9.13. Exposure scenario 13: Use at industrial sites - Soldering and brazing in industrial settings

Product category used: PC 7: Base metals and alloys; PC 33: Semiconductors; PC 38: Welding and soldering products, flux products
Sector of use: SU 17: General manufacturing, e.g. machinery, equipment, vehicles, other transport equipment.

Environment contributing scenario(s):		
CS 1	Soldering and brazing in industrial settings	ERC 5
Worker contributing scenario(s):		
CS 2	Soldering and brazing	PROC 25

Subsequent service life exposure scenario(s):
ES18: Service life (professional worker) - Service life of silver-containing articles in professional settings
ES19: Service life (consumers) - Service life of massive objects containing silver metal at ambient temperature (including trade bars)

9.13.1. Env CS 1: Soldering and brazing in industrial settings (ERC 5)

Assessment entity group used for the assessment of this contributing scenario: Silver in powder form

9.13.1.1. Conditions of use

Amount used, frequency and duration of use (or from service life)
• Daily use amount at site: <= 0.021 tonnes/day *Based on 240 days per year.*
• Annual use amount at site: <= 5 tonnes/year *Based on the maximum value reported by the companies.*
Technical and organisational conditions and measures
• The substance should not be released to air *Emissions to air are not allowed in this scenario*
• The substance should not be released to water *Emissions to surface water or to the sewage system are not allowed in this scenario*
Conditions and measures related to biological sewage treatment plant
• Biological STP: None [Effectiveness Water: 0%]
Conditions and measures related to external treatment of waste (including article waste)
• Particular considerations on the waste treatment operations: No (low concentration) *Hazardous wastes from onsite risk management measures and solid or liquid wastes from production, use and cleaning processes should be disposed of separately to hazardous waste incineration plants or hazardous waste landfills as hazardous waste. Releases to the floor, water and soil are to be prevented. If the silver content of the waste is elevated enough, internal or external recovery/recycling might be considered.* *Appropriate waste codes: 06 05 02*, 08 01 11, 08 03 12*, 09 01 01*, 09 01 03*, 09 01 04*, 09 01 05*, 09 01 06*, 09 01 13*, 10 06 06*, 10 07 01, 10 07 02, 10 07 03, 10 07 04, 10 07 05, 11 01 09*, 15 01 10*, 15 02 02*, 16 01 18, 16 03 03*, 16 08 01, 16 11 04* *Suitable disposal: Hazardous waste produced during the manufacture and downstream use is sent to a recycler only marginal amounts are sent to a landfill or an incinerator. Waste containing silver is recycled for almost a 100%* *A detailed assessment has been performed on modelled and measured data and is reported in the Waste report (ARCHE, 2013)*
Other conditions affecting environmental exposure
• Receiving surface water flow rate: >= 1.8E4 m3/day
• Discharge rate of effluent: >= 2E3 m3/day

9.13.1.2. 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 9.45. Local releases to the environment

Release	Assessment entity	Release estimation method	Explanations
Water	Silver in powder form	Estimated release factor	**Release factor before on site RMM:** 0% **Release factor after on site RMM:** 0% **Local release rate:** 0 kg/day **Explanation:** 12 out of 13 companies have reported no release to water. The remaining company didn't provide data. No discharge of waste water, waste water is evaporated and re-used, silver is used in closed systems or hand soldering workstation. No contact with water and no cleaning.
Air	Silver in powder form	Estimated release factor	**Release factor before on site RMM:** 0% **Release factor after on site RMM:** 0% **Local release rate:** 0 kg/day **Explanation:** 10 out of 13 companies have reported no release to water. The remaining companies didn't provide data. There are risk mitigation measures in place such as ventilation through a dust collector before released to outside, other filters in the ventilation systems are in place. Filter dust collecting silver is being recycled.
Non agricultural soil	Silver in powder form	Estimated release factor	**Release factor after on site RMM:** 0% **Explanation:** No direct emissions to soil.

Releases to waste

Release factor to external waste: 0 %
A detailed assessment has been performed on modelled and measured data and is reported in the Waste report (ARCHE, 2013)

9.13.1.3. 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 9.46. Exposure concentrations and risks for the environment and man via the environment

Protection target	Assessment entity	Exposure concentration	Risk quantification
Fresh water	Silver in powder form	**Local PEC:** 6.06E-6 mg/L RCR = 0.151	Final RCR = 0.151
Sediment (freshwater)	Silver in powder form	**Local PEC:** 1.155 mg/kg dw RCR = 2.64E-3	Final RCR < 0.01
Marine water	Silver in powder form	**Local PEC:** 1.91E-6 mg/L RCR = 2.22E-3	Final RCR < 0.01
Sediment (marine water)	Silver in powder form	**Local PEC:** 0.364 mg/kg dw RCR = 8.31E-4	Final RCR < 0.01
Sewage Treatment Plant	Silver in powder form	**Local PEC:** 0 mg/L RCR = 0	Final RCR < 0.01
Agricultural soil	Silver in powder form	**Local PEC:** 0.096 mg/kg dw RCR = 0.068	Final RCR = 0.068

9.13.2. Worker CS 2: Soldering and brazing (PROC 25)

Assessment entity group used for the assessment of this contributing scenario: Silver in powder form
Exposure assessment and risk characterisation are not required (see scope under 9.0.4).