

ES FOR COMMUNICATION

Substance Name: NICKEL BIS(DIHYDROGEN PHOSPHATE) (update 2017)

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0. General provisions related to conditions of use and guidance to downstream users

All provisions given in this section generally apply to each exposure scenario (ES) included below. They are to be supplemented or exchanged by more specific measures as given in the applicable exposure scenario as appropriate.

0.1. Good occupational hygiene practice

Good occupational hygiene practices are required to ensure safe handling of the substance. In general, inhalation (e.g. dust should not be blown off with compressed air) and ingestion must be avoided (e.g. no eating and smoking in the workplace, regular cleaning with suitable cleaning devices). Any contaminated clothing should not be taken home. Good general ventilation in the workplace should ensure an adequate supply of fresh air. Regular training in workplace hygiene practice and proper use of personal protective equipment (if relevant) are required.

0.2. General provisions related to personal protective equipment for workers

Use of personal protective equipment (PPE) for each of the exposure routes listed below is required as described here, unless exposure to the substance can be excluded for the respective route(s) of exposure. Such exclusion of exposure may be determined by:

- (i) the physical appearance of the substance in the specific type of application (e.g. wetting the substance can effectively prevent from the emission of dust),
- (ii) the emission potential resulting from the nature of the process (e.g. splashes, emission of dust can be excluded in a closed process),
- (iii) applied exposure prevention measures (segregation of the emission source or separation of the worker from the emission source), and
- (iv) the amount of the handled/emitted material during use in relation to the room size (i.e. dilution factor) under consideration of the prevailing air exchange rates during use.

If PPE needs to be used, refer to section 8 of the SDS for further specification of such equipment.

0.2.1. Dermal route (skin protection)

Skin protective equipment should be selected in consideration of mechanical, cold or heat stress or any other physico-chemical hazards as relevant for the conducted tasks and working environment in addition to the effectiveness of the equipment to control exposure. Certified safety clothing including coveralls and safety shoes have to be worn. The following requirements for gloves are to be met:

- Due to the classification of the substance, gloves and skin protective clothing have to be worn for precautionary reasons unless dermal exposure can be excluded (please see above).
- If gloves are to be worn, either due to these general provisions or due to specific requirements set in the ES, they have to comply with EN 374.
- Any prescribed gloves have to be changed according to manufacturer's information or when damaged, whatever is the earlier.

0.2.2. Inhalation route (respiratory protection)

Specific information on the required assigned protection factor (APF) may be provided in the occupational exposure scenarios below. RPE should be selected based on the given APF according to EN 529 and should comply with national legislation. The following requirements for respiratory protective equipment (RPE) are to be met in any case:

- Due to the classification of the substance, RPE has to be worn for precautionary reasons unless inhalation exposure can be excluded (please see above).

- If RPE has to be worn, either due to these general provisions or due to specific requirements set in the ES, an APF of 10 represents the required minimum level of protection.

0.2.3. Eye/face protection

Eye/face protective equipment should be selected in consideration of mechanical, cold or heat stress or any other physico-chemical hazards as relevant for the conducted tasks and working environment in addition to the effectiveness of the equipment to control exposure. The following requirements for eye/face protective equipment are to be met:

- Avoid direct contact of the eyes with the substance.
- Suitable eye protection equipment (e.g. goggles or visors) must be worn.
- Face protection must be worn unless face protection is already provided by eye protection (e.g. face covering visor) worn and/or RPE.

0.3. Generic guidance to DU to evaluate whether he works inside the boundaries set by the ES

In any of the included exposure scenarios (ES) below, the downstream user (DU) works inside the boundaries set by the ES if the given operational conditions (OCs) and risk management measures (RMMs) as described in the ES are met. In cases in which the DU's conditions are not explicitly included in the generic conditions described in the ES, the DU has to ensure that his specific OCs and implemented RMMs are compliant. If the concentration of the substance in mixture is not explicitly stated in the ES this does not represent a restriction (i.e. up to 100 % of the substance could be used). Depending on the basis for the exposure assessment conducted for the ES, this needs to be done in different ways as described separately for environmental and occupational ES below.

0.3.1. Occupational exposure scenarios

The occupational exposure assessment may be either based on monitoring data (including analogous or published data) or based on exposure assessment models. Depending on which method has been used for exposure assessment, different ways for compliance checking are to be followed as given below.

0.3.1.1. Monitoring data used as basis for assessment

If the exposure assessment in the ES is based on monitoring data, the same approach can be used by DUs for compliance checking. Please note that 6 measurements per workplace are required for an exposure assessment as a minimum. Depending on the variability of the data sets (expressed as the geometric standard deviation) and the level of the resulting risk characterisation ratio, additional measurements may be required. Only measurements of personal exposure to the inhalable fraction of airborne dust (according to EN 481) should be used. The exposure data shall either be applicable to the length of a specific task to be assessed or to a full-shift (i.e. sampled over a duration of at least 120 min) if the task to be assessed is conducted for a significant portion of the work shift. From the exposure data set, the maximum likelihood estimate of the upper 90 % confidence limit for the 75th percentile of the exposure distribution is to be used as a reasonable worst case estimate for comparison with the reported exposure level in the associated contributing ES. Respiratory protective equipment (RPE) may be taken into account by applying the assigned protection factor as given in EN 529:2005.

0.3.1.1.1. Specific considerations for efficiency values for RMMs prescribed in occupational exposure scenarios

When personal exposure data are used to evaluate whether the conditions prescribed in the ES are met, the efficiency of the RMMs implemented does not need to be separately assessed given that monitored exposure levels are in compliance with those reported for the ES after consideration of any PPE worn.

0.3.1.1.2. Deviations from the conditions of use if monitoring data were used for exposure assessment

Any deviations from the given conditions of use require either to:

- (i) inform the supplier of the SDS about these deviations and to request a reflection of these deviations in an ES or
- (ii) prepare a DU CSR (according to Article 37(4)) to be notified to ECHA and to be kept as in-house documentation.

0.3.1.2. Use of exposure models

If the exposure assessment in the ES is based on modelled data, the same model can be used to justify specific slight deviations from the generic conditions described in the ES. All parameters needed to run the exposure estimation tool MEASE (version 1.02.01; available on www.ebrc.de/mease.html) can be found in the ES. It is noted that the installation of the prescribed RMMs is mandatory and that exclusively the modification of the personal protective equipment (PPE) used is allowed as deviation. The only parameters which may therefore be modified in the MEASE-calculation are consequently:

- (i) concentration in mixture (only lower concentrations),
- (ii) efficiency of the installed RMMs (only higher efficiencies), and
- (iii) type of PPE to be used.

0.3.1.2.1. Specific considerations for efficiency values for RMMs prescribed in occupational exposure scenarios

Any efficiency values reported in the ES represent typical efficiencies for a given industry sector after evaluating conditions of use as made available to the consultants and are therefore considered to adequately approximate to actual efficiencies. If downstream users want to evaluate whether prescribed efficiencies are met, exposure monitoring could be conducted. In such a case, monitored exposure levels should be at or lower than reported for the ES after consideration of any PPE worn. Further information on efficiency values can be found in the glossary of MEASE.

0.3.1.2.2. Deviations from the conditions of use if exposure models were used for exposure assessment

Further deviations from the given conditions of use or if the DU assessment is to be based on monitoring data require either to:

- (i) inform the supplier of the SDS about these deviations and to request a reflection of these deviations in an ES or
- (ii) prepare a DU CSR (according to Article 37(4)) to be notified to ECHA and to be kept as in-house documentation.

0.3.2. Environmental exposure scenarios

0.3.2.1. Deviations from the conditions of use

This can be done by using the MetalEUSES scaling tool (free download: <http://www.arche-consulting.be/tools/du-scaling-tool/>) to estimate the associated exposure. Following parameters can be scaled: amount used at local site, number of emission days, discharge effluent rate, dilution factor (or flow rate of the river), presence/absence of municipal sewage treatment plant (STP), removal rate municipal STP, use of municipal sludge on agricultural soil, and release factors to air and water.

0.4. Man via the environment exposure and risk characterisation assessments

Inhalation is the critical exposure pathway for humans via the environment. The PEC for air at site neighbouring residential areas should be lower than the chronic inhalation DNEL for the general public of 60 ng Ni/m³ as annual average in PM10 in order to demonstrate adequate control of risk (RCR<1) for Man via the Environment (MvE). Hereto a safe use Exposure Scenario for MvE was developed based on the EUSES model. The MvE ES is defined as the product of tonnage (T) and emission factor

to air (EF) being lower than 72700 g Ni/year. The value of 72700 g Ni/year is derived by using EUSES model to back-calculate the product of T and EF that results in a local air concentration (C_{local}) of 55.5 ng Ni/m³. The value of 55.5 ng Ni/m³ is derived from the difference between the DNEL of 60 ng Ni/m³ and the EU regional background concentration ($C_{regional}$) of 4.5 ng Ni/m³ (P90 annual concentration for 2012).

Safe use ES for all sectors according to Tier 1 (EUSES model)

Sector	Tonnage (Ni T /year)	Emission factor (g Ni/T)	Tonnage × emission factor (g /year)	C_{local} (ng/m ³)	$C_{regional}$ (ng/m ³)	PEC_{local} (ng/m ³)	$RCR = PEC/DNEL$ (DNEL= 60 ng/m ³)
All	T	EF	T × EF < 72700	<55.5	4.5*	<60	<1

*: EU average of country P90 annual Ni concentrations (2012)

If a site is not compliant with these conditions, meaning that the product of tonnage and emission factor is above 72700 g Ni/year, a tiered approach including site-specific modelling can be applied to demonstrate safe use.

1. ES 1: Formulation or re-packing; Metal surface treatment products; Formulation of water-based inorganic preparations

1.1. Title section

Product category: Metal surface treatment products (PC 14)

Environment	
1: Formulation of water-based inorganic preparations - FW STP	ERC 2
2: Formulation of water-based inorganic preparations - FW direct	ERC 2
3: Formulation of water-based inorganic preparations - marine	ERC 2
Worker	
4: Formulation	PROC 4, PROC 3, PROC 2
5: Handling of solution	PROC 8b, PROC 9
6: Wet cleaning	PROC 28

1.2. Conditions of use affecting exposure

1.2.1. Control of environmental exposure: Formulation of water-based inorganic preparations - FW STP (ERC 2)

Amount used, frequency and duration of use (or from service life)
Daily amount per site ≤ 0.19 tonnes/day (All the amounts are expressed as Ni as this is the driver for the environmental risk assessment.)
Annual amount per site ≤ 41.0 tonnes/year
Emission days ≥ 220.0 days/year
Technical and organisational conditions and measures
Electrostatic precipitator or wet electrostatic precipitator or cyclones or fabric/bag filter or ceramic/metal mesh filter or wet scrubber
Chemical precipitation or sedimentation or filtration or electrolysis or reverse osmosis or ion exchange
Conditions and measures related to biological sewage treatment plant
Municipal sewage treatment plant is assumed
Assumed domestic sewage treatment plant flow ≥ 2000 m ³ /day
Conditions and measures related to external treatment of waste (including article waste)
Dispose of waste product or used containers according to local regulations.
Other conditions affecting environmental exposure
Receiving surface water flow ≥ 18000 m ³ /day
No discharge to marine water assumed
Receiving water dilution (fresh or marine) ≥ 10.0

1.2.2. Control of environmental exposure: Formulation of water-based inorganic preparations - FW direct (ERC 2)

Amount used, frequency and duration of use (or from service life)
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Daily amount per site <= 0.096 tonnes/day (All the amounts are expressed as Ni as this is the driver for the environmental risk assessment.)
Annual amount per site <= 21.0 tonnes/year
Emission days >= 220.0 days/year
Technical and organisational conditions and measures
Electrostatic precipitator or wet electrostatic precipitator or cyclones or fabric/bag filter or ceramic/metal mesh filter or wet scrubber
Chemical precipitation or sedimentation or filtration or electrolysis or reverse osmosis or ion exchange
Conditions and measures related to external treatment of waste (including article waste)
Dispose of waste product or used containers according to local regulations.
Other conditions affecting environmental exposure
Receiving surface water flow >= 4975 m3/day
No discharge to marine water assumed
Receiving water dilution (fresh or marine) >= 200.0
Assumed effluent discharge flow from site >= 25.0 m3/day

1.2.3. Control of environmental exposure: Formulation of water-based inorganic preparations - marine (ERC 2)

Amount used, frequency and duration of use (or from service life)
Daily amount per site <= 0.096 tonnes/day (All the amounts are expressed as Ni as this is the driver for the environmental risk assessment.)
Annual amount per site <= 21.0 tonnes/year
Emission days >= 220.0 days/year
Technical and organisational conditions and measures
Electrostatic precipitator or wet electrostatic precipitator or cyclones or fabric/bag filter or ceramic/metal mesh filter or wet scrubber
Chemical precipitation or sedimentation or filtration or electrolysis or reverse osmosis or ion exchange
Conditions and measures related to external treatment of waste (including article waste)
Dispose of waste product or used containers according to local regulations.
Other conditions affecting environmental exposure
No discharge to freshwater assumed
Receiving water dilution (fresh or marine) >= 100.0
Assumed effluent discharge flow from site >= 25.0 m3/day

1.2.4. Control of worker exposure: Formulation (PROC 4, PROC 3, PROC 2)

Product (Article) characteristics
Maximum emission potential covered in this ES: Very low.
Physical form covered in this ES: Solution.
Amount used (or contained in articles), frequency and duration of use/exposure
Covers daily exposures up to 8 hours
Technical and organisational conditions and measures
Covers use at ambient temperatures.

Use of a local exhaust ventilation with standard efficiency is required.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear suitable gloves tested to EN374.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.; For further specification, refer to section 8 of the SDS.

1.2.5. Control of worker exposure: Handling of solution (PROC 8b, PROC 9)

Product (Article) characteristics
Maximum emission potential covered in this ES: Very low.
Physical form covered in this ES: Solution.
Amount used (or contained in articles), frequency and duration of use/exposure
Covers daily exposures up to 8 hours
Technical and organisational conditions and measures
Closed process with occasional opening.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear suitable gloves tested to EN374.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.; For further specification, refer to section 8 of the SDS.

1.2.6. Control of worker exposure: Wet cleaning (PROC 28)

Product (Article) characteristics
Maximum emission potential covered in this ES: Very low.
Physical form covered in this ES: Solution.
Amount used (or contained in articles), frequency and duration of use/exposure
Covers daily exposures up to 8 hours
Technical and organisational conditions and measures
Cleaning machines such as power sweeper, no direct manual cleaning.
Covers use at ambient temperatures.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear suitable gloves tested to EN374.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.; For further specification, refer to section 8 of the SDS.

1.3. Exposure estimation and reference to its source

1.3.1. Environmental release and exposure: Formulation of water-based inorganic preparations - FW STP (ERC 2)

Release route	Release rate	Release estimation method
Water	0.022 kg/day	Estimated release factor
Air	9.32E-3 kg/day	Estimated release factor
Soil	0 kg/day	Estimated release factor

Protection target	Exposure estimate	RCR
Fresh water	3.37E-3 mg/L (EUSES 2.1.2)	0.474
Sediment (freshwater)	45.7 mg/kg dw (PEC sediment calculation method for metals)	0.419

Protection target	Exposure estimate	RCR
Sewage Treatment Plant	6.49E-3 mg/L (EUSES 2.1.2)	0.02
Agricultural soil	16.38 mg/kg dw (EUSES 2.1.2)	0.548

1.3.2. Environmental release and exposure: Formulation of water-based inorganic preparations - FW direct (ERC 2)

Release route	Release rate	Release estimation method
Water	0.011 kg/day	Estimated release factor
Air	4.77E-3 kg/day	Estimated release factor
Soil	0 kg/day	Estimated release factor

Protection target	Exposure estimate	RCR
Fresh water	4.49E-3 mg/L (EUSES 2.1.2)	0.632
Sediment (freshwater)	75.3 mg/kg dw (PEC sediment calculation method for metals)	0.691
Agricultural soil	16.2 mg/kg dw (EUSES 2.1.2)	0.542

1.3.3. Environmental release and exposure: Formulation of water-based inorganic preparations - marine (ERC 2)

Release route	Release rate	Release estimation method
Water	0.011 kg/day	Estimated release factor
Air	4.77E-3 kg/day	Estimated release factor
Soil	0 kg/day	Estimated release factor

Protection target	Exposure estimate	RCR
Marine water	3.48E-3 mg/L (EUSES 2.1.2)	0.404
Sediment (marine water)	99.65 mg/kg dw (PEC sediment calculation method for metals)	0.914
Agricultural soil	16.2 mg/kg dw (EUSES 2.1.2)	0.542

1.3.4. Worker exposure: Formulation (PROC 4, PROC 3, PROC 2)

Route of exposure and type of effects	Exposure estimate	RCR
Inhalation, systemic, long term	9E-3 mg/m ³ (Measured data)	0.18
Inhalation, systemic, acute	0.027 mg/m ³ (Measured data)	< 0.01
Inhalation, local, long term	9E-3 mg/m ³ (Measured data)	0.18
Inhalation, local, acute	0.027 mg/m ³ (Measured data)	0.017
Dermal, local, long term	0.06 µg/cm ² (Measured data)	0.136
Combined, systemic, long term		0.18
Combined, systemic, acute		< 0.01

1.3.5. Worker exposure: Handling of solution (PROC 8b, PROC 9)

Route of exposure and type of effects	Exposure estimate	RCR
Inhalation, systemic, long term	0.022 mg/m ³ (Measured data)	0.44
Inhalation, systemic, acute	0.067 mg/m ³ (Measured data)	< 0.01

Route of exposure and type of effects	Exposure estimate	RCR
Inhalation, local, long term	0.022 mg/m ³ (Measured data)	0.44
Inhalation, local, acute	0.067 mg/m ³ (Measured data)	0.042
Dermal, local, long term	0.06 µg/cm ² (Measured data)	0.136
Combined, systemic, long term		0.44
Combined, systemic, acute		< 0.01

1.3.6. Worker exposure: Wet cleaning (PROC 28)

Route of exposure and type of effects	Exposure estimate	RCR
Inhalation, systemic, long term	9E-3 mg/m ³ (Measured data)	0.18
Inhalation, systemic, acute	0.027 mg/m ³ (Measured data)	< 0.01
Inhalation, local, long term	9E-3 mg/m ³ (Measured data)	0.18
Inhalation, local, acute	0.027 mg/m ³ (Measured data)	0.017
Dermal, local, long term	0.06 µg/cm ² (Measured data)	0.136
Combined, systemic, long term		0.18
Combined, systemic, acute		< 0.01

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

Guidance: Please refer to Section 0.3 of this "ES for Communication".

2. ES 2: Use at industrial sites; Metal surface treatment products; Manufacture of basic metals, including alloys; Industrial use of metal treatment products

2.1. Title section

Product category: Metal surface treatment products (PC 14)

Sector of use: Manufacture of basic metals, including alloys (SU 14)

Environment	
1: Industrial use of metal treatment products - FW STP	ERC 5
2: Industrial use of metal treatment products - FW direct	ERC 5
3: Industrial use of metal treatment products - FW marine	ERC 5
Worker	
4: Handling of solutions as raw material	PROC 8b, PROC 9
5: Mixing and blending	PROC 5, PROC 3, PROC 4
6: Spray application	PROC 7, PROC 3
7: Dipping application	PROC 13
8: Testing of solution composition	PROC 15
9: Wet cleaning	PROC 28

2.2. Conditions of use affecting exposure

2.2.1. Control of environmental exposure: Industrial use of metal treatment products - FW STP (ERC 5)

Amount used, frequency and duration of use (or from service life)
Daily amount per site ≤ 0.033 tonnes/day (All the amounts are expressed as Ni as this is the driver for the environmental risk assessment.)
Annual amount per site ≤ 8.0 tonnes/year
Emission days ≥ 240.0 days/year
Technical and organisational conditions and measures
Electrostatic precipitator or wet electrostatic precipitator or cyclones or fabric/bag filter or ceramic/metal mesh filter or wet scrubber
Chemical precipitation or sedimentation or filtration or electrolysis or reverse osmosis or ion exchange
Conditions and measures related to biological sewage treatment plant
Municipal sewage treatment plant is assumed
Assumed domestic sewage treatment plant flow ≥ 2000 m ³ /day
Conditions and measures related to external treatment of waste (including article waste)
Dispose of waste product or used containers according to local regulations.
Other conditions affecting environmental exposure
Receiving surface water flow ≥ 18000 m ³ /day
No discharge to marine water assumed

Receiving water dilution (fresh or marine) ≥ 10.0
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2.2.2. Control of environmental exposure: Industrial use of metal treatment products - FW direct (ERC 5)

Amount used, frequency and duration of use (or from service life)
Daily amount per site ≤ 0.009 tonnes/day (All the amounts are expressed as Ni as this is the driver for the environmental risk assessment.)
Annual amount per site ≤ 2.1 tonnes/year
Emission days ≥ 240.0 days/year
Technical and organisational conditions and measures
Electrostatic precipitator or wet electrostatic precipitator or cyclones or fabric/bag filter or ceramic/metal mesh filter or wet scrubber
Chemical precipitation or sedimentation or filtration or electrolysis or reverse osmosis or ion exchange
Conditions and measures related to external treatment of waste (including article waste)
Dispose of waste product or used containers according to local regulations.
Other conditions affecting environmental exposure
Receiving surface water flow ≥ 12250 m ³ /day
No discharge to marine water assumed
Receiving water dilution (fresh or marine) ≥ 50.0
Assumed effluent discharge flow from site ≥ 250.0 m ³ /day

2.2.3. Control of environmental exposure: Industrial use of metal treatment products - FW marine (ERC 5)

Amount used, frequency and duration of use (or from service life)
Daily amount per site ≤ 0.016 tonnes/day (All the amounts are expressed as Ni as this is the driver for the environmental risk assessment.)
Annual amount per site ≤ 3.8 tonnes/year
Emission days ≥ 240.0 days/year
Technical and organisational conditions and measures
Electrostatic precipitator or wet electrostatic precipitator or cyclones or fabric/bag filter or ceramic/metal mesh filter or wet scrubber
Chemical precipitation or sedimentation or filtration or electrolysis or reverse osmosis or ion exchange
Conditions and measures related to external treatment of waste (including article waste)
Dispose of waste product or used containers according to local regulations.
Other conditions affecting environmental exposure
No discharge to freshwater assumed
Receiving water dilution (fresh or marine) ≥ 100.0
Assumed effluent discharge flow from site ≥ 250.0 m ³ /day

2.2.4. Control of worker exposure: Handling of solutions as raw material (PROC 8b, PROC 9)

Product (Article) characteristics
Maximum emission potential covered in this ES: Very low.

Physical form covered in this ES: Solution.
Amount used (or contained in articles), frequency and duration of use/exposure
Covers daily exposures up to 8 hours
Technical and organisational conditions and measures
Covers use at ambient temperatures.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear suitable gloves tested to EN374.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.; For further specification, refer to section 8 of the SDS.

2.2.5. Control of worker exposure: Mixing and blending (PROC 5, PROC 3, PROC 4)

Product (Article) characteristics
Maximum emission potential covered in this ES: Very low.
Physical form covered in this ES: Solution.
Amount used (or contained in articles), frequency and duration of use/exposure
Covers daily exposures up to 8 hours
Technical and organisational conditions and measures
Covers use at ambient temperatures.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear suitable gloves tested to EN374.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.; For further specification, refer to section 8 of the SDS.

2.2.6. Control of worker exposure: Spray application (PROC 7, PROC 3)

Product (Article) characteristics
Physical form covered in this ES: Solution.
Maximum emission potential covered in this ES: Medium (spraying process).
Amount used (or contained in articles), frequency and duration of use/exposure
Covers daily exposures up to 8 hours
Limit the substance content in the product to 1.0 ; %
Technical and organisational conditions and measures
Use in closed process
Automated task
Use of an integrated local exhaust ventilation with high efficiency is required.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear suitable gloves tested to EN374.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.; For further specification, refer to section 8 of the SDS.

2.2.7. Control of worker exposure: Dipping application (PROC 13)

Product (Article) characteristics
Maximum emission potential covered in this ES: Very low.
Physical form covered in this ES: Solution.
Technical and organisational conditions and measures
Automated task

Use of a surfactant/wetting/foaming agent is required.
Use of a rim ventilation is required.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear suitable gloves tested to EN374.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.; For further specification, refer to section 8 of the SDS.

2.2.8. Control of worker exposure: Testing of solution composition (PROC 15)

Product (Article) characteristics
Physical form covered in this ES: Solution.
Amount used (or contained in articles), frequency and duration of use/exposure
Amount per use < 1.0 kg
Technical and organisational conditions and measures
Use of an extraction hood with standard efficiency is required.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear suitable gloves tested to EN374.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.; For further specification, refer to section 8 of the SDS.

2.2.9. Control of worker exposure: Wet cleaning (PROC 28)

Product (Article) characteristics
Maximum emission potential covered in this ES: Very low.
Physical form covered in this ES: Solution.
Amount used (or contained in articles), frequency and duration of use/exposure
Covers daily exposures up to 8 hours
Technical and organisational conditions and measures
Cleaning machines such as power sweeper, no direct manual cleaning.
Covers use at ambient temperatures.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear suitable gloves tested to EN374.; For further specification, refer to section 8 of the SDS.
Use suitable eye protection.; For further specification, refer to section 8 of the SDS.

2.3. Exposure estimation and reference to its source

2.3.1. Environmental release and exposure: Industrial use of metal treatment products - FW STP (ERC 5)

Release route	Release rate	Release estimation method
Water	0.126 kg/day	Estimated release factor
Air	0.038 kg/day	Estimated release factor
Soil	0 kg/day	Estimated release factor

Protection target	Exposure estimate	RCR
Fresh water	5.61E-3 mg/L (EUSES 2.1.2)	0.79
Sediment (freshwater)	104.8 mg/kg dw (PEC sediment calculation method for metals)	0.962

Protection target	Exposure estimate	RCR
Sewage Treatment Plant	0.038 mg/L (EUSES 2.1.2)	0.114
Agricultural soil	17.26 mg/kg dw (EUSES 2.1.2)	0.577

2.3.2. Environmental release and exposure: Industrial use of metal treatment products - FW direct (ERC 5)

Release route	Release rate	Release estimation method
Water	0.034 kg/day	Estimated release factor
Air	0.01 kg/day	Estimated release factor
Soil	0 kg/day	Estimated release factor

Protection target	Exposure estimate	RCR
Fresh water	4.84E-3 mg/L (EUSES 2.1.2)	0.682
Sediment (freshwater)	84.6 mg/kg dw (PEC sediment calculation method for metals)	0.776
Agricultural soil	16.2 mg/kg dw (EUSES 2.1.2)	0.542

2.3.3. Environmental release and exposure: Industrial use of metal treatment products - FW marine (ERC 5)

Release route	Release rate	Release estimation method
Water	0.06 kg/day	Estimated release factor
Air	0.018 kg/day	Estimated release factor
Soil	0 kg/day	Estimated release factor

Protection target	Exposure estimate	RCR
Marine water	2.02E-3 mg/L (EUSES 2.1.2)	0.234
Sediment (marine water)	61.2 mg/kg dw (PEC sediment calculation method for metals)	0.561
Agricultural soil	16.2 mg/kg dw (EUSES 2.1.2)	0.542

2.3.4. Worker exposure: Handling of solutions as raw material (PROC 8b, PROC 9)

Route of exposure and type of effects	Exposure estimate	RCR
Inhalation, systemic, long term	9E-3 mg/m ³ (Measured data)	0.18
Inhalation, systemic, acute	0.027 mg/m ³ (Measured data)	< 0.01
Inhalation, local, long term	9E-3 mg/m ³ (Measured data)	0.18
Inhalation, local, acute	0.027 mg/m ³ (Measured data)	0.017
Dermal, local, long term	0.06 µg/cm ² (Measured data)	0.136
Combined, systemic, long term		0.18
Combined, systemic, acute		< 0.01

2.3.5. Worker exposure: Mixing and blending (PROC 5, PROC 3, PROC 4)

Route of exposure and type of effects	Exposure estimate	RCR
Inhalation, systemic, long term	9E-3 mg/m ³ (Measured data)	0.18
Inhalation, systemic, acute	0.027 mg/m ³ (Measured data)	< 0.01
Inhalation, local, long term	9E-3 mg/m ³ (Measured data)	0.18
Inhalation, local, acute	0.027 mg/m ³ (Measured data)	0.017
Dermal, local, long term	0.06 µg/cm ² (Measured data)	0.136
Combined, systemic, long term		0.18
Combined, systemic, acute		< 0.01

2.3.6. Worker exposure: Spray application (PROC 7, PROC 3)

Route of exposure and type of effects	Exposure estimate	RCR
Inhalation, systemic, long term	2E-3 mg/m ³ (Measured data)	0.04
Inhalation, systemic, acute	5E-3 mg/m ³ (Measured data)	< 0.01
Inhalation, local, long term	2E-3 mg/m ³ (Measured data)	0.04
Inhalation, local, acute	5E-3 mg/m ³ (Measured data)	< 0.01
Dermal, local, long term	0.06 µg/cm ² (Measured data)	0.136
Combined, systemic, long term		0.04
Combined, systemic, acute		< 0.01

2.3.7. Worker exposure: Dipping application (PROC 13)

Route of exposure and type of effects	Exposure estimate	RCR
Inhalation, systemic, long term	6E-3 mg/m ³ (Measured data)	0.12
Inhalation, systemic, acute	0.017 mg/m ³ (Measured data)	< 0.01
Inhalation, local, long term	6E-3 mg/m ³ (Measured data)	0.12
Inhalation, local, acute	0.017 mg/m ³ (Measured data)	0.011
Dermal, local, long term	0.076 µg/cm ² (Measured data)	0.173
Combined, systemic, long term		0.12
Combined, systemic, acute		< 0.01

2.3.8. Worker exposure: Testing of solution composition (PROC 15)

Route of exposure and type of effects	Exposure estimate	RCR
Inhalation, systemic, long term	3E-3 mg/m ³ (Measured data)	0.06
Inhalation, systemic, acute	0.01 mg/m ³ (Measured data)	< 0.01
Inhalation, local, long term	3E-3 mg/m ³ (Measured data)	0.06
Inhalation, local, acute	0.01 mg/m ³ (Measured data)	< 0.01
Dermal, local, long term	0.06 µg/cm ² (Measured data)	0.136
Combined, systemic, long term		0.06
Combined, systemic, acute		< 0.01

2.3.9. Worker exposure: Wet cleaning (PROC 28)

Route of exposure and type of effects	Exposure estimate	RCR
Inhalation, systemic, long term	9E-3 mg/m ³ (Measured data)	0.18
Inhalation, systemic, acute	0.027 mg/m ³ (Measured data)	< 0.01
Inhalation, local, long term	9E-3 mg/m ³ (Measured data)	0.18
Inhalation, local, acute	0.027 mg/m ³ (Measured data)	0.017
Dermal, local, long term	0.06 µg/cm ² (Measured data)	0.136
Combined, systemic, long term		0.18
Combined, systemic, acute		< 0.01

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

Guidance: Please refer to Section 0.3 of this "ES for Communication".