ul style="list-style-type: none">• Exposure via dermal route: Yes• Percentage (w/w) of substance in mixture/article: $\leq 0.1\%$ <p><i>It is strictly recommended to limit the concentration of Surfadone LP-300 at or below 1% in laundry and dish washing products designated for consumer use.</i></p> <ul style="list-style-type: none">• Exposure via inhalation route: Yes• Spray: No• Exposure via oral route: Oral exposure is considered to be not relevant• Physical form of the used product
Amount used (or contained in articles), frequency and duration of use/exposure
<ul style="list-style-type: none">• Exposure time per event: = 1.0 h/event• Frequency of use over a day: = 1.0 events per day• Amount of product used per application: ≤ 50.0 g/event• Frequency of use over a year: Frequent
Information and behavioral advice for consumers
<ul style="list-style-type: none">• Place of use: Indoor• Adult/child assumed: Adult
Other conditions affecting consumers exposure
<ul style="list-style-type: none">• Body parts potentially exposed: Hands• Inhalation factor: = 1.0• Dermal transfer factor: = 1.0

11. Exposure scenario 10: Formulation or re-packing - Formulation of cosmetics

11.1 Short description

Environment contributing scenario(s):		
CS 1	Environmental contributing scenario for large scale formulation of low viscosity liquids	ERC 2
CS 2	Environmental contributing scenario for small scale formulation of low viscosity liquids	ERC 2
CS 3	Environmental contributing scenario of formulation of cosmetic products involving cleaning	ERC 2
Worker contributing scenario(s):		
CS 4	Formulation of cosmetics	PROC 1
CS 5	Formulation process including sampling.	PROC 2
CS 6	Batch wise formulation of cosmetic products	PROC 3
CS 7	Mixing of the substance in formulations.	PROC 5
CS 8	Charging of the substance present in formulations or preparations to larger vessels.	PROC 8a
CS 9	Transfer of the substance to mixing containers and formulations or preparations containing the substance to smaller containers at dedicated facilities.	PROC 8b
CS 10	Transfer of formulations/preparations containing the substance at relatively low concentrations to smaller containers or packaging on a dedicated filling line.	PROC 9
CS 11	Production of preparations.	PROC 14
CS 12	Sample and quality checks at laboratory.	PROC 15

11.2 Env CS 1: Environmental contributing scenario for large scale formulation of low viscosity liquids (ERC 2)

11.2.1 Definition

Formulation of liquid water-borne cosmetic products - low viscosity liquids (large scale)

11.2.2 Conditions of use

Amount used, frequency and duration of use (or from service life)
<ul style="list-style-type: none"> • Annual use amount at site: ≤ 20.0 tonnes/year <p><i>Use of Surfadone LP-300 in cosmetic products exceeds 10 and are spread over more than five different countries. The highest tonnage used on one site is set at 20 with 250 emission days.</i></p> <ul style="list-style-type: none"> • Percentage of EU tonnage used at regional scale: = 100.0 % • Daily use amount at site: ≤ 0.08 tonnes/day <p><i>- The daily use amount is a maximum daily site tonnage. MSpERC represents an indicative worst case value for the substance use rate per site. The MSPERC values have been estimated in dependence of the size of the operation, the number of days emitting, and the concentration of the substance in a finished product (i.e. mixture)).</i></p> <p><i>- Emission days (days/year): 250</i></p>
Technical and organisational conditions and measures
<ul style="list-style-type: none"> • Process efficiency: Process optimized for highly efficient use of raw materials (II) • Equipment cleaning: Equipment cleaning with minimized emissions to wastewater

<ul style="list-style-type: none"> Indoor/outdoor use: Indoor use Type of Process: Substance applied in aqueous process solution with negligible volatilization
Conditions and measures related to biological sewage treatment plant
<ul style="list-style-type: none"> Application of the STP sludge on agricultural soil: No Biological STP: Site specific [Effectiveness Water: 88.52%] Discharge rate of STP: >= 2000 m3/day
Conditions and measures related to external treatment of waste (including article waste)
<ul style="list-style-type: none"> Particular considerations on the waste treatment operations: No (low concentration)
Other conditions affecting environmental exposure
<ul style="list-style-type: none"> Receiving surface water flow rate: >= 18000 m3/day

11.2.3 Releases

The releases have been estimated on the basis of SPERC Cosmetics Europe 2.1.a.v2: Industrial use in formulation of liquid water-borne cosmetic products - low viscosity liquids (large scale) - (Cosmetics Europe 2.1.a.v2: Formulation of low viscosity liquids (large scale);Formulation of low viscosity liquids (large scale))

Description of activities/processes covered by the SPERC

For economic reasons, formulation of mixtures requires minimized losses of raw materials during the mixing and packaging of products. Losses of raw materials via volatilization are negligible. Significant losses to the environment can be the result of cleaning of mixing vessels, tubing, production/packaging lines. High viscosity products adhere more strongly to the walls of mixing vessels, tubing, production/packaging lines. They are less efficiently transferred into the packaging. Hence, emissions caused by equipment cleaning are higher and lower for high and low viscosity products, respectively. These losses occur irrespective of the physical-chemical properties of the substance employed in a cosmetic product. For that reason, this SPERC pertains to all substances.

Technical comments

- Before treatment means: emissions as entering an on-site biological WWTP, or if absent, as leaving the site towards a municipal WWTP.
- It is assumed for simplicity that 1 kg cosmetic product (excl. water) represents ~ 1 kg COD. Actual average value for the chemical ingredients may range from 1-2.
- Emissions to soil or solid waste are not discussed here, as justified in IFRA (2009), these are considered negligible.

Product/substance domain

- Covers the whole process of formulation as it occurs in the manufacturing of liquid water-borne cosmetics and body care products. This includes storing, mixing, packaging of substances (as part of mixtures) and equipment cleaning, maintenance and associated laboratory activities.
- Low viscosity liquids include the following: Shampoo, hair conditioner, shower gel, foam bath. Typically, the viscosity of these products is specified and adjusted.
- The SPERCs are relevant for operations which discharge their wastewater to treatment by a municipal sewage treatment plant.
- The SPERCs cover large operations, which produce more than 10,000 tons of finished products per year, respectively.
- Substance Domain: All.

Local releases to the environment

Release	Explanations
Water	<p>Release factor: 0.1%</p> <p>Local release rate: 0.08 kg/day</p> <p>Explanation: Releases to the wastewater can be the result of cleaning of mixing vessels, tubing, production/packaging lines with water. The spent cleaning water is discharged to the wastewater. The numbers that are presented in this SPERC originate from the study by Royal Haskoning (2009). The number for Cosmetics Europe 2.1.a.v2 is equal to that for large production of liquid conditioner, shampoos and shower gels in the study by Royal Haskoning (2009). The release factor for Cosmetics Europe 2.1.a.v2 is further supported by the Life Cycle Inventories of detergents (LCI, Franke et al., 1991). That publication formed the basis for the A/B Tables for detergent manufacturing in the EU Technical Guidance (EU TGD 2003). Again, it is assumed that the findings for manufacturing</p>

Release	Explanations
	detergent products apply for the manufacturing of personal care and cosmetics products. Reference: Royal Haskoning 2009 Review and evaluation of environmental emission scenarios for fragrance materials during compounding of perfume oils and formulation of consumer products (Research Institute for Fragrance Materials Ref.:9S3975.01/R0007/Nijm, 2009). EU TGD 2003 Technical Guidance Document on Risk Assessment. Part II, Appendix1 A Table A2 (p 226) Franke et al., 1995 Ökobilanzierung- Sachbilanz für die Waschmittel-Konfektionierung Tenside Surf. Det, 32:(508-514)
Air	Release factor: 0% Local release rate: 0 kg/day Explanation: Releases of raw materials via volatilization are quantitatively very low. For that reason, the study by Royal Haskoning (2009) does not consider to establish release factors for the use of fragrance materials in the manufacturing of detergent products. It is assumed that these findings also apply for the manufacturing of personal care and cosmetics products. For that reason, the release factor is set to zero.
Non agricultural soil	Release factor: 0% Local release rate: - kg/day Explanation: Direct releases to soil must be avoided.

11.3 Env CS 2: Environmental contributing scenario for small scale formulation of low viscosity liquids (ERC 2)

11.3.1 Definition

Industrial use in formulation of liquid water-borne cosmetic products - low viscosity liquids (small scale).

11.3.2 Conditions of use

Amount used, frequency and duration of use (or from service life)
<ul style="list-style-type: none"> • Annual use amount at site: <= 20.0 tonnes/year • Percentage of EU tonnage used at regional scale: = 100.0 % • Daily use amount at site: <= 0.08 tonnes/day
Conditions and measures related to biological sewage treatment plant
<ul style="list-style-type: none"> • Application of the STP sludge on agricultural soil: No • Biological STP: Site specific [Effectiveness Water: 88.52%] • Discharge rate of STP: >= 0.0 m3/day
Conditions and measures related to external treatment of waste (including article waste)
<ul style="list-style-type: none"> • Particular considerations on the waste treatment operations: No (low concentration)
Other conditions affecting environmental exposure
<ul style="list-style-type: none"> • Receiving surface water flow rate: >= 18000 m3/day

11.3.3 Releases

Local releases to the environment

Release	Release estimation method	Explanations
Water	Estimated release factor (Industrial use in formulation of liquid water-borne cosmetic products - low	Release factor before on site RMM: 0.2% Release factor after on site RMM: 0.2% Local release rate: 0.16 kg/day Explanation:

Release	Release estimation method	Explanations
	viscosity liquids (small scale))	According to SpERC Cosmetics Europe 2.1c.v2.
Air	Estimated release factor (SpERC Cosmetics Europe 2.1c.v2)	Release factor before on site RMM: 0% Release factor after on site RMM: 0% Local release rate: 0 kg/day
Non agricultural soil	Estimated release factor (SpERC Cosmetics Europe 2.1c.v2)	Release factor after on site RMM: 0%

11.4 Env CS 3: Environmental contributing scenario of formulation of cosmetic products involving cleaning (ERC 2)

11.4.1 Definition

Formulation of cosmetic products involving cleaning with organic solvents (small scale)

11.4.2 Conditions of use

Amount used, frequency and duration of use (or from service life)
<ul style="list-style-type: none"> Annual use amount at site: ≤ 20.0 tonnes/year Percentage of EU tonnage used at regional scale: = 100.0 % Daily use amount at site: ≤ 0.08 tonnes/day <p><i>Default daily use amount is a maximum daily site tonnage (MSpERC value)</i> <i>Emission days (days/year): 250</i> <i>MSpERC can be used by the registrant when starting the environmental assessment. MSpERC represents an indicative worst case value for the substance use rate per site. The MSpERC values have been estimated in dependence of the size of the operation, the number of days emitting, and the concentration of the substance in a finished product (i.e. mixture)</i></p>
Technical and organisational conditions and measures
<ul style="list-style-type: none"> Process efficiency: Process with efficient use of raw materials. Indoor/outdoor use: Indoor use Type of Process: Solvent based process Equipment cleaning: Equipment cleaned with organic solvent, washings are collected and disposed of as solvent waste.
Conditions and measures related to biological sewage treatment plant
<ul style="list-style-type: none"> Application of the STP sludge on agricultural soil: Yes Biological STP: Standard [Effectiveness Water: 88.52%] Discharge rate of STP: ≥ 2000 m³/day
Conditions and measures related to external treatment of waste (including article waste)
<ul style="list-style-type: none"> Particular considerations on the waste treatment operations: No (low risk)
Other conditions affecting environmental exposure
<ul style="list-style-type: none"> Receiving surface water flow rate: ≥ 18000 m³/day

11.4.3 Releases

The releases have been estimated on the basis of SPERC Cosmetics Europe 2.2c.v2: Industrial use in formulation of cosmetic products which involve cleaning of manufacturing equipment with organic solvents - (small scale) (Cosmetics Europe 2.2c.v2: Formulation of cosmetic products involving cleaning with organic solvents (small scale); Formulation of cosmetic products involving cleaning with organic solvents (varnish, removers, decorative cosmetics, spray, lacquer, fine fragrance, solar oil, solid products) (small scale))

Description of activities/processes covered by the SPERC

For economic reasons, formulation of mixtures requires optimized use of raw materials for inclusion into products. Losses of raw materials via volatilization are negligible. Manufacturing equipment is cleaned with organic solvents. The resulting solvent rinsing are collected and disposed of according to local regulations or recycled.

Technical comments:

- Before treatment means: emissions as entering an on-site biological WWTP, or if absent, as leaving the site towards a municipal WWTP.
- It is assumed for simplicity that 1 kg cosmetic product (excl. water) represents ~1 kg COD. Actual average value for the chemical ingredients may range from 1-2.
- Emissions to soil or solid waste are not discussed here, as justified in IFRA (2009), these are considered negligible.

Product/substance domain:

- Covers the whole process of formulation as it occurs in the manufacturing of cosmetic products. This includes storing, mixing, packaging of substances (as part of mixtures) and equipment cleaning, maintenance and associated laboratory activities.
- The SpERCS are relevant for operations which discharge their wastewater to treatment by a municipal sewage treatment plant.
- The SpERCS cover small operations, which produce less than 1,000 tons of finished products per year, respectively.
- Substance domain: all.

Local releases to the environment

Release	Explanations
Water	Release factor: 0% Local release rate: 0 kg/day Explanation: No wastewater treatment required.
Air	Release factor: 0% Local release rate: 0 kg/day Explanation: Air emission controls are not applicable as there is no direct release to air.
Non agricultural soil	Release factor: 0% Local release rate: - kg/day Explanation: Must be avoided

11.5 Worker CS 4: Formulation of cosmetics (PROC 1)

11.5.1 Definition

First steps in formulation of cosmetics with very limited risk of exposure.

11.5.2 Conditions of use

Product (Article) characteristics
<ul style="list-style-type: none"> • Physical form of the used product: Liquid • Percentage (w/w) of substance in mixture/article: <= 100.0 %
Amount used (or contained in articles), frequency and duration of use/exposure
<ul style="list-style-type: none"> • Duration of activity: <= 8.0 h/day
Technical and organisational conditions and measures
<ul style="list-style-type: none"> • Local exhaust ventilation: No [Effectiveness Inhalation: 0%, Dermal: 0%] • Closed process without likelihood of exposure • General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness Inhalation: 0%] • Occupational Health and Safety Management System: Advanced
Conditions and measures related to personal protection, hygiene and health evaluation
<ul style="list-style-type: none"> • Dermal protection: No [Effectiveness Dermal: 0%] • Respiratory Protection: No [Effectiveness Inhalation: 0%]
Other conditions affecting workers exposure

- Skin surface potentially exposed: One hand face only (240 cm²)
- Operating temperature: ≤ 40.0 °C
- Place of use: Indoor

11.6 Worker CS 5: Formulation process including sampling. (PROC 2)

11.6.1 Definition

During the first steps, occasional sampling may be part of the process.

11.6.2 Conditions of use

Product (Article) characteristics
<ul style="list-style-type: none"> • Physical form of the used product: Liquid • Percentage (w/w) of substance in mixture/article: ≤ 100.0 %
Amount used (or contained in articles), frequency and duration of use/exposure
<ul style="list-style-type: none"> • Duration of activity: ≤ 8.0 h/day
Technical and organisational conditions and measures
<ul style="list-style-type: none"> • Local exhaust ventilation: Yes [Effectiveness Inhalation: 90%, Dermal: 0%] • General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness Inhalation: 0%] • Occupational Health and Safety Management System: Advanced • Closed continuous process with occasional controlled exposure
Conditions and measures related to personal protection, hygiene and health evaluation
<ul style="list-style-type: none"> • Dermal protection: Yes (Chemically resistant gloves conforming to EN374) and (other) appropriate dermal protection [Effectiveness Dermal: 80%] <i>Wearing gloves is advisory but not mandatory to achieve sufficient safety.</i> • Respiratory Protection: No [Effectiveness Inhalation: 0%]
Other conditions affecting workers exposure
<ul style="list-style-type: none"> • Skin surface potentially exposed: Two hands face (480 cm²) • Operating temperature: ≤ 40.0 °C • Place of use: Indoor

11.7 Worker CS 6: Batch wise formulation of cosmetic products (PROC 3)

11.7.1 Definition

Batch wise processing of the formulation of cosmetic products under controlled conditions.

11.7.2 Conditions of use

Product (Article) characteristics
<ul style="list-style-type: none"> • Physical form of the used product: Liquid • Percentage (w/w) of substance in mixture/article: ≤ 100.0 %
Amount used (or contained in articles), frequency and duration of use/exposure
<ul style="list-style-type: none"> • Duration of activity: ≤ 8.0 h/day
Technical and organisational conditions and measures
<ul style="list-style-type: none"> • Local exhaust ventilation: No [Effectiveness Inhalation: 0%, Dermal: 0%] <i>It is advisory but not mandatory to apply LEV at the sites of sampling or other process steps where exposure may occur.</i> • General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness Inhalation: 0%] • Occupational Health and Safety Management System: Advanced • Closed batch process with occasional controlled exposure

Conditions and measures related to personal protection, hygiene and health evaluation
<ul style="list-style-type: none"> • Dermal protection: Yes (Chemically resistant gloves conforming to EN374) and (other) appropriate dermal protection [Effectiveness Dermal: 80%] <i>Wearing gloves is advisory but not mandatory to achieve sufficient safety.</i> • Respiratory Protection: No [Effectiveness Inhalation: 0%] • In case of potential risk of exposure of the eyes: wear safety goggles.
Other conditions affecting workers exposure
<ul style="list-style-type: none"> • Skin surface potentially exposed: One hand face only (240 cm²) • Operating temperature: <= 40.0 °C • Place of use: Indoor

11.8 Worker CS 7: Mixing of the substance in formulations. (PROC 5)

11.8.1 Definition

Mixing is a standard part of the formulation of cosmetic products.

11.8.2 Conditions of use

Product (Article) characteristics
<ul style="list-style-type: none"> • Physical form of the used product: Liquid • Percentage (w/w) of substance in mixture/article: <= 5.0 % <i>Possible exposure is only anticipated for the formulation containing less than 5% of the substance in formulation or preparation.</i>
Amount used (or contained in articles), frequency and duration of use/exposure
<ul style="list-style-type: none"> • Duration of activity: <= 8.0 h/day
Technical and organisational conditions and measures
<ul style="list-style-type: none"> • Local exhaust ventilation: No [Effectiveness Inhalation: 0%, Dermal: 0%] • General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness Inhalation: 0%] • Occupational Health and Safety Management System: Advanced
Conditions and measures related to personal protection, hygiene and health evaluation
<ul style="list-style-type: none"> • Dermal protection: Yes (Chemically resistant gloves conforming to EN374) and (other) appropriate dermal protection [Effectiveness Dermal: 80%] <i>Wearing gloves is mandatory to achieve sufficient safety.</i> • Respiratory Protection: No [Effectiveness Inhalation: 0%] • In case of potential risk of exposure of the eyes: wear safety goggles.
Other conditions affecting workers exposure
<ul style="list-style-type: none"> • Skin surface potentially exposed: Two hands face (480 cm²) • Operating temperature: <= 40.0 °C • Place of use: Indoor

11.9 Worker CS 8: Charging of the substance present in formulations or preparations to larger vessels. (PROC 8a)

11.9.1 Definition

Refers to charging of the substance in formulations or preparations; charging of the substance as such should be performed in dedicated facilities.

11.9.2 Conditions of use

Product (Article) characteristics

<ul style="list-style-type: none"> Physical form of the used product: Liquid Percentage (w/w) of substance in mixture/article: <= 5.0 %
Amount used (or contained in articles), frequency and duration of use/exposure
<ul style="list-style-type: none"> Duration of activity: <= 8.0 h/day
Technical and organisational conditions and measures
<ul style="list-style-type: none"> Local exhaust ventilation: No [Effectiveness Inhalation: 0%, Dermal: 0%] General ventilation: Good general ventilation (3-5 air changes per hour) [Effectiveness Inhalation: 30%] <i>Good ventilation is advisory but not mandatory to achieve sufficient safety.</i> Occupational Health and Safety Management System: Advanced
Conditions and measures related to personal protection, hygiene and health evaluation
<ul style="list-style-type: none"> Dermal protection: Yes (Chemically resistant gloves conforming to EN374) and (other) appropriate dermal protection [Effectiveness Dermal: 80%] <i>Wearing gloves is mandatory to achieve sufficient safety. It is advisory to allow for basic employee training where dermal protection increases to 90%.</i> Respiratory Protection: No [Effectiveness Inhalation: 0%] In case of potential risk of exposure of the eyes: wear safety goggles.
Other conditions affecting workers exposure
<ul style="list-style-type: none"> Skin surface potentially exposed: Two hands (960 cm²) Operating temperature: <= 40.0 °C Place of use: Indoor

11.10 Worker CS 9: Transfer of the substance to mixing containers and formulations or preparations containing the substance to smaller containers at dedicated facilities. (PROC 8b)

11.10.1 Definition

Refers to both the charging of the substance as such as well as the substance in the preparations.

11.10.2 Conditions of use

Product (Article) characteristics
<ul style="list-style-type: none"> Physical form of the used product: Liquid Percentage (w/w) of substance in mixture/article: <= 100.0 %
Amount used (or contained in articles), frequency and duration of use/exposure
<ul style="list-style-type: none"> Duration of activity: <= 8.0 h/day
Technical and organisational conditions and measures
<ul style="list-style-type: none"> Local exhaust ventilation: No [Effectiveness Inhalation: 0%, Dermal: 0%] <i>It is advisory but not mandatory to apply LEV at the sites of any process steps where exposure may occur.</i> General ventilation: Good general ventilation (3-5 air changes per hour) [Effectiveness Inhalation: 30%] <i>Good ventilation is advisory but not mandatory to achieve sufficient safety.</i> Occupational Health and Safety Management System: Advanced
Conditions and measures related to personal protection, hygiene and health evaluation
<ul style="list-style-type: none"> Dermal protection: Yes (Chemically resistant gloves conforming to EN374 with specific activity training) and (other) appropriate dermal protection [Effectiveness Dermal: 95%] <i>Dermal exposure to the substance as such should be prevented as much as possible. In case of transfer of the substance as such to other containers, the process should be contained as much as possible to prevent any leaking, splashing or other condition where dermal exposure may occur.</i> Respiratory Protection: No [Effectiveness Inhalation: 0%] In case of potential risk of exposure of the eyes: wear safety goggles.
Other conditions affecting workers exposure

- Skin surface potentially exposed: Two hands (960 cm²)
- Operating temperature: ≤ 40.0 °C
- Place of use: Indoor

11.11 Worker CS 10: Transfer of formulations/preparations containing the substance at relatively low concentrations to smaller containers or packaging on a dedicated filling line. (PROC 9)

11.11.1 Definition

Refers only to the charging of the substance present in the preparations at low percentages.

11.11.2 Conditions of use

Product (Article) characteristics
<ul style="list-style-type: none"> • Physical form of the used product: Liquid • Percentage (w/w) of substance in mixture/article: ≤ 5.0 %
Amount used (or contained in articles), frequency and duration of use/exposure
<ul style="list-style-type: none"> • Duration of activity: ≤ 8.0 h/day
Technical and organisational conditions and measures
<ul style="list-style-type: none"> • Local exhaust ventilation: No [Effectiveness Inhalation: 0%, Dermal: 0%] • General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness Inhalation: 0%] • Occupational Health and Safety Management System: Advanced
Conditions and measures related to personal protection, hygiene and health evaluation
<ul style="list-style-type: none"> • Dermal protection: Yes (Chemically resistant gloves conforming to EN374) and (other) appropriate dermal protection [Effectiveness Dermal: 80%] • Respiratory Protection: No [Effectiveness Inhalation: 0%] • In case of potential risk of exposure of the eyes: wear safety goggles.
Other conditions affecting workers exposure
<ul style="list-style-type: none"> • Skin surface potentially exposed: Two hands face (480 cm²) • Operating temperature: ≤ 40.0 °C • Place of use: Indoor

11.12 Worker CS 11: Production of preparations. (PROC 14)

11.12.1 Definition

Refers only to the substance in preparations or final products.

11.12.2 Conditions of use

Product (Article) characteristics
<ul style="list-style-type: none"> • Physical form of the used product: Liquid • Percentage (w/w) of substance in mixture/article: ≤ 5.0 %
Amount used (or contained in articles), frequency and duration of use/exposure
<ul style="list-style-type: none"> • Duration of activity: ≤ 8.0 h/day
Technical and organisational conditions and measures
<ul style="list-style-type: none"> • Local exhaust ventilation: No [Effectiveness Inhalation: 0%, Dermal: 0%] • General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness Inhalation: 0%] • Occupational Health and Safety Management System: Advanced

Conditions and measures related to personal protection, hygiene and health evaluation
<ul style="list-style-type: none"> • Dermal protection: Yes (Chemically resistant gloves conforming to EN374) and (other) appropriate dermal protection [Effectiveness Dermal: 80%] <i>It is advisory but not mandatory to wear gloves during the process.</i> • Respiratory Protection: No [Effectiveness Inhalation: 0%] • In case of potential risk of exposure of the eyes: wear safety goggles.
Other conditions affecting workers exposure
<ul style="list-style-type: none"> • Skin surface potentially exposed: Two hands face (480 cm²) • Operating temperature: <= 40.0 °C • Place of use: Indoor

11.13 Worker CS 12: Sample and quality checks at laboratory. (PROC 15)

11.13.1 Definition

Checks on small samples from formulations containing the substance at the laboratory.

11.13.2 Conditions of use

Product (Article) characteristics
<ul style="list-style-type: none"> • Physical form of the used product: Liquid • Percentage (w/w) of substance in mixture/article: <= 5.0 %
Amount used (or contained in articles), frequency and duration of use/exposure
<ul style="list-style-type: none"> • Duration of activity: <= 8.0 h/day
Technical and organisational conditions and measures
<ul style="list-style-type: none"> • Local exhaust ventilation: No [Effectiveness Inhalation: 0%, Dermal: 0%] <i>It is advisory but not mandatory to apply LEV at the sites of handling the samples in the laboratory.</i> • General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness Inhalation: 0%] • Occupational Health and Safety Management System: Advanced
Conditions and measures related to personal protection, hygiene and health evaluation
<ul style="list-style-type: none"> • Dermal protection: No [Effectiveness Dermal: 0%] • Respiratory Protection: No [Effectiveness Inhalation: 0%] • In case of potential risk of exposure of the eyes: wear safety goggles.
Other conditions affecting workers exposure
<ul style="list-style-type: none"> • Skin surface potentially exposed: One hand face only (240 cm²) • Operating temperature: <= 40.0 °C • Place of use: Indoor

12. Exposure scenario 11: Widespread use by professional workers - Professional use of cosmetics

12.1 Short description

Environment contributing scenario(s):		
CS 1	Professional use of cosmetics	ERC 8a

12.2 Env CS 1: Professional use of cosmetics (ERC 8a)

12.2.1 Definition

Wide dispersive professional use of cosmetic products.

12.2.2 Conditions of use

Amount used, frequency and duration of use (or from service life)
<ul style="list-style-type: none"> Percentage of EU tonnage used at regional scale: = 10.0 % Daily local widespread use amount: <= 0.000016 tonnes/day
Conditions and measures related to biological sewage treatment plant
<ul style="list-style-type: none"> Biological STP: Standard [Effectiveness Water: 88.52%]
Conditions and measures related to external treatment of waste (including article waste)
<ul style="list-style-type: none"> Particular considerations on the waste treatment operations: No (low risk)

12.2.3 Releases

The local releases to the environment are reported in the following table. Note that the releases reported do not account for the removal in the modelled biological STP.

Local releases to the environment

Release	Release estimation method	Explanations
Water	ERC based	Release factor before on site RMM: 100% Release factor after on site RMM: 100% Local release rate: 0.017 kg/day
Air	ERC based	Release factor before on site RMM: 100% Release factor after on site RMM: 100%
Non agricultural soil	ERC based	Release factor after on site RMM: 0%

13. Exposure scenario 12: Consumer use - Consumer Use of hair care products

13.1 Short description

Environment contributing scenario(s):		
CS 1	Consumer Use of hair care products	ERC 8a

13.2 Conditions of use

Amount used, frequency and duration of use (or from service life)
<ul style="list-style-type: none"> Percentage of EU tonnage used at regional scale: = 10.0 % Daily local widespread use amount: <= 0.000016 tonnes/day <p><i>WARNING: According to this SPERC, the default daily use amount can be refined from the default. To that end, divide the default value of the amount used locally by a factor of 5 and substitute the result for the default value.</i></p> <p><i>In case of refinement, keep only the following explanation: The default value of the amount used locally has been divided by a factor of 5. This is justified by refined information on the consumption pattern of cosmetics and personal care products. According to this information, the Fraction of EU tonnage used in region (FRegion) is 0.053 (default: 0.1) and the Fraction of Regional tonnage used locally (FMainLocalSource) is 0.00075 (default is 0.002).</i></p>
Conditions and measures related to external treatment of waste (including article waste)
<ul style="list-style-type: none"> Particular considerations on the waste treatment operations: No (low risk)
Other conditions affecting environmental exposure
<ul style="list-style-type: none"> Biological STP: Standard [Effectiveness Water: 88.52%] Type of process: Spraying of involatile solids, which finally are disposed off via wastewater. Indoor/outdoor use: Indoor Use

13.3 Releases

The releases have been estimated on the basis of SPERC Cosmetics Europe 8a.1c.v2: Wide Dispersive Use of Cosmetic Products - Aerosol products for hair and skin care (non-propellants)
(Cosmetics Europe 8a.1c.v2: Wide dispersive use of Aerosol products for hair and skin care (non-propellants); Aerosol products (non-propellants): non-volatiles)

Description of activities/processes covered by the SPERC

The quantitative risk characterisation for this environmental exposure has been calculated using name of calculation model uses. The environmental exposure calculation per compartment is based on name of algorithms used (i.e. the algorithms of the EU TGD 2003 Risk Assessment Spreadsheet Model 1.24a)

Product/substance domain: Covers the use of substances in cosmetic products (e.g. hair care, oral care, body care and deodorants) for end users.

Substance Domain: Aerosol products (Non-Propellants): Non-volatiles

Local releases to the environment

Release	Explanations
Water	<p>Release factor: 100%</p> <p>Local release rate: 0.017 kg/day</p> <p>Explanation: Nonvolatile constituents personal care spray products (and other “leave-on” products that are not washed off immediately) will deposit on the skin surface and will be transferred to the waste water system in the next washing event.</p>
Air	<p>Release factor: 0%</p> <p>Local release rate: - kg/day</p> <p>Explanation: Nonvolatile constituents personal care spray products (and other “leave-on” products that are not washed off immediately) will deposit on the skin surface and will be transferred to the waste water system in the next washing event.</p>
Non agricultural soil	<p>Release factor: 0%</p> <p>Local release rate: - kg/day</p> <p>Explanation: Nonvolatile constituents personal care spray products (and other “leave-on” products that are not washed off immediately) will deposit on the skin surface and will be transferred to the waste water system in the next washing event.</p>

Releases to waste

Release factor to external waste: 0 %

Nonvolatile constituents personal care spray products (and other “leave-on” products that are not washed off immediately) will deposit on the skin surface and will be transferred to the waste water system in the next washing event.

14. Exposure scenario 13: Formulation or re-packing - Formulation of waterborne coatings, pigments & adhesives

14.1 Short description

Environment contributing scenario(s):		
CS 1	Formulation of waterborne coatings, pigments & adhesives	ERC 2
Worker contributing scenario(s):		
CS 2	Batch wise formulation of waterborne coatings, pigments & adhesives with only incidental exposure	PROC 3
CS 3	Mixing of waterborne coatings, pigments & adhesives	PROC 5
CS 4	Bulk transfer of waterborne coatings, pigments & adhesives	PROC 8a
CS 5	Bulk transfer of waterborne coatings, pigments & adhesives at dedicated facilities.	PROC 8b
CS 6	Transfer of waterborne coatings, pigments & adhesives to small containers using a dedicated filling line.	PROC 9
CS 7	Quality control of samples taken from waterborne coatings, pigments & adhesives in a laboratory.	PROC 15

Further description of the use:

Approximately 2.5% of the total tonnage per year is used for formulation of waterborne coatings and adhesives the number of sites is < 10. The maximum tonnage formulated on one site is set at 2.5 t/y. The minimum number of emission days for such a site is set at 50 days per year, i.e. approximately once a week.

14.2 Env CS 1: Formulation of waterborne coatings, pigments & adhesives (ERC 2)

14.2.1 Conditions of use

Amount used, frequency and duration of use (or from service life)
<ul style="list-style-type: none"> Annual use amount at site: <= 2.5 tonnes/year Daily use amount at site: <= 0.01 tonnes/day <p><i>The default daily use amount is the substance maximum use rate in a typical operation (M_{sperc}). It is a typical site tonnage, based on sector knowledge. 220 emission days per year are assumed.</i></p>
Technical and organisational conditions and measures
<ul style="list-style-type: none"> Indoor/outdoor use: Indoor use Type of Process: Solvent based process Equipment cleaning: Equipment cleaned with organic solvent, washings are collected and disposed of as solvent waste. Process efficiency: Process with efficient use of raw materials.
Conditions and measures related to biological sewage treatment plant
<ul style="list-style-type: none"> Application of the STP sludge on agricultural soil: Yes Biological STP: Standard [Effectiveness Water: 88.52%] Discharge rate of STP: >= 2000 m³/day
Conditions and measures related to external treatment of waste (including article waste)
<ul style="list-style-type: none"> Particular considerations on the waste treatment operations

14.2.2 Releases

Note that the releases reported do not account for the removal in the modelled biological STP.

Local releases to the environment

Release	Release estimation method	Explanations
Water	ERC based	Release factor before on site RMM: 2% Release factor after on site RMM: 2% Local release rate: 0.2 kg/day
Air	ERC based	Release factor before on site RMM: 2.5% Release factor after on site RMM: 2.5% Local release rate: 0.25 kg/day
Non agricultural soil	ERC based	Release factor after on site RMM: 0.01%

14.3 Worker CS 2: Batch wise formulation of waterborne coatings, pigments & adhesives with only incidental exposure (PROC 3)

14.3.1 Definition

Batch wise processing with various constituents where only shortly controlled exposure may occur to the respective mixtures or formulations.

14.3.2 Conditions of use

Product (Article) characteristics
<ul style="list-style-type: none"> Physical form of the used product: Liquid Percentage (w/w) of substance in mixture/article: <= 100.0 %
Amount used (or contained in articles), frequency and duration of use/exposure
<ul style="list-style-type: none"> Duration of activity: <= 8.0 h/day
Technical and organisational conditions and measures
<ul style="list-style-type: none"> Local exhaust ventilation: No [Effectiveness Inhalation: 0%, Dermal: 0%] General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness Inhalation: 0%] Occupational Health and Safety Management System: Advanced Closed batch process with occasional controlled exposure
Conditions and measures related to personal protection, hygiene and health evaluation
<ul style="list-style-type: none"> Dermal protection: No [Effectiveness Dermal: 0%] Respiratory Protection: No [Effectiveness Inhalation: 0%] In case of potential risk of exposure of the eyes: wear safety goggles.
Other conditions affecting workers exposure
<ul style="list-style-type: none"> Skin surface potentially exposed: One hand face only (240 cm²) Operating temperature: <= 40.0 °C Place of use: Indoor

14.4 Worker CS 3: Mixing of waterborne coatings, pigments & adhesives (PROC 5)

14.4.1 Definition

Batch wise mixing where only controlled exposure may occur to the respective mixtures or formulations.

14.4.2 Conditions of use

Product (Article) characteristics
<ul style="list-style-type: none"> Physical form of the used product: Liquid Percentage (w/w) of substance in mixture/article: <= 5.0 %
Amount used (or contained in articles), frequency and duration of use/exposure
<ul style="list-style-type: none"> Duration of activity: <= 8.0 h/day
Technical and organisational conditions and measures
<ul style="list-style-type: none"> Local exhaust ventilation: No [Effectiveness Inhalation: 0%, Dermal: 0%] General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness Inhalation: 0%] Occupational Health and Safety Management System: Advanced
Conditions and measures related to personal protection, hygiene and health evaluation
<ul style="list-style-type: none"> Dermal protection: Yes (Chemically resistant gloves conforming to EN374) and (other) appropriate dermal protection [Effectiveness Dermal: 80%] Respiratory Protection: No [Effectiveness Inhalation: 0%] In case of potential risk of exposure of the eyes: wear safety goggles.
Other conditions affecting workers exposure
<ul style="list-style-type: none"> Skin surface potentially exposed: Two hands face (480 cm²) Operating temperature: <= 40.0 °C Place of use: Indoor

14.5 Worker CS 4: Bulk transfer of waterborne coatings, pigments & adhesives (PROC 8a)

14.5.1 Definition

Non-dedicated transfer of bulk amounts to system vessels for formulation purposes with possible significant exposure.

14.5.2 Conditions of use

Product (Article) characteristics
<ul style="list-style-type: none"> Physical form of the used product: Liquid Percentage (w/w) of substance in mixture/article: <= 5.0 %
Amount used (or contained in articles), frequency and duration of use/exposure
<ul style="list-style-type: none"> Duration of activity: <= 1.0 h/day
Technical and organisational conditions and measures
<ul style="list-style-type: none"> Local exhaust ventilation: No [Effectiveness Inhalation: 0%, Dermal: 0%] General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness Inhalation: 0%] Occupational Health and Safety Management System: Advanced
Conditions and measures related to personal protection, hygiene and health evaluation
<ul style="list-style-type: none"> Dermal protection: Yes (Chemically resistant gloves conforming to EN374) and (other) appropriate dermal protection [Effectiveness Dermal: 80%] Respiratory Protection: No [Effectiveness Inhalation: 0%] In case of potential risk of exposure of the eyes: wear safety goggles.
Other conditions affecting workers exposure
<ul style="list-style-type: none"> Skin surface potentially exposed: Two hands (960 cm²) Operating temperature: <= 40.0 °C Place of use: Indoor

14.6 Worker CS 5: Bulk transfer of waterborne coatings, pigments & adhesives at dedicated facilities. (PROC 8b)

14.6.1 Definition

Dedicated transfer of bulk amounts to system vessels for formulation purposes with possible but controlled exposure.

14.6.2 Conditions of use

Product (Article) characteristics
<ul style="list-style-type: none"> Physical form of the used product: Liquid Percentage (w/w) of substance in mixture/article: $\leq 5.0\%$
Amount used (or contained in articles), frequency and duration of use/exposure
<ul style="list-style-type: none"> Duration of activity: ≤ 8.0 h/day
Technical and organisational conditions and measures
<ul style="list-style-type: none"> Local exhaust ventilation: No [Effectiveness Inhalation: 0%, Dermal: 0%] General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness Inhalation: 0%] Occupational Health and Safety Management System: Advanced
Conditions and measures related to personal protection, hygiene and health evaluation
<ul style="list-style-type: none"> Dermal protection: Yes (Chemically resistant gloves conforming to EN374) and (other) appropriate dermal protection [Effectiveness Dermal: 80%] Respiratory Protection: No [Effectiveness Inhalation: 0%] In case of potential risk of exposure of the eyes: wear safety goggles.
Other conditions affecting workers exposure
<ul style="list-style-type: none"> Skin surface potentially exposed: Two hands (960 cm²) Operating temperature: ≤ 40.0 °C Place of use: Indoor

14.7 Worker CS 6: Transfer of waterborne coatings, pigments & adhesives to small containers using a dedicated filling line. (PROC 9)

14.7.1 Definition

Dedicated transfer of formulations containing the substance to smaller containers with possible but controlled exposure.

14.7.2 Conditions of use

Product (Article) characteristics
<ul style="list-style-type: none"> Physical form of the used product: Liquid Percentage (w/w) of substance in mixture/article: $\leq 5.0\%$
Amount used (or contained in articles), frequency and duration of use/exposure
<ul style="list-style-type: none"> Duration of activity: ≤ 8.0 h/day
Technical and organisational conditions and measures
<ul style="list-style-type: none"> Local exhaust ventilation: No [Effectiveness Inhalation: 0%, Dermal: 0%] General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness Inhalation: 0%] Occupational Health and Safety Management System: Advanced
Conditions and measures related to personal protection, hygiene and health evaluation
<ul style="list-style-type: none"> Dermal protection: Yes (Chemically resistant gloves conforming to EN374) and (other) appropriate dermal protection [Effectiveness Dermal: 80%] Respiratory Protection: No [Effectiveness Inhalation: 0%]

<ul style="list-style-type: none"> • In case of potential risk of exposure of the eyes: wear safety goggles.
Other conditions affecting workers exposure
<ul style="list-style-type: none"> • Skin surface potentially exposed: Two hands face (480 cm²) • Operating temperature: ≤ 40.0 °C • Place of use: Indoor

14.8 Worker CS 7: Quality control of samples taken from waterborne coatings, pigments & adhesives in a laboratory. (PROC 15)

14.8.1 Definition

Checks on small samples from formulations containing the substance at the laboratory.

14.8.2 Conditions of use

Product (Article) characteristics
<ul style="list-style-type: none"> • Physical form of the used product: Liquid • Percentage (w/w) of substance in mixture/article: ≤ 5.0 %
Amount used (or contained in articles), frequency and duration of use/exposure
<ul style="list-style-type: none"> • Duration of activity: ≤ 8.0 h/day
Technical and organisational conditions and measures
<ul style="list-style-type: none"> • Local exhaust ventilation: No [Effectiveness Inhalation: 0%, Dermal: 0%] • General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness Inhalation: 0%] • Occupational Health and Safety Management System: Advanced
Conditions and measures related to personal protection, hygiene and health evaluation
<ul style="list-style-type: none"> • Dermal protection: Yes (Chemically resistant gloves conforming to EN374) and (other) appropriate dermal protection [Effectiveness Dermal: 80%] • Respiratory Protection: No [Effectiveness Inhalation: 0%] • In case of potential risk of exposure of the eyes: wear safety goggles.
Other conditions affecting workers exposure
<ul style="list-style-type: none"> • Skin surface potentially exposed: One hand face only (240 cm²) • Operating temperature: ≤ 40.0 °C • Place of use: Indoor

15. Exposure scenario 14: Use at industrial sites - Use at industrial site of waterborne coatings, pigments or adhesives

15.1 Short description

Environment contributing scenario(s):		
CS 1	Use at industrial site of waterborne coatings, pigments or adhesives	ERC 5
Worker contributing scenario(s):		
CS 2	Industrial use of waterborne coatings, pigments or adhesives in contained processing	PROC 1
CS 3	Industrial use of waterborne coatings, pigments or adhesives in closed systems with occasional sampling.	PROC 2
CS 4	Industrial use of waterborne coatings, pigments or adhesives in contained batch wise processing	PROC 3
CS 5	Industrial use of waterborne coatings, pigments or adhesives in only partially contained processing.	PROC 4
CS 6	Industrial use of waterborne coatings, pigments or adhesives in processes which include mixing or blending	PROC 5
CS 7	Industrial spraying of waterborne coatings, pigments or adhesives	PROC 7
CS 8	Industrial bulk transfer of waterborne coatings, pigments or adhesives	PROC 8a
CS 9	Dedicated industrial bulk transfer of waterborne coatings, pigments or adhesives	PROC 8b
CS 10	Industrial application of waterborne coatings, pigments or adhesives by roller or brush.	PROC 10
CS 11	Industrial dipping or pouring processes with waterborne coatings, pigments or adhesives	PROC 13

15.2 Env CS 1: Use at industrial site of waterborne coatings, pigments or adhesives (ERC 5)

15.2.1 Conditions of use

Amount used, frequency and duration of use (or from service life)
<ul style="list-style-type: none"> • Annual use amount at site: <= 1.0 tonnes/year • Percentage of EU tonnage used at regional scale: = 100.0 % • Daily use amount at site: <= 0.01 tonnes/day <p><i>The minimum number of emission days for use at an industrial site is set a 100 per year, i.e. approximately twice a week.</i></p>
Conditions and measures related to biological sewage treatment plant
<ul style="list-style-type: none"> • Application of the STP sludge on agricultural soil: Yes • Biological STP: Standard [Effectiveness Water: 88.52%] • Discharge rate of STP: >= 2000 m3/day
Conditions and measures related to external treatment of waste (including article waste)
<ul style="list-style-type: none"> • Particular considerations on the waste treatment operations: No (low amount)
Other conditions affecting environmental exposure
<ul style="list-style-type: none"> • Receiving surface water flow rate: >= 18000 m3/day

15.2.2 Releases

Note that the releases reported do not account for the removal in the modelled biological STP.

Local releases to the environment

Release	Release estimation method	Explanations
Water	Estimated release factor	Release factor before on site RMM: 1% Release factor after on site RMM: 1% Local release rate: 0.1 kg/day
Air	Estimated release factor	Release factor before on site RMM: 1% Release factor after on site RMM: 1% Local release rate: 0.1 kg/day
Non agricultural soil	ERC based	Release factor after on site RMM: 1%

15.3 Worker CS 2: Industrial use of waterborne coatings, pigments or adhesives in contained processing (PROC 1)

15.3.1 Definition

First steps in formulation of cosmetics with very limited risk of exposure.

15.3.2 Conditions of use

Product (Article) characteristics
<ul style="list-style-type: none"> Physical form of the used product: Liquid Percentage (w/w) of substance in mixture/article: <= 5.0 %
Amount used (or contained in articles), frequency and duration of use/exposure
<ul style="list-style-type: none"> Duration of activity: <= 8.0 h/day
Technical and organisational conditions and measures
<ul style="list-style-type: none"> Local exhaust ventilation: No [Effectiveness Inhalation: 0%, Dermal: 0%] Closed process without likelihood of exposure General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness Inhalation: 0%] Occupational Health and Safety Management System: Advanced
Conditions and measures related to personal protection, hygiene and health evaluation
<ul style="list-style-type: none"> Dermal protection: No [Effectiveness Dermal: 0%] Respiratory Protection: No [Effectiveness Inhalation: 0%]
Other conditions affecting workers exposure
<ul style="list-style-type: none"> Skin surface potentially exposed: One hand face only (240 cm²) Operating temperature: <= 40.0 °C Place of use: Indoor

15.4 Worker CS 3: Industrial use of waterborne coatings, pigments or adhesives in closed systems with occasional sampling. (PROC 2)

15.4.1 Definition

During the first steps, occasional sampling may be part of the process.

15.4.2 Conditions of use

Product (Article) characteristics
<ul style="list-style-type: none"> Physical form of the used product: Liquid Percentage (w/w) of substance in mixture/article: <= 5.0 %

Amount used (or contained in articles), frequency and duration of use/exposure
• Duration of activity: <= 8.0 h/day
Technical and organisational conditions and measures
• Local exhaust ventilation: No [Effectiveness Inhalation: 0%, Dermal: 0%] • General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness Inhalation: 0%] • Occupational Health and Safety Management System: Advanced • Closed continuous process with occasional controlled exposure
Conditions and measures related to personal protection, hygiene and health evaluation
• Dermal protection: No [Effectiveness Dermal: 0%] • Respiratory Protection: No [Effectiveness Inhalation: 0%]
Other conditions affecting workers exposure
• Skin surface potentially exposed: Two hands face (480 cm ²) • Operating temperature: <= 40.0 °C • Place of use: Indoor

15.5 Worker CS 4: Industrial use of waterborne coatings, pigments or adhesives in contained batch wise processing (PROC 3)

15.5.1 Definition

Batch wise processing where only shortly controlled exposure may occur to the respective mixtures or formulations.

15.5.2 Conditions of use

Product (Article) characteristics
• Physical form of the used product: Liquid • Percentage (w/w) of substance in mixture/article: <= 5.0 %
Amount used (or contained in articles), frequency and duration of use/exposure
• Duration of activity: <= 8.0 h/day
Technical and organisational conditions and measures
• Local exhaust ventilation: No [Effectiveness Inhalation: 0%, Dermal: 0%] • General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness Inhalation: 0%] • Occupational Health and Safety Management System: Advanced • Closed batch process with occasional controlled exposure
Conditions and measures related to personal protection, hygiene and health evaluation
• Dermal protection: No [Effectiveness Dermal: 0%] • Respiratory Protection: No [Effectiveness Inhalation: 0%] • In case of potential risk of exposure of the eyes: wear safety goggles.
Other conditions affecting workers exposure
• Skin surface potentially exposed: One hand face only (240 cm ²) • Operating temperature: <= 40.0 °C • Place of use: Indoor

15.6 Worker CS 5: Industrial use of waterborne coatings, pigments or adhesives in only partially contained processing. (PROC 4)

15.6.1 Definition

Partially contained processing where worker exposure may occur shortly to the respective mixtures or formulations.

15.6.2 Conditions of use

Product (Article) characteristics
<ul style="list-style-type: none"> Physical form of the used product: Liquid Percentage (w/w) of substance in mixture/article: <= 5.0 %
Amount used (or contained in articles), frequency and duration of use/exposure
<ul style="list-style-type: none"> Duration of activity: <= 8.0 h/day
Technical and organisational conditions and measures
<ul style="list-style-type: none"> Local exhaust ventilation: Yes [Effectiveness Inhalation: 90%, Dermal: 0%] General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness Inhalation: 0%] Occupational Health and Safety Management System: Advanced
Conditions and measures related to personal protection, hygiene and health evaluation
<ul style="list-style-type: none"> Dermal protection: Yes (Chemically resistant gloves conforming to EN374) and (other) appropriate dermal protection [Effectiveness Dermal: 80%] Respiratory Protection: No [Effectiveness Inhalation: 0%] In case of potential risk of exposure of the eyes: wear safety goggles.
Other conditions affecting workers exposure
<ul style="list-style-type: none"> Skin surface potentially exposed: Two hands face (480 cm²) Operating temperature: <= 40.0 °C Place of use: Indoor

15.7 Worker CS 6: Industrial use of waterborne coatings, pigments or adhesives in processes which include mixing or blending (PROC 5)

15.7.1 Definition

Batch wise mixing where only controlled exposure may occur to the respective mixtures or formulations.

15.7.2 Conditions of use

Product (Article) characteristics
<ul style="list-style-type: none"> Physical form of the used product: Liquid Percentage (w/w) of substance in mixture/article: <= 5.0 %
Amount used (or contained in articles), frequency and duration of use/exposure
<ul style="list-style-type: none"> Duration of activity: <= 8.0 h/day
Technical and organisational conditions and measures
<ul style="list-style-type: none"> Local exhaust ventilation: No [Effectiveness Inhalation: 0%, Dermal: 0%] General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness Inhalation: 0%] Occupational Health and Safety Management System: Advanced
Conditions and measures related to personal protection, hygiene and health evaluation
<ul style="list-style-type: none"> Dermal protection: Yes (Chemically resistant gloves conforming to EN374) and (other) appropriate dermal protection [Effectiveness Dermal: 80%] Respiratory Protection: No [Effectiveness Inhalation: 0%] In case of potential risk of exposure of the eyes: wear safety goggles.
Other conditions affecting workers exposure
<ul style="list-style-type: none"> Skin surface potentially exposed: Two hands face (480 cm²) Operating temperature: <= 40.0 °C Place of use: Indoor

15.8 Worker CS 7: Industrial spraying of waterborne coatings, pigments or adhesives (PROC 7)

15.8.1 Definition

Large-scale coating factories have installed spray booths with heating and air movement devices to increase production by reducing curing time. Smaller scale industries may use workers for manual spraying with spray guns. Control measures should be applied to limit possible exposure as much as possible.

15.8.2 Conditions of use

Product (Article) characteristics
<ul style="list-style-type: none"> Physical form of the used product: Liquid Percentage (w/w) of substance in mixture/article: $\leq 5.0\%$
Amount used (or contained in articles), frequency and duration of use/exposure
<ul style="list-style-type: none"> Duration of activity: ≤ 4.0 h/day
Technical and organisational conditions and measures
<ul style="list-style-type: none"> Local exhaust ventilation: Yes [Effectiveness Inhalation: 95%, Dermal: 0%] General ventilation: Enhanced general ventilation (5-10 air changes per hour) [Effectiveness Inhalation: 70%] Occupational Health and Safety Management System: Advanced
Conditions and measures related to personal protection, hygiene and health evaluation
<ul style="list-style-type: none"> Dermal protection: Yes (Chemically resistant gloves conforming to EN374 with specific activity training) and (other) appropriate dermal protection [Effectiveness Dermal: 95%] Respiratory Protection: No [Effectiveness Inhalation: 0%] In case of potential risk of exposure of the eyes: wear safety goggles.
Other conditions affecting workers exposure
<ul style="list-style-type: none"> Skin surface potentially exposed: Two hands and upper wrists (1500 cm²) Operating temperature: ≤ 40.0 °C Place of use: Indoor

15.9 Worker CS 8: Industrial bulk transfer of waterborne coatings, pigments or adhesives (PROC 8a)

15.9.1 Definition

Non-dedicated transfer of bulk amounts to system vessels for formulation purposes with possible significant exposure.

15.9.2 Conditions of use

Product (Article) characteristics
<ul style="list-style-type: none"> Physical form of the used product: Liquid Percentage (w/w) of substance in mixture/article: $\leq 5.0\%$
Amount used (or contained in articles), frequency and duration of use/exposure
<ul style="list-style-type: none"> Duration of activity: ≤ 8.0 h/day
Technical and organisational conditions and measures
<ul style="list-style-type: none"> Local exhaust ventilation: No [Effectiveness Inhalation: 0%, Dermal: 0%] General ventilation: Good general ventilation (3-5 air changes per hour) [Effectiveness Inhalation: 30%] Occupational Health and Safety Management System: Advanced
Conditions and measures related to personal protection, hygiene and health evaluation
<ul style="list-style-type: none"> Dermal protection: Yes (Chemically resistant gloves conforming to EN374) and (other) appropriate dermal protection

[Effectiveness Dermal: 80%] <ul style="list-style-type: none"> • Respiratory Protection: No [Effectiveness Inhalation: 0%] • In case of potential risk of exposure of the eyes: wear safety goggles.
Other conditions affecting workers exposure
<ul style="list-style-type: none"> • Skin surface potentially exposed: Two hands (960 cm²) • Operating temperature: ≤ 40.0 °C • Place of use: Indoor

15.10 Worker CS 9: Dedicated industrial bulk transfer of waterborne coatings, pigments or adhesives (PROC 8b)

15.10.1 Definition

Dedicated transfer of bulk amounts to system vessels for formulation purposes with possible but controlled exposure.

15.10.2 Conditions of use

Product (Article) characteristics
<ul style="list-style-type: none"> • Physical form of the used product: Liquid • Percentage (w/w) of substance in mixture/article: ≤ 5.0 %
Amount used (or contained in articles), frequency and duration of use/exposure
<ul style="list-style-type: none"> • Duration of activity: ≤ 8.0 h/day
Technical and organisational conditions and measures
<ul style="list-style-type: none"> • Local exhaust ventilation: No [Effectiveness Inhalation: 0%, Dermal: 0%] • General ventilation: Good general ventilation (3-5 air changes per hour) [Effectiveness Inhalation: 30%] • Occupational Health and Safety Management System: Advanced
Conditions and measures related to personal protection, hygiene and health evaluation
<ul style="list-style-type: none"> • Dermal protection: Yes (Chemically resistant gloves conforming to EN374) and (other) appropriate dermal protection [Effectiveness Dermal: 80%] • Respiratory Protection: No [Effectiveness Inhalation: 0%] • In case of potential risk of exposure of the eyes: wear safety goggles.
Other conditions affecting workers exposure
<ul style="list-style-type: none"> • Skin surface potentially exposed: Two hands (960 cm²) • Operating temperature: ≤ 40.0 °C • Place of use: Indoor

15.11 Worker CS 10: Industrial application of waterborne coatings, pigments or adhesives by roller or brush. (PROC 10)

15.11.1 Definition

Industrial application by brush, roller and pressure pads are defined as machinal or manual methods of application for architectural and industrial maintenance coatings. Control measures should be applied to limit as much as possible eventual exposure of the workers involved.

15.11.2 Conditions of use

Product (Article) characteristics
<ul style="list-style-type: none"> • Physical form of the used product: Liquid • Percentage (w/w) of substance in mixture/article: ≤ 5.0 %
Amount used (or contained in articles), frequency and duration of use/exposure
<ul style="list-style-type: none"> • Duration of activity: ≤ 8.0 h/day

Technical and organisational conditions and measures
<ul style="list-style-type: none"> • Local exhaust ventilation: Yes [Effectiveness Inhalation: 90%, Dermal: 0%] • General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness Inhalation: 0%] • Occupational Health and Safety Management System: Advanced
Conditions and measures related to personal protection, hygiene and health evaluation
<ul style="list-style-type: none"> • Dermal protection: Yes (Chemically resistant gloves conforming to EN374 with basic employee training) and (other) appropriate dermal protection [Effectiveness Dermal: 90%] • Respiratory Protection: No [Effectiveness Inhalation: 0%] • In case of potential risk of exposure of the eyes: wear safety goggles.
Other conditions affecting workers exposure
<ul style="list-style-type: none"> • Skin surface potentially exposed: Two hands (960 cm²) • Operating temperature: <= 40.0 °C • Place of use: Indoor

15.12 Worker CS 11: Industrial dipping or pouring processes with waterborne coatings, pigments or adhesives (PROC 13)

15.12.1 Definition

Dipping and pouring processes at industrial level under controlled conditions with preventive measures to limit worker exposure as much as possible.

15.12.2 Conditions of use

Product (Article) characteristics
<ul style="list-style-type: none"> • Physical form of the used product: Liquid • Percentage (w/w) of substance in mixture/article: <= 5.0 %
Amount used (or contained in articles), frequency and duration of use/exposure
<ul style="list-style-type: none"> • Duration of activity: <= 8.0 h/day
Technical and organisational conditions and measures
<ul style="list-style-type: none"> • Local exhaust ventilation: No [Effectiveness Inhalation: 0%, Dermal: 0%] <i>The use of an LEV at the working site is advised but not mandatory to assure safety.</i> • General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness Inhalation: 0%] • Occupational Health and Safety Management System: Advanced
Conditions and measures related to personal protection, hygiene and health evaluation
<ul style="list-style-type: none"> • Dermal protection: Yes (Chemically resistant gloves conforming to EN374) and (other) appropriate dermal protection [Effectiveness Dermal: 80%] • Respiratory Protection: No [Effectiveness Inhalation: 0%] • In case of potential risk of exposure of the eyes: wear safety goggles.
Other conditions affecting workers exposure
<ul style="list-style-type: none"> • Skin surface potentially exposed: Two hands face (480 cm²) • Operating temperature: <= 40.0 °C • Place of use: Indoor

16. Exposure scenario 15: Widespread use by professional workers - Use of waterborne coatings, pigments or adhesives by professional worker

16.1 Short description

Environment contributing scenario(s):		
CS 1	Use of waterborne coatings, pigments or adhesives by professional workers	ERC 8f
Worker contributing scenario(s):		
CS 2	Professional use of waterborne coatings, pigments or adhesives	PROC 10

16.2 Conditions of use

Amount used, frequency and duration of use (or from service life)
<ul style="list-style-type: none"> Percentage of EU tonnage used at regional scale: = 10.0 % Daily local widespread use amount: <= 0.00000055 tonnes/day
Conditions and measures related to biological sewage treatment plant
<ul style="list-style-type: none"> Biological STP: Standard [Effectiveness Water: 88.52%]
Conditions and measures related to external treatment of waste (including article waste)
<ul style="list-style-type: none"> Particular considerations on the waste treatment operations: No (low risk)

16.3 Releases

Note that the releases reported do not account for the removal in the modelled biological STP.

Table 9.89. Local releases to the environment

Release	Release estimation method	Explanations
Water	ERC based	Release factor before on site RMM: 5% Release factor after on site RMM: 5% Local release rate: 2.75E-5 kg/day
Air	ERC based	Release factor before on site RMM: 15% Release factor after on site RMM: 15%
Non agricultural soil	ERC based	Release factor after on site RMM: 0.5%

16.4 Worker CS 2: Professional use of waterborne coatings, pigments or adhesives (PROC 10)

16.4.1 Definition

Professional use by handling formulations containing the substance diluted in water with possible exposure to relatively low concentrations ($\leq 5\%$).

16.4.2 Conditions of use

Product (Article) characteristics
<ul style="list-style-type: none"> Physical form of the used product: Liquid Percentage (w/w) of substance in mixture/article: <= 5.0 %
Amount used (or contained in articles), frequency and duration of use/exposure

• Duration of activity: <= 4.0 h/day
Technical and organisational conditions and measures
<ul style="list-style-type: none"> • Local exhaust ventilation: Yes [Effectiveness Inhalation: 80%, Dermal: 0%] • General ventilation: Good general ventilation (3-5 air changes per hour) [Effectiveness Inhalation: 30%] • Occupational Health and Safety Management System: Basic
Conditions and measures related to personal protection, hygiene and health evaluation
<ul style="list-style-type: none"> • Dermal protection: Yes (Chemically resistant gloves conforming to EN374) and (other) appropriate dermal protection [Effectiveness Dermal: 80%] • Respiratory Protection: Yes (Respirator with APF of 10) [Effectiveness Inhalation: 90%] • In case of potential risk of exposure of the eyes: wear safety goggles.
Other conditions affecting workers exposure
<ul style="list-style-type: none"> • Skin surface potentially exposed: Two hands (960 cm²) • Operating temperature: <= 40.0 °C • Place of use: Indoor

17. Exposure scenario 16: Consumer use - Consumer use of waterborne coatings, pigments or adhesives

17.1 Short description

Environment contributing scenario(s):		
CS 1	Consumer use of waterborne coatings, pigments or adhesives	ERC 8f
Consumer contributing scenario(s):		
CS 2	Consumer contributing scenario [edit]	PC 1
CS 3	Consumer contributing scenario [edit]	PC 9a

17.2 Env CS 1: Consumer use of waterborne coatings, pigments or adhesives (ERC 8f)

17.2.1 Conditions of use

Amount used, frequency and duration of use (or from service life)
<ul style="list-style-type: none"> • Percentage of EU tonnage used at regional scale: = 10.0 % • Daily local widespread use amount: <= 0.00000028 tonnes/day
Conditions and measures related to external treatment of waste (including article waste)
• Particular considerations on the waste treatment operations: No (low risk)
Other conditions affecting environmental exposure
• Biological STP: Standard [Effectiveness Water: 88.52%]

17.2.2 Releases

The local releases to the environment are reported in the following table. Note that the releases reported do not account for the removal in the modelled biological STP.

Local releases to the environment

Release	Release estimation method	Explanations
Water	ERC based	Release factor before on site RMM: 5% Release factor after on site RMM: 5%

Release	Release estimation method	Explanations
		Local release rate: 1.38E-5 kg/day
Air	ERC based	Release factor before on site RMM: 15% Release factor after on site RMM: 15%
Non agricultural soil	ERC based	Release factor after on site RMM: 0.5%

17.3 Cons CS 2: Consumer contributing scenario hobby use (PC 1)

17.3.1 Definition

The contributing scenario is based on a subcategory of ECETOC TRA Consumer: Glues, hobby use

17.3.2 Conditions of use

Product (article) characteristics
<ul style="list-style-type: none"> • Exposure via dermal route: Yes • Percentage (w/w) of substance in mixture/article: <= 5.0 % • Exposure via inhalation route: Yes • Spray: No • Exposure via oral route: Oral exposure is considered to be not relevant • Physical form of the used product
Amount used (or contained in articles), frequency and duration of use/exposure
<ul style="list-style-type: none"> • Exposure time per event: = 4.0 h/event • Frequency of use over a day: = 1.0 events per day • Amount of product used per application: <= 9.0 g/event • Frequency of use over a year: Frequent
Information and behavioral advice for consumers
<ul style="list-style-type: none"> • Place of use: Indoor • Adult/child assumed: Adult
Other conditions affecting consumers exposure
<ul style="list-style-type: none"> • Body parts potentially exposed: Fingertips • Inhalation factor: = 1.0 • Dermal transfer factor: = 0.1

17.4 Cons CS 3: Consumer contributing scenario wall paint (PC 9a)

17.4.1 Definition

The contributing scenario is based on a subcategory of ECETOC TRA Consumer: Waterborne latex wall paint

17.4.2 Conditions of use

Product (article) characteristics
<ul style="list-style-type: none"> • Exposure via dermal route: Yes • Percentage (w/w) of substance in mixture/article: <= 1.0 % • Exposure via inhalation route: Yes • Spray: No • Exposure via oral route: Oral exposure is considered to be not relevant • Physical form of the used product
Amount used (or contained in articles), frequency and duration of use/exposure

- Exposure time per event: = 2.2 h/event
- Frequency of use over a day: = 1.0 events per day
- Amount of product used per application: ≤ 4000 g/event
- Frequency of use over a year: Frequent

Information and behavioral advice for consumers

- Place of use: Indoor
- Adult/child assumed: Adult

Other conditions affecting consumers exposure

- Body parts potentially exposed: Hands and forearms
- Inhalation factor: = 1.0
- Dermal transfer factor: = 0.1

18. Exposure scenario 17: Use at industrial sites - Manufacture of General Rubber Goods

18.1 Short description

Sector of use: SU 11: Manufacture of rubber products

Environment contributing scenario(s):		
CS 1	Use at industrial site [edit]	ERC 6d
Worker contributing scenario(s):		
CS 2	Mixing or blending in batch processes	PROC 5
CS 3	Industrial spraying by remote controlled robots.	PROC 7
CS 4	Transferring of raw materials into the mixing chambers.	PROC 8b
CS 5	Transferring of rubber and rubber related mixtures from mixing chambers to other type of containers.	PROC 9
CS 6	Application of rubber materials for shaping and curing.	PROC 10
CS 7	Dipping or pouring of articles in a rubber matrix.	PROC 13
CS 8	Process of shaping rubber compounds into components by milling, extrusion and calendaring.	PROC 14
CS 9	Low energy manipulation with substance bound in the rubber matrix.	PROC 21

18.2 Env CS 1: Use at industrial site [edit] (ERC 6d)

18.2.1 Conditions of use

Amount used, frequency and duration of use (or from service life)
<ul style="list-style-type: none"> Annual use amount at site: <= 10.0 tonnes/year Percentage of EU tonnage used at regional scale: = 100.0 % Daily use amount at site: <= 0.05 tonnes/day <p><i>This theoretical default daily-use amount is the substance maximum use rate typical for use as a surfactant in manufacture of rubber goods. A minimum of 200 emission days per year are assumed.</i></p>
Conditions and measures related to biological sewage treatment plant
<ul style="list-style-type: none"> Application of the STP sludge on agricultural soil: Yes Biological STP: Standard [Effectiveness Water: 88.52%] Discharge rate of STP: >= 2000 m3/day
Conditions and measures related to external treatment of waste (including article waste)
<ul style="list-style-type: none"> Particular considerations on the waste treatment operations: No (low risk)
Other conditions affecting environmental exposure
<ul style="list-style-type: none"> Receiving surface water flow rate: >= 18000 m3/day

18.2.2 Releases

Local releases to the environment

Release	Release estimation method	Explanations
Water	ERC based	Release factor before on site RMM: 5E-3% Release factor after on site RMM: 5E-3% Local release rate: 2.5E-3 kg/day
Air	ERC based	Release factor before on site RMM: 35% Release factor after on site RMM: 35% Local release rate: 17.5 kg/day

Release	Release estimation method	Explanations
Non agricultural soil	ERC based	Release factor after on site RMM: 0.025%

18.3 Worker CS 2: Mixing or blending in batch processes (PROC 5)

18.3.1 Definition

Transferring of raw materials into the mixing chambers with liquid materials directly injected into the chamber. Once mixed the compound batch is extruded into a cooling bath.

18.3.2 Conditions of use

Product (Article) characteristics
<ul style="list-style-type: none"> Physical form of the used product: Liquid Percentage (w/w) of substance in mixture/article: <= 1.0 %
Amount used (or contained in articles), frequency and duration of use/exposure
<ul style="list-style-type: none"> Duration of activity: <= 8.0 h/day
Technical and organisational conditions and measures
<ul style="list-style-type: none"> Local exhaust ventilation: No [Effectiveness Inhalation: 0%, Dermal: 0%] General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness Inhalation: 0%] Occupational Health and Safety Management System: Advanced
Conditions and measures related to personal protection, hygiene and health evaluation
<ul style="list-style-type: none"> Dermal protection: Yes (Chemically resistant gloves conforming to EN374) and (other) appropriate dermal protection [Effectiveness Dermal: 80%] Respiratory Protection: No [Effectiveness Inhalation: 0%]
Other conditions affecting workers exposure
<ul style="list-style-type: none"> Skin surface potentially exposed: Two hands face (480 cm²) Operating temperature: <= 40.0 °C Place of use: Indoor

18.4 Worker CS 3: Industrial spraying by remote controlled robots. (PROC 7)

18.4.1 Definition

Spraying occurs by robots in working areas separated from the respective control rooms.

18.4.2 Conditions of use

Product (Article) characteristics
<ul style="list-style-type: none"> Physical form of the used product: Liquid Percentage (w/w) of substance in mixture/article: <= 1.0 %
Amount used (or contained in articles), frequency and duration of use/exposure
<ul style="list-style-type: none"> Duration of activity: <= 8.0 h/day
Technical and organisational conditions and measures
<ul style="list-style-type: none"> Local exhaust ventilation: Yes [Effectiveness Inhalation: 95%, Dermal: 0%] General ventilation: Enhanced general ventilation (5-10 air changes per hour) [Effectiveness Inhalation: 70%] Occupational Health and Safety Management System: Advanced
<i>Spraying occurs by robots in working areas separated from the respective control rooms.</i>

Conditions and measures related to personal protection, hygiene and health evaluation
<ul style="list-style-type: none"> • Dermal protection: Yes (Chemically resistant gloves conforming to EN374 with specific activity training) and (other) appropriate dermal protection [Effectiveness Dermal: 95%] • Respiratory Protection: Yes (Respirator with APF of 20) [Effectiveness Inhalation: 95%]
Other conditions affecting workers exposure
<ul style="list-style-type: none"> • Skin surface potentially exposed: Two hands and upper wrists (1500 cm²) • Operating temperature: <= 40.0 °C • Place of use: Indoor

18.5 Worker CS 4: Transferring of raw materials into the mixing chambers. (PROC 8b)

18.5.1 Definition

Transferring of raw materials into the mixing chambers with liquid materials directly injected into the chamber.

18.5.2 Conditions of use

Product (Article) characteristics
<ul style="list-style-type: none"> • Physical form of the used product: Liquid • Percentage (w/w) of substance in mixture/article: <= 1.0 %
Amount used (or contained in articles), frequency and duration of use/exposure
<ul style="list-style-type: none"> • Duration of activity: <= 8.0 h/day
Technical and organisational conditions and measures
<ul style="list-style-type: none"> • Local exhaust ventilation: No [Effectiveness Inhalation: 0%, Dermal: 0%] • General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness Inhalation: 0%] • Occupational Health and Safety Management System: Advanced
Conditions and measures related to personal protection, hygiene and health evaluation
<ul style="list-style-type: none"> • Dermal protection: Yes (Chemically resistant gloves conforming to EN374) and (other) appropriate dermal protection [Effectiveness Dermal: 80%] • Respiratory Protection: No [Effectiveness Inhalation: 0%]
Other conditions affecting workers exposure
<ul style="list-style-type: none"> • Skin surface potentially exposed: Two hands (960 cm²) • Operating temperature: <= 40.0 °C • Place of use: Indoor

18.6 Worker CS 5: Transferring of rubber and rubber related mixtures from mixing chambers to other type of containers. (PROC 9)

18.6.1 Definition

Once mixed the compound batches are extruded into a cooling bath. Certain compounds are dissolved in a liquid mixture used as a cement or viscous glue between rubber components.

18.6.2 Conditions of use

Product (Article) characteristics
<ul style="list-style-type: none"> • Physical form of the used product: Liquid • Percentage (w/w) of substance in mixture/article: <= 1.0 %
Amount used (or contained in articles), frequency and duration of use/exposure

• Duration of activity: <= 8.0 h/day
Technical and organisational conditions and measures
• Local exhaust ventilation: No [Effectiveness Inhalation: 0%, Dermal: 0%] • General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness Inhalation: 0%] • Occupational Health and Safety Management System: Advanced
Conditions and measures related to personal protection, hygiene and health evaluation
• Dermal protection: No [Effectiveness Dermal: 0%] • Respiratory Protection: No [Effectiveness Inhalation: 0%]
Other conditions affecting workers exposure
• Skin surface potentially exposed: Two hands face (480 cm ²) • Operating temperature: <= 40.0 °C • Place of use: Indoor

18.7 Worker CS 6: Application of rubber materials for shaping and curing. (PROC 10)

18.7.1 Definition

Compounds are given a specific shape and associated in case of complex articles ready to be cured. Substance are now bound in the rubber matrix. Concentration is defined by cement recipe.

18.7.2 Conditions of use

Product (Article) characteristics
• Physical form of the used product: Liquid • Percentage (w/w) of substance in mixture/article: <= 1.0 %
Amount used (or contained in articles), frequency and duration of use/exposure
• Duration of activity: <= 8.0 h/day
Technical and organisational conditions and measures
• Local exhaust ventilation: Yes [Effectiveness Inhalation: 90%, Dermal: 0%] • General ventilation: Good general ventilation (3-5 air changes per hour) [Effectiveness Inhalation: 30%] • Occupational Health and Safety Management System: Advanced
Conditions and measures related to personal protection, hygiene and health evaluation
• Dermal protection: Yes (Chemically resistant gloves conforming to EN374) and (other) appropriate dermal protection [Effectiveness Dermal: 80%] • Respiratory Protection: No [Effectiveness Inhalation: 0%]
Other conditions affecting workers exposure
• Skin surface potentially exposed: Two hands (960 cm ²) • Operating temperature: <= 40.0 °C • Place of use: Indoor

18.8 Worker CS 7: Dipping or pouring of articles in a rubber matrix. (PROC 13)

18.8.1 Definition

Substance is bound in the liquid rubber matrix. Concentration is defined by cement recipe. Typically, the temperature may rise as high as to approximately 135 °C max.

18.8.2 Conditions of use

Product (Article) characteristics
<ul style="list-style-type: none"> Physical form of the used product: Liquid Percentage (w/w) of substance in mixture/article: <= 1.0 %
Amount used (or contained in articles), frequency and duration of use/exposure
<ul style="list-style-type: none"> Duration of activity: <= 8.0 h/day
Technical and organisational conditions and measures
<ul style="list-style-type: none"> Local exhaust ventilation: No [Effectiveness Inhalation: 0%, Dermal: 0%] General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness Inhalation: 0%] Occupational Health and Safety Management System: Advanced
Conditions and measures related to personal protection, hygiene and health evaluation
<ul style="list-style-type: none"> Dermal protection: Yes (Chemically resistant gloves conforming to EN374) and (other) appropriate dermal protection [Effectiveness Dermal: 80%] Respiratory Protection: No [Effectiveness Inhalation: 0%]
Other conditions affecting workers exposure
<ul style="list-style-type: none"> Skin surface potentially exposed: Two hands face (480 cm²) Operating temperature: <= 40.0 °C Place of use: Indoor

18.9 Worker CS 8: Process of shaping rubber compounds into components by milling, extrusion and calendaring. (PROC 14)

18.9.1 Definition

The processes in which rubber compounds are shaped into components, subsequently assembled and cured to give a final article, are typically, milling (between rolls), extrusion (through specific dies) and homogenisation at a calender (roller mill), so called calendaring. Typically, the temperature, during the above production steps, rises as high as to approximately 135 °C max. Curing happens within containment where most of the substances react to give a three-dimensional polymer network (final article). Unreacted substances remain bound to the matrix with reduced mobility

18.9.2 Conditions of use

Product (Article) characteristics
<ul style="list-style-type: none"> Physical form of the used product: Liquid Percentage (w/w) of substance in mixture/article: <= 1.0 %
Amount used (or contained in articles), frequency and duration of use/exposure
<ul style="list-style-type: none"> Duration of activity: <= 8.0 h/day
Technical and organisational conditions and measures
<ul style="list-style-type: none"> Local exhaust ventilation: No [Effectiveness Inhalation: 0%, Dermal: 0%] General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness Inhalation: 0%] Occupational Health and Safety Management System: Advanced
Conditions and measures related to personal protection, hygiene and health evaluation
<ul style="list-style-type: none"> Dermal protection: No [Effectiveness Dermal: 0%] Respiratory Protection: No [Effectiveness Inhalation: 0%]
Other conditions affecting workers exposure
<ul style="list-style-type: none"> Skin surface potentially exposed: Two hands face (480 cm²) Operating temperature: <= 40.0 °C Place of use: Indoor

18.10 Worker CS 9: Low energy manipulation with substance bound in the rubber matrix. (PROC 21)

18.10.1 Definition

Compounds are given a specific shape and associated in case of complex articles ready to be cured. Curing happens within containment where most of the substances react to give a three-dimensional polymer network (final article). Unreacted substances remain bound to the matrix with reduced mobility.

18.10.2 Conditions of use

Product (Article) characteristics
<ul style="list-style-type: none"> Physical form of the used product: Liquid Percentage (w/w) of substance in mixture/article: $\leq 1.0\%$
Amount used (or contained in articles), frequency and duration of use/exposure
<ul style="list-style-type: none"> Duration of activity: ≤ 8.0 h/day
Technical and organisational conditions and measures
<ul style="list-style-type: none"> Local exhaust ventilation: No [Effectiveness Inhalation: 0%, Dermal: 0%] General ventilation: Basic general ventilation (1-3 air changes per hour) [Effectiveness Inhalation: 0%] Occupational Health and Safety Management System: Advanced
Conditions and measures related to personal protection, hygiene and health evaluation
<ul style="list-style-type: none"> Dermal protection: Yes (Chemically resistant gloves conforming to EN374) and (other) appropriate dermal protection [Effectiveness Dermal: 80%] Respiratory Protection: No [Effectiveness Inhalation: 0%]
Other conditions affecting workers exposure
<ul style="list-style-type: none"> Skin surface potentially exposed: One hand face only (240 cm²) Operating temperature: ≤ 40.0 °C Place of use: Indoor

19. Exposure scenario 18: Service life (consumers) - Service life (consumers) of rubber goods including tyres

19.11 Short description

Environment contributing scenario(s):		
CS 1	Service life (consumers) of rubber goods	ERC 10b, ERC 10a

19.12 Env CS 1: Service life (consumers) of rubber goods (ERC 10b)

19.12.1 Conditions of use

Amount used, frequency and duration of use (or from service life)
<ul style="list-style-type: none"> Percentage of EU tonnage used at regional scale: = 10.0 % Daily local widespread use amount: ≤ 0.0000055 tonnes/day
Conditions and measures related to external treatment of waste (including article waste)
<ul style="list-style-type: none"> Particular considerations on the waste treatment operations: No (low risk)
Other conditions affecting environmental exposure
<ul style="list-style-type: none"> Biological STP: Standard [Effectiveness Water: 88.52%]

19.12.2 Releases

Local releases to the environment

Release	Release estimation method	Explanations
Water	ERC based	Release factor before on site RMM: 100% Release factor after on site RMM: 100% Local release rate: 5.5E-3 kg/day
Air	ERC based	Release factor before on site RMM: 100% Release factor after on site RMM: 100%
Non agricultural soil	ERC based	Release factor after on site RMM: 100%