ES1: Manufacture

1. Title Section	
Manufacture of cetrimonium bromide (CAS 57-09-0) (Cetyl Trimethyl Ammonium Bromide (CTAB))	
Environment	
CS 1: Manufacture	ERC 1
Worker	
CS 2: Use in closed system	PROC 1
CS 3: Use in closed batch process	PROC 3
CS 4: Transfer of substance/preparations; dedicated facilities	PROC 8b
CS 5: Transfer of substance/preparations into small containers	PROC 9

2. Conditions of use affecting exposure

CS 1: Control of environmental exposure: Manufacture (ERC 1)
Amounts used, frequency and duration of use (or from service life)
Daily amount per site: ≤ 0.409 tonnes/day or local release rate (water): 0.008 kg/day
Annual amount per site: < 90 tonnes/year
Frequency and duration of use: 220 days/year
Technical and organisational conditions and measures
No special precautions
Conditions and measures related to sewage treatment plant
• Municipal STP: Yes [Effectiveness Water: 93.11%]
• Discharge rate of STP: ≥ 2E4 m3/day
• Application of the STP sludge on agricultural soil: Yes
Conditions and measures related to treatment of waste
Waste disposal according to national/local legislation is sufficient.
Other conditions affecting environmental exposure
Receiving surface water flow rate: ≥ 1.8E4 m3/day

CS 2: Control of worker exposure: Use in closed system (PROC 1)
Product (article) characteristics
Substance as such. Low dustiness
Amounts used, frequency and duration of use
< 8 hours/day
Technical and organisational conditions and measures
General ventilation: Basic general ventilation (1-3 air changes per hour)
Use in closed process
Conditions and measures related to personal protection, hygiene and health evaluation
Wear goggles/face shield if there is the slightest risk of exposure.
Other conditions affecting workers exposure
Place of use: Indoor Process temperature (for solid): Ambient

CS 3: Control of worker exposure: Use in closed batch process (PROC 3)
Product (article) characteristics
Substance as such. Low dustiness
Amounts used, frequency and duration of use
< 8 hours/day
Technical and organisational conditions and measures
General ventilation: Basic general ventilation (1-3 air changes per hour)
Local exhaust ventilation: Yes [Effectiveness Inhal: 95%]
Closed batch process with occasional controlled exposure
Conditions and measures related to personal protection, hygiene and health evaluation
Use chemically resistant gloves conforming to EN374 [Effectiveness Dermal: 80%]
Wear goggles/face shield if there is the slightest risk of exposure.
Other conditions affecting workers exposure
Place of use: Indoor Process temperature (for solid): Ambient

CS 4: Control of worker exposure: Transfer of substance/preparations; dedicated facilities (PROC 8b)
Product (article) characteristics
Substance as such. Low dustiness
Amounts used, frequency and duration of use
< 8 hours/day
Technical and organisational conditions and measures
General ventilation: Basic general ventilation (1-3 air changes per hour)
Local exhaust ventilation: Yes [Effectiveness Inhal: 90%]
Semi-closed process with occasional controlled exposure
Conditions and measures related to personal protection, hygiene and health evaluation
Use chemically resistant gloves conforming to EN374 [Effectiveness Dermal: 80%]
Wear goggles/face shield if there is the slightest risk of exposure.
Other conditions affecting workers exposure
Place of use: Indoor Process temperature (for solid): Ambient

CS 5: Transfer of substance or preparation into small containers (PROC 9)
Product (article) characteristics
Substance as such. Low dustiness
Amounts used, frequency and duration of use
< 8 hours/day
Technical and organisational conditions and measures
General ventilation: Basic general ventilation (1-3 air changes per hour)
Local exhaust ventilation: Yes [Effectiveness Inhal: 90%]
Semi-closed process with occasional controlled exposure
Conditions and measures related to personal protection, hygiene and health evaluation

Use chemically resistant gloves conforming to EN374 [Effectiveness Dermal: 80%]
Wear goggles/face shield if there is the slightest risk of exposure.
Other conditions affecting workers exposure
Place of use: Indoor Process temperature (for solid): Ambient

3. Exposure and risk estimation

CS 1: Environmental release and exposure: Industrial settings, use of intermediates (ERC 6b)		
Release route	Release rate	Release estimation method
Water	**Final release factor:** 0.002% **Local release rate:** 0.008 kg/day	Max release rate
Air	**Initial release factor:** 0.001% **Final release factor:** 0.001% **Local release rate:** 0.004 kg/day **Explanation / Justification:** A-table (A1.1) in EU (2003): Technical Guidance Document on Risk Assessment, Part II. MC=3	Release factor
Soil	**Final release factor:** 0.01%	ERC based

Protection target	Exposure estimate	PNEC	RCR
Freshwater	**Local PEC:** 1.983E-5 mg/L	0.022 µg/L	0.901
Marine water	**Local PEC:** 8.336E-7 mg/L	0.0022 µg/L	0.379
Agricultural Soil	**Local PEC:** 0.001 mg/kg dw	0.21 mg/kg	<0.01
STP	**Local PEC:** 2.754E-5 mg/L	0.19 mg/L	<0.01

CS 2: Worker exposure: Use in closed system (PROC 1)			
Route of exposure and type of effects	Exposure estimate and method	DNEL	RCR
Dermal, systemic, acute	-	Long-term systemic dermal DNEL is considered sufficiently low to protect against potential acute effects from peak exposure (toxicological threshold for acute effects several orders of magnitude higher than DNEL for long-term effects).	
Dermal, local, acute	-	Short term exposure is assessed to be controlled by conditions for long-term, as acute toxicological threshold is 5 times higher than long-term toxicological threshold.	
Dermal, systemic, long-term	0.034 mg/kg bw/day (TRA Worker v3)	0.4 mg/kg bw/day	0.085
Dermal, local, long-term	0.01 mg/cm² (TRA Worker v3)	Exposure is well below the toxicological threshold of 0.05 mg/cm²	
Inhalation, systemic, acute	0.04 mg/m³ (TRA Worker v3)	Risk for systemic effects is considered controlled, if risk for local effects is controlled	

Inhalation, local, acute	0.04 mg/m³ (TRA Worker v3)	0.05 mg/m³	0.8
Inhalation, systemic, long-term	0.01 mg/m³ (TRA Worker v3)	Risk for systemic effects is considered controlled, if risk for local effects is controlled	
Inhalation, local, long-term	0.01 mg/m³ (TRA Worker v3)	Exposure is well below the toxicological threshold of 0.05 mg/m³	
Eye, local		Risk is considered to be controlled if the worker wears goggles at any potential eye exposure to substance	
Combined routes, systemic, long-term			0.085

CS 3: Worker exposure: Use in closed batch process (PROC 3)			
Route of exposure and type of effects	Exposure estimate and method	DNEL	RCR
Dermal, systemic, acute		Long-term systemic dermal DNEL is considered sufficiently low to protect against potential acute effects from peak exposure (toxicological threshold for acute effects several orders of magnitude higher than DNEL for long-term effects).	
Dermal, local, acute		Short term exposure is assessed to be controlled by conditions for long-term, as acute toxicological threshold is 5 times higher than long-term toxicological threshold.	
Dermal, systemic, long-term	0.138 mg/kg bw/day (TRA Worker v3)	0.4 mg/kg bw/day	0.345
Dermal, local, long-term	0.04 mg/cm² (TRA Worker v3)	Exposure is well below the toxicological threshold of 0.05 mg/cm²	
Inhalation, systemic, acute	0.04 mg/m³ (TRA Worker v3)	Risk for systemic effects is considered controlled, if risk for local effects is controlled	
Inhalation, local, acute	0.04 mg/m³ (TRA Worker v3)	0.05 mg/m³	0.8
Inhalation, systemic, long-term	0.01 mg/m³ (TRA Worker v3	Risk for systemic effects is considered controlled, if risk for local effects is controlled	
Inhalation, local, long-term	0.01 mg/m³ (TRA Worker v3)	Exposure is well below the toxicological threshold of 0.05 mg/m³	
Eye, local		Risk is considered to be controlled if the worker wears goggles at any potential eye exposure to substance	
Combined routes, systemic, long-term			0.345

CS 4: Worker exposure: Transfer of substance/preparations; dedicated facilities (PROC 8b)			
Route of exposure and type of effects	Exposure estimate and method	DNEL	RCR
Dermal, systemic, acute		Long-term systemic dermal DNEL is considered sufficiently low to protect against potential acute effects from peak exposure (toxicological threshold for acute effects several orders of magnitude higher than DNEL for long-term effects).	

Dermal, local, acute		Short term exposure is assessed to be controlled by conditions for long-term, as acute toxicological threshold is 5 times higher than long-term toxicological threshold.	
Dermal, systemic, long-term	0.137 mg/kg bw/day (TRA Worker v3)	0.4 mg/kg bw/day	0.343
Dermal, local, long-term	0.01 mg/cm² (TRA Worker v3)	Exposure is well below the toxicological threshold of 0.05 mg/cm^2	
Inhalation, systemic, acute	0.02 mg/m³ (TRA Worker v3)	Risk for systemic effects is considered controlled, if risk for local effects is controlled	
Inhalation, local, acute	0.02 mg/m³ (TRA Worker v3)	0.05 mg/m³	0.4
Inhalation, systemic, long-term	0.005 mg/m³ (TRA Worker v3)	Risk for systemic effects is considered controlled, if risk for local effects is controlled	
Inhalation, local, long-term	0.005 mg/m³ (TRA Worker v3)	Exposure is well below the toxicological threshold of 0.05 mg/m^3	
Eye, local		Risk is considered to be controlled if the worker wears goggles at any potential eye exposure to substance	
Combined routes, systemic, long-term			0.343

CS 5: Worker exposure: Transfer of substance or preparation into small containers (PROC 9)			
Route of exposure and type of effects	Exposure estimate and method	DNEL	RCR
Dermal, systemic, acute		Long-term systemic dermal DNEL is considered sufficiently low to protect against potential acute effects from peak exposure (toxicological threshold for acute effects several orders of magnitude higher than DNEL for long-term effects).	
Dermal, local, acute		Short term exposure is assessed to be controlled by conditions for long-term, as acute toxicological threshold is 5 times higher than long-term toxicological threshold.	
Dermal, systemic, long-term	0.137 mg/kg bw/day (TRA Worker v3)	0.4 mg/kg bw/day	0.343
Dermal, local, long-term	0.02 mg/cm² (TRA Worker v3)	Exposure is well below the toxicological threshold of 0.05 mg/cm^2	
Inhalation, systemic, acute	0.04 mg/m³ (TRA Worker v3)	Risk for systemic effects is considered controlled, if risk for local effects is controlled	
Inhalation, local, acute	0.04 mg/m³ (TRA Worker v3)	0.05 mg/m³	0.8
Inhalation, systemic, long-term	0.01 mg/m³ (TRA Worker v3)	Risk for systemic effects is considered controlled, if risk for local effects is controlled	
Inhalation, local, long-term	0.01 mg/m³ (TRA Worker v3)	Exposure is well below the toxicological threshold of 0.05 mg/m^3	
Eye, local		Risk is considered to be controlled if the worker wears goggles at any potential eye exposure to substance	
Combined routes, systemic, long-term			0.343

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

Scaling method - Environment
Algorithm
Scalable parameters - Environment
Daily use. Local release rate
Boundaries of scaling -Environment
Do not exceed local release rate

Scaling method - Workers	
TRA Worker v3	
Scalable parameters - Workers	
Daily amounts used per day	
Boundaries of scaling - Workers	
Estimated RCR shall be < 1 to demonstrate safe use	

ABBREVIATIONS	
BW	Body weight
CS	Contributing Scenario
DNEL	Derived no-effect level
DU	Downstream user
DW	Dry Weight
ERC	Environmental release category
ES	Exposure scenario
PEC	Predicted Exposure Concentrations
PNEC	Predicted no-effect concentration
PROC	Process category
RCR	Risk characterisation ratio
STP	Sewage treatment plant
TRA	Targeted Risk Assessment

ES2: Formulation of laboratory chemicals, cosmetics, pharmaceuticals etc.

1. Title Section	
Formulation with cetrimonium bromide (CAS 57-09-0) (Cetyl Trimethyl Ammonium Bromide (CTAB))	
Environment	
CS 1: Formulation	ERC 2
Worker	
CS 2: Use in closed system	PROC 1
CS 3: Use in closed system with occasional controlled exposure	PROC 2
CS 4: Mixing and blending operations	PROC 5
CS 5: Transfer of substance/preparations	PROC 8a
CS 6: Transfer of substance/preparations into small containers	PROC 9

2. Conditions of use affecting exposure

CS 1: Control of environmental exposure: Formulation (ERC 2)
Amounts used, frequency and duration of use (or from service life)
Daily amount per site: ≤ 0.1 tonnes/day or local release rate (water): 0.003 kg/day
Annual amount per site: ≤ 25 tonnes/year
Frequency and duration of use: 250 days/year
Technical and organisational conditions and measures
No special precautions
Conditions and measures related to sewage treatment plant
• Municipal STP: Yes [Effectiveness Water: 93.11%]
• Discharge rate of STP: ≥ 2E3 m3/day
• Application of the STP sludge on agricultural soil: Yes
Conditions and measures related to treatment of waste
Waste disposal according to national/local legislation is sufficient.
Other conditions affecting environmental exposure
Receiving surface water flow rate: ≥ 1.8E4 m3/day

CS 2: Control of worker exposure: Use in closed process (PROC 1)
Product (article) characteristics
Substance as such. Low dustiness
Amounts used, frequency and duration of use
< 8 hours/day
Technical and organisational conditions and measures
General ventilation: Basic general ventilation (1-3 air changes per hour)
Use in closed process
Conditions and measures related to personal protection, hygiene and health evaluation
Wear goggles/face shield if there is the slightest risk of exposure.
Other conditions affecting workers exposure
Place of use: Indoor

Process temperature (for solid): Ambient

CS 3: Control of worker exposure: Use in closed, continuous process with occasional controlled exposure (PROC 2)
Product (article) characteristics
Substance as such. Low dustiness
Amounts used, frequency and duration of use
< 8 hours/day
Technical and organisational conditions and measures
General ventilation: Basic general ventilation (1-3 air changes per hour)
Closed continuous process with occasional controlled exposure
Conditions and measures related to personal protection, hygiene and health evaluation
Use chemically resistant gloves conforming to EN374 [Effectiveness Dermal: 80%]
Wear goggles/face shield if there is the slightest risk of exposure.
Other conditions affecting workers exposure
Place of use: Indoor Process temperature (for solid): Ambient

CS 4: Mixing and blending operations (PROC 5)
Product (article) characteristics
Substance as such. Low dustiness
Amounts used, frequency and duration of use
< 8 hours/day
Technical and organisational conditions and measures
General ventilation: Basic general ventilation (1-3 air changes per hour)
Local exhaust ventilation: Yes [Effectiveness Inhal: 90%]
Conditions and measures related to personal protection, hygiene and health evaluation
Use chemically resistant gloves conforming to EN374 [Effectiveness Dermal: 80%]
Use Respiratory Protection: Use Respirator with APF of 10 [Effectiveness Inhal: 90%]
Wear goggles/face shield if there is the slightest risk of exposure.
Other conditions affecting workers exposure
Place of use: Indoor Process temperature (for solid): Ambient

CS 5: Transfer of substance or preparation (PROC 8a)
Product (article) characteristics
Substance as such. Low dustiness
Amounts used, frequency and duration of use
< 8 hours/day
Technical and organisational conditions and measures
General ventilation: Basic general ventilation (1-3 air changes per hour)
Local exhaust ventilation: Yes [Effectiveness Inhal: 90%]
Conditions and measures related to personal protection, hygiene and health evaluation
Use chemically resistant gloves conforming to EN374 [Effectiveness Dermal: 80%]

Use Respiratory Protection: Use Respirator with APF of 10 [Effectiveness Inhal: 90%]
Wear goggles/face shield if there is the slightest risk of exposure.
Other conditions affecting workers exposure
Place of use: Indoor Process temperature (for solid): Ambient

CS 6: Transfer of substance or preparation into small containers (PROC 9)
Product (article) characteristics
Substance as such. Low dustiness
Amounts used, frequency and duration of use
< 8 hours/day
Technical and organisational conditions and measures
General ventilation: Basic general ventilation (1-3 air changes per hour)
Local exhaust ventilation: Yes [Effectiveness Inhal: 90%]
Semi-closed process with occasional controlled exposure
Conditions and measures related to personal protection, hygiene and health evaluation
Use chemically resistant gloves conforming to EN374 [Effectiveness Dermal: 80%]
Wear goggles/face shield if there is the slightest risk of exposure.
Other conditions affecting workers exposure
Place of use: Indoor Process temperature (for solid): Ambient

3. Exposure and risk estimation

CS 1: Environmental release and exposure: Formulation (ERC 2)		
Release route	Release rate	Release estimation method
Water	**Final release factor:** 0.003% **Local release rate:** 0.003 kg/day **Explanation / Justification:** This is the maximum daily release rate (per point source) which will keep RCR < 0.8	Maximum acceptable release rate in order to keep the RCR below 0.8
Air	**Initial release factor:** 0.25% **Final release factor:** 0.25% **Local release rate:** 0.25 kg/day **Explanation / Justification:** A-table (A1.2) in EU (2003): Technical Guidance Document on Risk Assessment, Part II. MC=3, vapour pressure < 10 Pa	Release factor (Formulation release factor (A-table))
Soil	**Final release factor:** 0.01%	ERC based

Protection target	Exposure estimate	PNEC	RCR
Freshwater	**Local PEC:** 1.749E-5 mg/L	0.022 µg/L	0.795
Marine water	**Local PEC:** 1.722E-6 mg/L	0.0022 µg/L	0.783
Agricultural Soil	**Local PEC:** 0.006 mg/kg dw	0.21 mg/kg dw	0.028
STP	**Local PEC:** 1.205E-4 mg/L	0.19 mg/L	<0.01

CS 2: Worker exposure: Use in closed system (PROC 1)			
Route of exposure and type of effects	Exposure estimate and method	DNEL	RCR
Dermal, systemic, acute	-	Long-term systemic dermal DNEL is considered sufficiently low to protect against potential acute effects from peak exposure (toxicological threshold for acute effects several orders of magnitude higher than DNEL for long-term effects).	
Dermal, local, acute	-	Short term exposure is assessed to be controlled by conditions for long-term, as acute toxicological threshold is 5 times higher than long-term toxicological threshold.	
Dermal, systemic, long-term	0.034 mg/kg bw/day (TRA Worker v3)	0.4 mg/kg bw/day	0.085
Dermal, local, long-term	0.01 mg/cm² (TRA Worker v3)	Exposure is well below the toxicological threshold of 0.05 mg/cm^2	
Inhalation, systemic, acute	0.04 mg/m³ (TRA Worker v3)	Risk for systemic effects is considered controlled, if risk for local effects is controlled	
Inhalation, local, acute	0.04 mg/m³ (TRA Worker v3)	0.05 mg/m³	0.8
Inhalation, systemic, long-term	0.01 mg/m³ (TRA Worker v3)	Risk for systemic effects is considered controlled, if risk for local effects is controlled	
Inhalation, local, long-term	0.01 mg/m³ (TRA Worker v3)	Exposure is well below the toxicological threshold of 0.05 mg/m^3	
Eye, local		Risk is considered to be controlled if the worker wears goggles at any potential eye exposure to substance	
Combined routes, systemic, long-term			0.085

CS 3: Worker exposure: Use in closed, continuous process with occasional controlled exposure (PROC 2)			
Route of exposure and type of effects	Exposure estimate and method	DNEL	RCR
Dermal, systemic, acute		Long-term systemic dermal DNEL is considered sufficiently low to protect against potential acute effects from peak exposure (toxicological threshold for acute effects several orders of magnitude higher than DNEL for long-term effects).	
Dermal, local, acute		Short term exposure is assessed to be controlled by conditions for long-term, as acute toxicological threshold is 5 times higher than long-term toxicological threshold.	
Dermal, systemic, long-term	0.274 mg/kg bw/day (TRA Worker v3)	0.4 mg/kg bw/day	0.685

Dermal, local, long-term	0.04 mg/cm² (TRA Worker v3)	Exposure is well below the toxicological threshold of 0.05 mg/cm²	
Inhalation, systemic, acute	0.04 mg/m³ (TRA Worker v3)	Risk for systemic effects is considered controlled, if risk for local effects is controlled	
Inhalation, local, acute	0.04 mg/m³ (TRA Worker v3)	0.05 mg/m³	0.8
Inhalation, systemic, long-term	0.01 mg/m³ (TRA Worker v3)	Risk for systemic effects is considered controlled, if risk for local effects is controlled	
Inhalation, local, long-term	0.01 mg/m³ (TRA Worker v3)	Exposure is well below the toxicological threshold of 0.05 mg/m³	
Eye, local		Risk is considered to be controlled if the worker wears goggles at any potential eye exposure to substance	
Combined routes, systemic, long-term			0.685

CS 4: Worker exposure: Mixing and blending operations (PROC 5)			
Route of exposure and type of effects	Exposure estimate and method	DNEL	RCR
Dermal, systemic, acute		Long-term systemic dermal DNEL is considered sufficiently low to protect against potential acute effects from peak exposure (toxicological threshold for acute effects several orders of magnitude higher than DNEL for long-term effects).	
Dermal, local, acute		Short term exposure is assessed to be controlled by conditions for long-term, as acute toxicological threshold is 5 times higher than long-term toxicological threshold.	
Dermal, systemic, long-term	0.274 mg/kg bw/day (TRA Worker v3)	0.4 mg/kg bw/day	0.686
Dermal, local, long-term	0.04 mg/cm² (TRA Worker v3)	Exposure is well below the toxicological threshold of 0.05 mg/cm²	
Inhalation, systemic, acute	0.02 mg/m³ (TRA Worker v3)	Risk for systemic effects is considered controlled, if risk for local effects is controlled	
Inhalation, local, acute	0.02 mg/m³ (TRA Worker v3)	0.05 mg/m³	0.4
Inhalation, systemic, long-term	0.005 mg/m³ (TRA Worker v3)	Risk for systemic effects is considered controlled, if risk for local effects is controlled	
Inhalation, local, long-term	0.005 mg/m³ (TRA Worker v3)	Exposure is well below the toxicological threshold of 0.05 mg/m³	
Eye, local		Risk is considered to be controlled if the worker wears goggles at any potential eye exposure to substance	
Combined routes, systemic, long-term			0.686

CS 5: Worker exposure: Transfer of substance/ preparations (PROC 8a)			
Route of exposure and type of effects	Exposure estimate and method	DNEL	RCR
Dermal, systemic, acute		Long-term systemic dermal DNEL is considered sufficiently low to protect against potential acute effects from peak exposure (toxicological threshold for acute effects several orders of magnitude higher than DNEL for long-term effects).	
Dermal, local, acute		Short term exposure is assessed to be controlled by conditions for long-term, as acute toxicological threshold is 5 times higher than long-term toxicological threshold.	
Dermal, systemic, long-term	0.274 mg/kg bw/day (TRA Worker v3)	0.4 mg/kg bw/day	0.686
Dermal, local, long-term	0.02 mg/cm² (TRA Worker v3)	Exposure is well below the toxicological threshold of 0.05 mg/cm^2	
Inhalation, systemic, acute	0.02 mg/m³ (TRA Worker v3)	Risk for systemic effects is considered controlled, if risk for local effects is controlled	
Inhalation, local, acute	0.02 mg/m³ (TRA Worker v3)	0.05 mg/m³	0.4
Inhalation, systemic, long-term	0.005 mg/m³ (TRA Worker v3)	Risk for systemic effects is considered controlled, if risk for local effects is controlled	
Inhalation, local, long-term	0.005 mg/m³ (TRA Worker v3)	Exposure is well below the toxicological threshold of 0.05 mg/m^3	
Eye, local		Risk is considered to be controlled if the worker wears goggles at any potential eye exposure to substance	
Combined routes, systemic, long-term			0.686

CS 6: Worker exposure: Transfer of substance or preparation into small containers (PROC 9)			
Route of exposure and type of effects	Exposure estimate and method	DNEL	RCR
Dermal, systemic, acute		Long-term systemic dermal DNEL is considered sufficiently low to protect against potential acute effects from peak exposure (toxicological threshold for acute effects several orders of magnitude higher than DNEL for long-term effects).	
Dermal, local, acute		Short term exposure is assessed to be controlled by conditions for long-term, as acute toxicological threshold is 5 times higher than long-term toxicological threshold.	
Dermal, systemic, long-term	0.137 mg/kg bw/day (TRA Worker v3)	0.4 mg/kg bw/day	0.343
Dermal, local, long-term	0.02 mg/cm² (TRA Worker v3)	Exposure is well below the toxicological threshold of 0.05 mg/cm^2	
Inhalation, systemic, acute	0.04 mg/m³ (TRA Worker v3)	Risk for systemic effects is considered controlled, if risk for local effects is controlled	
Inhalation, local, acute	0.04 mg/m³ (TRA Worker v3)	0.05 mg/m³	0.8
Inhalation, systemic, long-term	0.01 mg/m³ (TRA Worker v3)	Risk for systemic effects is considered controlled, if risk for local effects is controlled	
Inhalation, local, long-term	0.01 mg/m³ (TRA Worker	Exposure is well below the toxicological	

	v3)	threshold of 0.05 mg/m^3	
Eye, local		Risk is considered to be controlled if the worker wears goggles at any potential eye exposure to substance	
Combined routes, systemic, long-term			0.343

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

Scaling method - Environment
Algorithm
Scalable parameters - Environment
Daily use. Local release rate
Boundaries of scaling -Environment
Do not exceed local release rate

Scaling method - Workers
TRA Worker v3
Scalable parameters - Workers
Daily amounts used per day
Boundaries of scaling - Workers
Estimated RCR shall be < 1 to demonstrate safe use

ABBREVIATIONS	
BW	Body weight
CS	Contributing Scenario
DNEL	Derived no-effect level
DU	Downstream user
DW	Dry Weight
ERC	Environmental release category
ES	Exposure scenario
PEC	Predicted Exposure Concentrations
PNEC	Predicted no-effect concentration
PROC	Process category
RCR	Risk characterisation ratio
STP	Sewage treatment plant
TRA	Targeted Risk Assessment

ES3: Formulation of articles with cosmetics, pharmaceuticals (e.g. wet wipes, tablets)

1. Title Section	
Formulation of articles with cetrimonium bromide (CAS 57-09-0) (Cetyl Trimethyl Ammonium Bromide (CTAB))	
Environment	
CS 1: Formulation in materials	ERC 3
Worker	
CS 2: Use in closed process, no likelihood of exposure	PROC 1
CS 3: Use in closed, continuous process with occasional controlled exposure	PROC 2
CS 4: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)	PROC 5
CS 5: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities	PROC 8a
CS 6: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	PROC 9
CS 7: Production of preparations or articles by tabletting, compression, extrusion, pelletisation	PROC 14

2. Conditions of use affecting exposure

CS 1: Control of environmental exposure: Formulation in materials (ERC 3)
Amounts used, frequency and duration of use (or from service life)
Daily amount per site: ≤ 8 kg/day or local release rate (Water): 0.003 kg/day
Annual amount per site: ≤ 2 tonnes/year
Frequency and duration of use: 250 days/year
Technical and organisational conditions and measures
No special precautions
Conditions and measures related to sewage treatment plant
Municipal STP: Yes [Effectiveness Water: 93.11%]
Discharge rate of STP: ≥ 2E3 m3/day
Application of the STP sludge on agricultural soil: Yes
Conditions and measures related to treatment of waste
Waste disposal according to national/local legislation is sufficient.
Other conditions affecting environmental exposure
Receiving surface water flow rate: ≥ 1.8E4 m3/day

CS 2: Control of worker exposure: Use in closed process (PROC 1)
Product (article) characteristics
Substance as such. High dustiness
Amounts used, frequency and duration of use
< 8 hours/day
Technical and organisational conditions and measures

General ventilation: Basic general ventilation (1-3 air changes per hour)
Use in closed process
Conditions and measures related to personal protection, hygiene and health evaluation
Wear goggles/face shield if there is the slightest risk of exposure.
Other conditions affecting workers exposure
Place of use: Indoor Process temperature (for solid): Ambient

CS 3: Control of worker exposure: Use in closed, continuous process with occasional controlled exposure (PROC 2)
Product (article) characteristics
Substance as such. Low dustiness
Amounts used, frequency and duration of use
< 8 hours/day
Technical and organisational conditions and measures
General ventilation: Basic general ventilation (1-3 air changes per hour)
Closed continuous process with occasional controlled exposure
Conditions and measures related to personal protection, hygiene and health evaluation
Use chemically resistant gloves conforming to EN374 [Effectiveness Dermal: 80%]
Wear goggles/face shield if there is the slightest risk of exposure.
Other conditions affecting workers exposure
Place of use: Indoor Process temperature (for solid): Ambient

CS 4: Control of worker exposure: Mixing or blending in batch processes for formulation of preparations and articles (PROC 5)
Product (article) characteristics
Substance as such. Low dustiness
Amounts used, frequency and duration of use
< 8 hours/day
Technical and organisational conditions and measures
General ventilation: Basic general ventilation (1-3 air changes per hour)
Local exhaust ventilation: Yes [Effectiveness Inhal: 90%]
Conditions and measures related to personal protection, hygiene and health evaluation
Use chemically resistant gloves conforming to EN374 [Effectiveness Dermal: 80%]
Respiratory Protection: Yes (Respirator with APF of 10) [Effectiveness Inhal: 90%]
Wear goggles/face shield if there is the slightest risk of exposure.
Other conditions affecting workers exposure
Place of use: Indoor Process temperature (for solid): Ambient

CS 5: Control of worker exposure: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities (PROC 8a)
Product (article) characteristics
Substance as such. Low dustiness
Amounts used, frequency and duration of use
< 8 hours/day
Technical and organisational conditions and measures
General ventilation: Basic general ventilation (1-3 air changes per hour)
Local exhaust ventilation: Yes [Effectiveness Inhal: 90%]
Conditions and measures related to personal protection, hygiene and health evaluation
Use chemically resistant gloves conforming to EN374 [Effectiveness Dermal: 80%]
Respiratory Protection: Yes (Respirator with APF of 10) [Effectiveness Inhal: 90%]
Wear goggles/face shield if there is the slightest risk of exposure.
Other conditions affecting workers exposure
Place of use: Indoor Process temperature (for solid): Ambient

CS 6: Control of worker exposure: Transfer of substance or preparation into small containers (PROC 9)
Product (article) characteristics
Substance as such. Low dustiness
Amounts used, frequency and duration of use
< 8 hours/day
Technical and organisational conditions and measures
General ventilation: Basic general ventilation (1-3 air changes per hour)
Local exhaust ventilation: Yes [Effectiveness Inhal: 90%]
Semi-closed process with occasional controlled exposure
Conditions and measures related to personal protection, hygiene and health evaluation
Use chemically resistant gloves conforming to EN374 [Effectiveness Dermal: 80%]
Wear goggles/face shield if there is the slightest risk of exposure.
Other conditions affecting workers exposure
Place of use: Indoor Process temperature (for solid): Ambient

CS 7: Control of worker exposure: Production of preparations or articles by tabletting, compression, extrusion, pelletisation (PROC 14)
Product (article) characteristics
Substance as such. Low dustiness
Amounts used, frequency and duration of use
< 8 hours/day
Technical and organisational conditions and measures
General ventilation: Basic general ventilation (1-3 air changes per hour)
Local exhaust ventilation: Yes [Effectiveness Inhal: 90%]
Conditions and measures related to personal protection, hygiene and health evaluation
Use chemically resistant gloves conforming to EN374 [Effectiveness Dermal: 80%]

Wear goggles/face shield if there is the slightest risk of exposure.
Other conditions affecting workers exposure
Place of use: Indoor Process temperature (for solid): Ambient

3. Exposure and risk estimation

CS 1: Environmental release and exposure: Formulation in materials (ERC 3)		
Release route	Release rate	Release estimation method
Water	**Final release factor:** 0.044% **Local release rate:** 0.003 kg/day **Explanation / Justification:** This is the maximum daily release rate (per point source) which will keep RCR < 0.8	Maximum acceptable release rate in order to keep the RCR below 0.8
Air	**Initial release factor:** 0.25% **Final release factor:** 0.25% **Local release rate:** 0.02 kg/day	Release factor
Soil	**Final release factor:** 0.1%	ERC based

Protection target	Exposure estimate	PNEC	RCR
Freshwater	**Local PEC:** 1.749E-5 mg/L	0.022 µg/L	0.795
Marine water	**Local PEC:** 1.722E-6 mg/L	0.0022 µg/L	0.783
Agricultural Soil	**Local PEC:** 0.005 mg/kg dw	0.21 mg/kg	0.023
STP	**Local PEC:** 1.205E-4 mg/L	0.19 mg/L	<0.01

CS 2: Worker exposure: Use in closed process (PROC 1)			
Route of exposure and type of effects	Exposure estimate and method	DNEL	RCR
Dermal, systemic, acute	-	Long-term systemic dermal DNEL is considered sufficiently low to protect against potential acute effects from peak exposure (toxicological threshold for acute effects several orders of magnitude higher than DNEL for long-term effects).	
Dermal, local, acute	-	Short term exposure is assessed to be controlled by conditions for long-term, as acute toxicological threshold is 5 times higher than long-term toxicological threshold.	
Dermal, systemic, long-term	0.034 mg/kg bw/day (TRA Worker v3)	0.4 mg/kg bw/day	0.085
Dermal, local, long-term	0.01 mg/cm² (TRA Worker v3)	Exposure is well below the toxicological threshold of 0.05 mg/cm²	
Inhalation, systemic, acute	0.04 mg/m³ (TRA Worker v3)	Risk for systemic effects is considered controlled, if risk for local effects is controlled	
Inhalation, local, acute	0.04 mg/m³ (TRA Worker v3)	0.05 mg/m³	0.8
Inhalation, systemic, long-term	0.01 mg/m³ (TRA Worker	Risk for systemic effects is considered controlled, if risk for local effects is controlled	

	v3)		
Inhalation, local, long-term	0.01 mg/m³ (TRA Worker v3)	Exposure is well below the toxicological threshold of 0.05 mg/m³	
Eye, local		Risk is considered to be controlled if the worker wears goggles at any potential eye exposure to substance	
Combined routes, systemic, long-term			0.085

CS 3: Worker exposure: Use in closed, continuous process with occasional controlled exposure (PROC 2)			
Route of exposure and type of effects	Exposure estimate and method	DNEL	RCR
Dermal, systemic, acute		Long-term systemic dermal DNEL is considered sufficiently low to protect against potential acute effects from peak exposure (toxicological threshold for acute effects several orders of magnitude higher than DNEL for long-term effects).	
Dermal, local, acute		Short term exposure is assessed to be controlled by conditions for long-term, as acute toxicological threshold is 5 times higher than long-term toxicological threshold.	
Dermal, systemic, long-term	0.274 mg/kg bw/day (TRA Worker v3)	0.4 mg/kg bw/day	0.685
Dermal, local, long-term	0.04 mg/cm² (TRA Worker v3)	Exposure is well below the toxicological threshold of 0.05 mg/cm²	
Inhalation, systemic, acute	0.04 mg/m³ (TRA Worker v3)	Risk for systemic effects is considered controlled, if risk for local effects is controlled	
Inhalation, local, acute	0.04 mg/m³ (TRA Worker v3)	0.05 mg/m³	0.8
Inhalation, systemic, long-term	0.01 mg/m³ (TRA Worker v3)	Risk for systemic effects is considered controlled, if risk for local effects is controlled	
Inhalation, local, long-term	0.01 mg/m³ (TRA Worker v3)	Exposure is well below the toxicological threshold of 0.05 mg/m³	
Eye, local		Risk is considered to be controlled if the worker wears goggles at any potential eye exposure to substance	
Combined routes, systemic, long-term			0.685

CS 4: Worker exposure: Mixing or blending in batch processes for formulation of preparations and articles (PROC 5)			
Route of exposure and type of effects	Exposure estimate and method	DNEL	RCR
Dermal, systemic, acute		Long-term systemic dermal DNEL is considered sufficiently low to protect against potential acute effects from peak exposure (toxicological threshold for acute effects several orders of magnitude higher than DNEL for long-term effects).	
Dermal, local, acute		Short term exposure is assessed to be controlled by conditions for long-term, as acute toxicological threshold is 5 times higher than long-term toxicological threshold.	

Dermal, systemic, long-term	0.274 mg/kg bw/day (TRA Worker v3)	0.4 mg/kg bw/day	0.686
Dermal, local, long-term	0.04 mg/cm² (TRA Worker v3)	Exposure is well below the toxicological threshold of 0.05 mg/cm²	
Inhalation, systemic, acute	0.02 mg/m³ (TRA Worker v3)	Risk for systemic effects is considered controlled, if risk for local effects is controlled	
Inhalation, local, acute	0.02 mg/m³ (TRA Worker v3)	0.05 mg/m³	0.4
Inhalation, systemic, long-term	0.005 mg/m³ (TRA Worker v3)	Risk for systemic effects is considered controlled, if risk for local effects is controlled	
Inhalation, local, long-term	0.005 mg/m³ (TRA Worker v3)	Exposure is well below the toxicological threshold of 0.05 mg/m³	
Eye, local		Risk is considered to be controlled if the worker wears goggles at any potential eye exposure to substance	
Combined routes, systemic, long-term			0.686

CS 5: Worker exposure: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities (PROC 8a)			
Route of exposure and type of effects	Exposure estimate and method	DNEL	RCR
Dermal, systemic, acute		Long-term systemic dermal DNEL is considered sufficiently low to protect against potential acute effects from peak exposure (toxicological threshold for acute effects several orders of magnitude higher than DNEL for long-term effects).	
Dermal, local, acute		Short term exposure is assessed to be controlled by conditions for long-term, as acute toxicological threshold is 5 times higher than long-term toxicological threshold.	
Dermal, systemic, long-term	0.274 mg/kg bw/day (TRA Worker v3)	0.4 mg/kg bw/day	0.686
Dermal, local, long-term	0.02 mg/cm² (TRA Worker v3)	Exposure is well below the toxicological threshold of 0.05 mg/cm²	
Inhalation, systemic, acute	0.02 mg/m³ (TRA Worker v3)	Risk for systemic effects is considered controlled, if risk for local effects is controlled	
Inhalation, local, acute	0.02 mg/m³ (TRA Worker v3)	0.05 mg/m³	0.4
Inhalation, systemic, long-term	0.005 mg/m³ (TRA Worker v3)	Risk for systemic effects is considered controlled, if risk for local effects is controlled	
Inhalation, local, long-term	0.005 mg/m³ (TRA Worker v3)	Exposure is well below the toxicological threshold of 0.05 mg/m³	
Eye, local		Risk is considered to be controlled if the worker wears goggles at any potential eye exposure to substance	
Combined routes, systemic, long-term			0.686

CS 6: Worker exposure: Transfer of substance or preparation into small containers (PROC 9)			
Route of exposure and type of effects	Exposure estimate and method	DNEL	RCR
Dermal, systemic, acute		Long-term systemic dermal DNEL is considered sufficiently low to protect against potential acute effects from peak exposure (toxicological threshold for acute effects several orders of magnitude higher than DNEL for long-term effects).	
Dermal, local, acute		Short term exposure is assessed to be controlled by conditions for long-term, as acute toxicological threshold is 5 times higher than long-term toxicological threshold.	
Dermal, systemic, long-term	0.137 mg/kg bw/day (TRA Worker v3)	0.4 mg/kg bw/day	0.343
Dermal, local, long-term	0.02 mg/cm² (TRA Worker v3)	Exposure is well below the toxicological threshold of 0.05 mg/cm^2	
Inhalation, systemic, acute	0.04 mg/m³ (TRA Worker v3)	Risk for systemic effects is considered controlled, if risk for local effects is controlled	
Inhalation, local, acute	0.04 mg/m³ (TRA Worker v3)	0.05 mg/m³	0.8
Inhalation, systemic, long-term	0.01 mg/m³ (TRA Worker v3)	Risk for systemic effects is considered controlled, if risk for local effects is controlled	
Inhalation, local, long-term	0.01 mg/m³ (TRA Worker v3)	Exposure is well below the toxicological threshold of 0.05 mg/m^3	
Eye, local		Risk is considered to be controlled if the worker wears goggles at any potential eye exposure to substance	
Combined routes, systemic, long-term			0.343

CS 7: Worker exposure: Production of preparations or articles by tabletting, compression, extrusion, pelletisation (PROC 14)			
Route of exposure and type of effects	Exposure estimate and method	DNEL	RCR
Dermal, systemic, acute		Long-term systemic dermal DNEL is considered sufficiently low to protect against potential acute effects from peak exposure (toxicological threshold for acute effects several orders of magnitude higher than DNEL for long-term effects).	
Dermal, local, acute		Short term exposure is assessed to be controlled by conditions for long-term, as acute toxicological threshold is 5 times higher than long-term toxicological threshold.	
Dermal, systemic, long-term	0.069 mg/kg bw/day (TRA Worker v3)	0.4 mg/kg bw/day	0.172
Dermal, local, long-term	0.01 mg/cm² (TRA Worker v3)	Exposure is well below the toxicological threshold of 0.05 mg/cm^2	
Inhalation, systemic, acute	0.04 mg/m³ (TRA Worker v3)	Risk for systemic effects is considered controlled, if risk for local effects is controlled	
Inhalation, local, acute	0.04 mg/m³ (TRA Worker v3)	0.05 mg/m³	0.8
Inhalation, systemic, long-term	0.01 mg/m³ (TRA Worker	Risk for systemic effects is considered controlled, if risk for local effects is controlled	

	v3)		
Eye, local		Risk is considered to be controlled if the worker wears goggles at any potential eye exposure to substance	
Inhalation, local, long-term	0.01 mg/m³ (TRA Worker v3)	Exposure is well below the toxicological threshold of 0.05 mg/m³	
Combined routes, systemic, long-term			0.172

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

Scaling method - Environment
Algorithm
Scalable parameters - Environment
Daily use. Local release rate
Boundaries of scaling -Environment
Do not exceed local release rate

Scaling method - Workers
TRA Worker v3
Scalable parameters - Workers
Daily amounts used per day
Boundaries of scaling - Workers
Estimated RCR shall be < 1 to demonstrate safe use

ABBREVIATIONS	
BW	Body weight
CS	Contributing Scenario
DNEL	Derived no-effect level
DU	Downstream user
DW	Dry Weight
ERC	Environmental release category
ES	Exposure scenario
PEC	Predicted Exposure Concentrations
PNEC	Predicted no-effect concentration
PROC	Process category
RCR	Risk characterisation ratio
STP	Sewage treatment plant
TRA	Targeted Risk Assessment

ES4: Use at industrial site - Use of Phase Transfer Catalysts

1. Title Section	
Industrial use of cetrimonium bromide (CAS 57-09-0) – use of phase transfer catalysts (Cetyl Trimethyl Ammonium Bromide (CTAB))	
Environment	
CS 1: Industrial settings, use of intermediates	ERC 6b
Worker	
CS 2: Use in closed system	PROC 1
CS 3: Use in closed system with occasional controlled exposure	PROC 2
CS 4: Use in closed batch process	PROC 3
CS 5: Use in batch system with occasional controlled exposure	PROC 4
CS 6: Transfer of mixture	PROC 8a
CS 7: Transfer of substance/preparations; dedicated facilities	PROC 8b
CS 8: Transfer of substance/preparations into small containers	PROC 9

2. Conditions of use affecting exposure

CS 1: Control of environmental exposure: Use at industrial site - Use of Phase Transfer Catalysts (ERC 6b)
Amounts used, frequency and duration of use (or from service life)
Daily amount per site: ≤ 0.008 tonnes/day or local release rate (water): 0.003 kg/day
Annual amount per site: ≤ 2 tonnes/year
Frequency and duration of use: 250 days/year
Technical and organisational conditions and measures
No special precautions
Conditions and measures related to sewage treatment plant
• Municipal STP: Yes [Effectiveness Water: 93.11%]
• Discharge rate of STP: ≥ 2E3 m3/day
• Application of the STP sludge on agricultural soil: Yes
Conditions and measures related to treatment of waste
Waste disposal according to national/local legislation is sufficient.
Other conditions affecting environmental exposure
Receiving surface water flow rate: ≥ 1.8E4 m3/day

CS 2: Control of worker exposure: Use in closed system (PROC 1)
Product (article) characteristics
Substance as such. Low dustiness
Amounts used, frequency and duration of use
< 8 hours/day
Technical and organisational conditions and measures
General ventilation: Basic general ventilation (1-3 air changes per hour)
Use in closed process

Conditions and measures related to personal protection, hygiene and health evaluation
Use chemically resistant gloves conforming to EN374 [Effectiveness Dermal: 80%]
Wear goggles/face shield if there is the slightest risk of exposure.
Other conditions affecting workers exposure
Place of use: Indoor Process temperature (for solid): Ambient

CS 3: Control of worker exposure: Use in closed, continuous process with occasional controlled exposure (PROC 2)
Product (article) characteristics
Substance as such. Low dustiness
Amounts used, frequency and duration of use
< 8 hours/day
Technical and organisational conditions and measures
General ventilation: Basic general ventilation (1-3 air changes per hour)
Closed continuous process with occasional controlled exposure
Conditions and measures related to personal protection, hygiene and health evaluation
Use chemically resistant gloves conforming to EN374 [Effectiveness Dermal: 80%]
Wear goggles/face shield if there is the slightest risk of exposure.
Other conditions affecting workers exposure
Place of use: Indoor Process temperature (for solid): Ambient

CS 4: Control of worker exposure: Use in closed batch process (PROC 3)
Product (article) characteristics
Substance as such. Low dustiness
Amounts used, frequency and duration of use
< 8 hours/day
Technical and organisational conditions and measures
General ventilation: Basic general ventilation (1-3 air changes per hour)
Local exhaust ventilation: Yes [Effectiveness Inhal: 90%]
Closed batch process with occasional controlled exposure
Conditions and measures related to personal protection, hygiene and health evaluation
Use chemically resistant gloves conforming to EN374 [Effectiveness Dermal: 80%]
Wear goggles/face shield if there is the slightest risk of exposure.
Other conditions affecting workers exposure
Place of use: Indoor Process temperature (for solid): Ambient

CS 5: Control of worker exposure: Use in batch system with occasional controlled exposure (PROC 4)
Product (article) characteristics
Substance as such. Low dustiness
Amounts used, frequency and duration of use

< 8 hours/day
Technical and organisational conditions and measures
General ventilation: Basic general ventilation (1-3 air changes per hour)
Local exhaust ventilation: Yes [Effectiveness Inhal: 90%]
Semi-closed process with occasional controlled exposure
Conditions and measures related to personal protection, hygiene and health evaluation
Use chemically resistant gloves conforming to EN374 [Effectiveness Dermal: 80%]
Use Respiratory Protection: Use Respirator with APF of 10 [Effectiveness Inhal: 90%]
Wear goggles/face shield if there is the slightest risk of exposure.
Other conditions affecting workers exposure
Place of use: Indoor Process temperature (for solid): Ambient

CS 6: Control of worker exposure: Transfer of mixture (PROC 8a)
Product (article) characteristics
Substance as such. Low dustiness
Amounts used, frequency and duration of use
< 8 hours/day
Technical and organisational conditions and measures
General ventilation: Basic general ventilation (1-3 air changes per hour)
Local exhaust ventilation: Yes [Effectiveness Inhal: 90%]
Conditions and measures related to personal protection, hygiene and health evaluation
Use chemically resistant gloves conforming to EN374 [Effectiveness Dermal: 80%]
Use Respiratory Protection: Use Respirator with APF of 10 [Effectiveness Inhal: 90%]
Wear goggles/face shield if there is the slightest risk of exposure.
Other conditions affecting workers exposure
Place of use: Indoor Process temperature (for solid): Ambient

CS 7: Control of worker exposure: Transfer of substance/preparations; dedicated facilities (PROC 8b)
Product (article) characteristics
Substance as such. Low dustiness
Amounts used, frequency and duration of use
< 8 hours/day
Technical and organisational conditions and measures
General ventilation: Basic general ventilation (1-3 air changes per hour)
Local exhaust ventilation: Yes [Effectiveness Inhal: 95%]
Semi-closed process with occasional controlled exposure
Conditions and measures related to personal protection, hygiene and health evaluation
Use chemically resistant gloves conforming to EN374 [Effectiveness Dermal: 80%]
Wear goggles/face shield if there is the slightest risk of exposure.
Other conditions affecting workers exposure
Place of use: Indoor

Process temperature (for solid): Ambient

CS 8: Transfer of substance or preparation into small containers (PROC 9)
Product (article) characteristics
Substance as such. Low dustiness
Amounts used, frequency and duration of use
< 8 hours/day
Technical and organisational conditions and measures
General ventilation: Basic general ventilation (1-3 air changes per hour)
Local exhaust ventilation: Yes [Effectiveness Inhal: 90%]
Semi-closed process with occasional controlled exposure
Conditions and measures related to personal protection, hygiene and health evaluation
Use chemically resistant gloves conforming to EN374 [Effectiveness Dermal: 80%]
Wear goggles/face shield if there is the slightest risk of exposure.
Other conditions affecting workers exposure
Place of use: Indoor Process temperature (for solid): Ambient

3. Exposure and risk estimation

CS 1: Environmental release and exposure: Industrial settings, use of intermediates (ERC 6b)

Release route	Release rate	Release estimation method
Water	**Final release factor:** 0.044% **Local release rate:** 0.003 kg/day **Explanation / Justification:** This is the maximum daily release rate (per point source) which will keep RCR < 0.8	Maximum acceptable release rate in order to keep the RCR below 0.8
Air	**Initial release factor:** 0.1% **Final release factor:** 0.1% **Local release rate:** 0.008 kg/day	ERC based
Soil	**Final release factor:** 0.025%	ERC based

Protection target	Exposure estimate	PNEC	RCR
Freshwater	**Local PEC:** 1.749E-5 mg/L	0.022 µg/L	0.795
Marine water	**Local PEC:** 1.722E-6 mg/L	0.0022 µg/L	0.783
Agricultural Soil	**Local PEC:** 0.005 mg/kg dw	0.21 mg/kg	0.023
STP	**Local PEC:** 1.205E-4 mg/L	0.19 mg/L	<0.01

CS 2: Worker exposure: Use in closed system (PROC 1)			
Route of exposure and type of effects	Exposure estimate and method	DNEL	RCR
Dermal, systemic, acute	-	Long-term systemic dermal DNEL is considered sufficiently low to protect against potential acute effects from peak exposure (toxicological threshold for acute effects several orders of magnitude higher than DNEL for long-term effects).	
Dermal, local, acute	-	Short term exposure is assessed to be controlled by conditions for long-term, as acute toxicological threshold is 5 times higher than long-term toxicological threshold.	
Dermal, systemic, long-term	0.007 mg/kg bw/day (TRA Worker v3)	0.4 mg/kg bw/day	0.017
Dermal, local, long-term	0.002 mg/cm² (TRA Worker v3)	Exposure is well below the toxicological threshold of 0.05 mg/cm^2	
Inhalation, systemic, acute	0.04 mg/m³ (TRA Worker v3)	Risk for systemic effects is considered controlled, if risk for local effects is controlled	
Inhalation, local, acute	0.04 mg/m³ (TRA Worker v3)	0.05 mg/m³	0.8
Inhalation, systemic, long-term	0.01 mg/m³ (TRA Worker v3)	Risk for systemic effects is considered controlled, if risk for local effects is controlled	
Inhalation, local, long-term	0.01 mg/m³ (TRA Worker v3)	Exposure is well below the toxicological threshold of 0.05 mg/m^3	
Eye, local		Risk is considered to be controlled if the worker wears goggles at any potential eye exposure to substance	
Combined routes, systemic, long-term			0.017

CS 3: Worker exposure: Use in closed, continuous process with occasional controlled exposure (PROC 2)			
Route of exposure and type of effects	Exposure estimate and method	DNEL	RCR
Dermal, systemic, acute		Long-term systemic dermal DNEL is considered sufficiently low to protect against potential acute effects from peak exposure (toxicological threshold for acute effects several orders of magnitude higher than DNEL for long-term effects).	
Dermal, local, acute		Short term exposure is assessed to be controlled by conditions for long-term, as acute toxicological threshold is 5 times higher than long-term toxicological threshold.	
Dermal, systemic, long-term	0.274 mg/kg bw/day (TRA Worker v3)	0.4 mg/kg bw/day	0.685
Dermal, local, long-term	0.04 mg/cm² (TRA Worker v3)	Exposure is well below the toxicological threshold of 0.05 mg/cm^2	
Inhalation, systemic, acute	0.04 mg/m³ (TRA Worker v3)	Risk for systemic effects is considered controlled, if risk for local effects is controlled	
Inhalation, local, acute	0.04 mg/m³ (TRA Worker v3)	0.05 mg/m³	0.8

Inhalation, systemic, long-term	0.01 mg/m³ (TRA Worker v3)	Risk for systemic effects is considered controlled, if risk for local effects is controlled	
Inhalation, local, long-term	0.01 mg/m³ (TRA Worker v3)	Exposure is well below the toxicological threshold of 0.05 mg/m^3	
Eye, local		Risk is considered to be controlled if the worker wears goggles at any potential eye exposure to substance	
Combined routes, systemic, long-term			0.685

CS 4: Worker exposure: Use in closed batch process (PROC 3)			
Route of exposure and type of effects	Exposure estimate and method	DNEL	RCR
Dermal, systemic, acute		Long-term systemic dermal DNEL is considered sufficiently low to protect against potential acute effects from peak exposure (toxicological threshold for acute effects several orders of magnitude higher than DNEL for long-term effects).	
Dermal, local, acute		Short term exposure is assessed to be controlled by conditions for long-term, as acute toxicological threshold is 5 times higher than long-term toxicological threshold.	
Dermal, systemic, long-term	0.138 mg/kg bw/day (TRA Worker v3)	0.4 mg/kg bw/day	0.345
Dermal, local, long-term	0.04 mg/cm² (TRA Worker v3)	Exposure is well below the toxicological threshold of 0.05 mg/cm^2	
Inhalation, systemic, acute	0.04 mg/m³ (TRA Worker v3)	Risk for systemic effects is considered controlled, if risk for local effects is controlled	
Inhalation, local, acute	0.04 mg/m³ (TRA Worker v3)	0.05 mg/m³	0.8
Inhalation, systemic, long-term	0.01 mg/m³ (TRA Worker v3)	Risk for systemic effects is considered controlled, if risk for local effects is controlled	
Inhalation, local, long-term	0.01 mg/m³ (TRA Worker v3)	Exposure is well below the toxicological threshold of 0.05 mg/m^3	
Eye, local		Risk is considered to be controlled if the worker wears goggles at any potential eye exposure to substance	
Combined routes, systemic, long-term			0.345

CS 5: Worker exposure: Use in batch system with occasional controlled exposure (PROC 4)			
Route of exposure and type of effects	Exposure estimate and method	DNEL	RCR
Dermal, systemic, acute		Long-term systemic dermal DNEL is considered sufficiently low to protect against potential acute effects from peak exposure (toxicological threshold for acute effects several orders of magnitude higher than DNEL for long-term effects).	
Dermal, local, acute		Short term exposure is assessed to be controlled by conditions for long-term, as acute toxicological threshold is 5 times higher than long-term toxicological threshold.	

Dermal, systemic, long-term	0.137 mg/kg bw/day (TRA Worker v3)	0.4 mg/kg bw/day	0.343
Dermal, local, long-term	0.02 mg/cm² (TRA Worker v3)	Exposure is well below the toxicological threshold of 0.05 mg/cm²	
Inhalation, systemic, acute	0.02 mg/m³ (TRA Worker v3)	Risk for systemic effects is considered controlled, if risk for local effects is controlled	
Inhalation, local, acute	0.02 mg/m³ (TRA Worker v3)	0.05 mg/m³	0.4
Inhalation, systemic, long-term	0.005 mg/m³ (TRA Worker v3)	Risk for systemic effects is considered controlled, if risk for local effects is controlled	
Inhalation, local, long-term	0.005 mg/m³ (TRA Worker v3)	Exposure is well below the toxicological threshold of 0.05 mg/m³	
Eye, local		Risk is considered to be controlled if the worker wears goggles at any potential eye exposure to substance	
Combined routes, systemic, long-term			0.343

CS 6: Worker exposure: Transfer of mixture (PROC 8a)			
Route of exposure and type of effects	Exposure estimate and method	DNEL	RCR
Dermal, systemic, acute		Long-term systemic dermal DNEL is considered sufficiently low to protect against potential acute effects from peak exposure (toxicological threshold for acute effects several orders of magnitude higher than DNEL for long-term effects).	
Dermal, local, acute		Short term exposure is assessed to be controlled by conditions for long-term, as acute toxicological threshold is 5 times higher than long-term toxicological threshold.	
Dermal, systemic, long-term	0.274 mg/kg bw/day (TRA Worker v3)	0.4 mg/kg bw/day	0.686
Dermal, local, long-term	0.02 mg/cm² (TRA Worker v3)	Exposure is well below the toxicological threshold of 0.05 mg/cm²	
Inhalation, systemic, acute	0.02 mg/m³ (TRA Worker v3)	Risk for systemic effects is considered controlled, if risk for local effects is controlled	
Inhalation, local, acute	0.02 mg/m³ (TRA Worker v3)	0.05 mg/m³	0.4
Inhalation, systemic, long-term	0.005 mg/m³ (TRA Worker v3)	Risk for systemic effects is considered controlled, if risk for local effects is controlled	
Inhalation, local, long-term	0.005 mg/m³ (TRA Worker v3)	Exposure is well below the toxicological threshold of 0.05 mg/m³	
Eye, local		Risk is considered to be controlled if the worker wears goggles at any potential eye exposure to substance	
Combined routes, systemic, long-term			0.686

CS 7: Worker exposure: Transfer of substance/preparations; dedicated facilities (PROC 8b)			
Route of exposure and type of effects	Exposure estimate and method	DNEL	RCR
Dermal, systemic, acute		Long-term systemic dermal DNEL is considered sufficiently low to protect against potential acute effects from peak exposure (toxicological threshold for acute effects several orders of magnitude higher than DNEL for long-term effects).	
Dermal, local, acute		Short term exposure is assessed to be controlled by conditions for long-term, as acute toxicological threshold is 5 times higher than long-term toxicological threshold.	
Dermal, systemic, long-term	0.137 mg/kg bw/day (TRA Worker v3)	0.4 mg/kg bw/day	0.343
Dermal, local, long-term	0.01 mg/cm² (TRA Worker v3)	Exposure is well below the toxicological threshold of 0.05 mg/cm^2	
Inhalation, systemic, acute	0.02 mg/m³ (TRA Worker v3)	Risk for systemic effects is considered controlled, if risk for local effects is controlled	
Inhalation, local, acute	0.02 mg/m³ (TRA Worker v3)	0.05 mg/m³	0.4
Inhalation, systemic, long-term	0.005 mg/m³ (TRA Worker v3)	Risk for systemic effects is considered controlled, if risk for local effects is controlled	
Inhalation, local, long-term	0.005 mg/m³ (TRA Worker v3)	Exposure is well below the toxicological threshold of 0.05 mg/m^3	
Eye, local		Risk is considered to be controlled if the worker wears goggles at any potential eye exposure to substance	
Combined routes, systemic, long-term			0.343

CS 8: Worker exposure: Transfer of substance or preparation into small containers (PROC 9)			
Route of exposure and type of effects	Exposure estimate and method	DNEL	RCR
Dermal, systemic, acute		Long-term systemic dermal DNEL is considered sufficiently low to protect against potential acute effects from peak exposure (toxicological threshold for acute effects several orders of magnitude higher than DNEL for long-term effects).	
Dermal, local, acute		Short term exposure is assessed to be controlled by conditions for long-term, as acute toxicological threshold is 5 times higher than long-term toxicological threshold.	
Dermal, systemic, long-term	0.137 mg/kg bw/day (TRA Worker v3)	0.4 mg/kg bw/day	0.343
Dermal, local, long-term	0.02 mg/cm² (TRA Worker v3)	Exposure is well below the toxicological threshold of 0.05 mg/cm^2	
Inhalation, systemic, acute	0.04 mg/m³ (TRA Worker v3)	Risk for systemic effects is considered controlled, if risk for local effects is controlled	
Inhalation, local, acute	0.04 mg/m³ (TRA Worker v3)	0.05 mg/m³	0.8
Inhalation, systemic, long-term	0.01 mg/m³ (TRA Worker	Risk for systemic effects is considered controlled, if risk for local effects is controlled	

	v3)		
Inhalation, local, long-term	0.01 mg/m³ (TRA Worker v3)	Exposure is well below the toxicological threshold of 0.05 mg/m^3	
Eye, local		Risk is considered to be controlled if the worker wears goggles at any potential eye exposure to substance	
Combined routes, systemic, long-term			0.343

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

Scaling method - Environment
Algorithm
Scalable parameters - Environment
Daily use. Local release rate
Boundaries of scaling -Environment
Do not exceed local release rate

Scaling method - Workers
TRA Worker v3
Scalable parameters - Workers
Daily amounts used per day
Boundaries of scaling - Workers
Estimated RCR shall be < 1 to demonstrate safe use

ABBREVIATIONS	
BW	Body weight
CS	Contributing Scenario
DNEL	Derived no-effect level
DU	Downstream user
DW	Dry Weight
ERC	Environmental release category
ES	Exposure scenario
PEC	Predicted Exposure Concentrations
PNEC	Predicted no-effect concentration
PROC	Process category
RCR	Risk characterisation ratio
STP	Sewage treatment plant
TRA	Targeted Risk Assessment

ES5: Use by professional worker - Professional use of cosmetics and personal care products

1. Title Section	
Professional use of cetrimonium bromide (CAS 57-09-0), SU 20: Health services (Cetyl Trimethyl Ammonium Bromide (CTAB))	
Environment	
CS 1: Use by professional worker	ERC 8a
Worker	
CS 2: Hand mixing	PROC 19

2. Conditions of use affecting exposure

CS 1: Use by professional worker (ERC 8a)
Amounts used, frequency and duration of use (or from service life)
Daily wide dispersive use: ≤ 8.2E-7 tonnes/day or local release rate (water): 8.2E-4 kg/day
Total tonnage: 6 tonnes/year; Regional level: 0.6 tonnes/year
Frequency and duration of use: 365 days/year
Technical and organisational conditions and measures
No special precautions
Conditions and measures related to sewage treatment plant
• Municipal STP: Yes [Effectiveness Water: 93.11%]
• Discharge rate of STP: ≥ 2E3 m3/day
• Application of the STP sludge on agricultural soil: Yes
Conditions and measures related to treatment of waste
Waste disposal according to national/local legislation is sufficient.
Other conditions affecting environmental exposure
Receiving surface water flow rate: ≥ 1.8E4 m3/day

CS 2: Control of worker exposure: Hand mixing (PROC 19)
Product (article) characteristics
Solid in solid mixtures
Concentration of substance in mixture: <1%
Low dustiness
Amounts used, frequency and duration of use
< 8 hours/day
Technical and organisational conditions and measures
General ventilation: Basic general ventilation (1-3 air changes per hour)
Local exhaust ventilation: yes [Effectiveness Inhal: 80%]
Conditions and measures related to personal protection, hygiene and health evaluation
Wear goggles/face shield if there is the slightest risk of exposure.
Other conditions affecting workers exposure
Place of use: Indoor Process temperature (for solid): Ambient

3. Exposure and risk estimation

CS 1: Environmental release and exposure: Use by professional worker (ERC 8a)		
Release route	Release rate	Release estimation method
Water	**Initial release factor:** 100% **Final release factor:** 100% **Local release rate:** 8.2E-4 kg/day	ERC based
Air	**Initial release factor:** 0% **Final release factor:** 0%	Release factor
Soil	**Final release factor:** 0%	ERC based

Protection target	Exposure estimate	PNEC	RCR
Freshwater	**Local PEC:** 8.675E-6 mg/L	0.022 µg/L	0.394
Marine water	**Local PEC:** 8.402E-7 mg/L	0.0022 µg/L	0.382
Agricultural Soil	**Local PEC:** 0.001 mg/kg dw	0.21 mg/kg	<0.01
STP	**Local PEC:** 2.823E-5 mg/L	0.19 mg/L	<0.01

CS 2: Worker exposure: Hand mixing (PROC 19)			
Route of exposure and type of effects	Exposure estimate and method	DNEL	RCR
Dermal, systemic, acute	-	Long-term systemic dermal DNEL is considered sufficiently low to protect against potential acute effects from peak exposure (toxicological threshold for acute effects several orders of magnitude higher than DNEL for long-term effects).	
Dermal, local, acute	-	Short term exposure is assessed to be controlled by conditions for long-term, as acute toxicological threshold is 5 times higher than long-term toxicological threshold.	
Dermal, systemic, long-term	0.28 mg/kg bw/day (External Tool (Based on ECETOC Tra)) [1]	0.4 mg/kg bw/day	0.7
Dermal, local, long-term	0.01 mg/cm² (External Tool (Based on ECETOC Tra))[2]	Exposure is well below the toxicological threshold of 0.05 mg/cm²	

- [1] Dermal, systemic, long-term:
  ECETOC TRA predicts 28.29 mg/kg bw/d for 8 hr exposure to 100% substance. We assumed that exposure is proportional to concentration, which is set to 1% => 0.28 mg/kg bw/d

- [2] Dermal, local, long-term:
  ECETOC TRA predicts 1 mg/cm2 for 8 hr exposure to 100% substance. We assumed that exposure is proportional to concentration, which is set to 1% => 0.01 mg/cm2

Inhalation, systemic, acute	0.04 mg/m³ (TRA Worker v3)	Risk for systemic effects is considered controlled, if risk for local effects is controlled	
Inhalation, local, acute	0.04 mg/m³ (TRA Worker v3)	0.05 mg/m³	0.8
Inhalation, systemic, long-term	0.01 mg/m³ (TRA Worker v3)	Risk for systemic effects is considered controlled, if risk for local effects is controlled	
Inhalation, local, long-term	0.01 mg/m³ (TRA Worker v3)	Exposure is well below the toxicological threshold of 0.05 mg/m³	
Eye, local		Risk is considered to be controlled if the worker wears goggles at any potential eye exposure to substance	
Combined routes, systemic, long-term			0.7

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

Scaling method - Environment
Algorithm
Scalable parameters - Environment
Daily use. Local release rate
Boundaries of scaling -Environment
Do not exceed local release rate

Scaling method - Workers
TRA Worker v3
Scalable parameters - Workers
Daily amounts used per day. Concentration in mixture
Boundaries of scaling - Workers
Estimated RCR shall be < 1 to demonstrate safe use

ABBREVIATIONS	
BW	Body weight
CS	Contributing Scenario
DNEL	Derived no-effect level
DU	Downstream user
DW	Dry Weight
ERC	Environmental release category
ES	Exposure scenario
PEC	Predicted Exposure Concentrations
PNEC	Predicted no-effect concentration
PROC	Process category
RCR	Risk characterisation ratio
STP	Sewage treatment plant
SU	Sector of Use
TRA	Targeted Risk Assessment

ES6: Use by professional worker - Professional use of laboratory chemicals

1. Title Section	
Professional use of cetrimonium bromide (CAS 57-09-0), laboratory chemicals (Cetyl Trimethyl Ammonium Bromide (CTAB))	
Environment	
CS 1: Use by professional worker	ERC 8a
Worker	
CS 2: Use as laboratory reagent	PROC 15

2. Conditions of use affecting exposure

CS 1: Use by professional worker (ERC 8a)
Amounts used, frequency and duration of use (or from service life)
Daily wide dispersive use: ≤ 1.4E-7 tonnes/day or local release rate (water): 1.4E-4 kg/day
Total tonnage: 1 tonnes/year; Regional level: 0.1 tonnes/year
Frequency and duration of use: 365 days/year
Technical and organisational conditions and measures
No special precautions
Conditions and measures related to sewage treatment plant
• Municipal STP: Yes [Effectiveness Water: 93.11%]
• Discharge rate of STP: ≥ 2E3 m3/day
• Application of the STP sludge on agricultural soil: Yes
Conditions and measures related to treatment of waste
Waste disposal according to national/local legislation is sufficient.
Other conditions affecting environmental exposure
Receiving surface water flow rate: ≥ 1.8E4 m3/day

CS 2: Control of worker exposure: Use as laboratory reagent (PROC 15)
Product (article) characteristics
Solid in solid mixtures
Concentration of substance in mixture: <1%
Low dustiness
Amounts used, frequency and duration of use
< 8 hours/day
Technical and organisational conditions and measures
General ventilation: Basic general ventilation (1-3 air changes per hour)
Local exhaust ventilation: yes [Effectiveness Inhal: 80%]
Conditions and measures related to personal protection, hygiene and health evaluation
Use chemically resistant gloves conforming to EN374 [Effectiveness Dermal: 80%]
Wear goggles/face shield if there is the slightest risk of exposure.
Other conditions affecting workers exposure
Place of use: Indoor Process temperature (for solid): Ambient

3. Exposure and risk estimation

CS 1: Environmental release and exposure: Use by professional worker (ERC 8a)		
Release route	Release rate	Release estimation method
Water	**Initial release factor:** 100% **Final release factor:** 100% **Local release rate:** 1.4E-4 kg/day	ERC based
Air	**Initial release factor:** 0% **Final release factor:** 0%	Release factor
Soil	**Final release factor:** 0%	ERC based

Protection target	Exposure estimate	PNEC	RCR
Freshwater	**Local PEC:** 6.438E-6 mg/L	0.022 µg/L	0.293
Marine water	**Local PEC:** 6.164E-7 mg/L	0.0022 µg/L	0.28
Agricultural Soil	**Local PEC:** 1.904E-4 mg/kg dw	0.21 mg/kg	<0.01
STP	**Local PEC:** 4.82E-6 mg/L	0.19 mg/L	<0.01

CS 2: Worker exposure: Use as laboratory reagent (PROC 15)			
Route of exposure and type of effects	Exposure estimate and method	DNEL	RCR
Dermal, systemic, acute	-	Long-term systemic dermal DNEL is considered sufficiently low to protect against potential acute effects from peak exposure (toxicological threshold for acute effects several orders of magnitude higher than DNEL for long-term effects).	
Dermal, local, acute	-	Short term exposure is assessed to be controlled by conditions for long-term, as acute toxicological threshold is 5 times higher than long-term toxicological threshold.	
Dermal, systemic, long-term	0.007 mg/kg bw/day (TRA Worker v3)	0.4 mg/kg bw/day	0.017
Dermal, local, long-term	0.002 mg/cm² (TRA Worker v3)	Exposure is well below the toxicological threshold of 0.05 mg/cm²	
Inhalation, systemic, acute	0.008 mg/m³ (TRA Worker v3)	Risk for systemic effects is considered controlled, if risk for local effects is controlled	
Inhalation, local, acute	0.008 mg/m³ (TRA Worker v3)	0.05 mg/m³	0.16
Inhalation, systemic, long-term	0.002 mg/m³ (TRA Worker v3)	Risk for systemic effects is considered controlled, if risk for local effects is controlled	
Inhalation, local, long-term	0.002 mg/m³ (TRA Worker v3)	Exposure is well below the toxicological threshold of 0.05 mg/m³	
Eye, local		Risk is considered to be controlled if the worker wears goggles at any potential eye exposure to substance	
Combined routes, systemic, long-term			0.017

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

Scaling method - Environment
Algorithm
Scalable parameters - Environment
Daily use. Local release rate
Boundaries of scaling -Environment
Do not exceed local release rate

Scaling method - Workers
TRA Worker v3
Scalable parameters - Workers
Daily amounts used per day. Concentration in mixture
Boundaries of scaling - Workers
Estimated RCR shall be < 1 to demonstrate safe use

ABBREVIATIONS	
BW	Body weight
CS	Contributing Scenario
DNEL	Derived no-effect level
DU	Downstream user
DW	Dry Weight
ERC	Environmental release category
ES	Exposure scenario
PEC	Predicted Exposure Concentrations
PNEC	Predicted no-effect concentration
PROC	Process category
RCR	Risk characterisation ratio
STP	Sewage treatment plant
TRA	Targeted Risk Assessment

ES7: Consumer Use - Consumer use of cosmetics, perfumes and personal products indoor and outdoor

1. Title Section	
Consumer use of cetrimonium bromide (CAS 57-09-0), indoor and outdoor. (Cetyl Trimethyl Ammonium Bromide (CTAB))	
Environment	
CS 1: Consumer use, indoor	ERC 8d, ERC 8a

2. Conditions of use affecting exposure

CS 1: Control of environmental exposure: Consumer use, indoor (ERC 8d, ERC 8a)
Amounts used, frequency and duration of use (or from service life)
Daily wide dispersive use: ≤ 2E-6 tonnes/day or local release rate (water): 0.002 kg/day
Total tonnage: 16 tonnes/year; Regional level: 1.6 tonnes/year
Frequency and duration of use: 365 days/year
Technical and organisational conditions and measures
No special precautions
Conditions and measures related to sewage treatment plant
• Municipal STP: Yes [Effectiveness Water: 93.11%]
• Discharge rate of STP: ≥ 2E3 m3/day
• Application of the STP sludge on agricultural soil: Yes
Conditions and measures related to treatment of waste
Waste disposal according to national/local legislation is sufficient.
Other conditions affecting environmental exposure
Receiving surface water flow rate: ≥ 1.8E4 m3/day

3. Exposure and risk estimation

CS 1: Environmental release and exposure: Consumer use, indoor (ERC 8d, ERC 8a)		
Release route	Release rate	Release estimation method
Water	**Initial release factor:** 100% **Final release factor:** 100% **Local release rate:** 0.002 kg/day	ERC based
Air	**Initial release factor:** 0% **Final release factor:** 0%	Release factor
Soil	**Final release factor:** 20%	ERC based

Protection target	Exposure estimate	PNEC	RCR
Freshwater	**Local PEC:** 1.256E-5 mg/L	0.022 µg/L	0.571
Marine water	**Local PEC:** 1.228E-6 mg/L	0.0022 µg/L	0.558
Agricultural Soil	**Local PEC:** 0.003 mg/kg dw	0.21 mg/kg	0.013

STP	**Local PEC:** 6.886E-5 mg/L	0.19 mg/L	<0.01

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

Scaling method - Environment
Algorithm
Scalable parameters - Environment
Daily use. Local release rate
Boundaries of scaling -Environment
Do not exceed local release rate

ABBREVIATIONS	
BW	Body weight
CS	Contributing Scenario
DNEL	Derived no-effect level
DU	Downstream user
DW	Dry Weight
ERC	Environmental release category
ES	Exposure scenario
PEC	Predicted Exposure Concentrations
PNEC	Predicted no-effect concentration
PROC	Process category
RCR	Risk characterisation ratio
STP	Sewage treatment plant
TRA	Targeted Risk Assessment

ES8: Service life (consumers) - Consumer and professional indoor use of cosmetics in wet wipes

1. Title Section

Service life from consumer use of cetrimonium bromide (CAS 57-09-0) (Cetyl Trimethyl Ammonium Bromide (CTAB))	
Environment	
CS 1: Consumer use indoor, cosmetics, pharmaceuticals in articles	ERC 11a

2. Conditions of use affecting exposure

CS 1: Control of environmental exposure: Consumer use indoor, cosmetics, pharmaceuticals in articles (ERC 11a)
Amounts used, frequency and duration of use (or from service life)
Daily wide dispersive use: ≤ 2.7E-7 tonnes/day or local release rate (water): 1.35E-7 kg/day
Total tonnage: 2 tonnes/year; Regional level: 0.2 tonnes/year
Frequency and duration of use: 365 days/year
Technical and organisational conditions and measures
No special precautions
Conditions and measures related to sewage treatment plant
• Municipal STP: Yes [Effectiveness Water: 93.11%]
• Discharge rate of STP: ≥ 2E3 m3/day
• Application of the STP sludge on agricultural soil: Yes
Conditions and measures related to treatment of waste
Waste disposal according to national/local legislation is sufficient.
Other conditions affecting environmental exposure
Receiving surface water flow rate: ≥ 1.8E4 m3/day

3. Exposure and risk estimation

CS 1: Environmental release and exposure: Consumer use, indoor (ERC 8d, ERC 8a)		
Release route	Release rate	Release estimation method
Water	**Initial release factor:** 0.05% **Final release factor:** 0.05% **Local release rate:** 1.35E-7 kg/day	ERC based
Air	**Initial release factor:** 0% **Final release factor:** 0%	Release factor
Soil	**Final release factor:** 0%	ERC based

Protection target	Exposure estimate	PNEC	RCR
Freshwater	**Local PEC:** 5.978E-6 mg/L	0.022 µg/L	0.272
Marine water	**Local PEC:** 5.704E-7 mg/L	0.0022 µg/L	0.259
Agricultural Soil	**Local PEC:** 1.499E-6 mg/kg dw	0.21 mg/kg	< 0.01
STP	**Local PEC:** 4.648E-9 mg/L	0.19 mg/L	<0.01

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

Scaling method - Environment
Algorithm
Scalable parameters - Environment
Daily use. Local release rate
Boundaries of scaling -Environment
Do not exceed local release rate

ABBREVIATIONS	
BW	Body weight
CS	Contributing Scenario
DNEL	Derived no-effect level
DU	Downstream user
DW	Dry Weight
ERC	Environmental release category
ES	Exposure scenario
PEC	Predicted Exposure Concentrations
PNEC	Predicted no-effect concentration
PROC	Process category
RCR	Risk characterisation ratio
STP	Sewage treatment plant
TRA	Targeted Risk Assessment