



9.2. Exposure scenario 2: Use at industrial sites - Use as an intermediate

Market sector: Manufacture of other substances

Sector of use: SU 8: Manufacture of bulk, large scale chemicals (including petroleum products); SU 9: Manufacture of fine chemicals

Environment contributing scenario(s):		
CS 1	Use as an intermediate ES 2.1	ERC 6a
CS 2	Use as an intermediate ES 2.2	ERC 6a
CS 3	Use as an intermediate ES 2.3	ERC 6a
Worker contributing scenario(s):		
CS 4	Handling/Transfer of solutions	PROC 8b
CS 5	Small scale handling/transfer of solutions	PROC 9
CS 6	Handling of dusty materials	PROC 26
CS 7	Fully contained process	PROC 1
CS 8	Batch process in closed system	PROC 3
CS 9	Open or semi-closed wet chemical process	PROC 4
CS 10	Wet cleaning	PROC 8a
CS 11	Vacuum cleaning	PROC 26

Explanation on the approach taken for the ES:

It is noted that this exposure scenario focusses on exposure to the substance to be registered. Please refer to information on safe use for the handling of the individual manufactured substances for process steps commencing the chemical transformation step.

9.2.1. Env CS 1: Use as an intermediate ES 2.1 (ERC 6a)

Assessment entity group used for the assessment of this contributing scenario: Pd dissolved for ENV assessment

9.2.1.1. Conditions of use

Amount used, frequency and duration of use (or from service life)
<ul style="list-style-type: none"> Annual use amount at site: ≤ 28 tonnes/year <i>77.41 tonnes disodium tetrachloropalladate (28.0 tonnes Pd metal equivalent); 90P from sector data</i> Daily use amount at site: ≤ 0.1 tonnes/day <i>Based on 280 days per year (50P from sector data)</i>
Conditions and measures related to biological sewage treatment plant
<ul style="list-style-type: none"> Biological STP: Site specific [Effectiveness Water: 73.4%] Discharge rate of STP: $\geq 3E3$ m³/day Application of the STP sludge on agricultural soil: No <i>The sludge is incinerated (with ash going to landfill)</i>
Conditions and measures related to external treatment of waste (including article waste)
<ul style="list-style-type: none"> Particular considerations on the waste treatment operations: Other <i>Dihydrogen tetrachloropalladate- and other Pd -containing waste suitable for recycling may be recycled either internally or at licensed recycling facility.</i> <i>The sludge from the on-site treatment plant is processed for metal reclamation (recycling).</i>
Other conditions affecting environmental exposure
<ul style="list-style-type: none"> Receiving surface water flow rate: $\geq 9.3E4$ m³/day Discharge to: Freshwater only

**Fate (release percentage) in the biological sewage treatment plant**

The biological STP is site specific and the releases to the various compartments have been set by the assessor for some assessment entities. They are distributed in the following way:

Assessment entities	Pd dissolved
Release to water	26.6%
Release to air	0%
Release to sludge	73.4%
Release degraded	0%

Explanation for Pd dissolved:

Stutt E, Wilson I, Merrington G & Rothenbacher K (2016) Determining the Removal of Platinum Group Metals in Industrial Effluent during Sewage Treatment.

9.2.1.2. Releases

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

Table 9.21. Local releases to the environment

Release	Assessment entity	Release estimation method	Explanations
Water	Pd dissolved	Estimated release factor	Release factor before on site RMM: 5.62E-3% Release factor after on site RMM: 5.62E-3% Local release rate: 5.62E-3 kg/day Explanation: On-site wastewater treatment by chemical precipitation, sedimentation and/or filtration. Efficiency 99.9 % (sector data) Release factor after on-site treatment: 56.2 g/T (50P from sector data)
Air	Pd dissolved	Estimated release factor	Release factor before on site RMM: 3E-3% Release factor after on site RMM: 3E-3% Local release rate: 3E-3 kg/day Explanation: Treatment of air emissions by wet scrubbers and filters (e.g. fabric, bag, HEPA). Release factor after on-site treatment: 30 g/T (10% of SpERC RF for 'Manufacture of metal compounds')
Non agricultural soil	Pd dissolved	Estimated release factor	Release factor after on site RMM: 0% Explanation: No direct emissions to soil.

9.2.1.3. Exposure and risks for the environment and man via the environment

The exposure concentrations and risk characterisation ratios (RCR) are reported in the following table. The exposure estimates have been obtained with EUSES 2.1.2 unless stated otherwise.

Table 9.22. Exposure concentrations and risks for the environment and man via the environment

Protection target	Assessment entity	Exposure concentration	Risk quantification
Fresh water	Pd dissolved	Local PEC: 1.52E-5 mg/L RCR = 0.338	Final RCR = 0.338
Sediment (freshwater)	Pd dissolved	Local PEC: 0.037 mg/kg dw RCR = 0.136	Final RCR = 0.136
Sewage Treatment	Pd dissolved	Local PEC: 4.98E-4 mg/L	Final RCR < 0.01



Protection target	Assessment entity	Exposure concentration	Risk quantification
Plant		RCR = 9.47E-4	
Agricultural soil	Pd dissolved	Local PEC: 2.13E-3 mg/kg dw RCR = 0.108	Final RCR = 0.108

9.2.2. Env CS 2: Use as an intermediate ES 2.2 (ERC 6a)

Assessment entity group used for the assessment of this contributing scenario: Pd dissolved for ENV assessment

9.2.2.1. Conditions of use

Amount used, frequency and duration of use (or from service life)
<ul style="list-style-type: none"> Annual use amount at site: <= 28 tonnes/year <i>77.41 tonnes disodium tetrachloropalladate (28.0 tonnes Pd metal equivalent); 90P from sector data</i> Daily use amount at site: <= 0.1 tonnes/day <i>Based on 280 days per year (50P from sector data)</i>
Conditions and measures related to biological sewage treatment plant
<ul style="list-style-type: none"> Biological STP: None [Effectiveness Water: 0%]
Conditions and measures related to external treatment of waste (including article waste)
<ul style="list-style-type: none"> Particular considerations on the waste treatment operations: Other <i>Dihydrogen tetrachloropalladate- and other Pd -containing waste suitable for recycling may be recycled either internally or at licensed recycling facility.</i> <i>The sludge from the on-site treatment plant is processed for metal reclamation (recycling).</i>
Other conditions affecting environmental exposure
<ul style="list-style-type: none"> Receiving surface water flow rate: >= 2.98E6 m3/day Discharge to: Freshwater only Discharge rate of effluent: >= 3E3 m3/day

9.2.2.2. Releases

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

Table 9.23. Local releases to the environment

Release	Assessment entity	Release estimation method	Explanations
Water	Pd dissolved	Estimated release factor	Release factor before on site RMM: 5.62E-3% Release factor after on site RMM: 5.62E-3% Local release rate: 5.62E-3 kg/day Explanation: On-site wastewater treatment by chemical precipitation, sedimentation and/or filtration. Efficiency 99.9 % (sector data) Release factor after on-site treatment: 56.2 g/T (50P from sector data)
Air	Pd dissolved	Estimated release factor	Release factor before on site RMM: 3E-3% Release factor after on site RMM: 3E-3% Local release rate: 3E-3 kg/day Explanation: Treatment of air emissions by wet scrubbers and filters (e.g. fabric, bag, HEPA). Release factor after on-site treatment: 30 g/T (10% of SpERC RF for 'Manufacture of metal compounds')
Non agricultural	Pd dissolved	Estimated release	Release factor after on site RMM: 0%



Release	Assessment entity	Release estimation method	Explanations
soil		factor	Explanation: No direct emissions to soil.

9.2.2.3. Exposure and risks for the environment and man via the environment

The exposure concentrations and risk characterisation ratios (RCR) are reported in the following table. The exposure estimates have been obtained with EUSES 2.1.2 unless stated otherwise.

Table 9.24. Exposure concentrations and risks for the environment and man via the environment

Protection target	Assessment entity	Exposure concentration	Risk quantification
Fresh water	Pd dissolved	Local PEC: 1.99E-6 mg/L RCR = 0.044	Final RCR = 0.044
Sediment (freshwater)	Pd dissolved	Local PEC: 4.9E-3 mg/kg dw RCR = 0.018	Final RCR = 0.018
Agricultural soil	Pd dissolved	Local PEC: 2.13E-3 mg/kg dw RCR = 0.108	Final RCR = 0.108

9.2.3. Env CS 3: Use as an intermediate ES 2.3 (ERC 6a)

Assessment entity group used for the assessment of this contributing scenario: Pd dissolved for ENV assessment

9.2.3.1. Conditions of use

Amount used, frequency and duration of use (or from service life)
<ul style="list-style-type: none"> Annual use amount at site: ≤ 0.5 tonnes/year <i>1.38 tonnes disodium tetrachloropalladate (0.50 tonnes Pd metal equivalent); calculated Msafe</i> Daily use amount at site: $\leq 1.8E-3$ tonnes/day <i>Based on 280 days per year (50P from sector data)</i>
Conditions and measures related to biological sewage treatment plant
<ul style="list-style-type: none"> Biological STP: None [Effectiveness Water: 0%]
Conditions and measures related to external treatment of waste (including article waste)
<ul style="list-style-type: none"> Particular considerations on the waste treatment operations: Other <i>Dihydrogen tetrachloropalladate- and other Pd -containing waste suitable for recycling may be recycled either internally or at licensed recycling facility.</i> <i>The sludge from the on-site treatment plant is processed for metal reclamation (recycling).</i>
Other conditions affecting environmental exposure
<ul style="list-style-type: none"> Discharge to: Marine water only Discharge rate of effluent: ≥ 120 m³/day Dilution factor to marine water: ≤ 100

9.2.3.2. Releases

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

Table 9.25. Local releases to the environment

Release	Assessment entity	Release estimation method	Explanations
Water	Pd dissolved	Estimated release factor	Release factor before on site RMM: 1E-3% Release factor after on site RMM: 1E-3%



Release	Assessment entity	Release estimation method	Explanations
			Local release rate: 1.8E-5 kg/day Explanation: Arbitrary
Air	Pd dissolved	Estimated release factor	Release factor before on site RMM: 3E-3% Release factor after on site RMM: 3E-3% Local release rate: 5.4E-5 kg/day Explanation: Treatment of air emissions by wet scrubbers and filters (e.g. fabric, bag, HEPA). Release factor after on-site treatment: 30 g/T (10% of SpERC RF for 'Manufacture of metal compounds')
Non agricultural soil	Pd dissolved	Estimated release factor	Release factor after on site RMM: 0% Explanation: No direct emissions to soil.

9.2.3.3. Exposure and risks for the environment and man via the environment

The exposure concentrations and risk characterisation ratios (RCR) are reported in the following table. The exposure estimates have been obtained with EUSES 2.1.2 unless stated otherwise.

Table 9.26. Exposure concentrations and risks for the environment and man via the environment

Protection target	Assessment entity	Exposure concentration	Risk quantification
Marine water	Pd dissolved	Clocal: 1.21E-6 mg/L (estimated by Calculation with Kp susp. matter marine (logKp = 4.21)) RCR = 0.273	Final RCR = 0.273
Sediment (marine water)	Pd dissolved	Clocal: 0.02 mg/kg dw (estimated by Calculation with Kp susp. matter marine (logKp = 4.21)) RCR = 0.735	Final RCR = 0.735
Agricultural soil	Pd dissolved	Local PEC: 1.85E-3 mg/kg dw RCR = 0.094	Final RCR = 0.094

9.2.4. Worker CS 4: Handling/Transfer of solutions (PROC 8b)

Assessment entity group used for the assessment of this contributing scenario: disodium tetrachloropalladate for OCC assessment

9.2.4.1. Conditions of use

	Method
Product (article) characteristics	
• Content in preparation: Not restricted [Effectiveness Inhalation: 0%, Dermal: 0%]	MEASE 1
• Maximum emission potential of the substance: Very low	MEASE 1
• Physical form of the used product	MEASE 1
• Physical form of substance: Solution	MEASE 1
• Percentage (w/w) of substance in mixture/article: <= 100 %	MEASE 1
Amount used (or contained in articles), frequency and duration of use/exposure	
• Duration of activity: <= 8 h/day	MEASE 1
• Maximum duration of exposure: > 240 min (not restricted) [Effectiveness Inhalation: 0%, Dermal: 0%]	MEASE 1



	Method
Technical and organisational conditions and measures	
• Contact level: Intermittent	MEASE 1
• Local exhaust ventilation: No	MEASE 1
• Room ventilation: Basic (up to 3 ACH)	MEASE 1
• Pattern of exposure control: Non-direct handling	MEASE 1
• Occupational Health and Safety Management System: Advanced	MEASE 1
• Pattern of use: Non-dispersive use	MEASE 1
Conditions and measures related to personal protection, hygiene and health evaluation	
• Dermal protection: No	MEASE 1
• Respiratory protective equipment (RPE) as precautionary measure: RPE protecting from local effects via inhalation	
• Face/eye protection: No	
• Respiratory protection: No	MEASE 1
• Gloves as precautionary measure: Gloves protecting from local effects to the skin (high hazard)	
• Eye protection: Eye protection to be worn to protect from adverse effects to the eyes	
Other conditions affecting workers exposure	
• Place of use: Indoor	MEASE 1
• Operating temperature: ≤ 40 °C	MEASE 1

9.2.4.2. Exposure and risks for workers

The exposure concentrations and risk characterisation ratios (RCR) are reported in the following table.

Table 9.27. Exposure concentrations and risks for workers

Route of exposure and type of effects	Assessment entity	Exposure concentration	Risk quantification
Inhalation, systemic, long term	disodium tetrachloropalladate	10 $\mu\text{g}/\text{m}^3$ (MEASE 1) RCR = 7.81E-4	Final RCR < 0.01
Dermal, systemic, long term	disodium tetrachloropalladate	3.43 $\mu\text{g}/\text{kg}$ bw/day (MEASE 1) RCR = 1.9E-4	Final RCR < 0.01
Combined routes, systemic, long-term			Final RCR < 0.01

Remarks on exposure data from external estimation tools:

MEASE 1 for disodium tetrachloropalladate:

Explanation:

Dermal, systemic, long term

For calculation of systemic exposure, the exposure estimate for total dermal loading as obtained in MEASE (reported in mg/day) is divided by a body weight of 70 kg for workers.

Risk characterisation

Qualitative risk characterisation (Inhalation, local, long term, Inhalation, local, acute, Dermal, local, long term, Dermal, local, acute, Eye, local):

Further information on the risk characterisation for local effects via inhalation, for local dermal effects and local effects to the eyes is given in Section 9.0.2.3.

Additional remarks on risk characterisation: Under the prescribed conditions of use, exposure is well below the DNELs and no local effects are expected. Therefore, risks are adequately controlled.

9.2.5. Worker CS 5: Small scale handling/transfer of solutions (PROC 9)



Assessment entity group used for the assessment of this contributing scenario: disodium tetrachloropalladate for OCC assessment

9.2.5.1. Conditions of use

	Method
Product (article) characteristics	
• Content in preparation: Not restricted [Effectiveness Inhalation: 0%, Dermal: 0%]	MEASE 1
• Maximum emission potential of the substance: Very low	MEASE 1
• Physical form of the used product	MEASE 1
• Physical form of substance: Solution	MEASE 1
• Percentage (w/w) of substance in mixture/article: <= 100 %	MEASE 1
Amount used (or contained in articles), frequency and duration of use/exposure	
• Duration of activity: <= 8 h/day	MEASE 1
• Maximum duration of exposure: > 240 min (not restricted) [Effectiveness Inhalation: 0%, Dermal: 0%]	MEASE 1
Technical and organisational conditions and measures	
• Contact level: Intermittent	MEASE 1
• Local exhaust ventilation: No	MEASE 1
• Room ventilation: Basic (up to 3 ACH)	MEASE 1
• Pattern of exposure control: Direct handling	MEASE 1
• Occupational Health and Safety Management System: Advanced	MEASE 1
• Pattern of use: Non-dispersive use	MEASE 1
Conditions and measures related to personal protection, hygiene and health evaluation	
• Dermal protection: No	MEASE 1
• Respiratory protective equipment (RPE) as precautionary measure: RPE protecting from local effects via inhalation	
• Face/eye protection: No	
• Respiratory protection: No	MEASE 1
• Gloves as precautionary measure: Gloves protecting from local effects to the skin (high hazard)	
• Eye protection: Eye protection to be worn to protect from adverse effects to the eyes	
Other conditions affecting workers exposure	
• Place of use: Indoor	MEASE 1
• Operating temperature: <= 40 °C	MEASE 1

9.2.5.2. Exposure and risks for workers

The exposure concentrations and risk characterisation ratios (RCR) are reported in the following table.

Table 9.28. Exposure concentrations and risks for workers

Route of exposure and type of effects	Assessment entity	Exposure concentration	Risk quantification
Inhalation, systemic, long term	disodium tetrachloropalladate	10 µg/m ³ (MEASE 1) RCR = 7.81E-4	Final RCR < 0.01
Dermal, systemic, long term	disodium tetrachloropalladate	34.29 µg/kg bw/day (MEASE 1) RCR = 1.89E-3	Final RCR < 0.01
Combined routes, systemic, long-term			Final RCR < 0.01

**Remarks on exposure data from external estimation tools:**

MEASE 1 for disodium tetrachloropalladate:

Explanation:

Dermal, systemic, long term

For calculation of systemic exposure, the exposure estimate for total dermal loading as obtained in MEASE (reported in mg/day) is divided by a body weight of 70 kg for workers.

Risk characterisation

Qualitative risk characterisation (Inhalation, local, long term, Inhalation, local, acute, Dermal, local, long term, Dermal, local, acute, Eye, local):

Further information on the risk characterisation for local effects via inhalation, for local dermal effects and local effects to the eyes is given in Section 9.0.2.3.

Additional remarks on risk characterisation: Under the prescribed conditions of use, exposure is well below the DNELs and no local effects are expected. Therefore, risks are adequately controlled.

9.2.6. Worker CS 6: Handling of dusty materials (PROC 26)

Assessment entity group used for the assessment of this contributing scenario: disodium tetrachloropalladate for OCC assessment

9.2.6.1. Conditions of use

	Method
Product (article) characteristics	
• Physical form of substance: Solid, powder / dust	MEASE 1
• Content in preparation: Not restricted [Effectiveness Inhalation: 0%, Dermal: 0%]	MEASE 1
• Maximum emission potential of the substance: High	MEASE 1
• Physical form of the used product	MEASE 1
• Percentage (w/w) of substance in mixture/article: <= 100 %	MEASE 1
Amount used (or contained in articles), frequency and duration of use/exposure	
• Duration of activity: <= 8 h/day	MEASE 1
• Maximum duration of exposure: > 240 min (not restricted) [Effectiveness Inhalation: 0%, Dermal: 0%]	MEASE 1
Technical and organisational conditions and measures	
• Contact level: Intermittent	MEASE 1
• Local exhaust ventilation: No	MEASE 1
• Generic local exhaust ventilation: Lower confidence limit (industrial use) [Effectiveness Inhalation: 78%] Inhalation explanation: <i>Efficiency for industrial use</i>	MEASE 1
• Room ventilation: Basic (up to 3 ACH)	MEASE 1
• Pattern of exposure control: Non-direct handling	MEASE 1
• Occupational Health and Safety Management System: Advanced	MEASE 1
• Pattern of use: Non-dispersive use	MEASE 1
Conditions and measures related to personal protection, hygiene and health evaluation	
• Dermal protection: No	MEASE 1
• Respiratory protective equipment (RPE) as precautionary measure: RPE protecting from local effects via inhalation	
• Face/eye protection: No	
• Respiratory protection: No	MEASE 1
• Gloves as precautionary measure: Gloves protecting from local effects to the skin (high hazard)	



	Method
• Eye protection: Eye protection to be worn to protect from adverse effects to the eyes	
Other conditions affecting workers exposure	
• Place of use: Indoor	MEASE 1
• Operating temperature: ≤ 40 °C	MEASE 1

9.2.6.2. Exposure and risks for workers

The exposure concentrations and risk characterisation ratios (RCR) are reported in the following table.

Table 9.29. Exposure concentrations and risks for workers

Route of exposure and type of effects	Assessment entity	Exposure concentration	Risk quantification
Inhalation, systemic, long term	disodium tetrachloropalladate	2.2E3 $\mu\text{g}/\text{m}^3$ (MEASE 1) RCR = 0.172	Final RCR = 0.172
Dermal, systemic, long term	disodium tetrachloropalladate	14.14 $\mu\text{g}/\text{kg}$ bw/day (MEASE 1) RCR = 7.81E-4	Final RCR < 0.01
Combined routes, systemic, long-term			Final RCR = 0.173

Remarks on exposure data from external estimation tools:

MEASE 1 for disodium tetrachloropalladate:

Explanation:

Dermal, systemic, long term

For calculation of systemic exposure, the exposure estimate for total dermal loading as obtained in MEASE (reported in mg/day) is divided by a body weight of 70 kg for workers.

Risk characterisation

Qualitative risk characterisation (Inhalation, local, long term, Inhalation, local, acute, Dermal, local, long term, Dermal, local, acute, Eye, local):

Further information on the risk characterisation for local effects via inhalation, for local dermal effects and local effects to the eyes is given in Section 9.0.2.3.

Additional remarks on risk characterisation: Under the prescribed conditions of use, exposure is well below the DNELs and no local effects are expected. Therefore, risks are adequately controlled.

9.2.7. Worker CS 7: Fully contained process (PROC 1)

Assessment entity group used for the assessment of this contributing scenario: disodium tetrachloropalladate for OCC assessment

Task(s) covered with this contributing scenario: Reaction process, spraying in fully contained systems.

9.2.7.1. Conditions of use

	Method
Product (article) characteristics	
• Content in preparation: Not restricted [Effectiveness Inhalation: 0%, Dermal: 0%]	MEASE 1
• Maximum emission potential of the substance: Very low <i>Higher emission potential during e.g. spraying processes not relevant due to full containment of the system.</i>	MEASE 1
• Physical form of the used product	MEASE 1
• Physical form of substance: Solution	MEASE 1
• Percentage (w/w) of substance in mixture/article: ≤ 100 %	MEASE 1
Amount used (or contained in articles), frequency and duration of use/exposure	
• Duration of activity: ≤ 8 h/day	MEASE 1



	Method
• Maximum duration of exposure: > 240 min (not restricted) [Effectiveness Inhalation: 0%, Dermal: 0%]	MEASE 1
Technical and organisational conditions and measures	
• Contact level: None	MEASE 1
• Local exhaust ventilation: No	MEASE 1
• Room ventilation: Basic (up to 3 ACH)	MEASE 1
• Pattern of exposure control: Non-direct handling	MEASE 1
• Occupational Health and Safety Management System: Advanced	MEASE 1
• Level of containment: Closed process	MEASE 1
• Pattern of use: Closed system without breaches	MEASE 1
Conditions and measures related to personal protection, hygiene and health evaluation	
• Dermal protection: No	MEASE 1
• Respiratory protective equipment (RPE) as precautionary measure: RPE protecting from local effects via inhalation	
• Face/eye protection: No	
• Respiratory protection: No	MEASE 1
• Gloves as precautionary measure: Gloves protecting from local effects to the skin (high hazard)	
• Eye protection: Eye protection to be worn to protect from adverse effects to the eyes	
Other conditions affecting workers exposure	
• Place of use: Indoor	MEASE 1
• Operating temperature: ≤ 40 °C	MEASE 1

9.2.7.2. Exposure and risks for workers

The exposure concentrations and risk characterisation ratios (RCR) are reported in the following table.

Table 9.30. Exposure concentrations and risks for workers

Route of exposure and type of effects	Assessment entity	Exposure concentration	Risk quantification
Inhalation, systemic, long term	disodium tetrachloropalladate	1 µg/m ³ (MEASE 1) RCR = 7.81E-5	Final RCR < 0.01
Dermal, systemic, long term	disodium tetrachloropalladate	1.71 µg/kg bw/day (MEASE 1) RCR = 9.45E-5	Final RCR < 0.01
Combined routes, systemic, long-term			Final RCR < 0.01

Remarks on exposure data from external estimation tools:

MEASE 1 for disodium tetrachloropalladate:

Explanation:

Dermal, systemic, long term

For calculation of systemic exposure, the exposure estimate for total dermal loading as obtained in MEASE (reported in mg/day) is divided by a body weight of 70 kg for workers.

Risk characterisation

Qualitative risk characterisation (Inhalation, local, long term, Inhalation, local, acute, Dermal, local, long term, Dermal, local, acute, Eye, local):

Further information on the risk characterisation for local effects via inhalation, for local dermal effects and local effects to the eyes is given in Section 9.0.2.3.

Additional remarks on risk characterisation: Under the prescribed conditions of use, exposure is well below the



DNELs and no local effects are expected. Therefore, risks are adequately controlled.

9.2.8. Worker CS 8: Batch process in closed system (PROC 3)

Assessment entity group used for the assessment of this contributing scenario: disodium tetrachloropalladate for OCC assessment

Task(s) covered with this contributing scenario: Reaction process, spraying in closed systems.

9.2.8.1. Conditions of use

	Method
Product (article) characteristics	
• Content in preparation: Not restricted [Effectiveness Inhalation: 0%, Dermal: 0%]	MEASE 1
• Maximum emission potential of the substance: Medium	MEASE 1
• Physical form of the used product	MEASE 1
• Physical form of substance: Solution <i>Solid is used as surrogate to reflect the higher emission potential during spraying in closed systems.</i>	MEASE 1
• Percentage (w/w) of substance in mixture/article: <= 100 %	MEASE 1
Amount used (or contained in articles), frequency and duration of use/exposure	
• Duration of activity: <= 8 h/day	MEASE 1
• Maximum duration of exposure: > 240 min (not restricted) [Effectiveness Inhalation: 0%, Dermal: 0%]	MEASE 1
Technical and organisational conditions and measures	
• Contact level: Intermittent	MEASE 1
• Local exhaust ventilation: No	MEASE 1
• Room ventilation: Basic (up to 3 ACH)	MEASE 1
• Pattern of exposure control: Non-direct handling	MEASE 1
• Occupational Health and Safety Management System: Advanced	MEASE 1
• Level of containment: Closed process	MEASE 1
• Pattern of use: Non-dispersive use	MEASE 1
Conditions and measures related to personal protection, hygiene and health evaluation	
• Dermal protection: No	MEASE 1
• Respiratory protective equipment (RPE) as precautionary measure: RPE protecting from local effects via inhalation	
• Face/eye protection: No	
• Respiratory protection: No	MEASE 1
• Gloves as precautionary measure: Gloves protecting from local effects to the skin (high hazard)	
• Eye protection: Eye protection to be worn to protect from adverse effects to the eyes	
Other conditions affecting workers exposure	
• Place of use: Indoor	MEASE 1
• Operating temperature: <= 40 °C	MEASE 1

9.2.8.2. Exposure and risks for workers

The exposure concentrations and risk characterisation ratios (RCR) are reported in the following table.

Table 9.31. Exposure concentrations and risks for workers



Route of exposure and type of effects	Assessment entity	Exposure concentration	Risk quantification
Inhalation, systemic, long term	disodium tetrachloropalladate	1E3 µg/m ³ (MEASE 1) RCR = 0.078	Final RCR = 0.078
Dermal, systemic, long term	disodium tetrachloropalladate	1.71 µg/kg bw/day (MEASE 1) RCR = 9.45E-5	Final RCR < 0.01
Combined routes, systemic, long-term			Final RCR = 0.078

Remarks on exposure data from external estimation tools:

MEASE 1 for disodium tetrachloropalladate:

Explanation:

Dermal, systemic, long term

For calculation of systemic exposure, the exposure estimate for total dermal loading as obtained in MEASE (reported in mg/day) is divided by a body weight of 70 kg for workers.

Risk characterisation

Qualitative risk characterisation (Inhalation, local, long term, Inhalation, local, acute, Dermal, local, long term, Dermal, local, acute, Eye, local):

Further information on the risk characterisation for local effects via inhalation, for local dermal effects and local effects to the eyes is given in Section 9.0.2.3.

Additional remarks on risk characterisation: Under the prescribed conditions of use, exposure is well below the DNELs and no local effects are expected. Therefore, risks are adequately controlled.

9.2.9. Worker CS 9: Open or semi-closed wet chemical process (PROC 4)

Assessment entity group used for the assessment of this contributing scenario: disodium tetrachloropalladate for OCC assessment

9.2.9.1. Conditions of use

	Method
Product (article) characteristics	
• Content in preparation: Not restricted [Effectiveness Inhalation: 0%, Dermal: 0%]	MEASE 1
• Maximum emission potential of the substance: Very low	MEASE 1
• Physical form of the used product	MEASE 1
• Physical form of substance: Solution	MEASE 1
• Percentage (w/w) of substance in mixture/article: <= 100 %	MEASE 1
Amount used (or contained in articles), frequency and duration of use/exposure	
• Duration of activity: <= 8 h/day	MEASE 1
• Maximum duration of exposure: > 240 min (not restricted) [Effectiveness Inhalation: 0%, Dermal: 0%]	MEASE 1
Technical and organisational conditions and measures	
• Contact level: Intermittent	MEASE 1
• Local exhaust ventilation: No	MEASE 1
• Room ventilation: Basic (up to 3 ACH)	MEASE 1
• Pattern of exposure control: Non-direct handling	MEASE 1
• Occupational Health and Safety Management System: Advanced	MEASE 1
• Pattern of use: Non-dispersive use	MEASE 1
Conditions and measures related to personal protection, hygiene and health evaluation	
• Dermal protection: No	MEASE 1
• Respiratory protective equipment (RPE) as precautionary measure: RPE protecting	



	Method
from local effects via inhalation	
• Face/eye protection: No	
• Respiratory protection: No	MEASE 1
• Gloves as precautionary measure: Gloves protecting from local effects to the skin (high hazard)	
• Eye protection: Eye protection to be worn to protect from adverse effects to the eyes	
Other conditions affecting workers exposure	
• Place of use: Indoor	MEASE 1
• Operating temperature: ≤ 40 °C	MEASE 1

9.2.9.2. Exposure and risks for workers

The exposure concentrations and risk characterisation ratios (RCR) are reported in the following table.

Table 9.32. Exposure concentrations and risks for workers

Route of exposure and type of effects	Assessment entity	Exposure concentration	Risk quantification
Inhalation, systemic, long term	disodium tetrachloropalladate	50 $\mu\text{g}/\text{m}^3$ (MEASE 1) RCR = 3.91E-3	Final RCR < 0.01
Dermal, systemic, long term	disodium tetrachloropalladate	3.43 $\mu\text{g}/\text{kg}$ bw/day (MEASE 1) RCR = 1.9E-4	Final RCR < 0.01
Combined routes, systemic, long-term			Final RCR < 0.01

Remarks on exposure data from external estimation tools:

MEASE 1 for disodium tetrachloropalladate:

Explanation:

Dermal, systemic, long term

For calculation of systemic exposure, the exposure estimate for total dermal loading as obtained in MEASE (reported in mg/day) is divided by a body weight of 70 kg for workers.

Risk characterisation

Qualitative risk characterisation (Inhalation, local, long term, Inhalation, local, acute, Dermal, local, long term, Dermal, local, acute, Eye, local):

Further information on the risk characterisation for local effects via inhalation, for local dermal effects and local effects to the eyes is given in Section 9.0.2.3.

Additional remarks on risk characterisation: Under the prescribed conditions of use, exposure is well below the DNELs and no local effects are expected. Therefore, risks are adequately controlled.

9.2.10. Worker CS 10: Wet cleaning (PROC 8a)

Assessment entity group used for the assessment of this contributing scenario: disodium tetrachloropalladate for OCC assessment

9.2.10.1. Conditions of use

	Method
Product (article) characteristics	
• Content in preparation: Not restricted [Effectiveness Inhalation: 0%, Dermal: 0%]	MEASE 1
• Maximum emission potential of the substance: Very low	MEASE 1
• Physical form of the used product	MEASE 1
• Physical form of substance: Solution	MEASE 1



	Method
• Percentage (w/w) of substance in mixture/article: ≤ 100 %	MEASE 1
Amount used (or contained in articles), frequency and duration of use/exposure	
• Duration of activity: ≤ 8 h/day	MEASE 1
• Maximum duration of exposure: > 240 min (not restricted) [Effectiveness Inhalation: 0%, Dermal: 0%]	MEASE 1
Technical and organisational conditions and measures	
• Contact level: Extensive	MEASE 1
• Local exhaust ventilation: No	MEASE 1
• Room ventilation: Basic (up to 3 ACH)	MEASE 1
• Pattern of exposure control: Direct handling	MEASE 1
• Occupational Health and Safety Management System: Advanced	MEASE 1
• Pattern of use: Non-dispersive use	MEASE 1
Conditions and measures related to personal protection, hygiene and health evaluation	
• Dermal protection: No	MEASE 1
• Respiratory protective equipment (RPE) as precautionary measure: RPE protecting from local effects via inhalation	
• Face/eye protection: No	
• Respiratory protection: No	MEASE 1
• Eye protection: Eye protection to be worn to protect from adverse effects to the eyes	
• Gloves: Protective gloves according to EN 374 have to be worn. Gloves have to be changed according to manufacturer's information or when damaged, whatever is the earlier. [Effectiveness Dermal: 90%]	MEASE 1
Other conditions affecting workers exposure	
• Place of use: Indoor	MEASE 1
• Operating temperature: ≤ 40 °C	MEASE 1

9.2.10.2. Exposure and risks for workers

The exposure concentrations and risk characterisation ratios (RCR) are reported in the following table.

Table 9.33. Exposure concentrations and risks for workers

Route of exposure and type of effects	Assessment entity	Exposure concentration	Risk quantification
Inhalation, systemic, long term	disodium tetrachloropalladate	50 µg/m ³ (MEASE 1) RCR = 3.91E-3	Final RCR < 0.01
Dermal, systemic, long term	disodium tetrachloropalladate	34.29 µg/kg bw/day (MEASE 1) RCR = 1.89E-3	Final RCR < 0.01
Combined routes, systemic, long-term			Final RCR < 0.01

Remarks on exposure data from external estimation tools:

MEASE 1 for disodium tetrachloropalladate:

Explanation:

Dermal, systemic, long term

For calculation of systemic exposure, the exposure estimate for total dermal loading as obtained in MEASE (reported in mg/day) is divided by a body weight of 70 kg for workers.

Risk characterisation

Qualitative risk characterisation (Inhalation, local, long term, Inhalation, local, acute, Dermal, local, long term,



Dermal, local, acute, Eye, local):

Further information on the risk characterisation for local effects via inhalation, for local dermal effects and local effects to the eyes is given in Section 9.0.2.3.

Additional remarks on risk characterisation: Under the prescribed conditions of use, exposure is well below the DNELs and no local effects are expected. Therefore, risks are adequately controlled.

9.2.11. Worker CS 11: Vacuum cleaning (PROC 26)

Assessment entity group used for the assessment of this contributing scenario: disodium tetrachloropalladate for OCC assessment

9.2.11.1. Conditions of use

	Method
Product (article) characteristics	
• Physical form of substance: Solid, powder / dust	MEASE 1
• Content in preparation: Not restricted [Effectiveness Inhalation: 0%, Dermal: 0%]	MEASE 1
• Maximum emission potential of the substance: High	MEASE 1
• Physical form of the used product	MEASE 1
• Percentage (w/w) of substance in mixture/article: <= 100 %	MEASE 1
Amount used (or contained in articles), frequency and duration of use/exposure	
• Duration of activity: <= 8 h/day	MEASE 1
• Maximum duration of exposure: > 240 min (not restricted) [Effectiveness Inhalation: 0%, Dermal: 0%]	MEASE 1
Technical and organisational conditions and measures	
• Additional operational conditions for cleaning: No direct manual removal of dust.	MEASE 1
• Contact level: Extensive	MEASE 1
• Local exhaust ventilation: No	MEASE 1
• Room ventilation: Basic (up to 3 ACH)	MEASE 1
• Pattern of exposure control: Non-direct handling	MEASE 1
• Occupational Health and Safety Management System: Advanced	MEASE 1
• Integrated local exhaust ventilation: Lower confidence limit (industrial use) [Effectiveness Inhalation: 84%] <i>Surrogate exposure determinant used to reflect the efficiency of a vacuum cleaner.</i> Inhalation explanation: <i>Efficiency for industrial use</i>	MEASE 1
• Pattern of use: Non-dispersive use	MEASE 1
Conditions and measures related to personal protection, hygiene and health evaluation	
• Respiratory protective equipment (RPE): RPE with minimum APF = 20 [Effectiveness Inhalation: 95%]	MEASE 1
• Dermal protection: No	MEASE 1
• Face/eye protection: No	
• Respiratory protection: No	MEASE 1
• Eye protection: Eye protection to be worn to protect from adverse effects to the eyes	
• Gloves: Protective gloves according to EN 374 have to be worn. Gloves have to be changed according to manufacturer's information or when damaged, whatever is the earlier. [Effectiveness Dermal: 90%]	MEASE 1
Other conditions affecting workers exposure	
• Place of use: Indoor	MEASE 1
• Operating temperature: <= 40 °C	MEASE 1



9.2.11.2. Exposure and risks for workers

The exposure concentrations and risk characterisation ratios (RCR) are reported in the following table.

Table 9.34. Exposure concentrations and risks for workers

Route of exposure and type of effects	Assessment entity	Exposure concentration	Risk quantification
Inhalation, systemic, long term	disodium tetrachloropalladate	80 µg/m ³ (MEASE 1) RCR = 6.25E-3	Final RCR < 0.01
Dermal, systemic, long term	disodium tetrachloropalladate	1.41 µg/kg bw/day (MEASE 1) RCR = 7.79E-5	Final RCR < 0.01
Combined routes, systemic, long-term			Final RCR < 0.01

Remarks on exposure data from external estimation tools:

MEASE 1 for disodium tetrachloropalladate:

Explanation:

Dermal, systemic, long term

For calculation of systemic exposure, the exposure estimate for total dermal loading as obtained in MEASE (reported in mg/day) is divided by a body weight of 70 kg for workers.

Risk characterisation

Qualitative risk characterisation (Inhalation, local, long term, Inhalation, local, acute, Dermal, local, long term, Dermal, local, acute, Eye, local):

Further information on the risk characterisation for local effects via inhalation, for local dermal effects and local effects to the eyes is given in Section 9.0.2.3.

Additional remarks on risk characterisation: Under the prescribed conditions of use, exposure is well below the DNELs and no local effects are expected. Therefore, risks are adequately controlled.