

5. ES 5: Use at industrial sites; Use of cobalt in the manufacture of cobalt carboxylates and resinates (intermediate use)

5.1. Title section

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

Environment	
1: Use of cobalt in the manufacture of cobalt carboxylates and resinates (intermediate use)	ERC 6a
Worker	
2: Raw material handling	PROC 26, PROC 8b
3: Reaction	PROC 4, PROC 3, PROC 1
4: Packaging of powders	PROC 26
5: Filling of liquids	PROC 9, PROC 8b
6: Packaging of low and/or medium dusty materials	PROC 26, PROC 8b
7: Cleaning & Maintenance	PROC 28

5.2. Conditions of use affecting exposure

5.2.1. Control of environmental exposure: Use of cobalt in the manufacture of cobalt carboxylates and resinates (intermediate use) (ERC 6a)

Amount used, frequency and duration of use (or from service life)
Daily amount per site <= 1.8 tonnes/day
Annual amount per site <= 250 tonnes/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
Provide onsite wastewater treatment.
Assumed domestic sewage treatment plant flow >= 4E4 m3/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
No discharge to marine water assumed
Local freshwater dilution factor 10

5.2.2. Control of worker exposure: Raw material handling (PROC 26, PROC 8b)

Product (article) characteristics
Maximum emission potential covered in this ES: Medium.
Concentration of the substance in mixture is not restricted.
Physical form covered in this ES: Solid, powder / dust.
Physical form of product; Aqueous solution
Amount used (or contained in articles), frequency and duration of use/exposure
Duration of exposure: Not restricted.
Technical and organisational conditions and measures
Process is carried out at ambient temperature.
Use of an integrated local exhaust ventilation with an efficiency of at least 90% 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.
APF of RPE = 10 (90% respiratory protection).
Wear protective suit conforming to EN 13982 in cases where direct contact with the substance cannot be avoided.

5.2.3. Control of worker exposure: Reaction (PROC 4, PROC 3, PROC 1)

Product (article) characteristics
Maximum emission potential covered in this ES: Very low.
Concentration of the substance in mixture is not restricted.
Physical form covered in this ES: Aqueous solution.
Amount used (or contained in articles), frequency and duration of use/exposure
Duration of exposure: Not restricted.
Technical and organisational conditions and measures
Limit the process temperature to 180 °C.
Ensure full containment of the process.
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.
Wear respiratory protection providing a minimum assigned protection factor of 10 (a minimum efficiency of 90%) unless inhalation exposure to the substance can be excluded. For further specification, refer to section 8 of the SDS.

5.2.4. Control of worker exposure: Packaging of powders (PROC 26)

Product (article) characteristics
Maximum emission potential covered in this ES: High.
Concentration of the substance in mixture is not restricted.
Physical form covered in this ES: Solid, powder / dust.
Amount used (or contained in articles), frequency and duration of use/exposure
Duration of exposure: Not restricted.
Technical and organisational conditions and measures

Process is carried out at ambient temperature.
Ensure containment of the process as far as technically feasible.
Level of automation should be semi-automated.
Use of an integrated local exhaust ventilation with an efficiency of at least 90% is required.
Conditions and measures related to personal protection, hygiene and health evaluation
Use suitable eye protection.; For further specification, refer to section 8 of the SDS.
Wear suitable gloves tested to EN374.; For further specification, refer to section 8 of the SDS.
APF of RPE = 20 (95% respiratory protection).
Wear protective suit conforming to EN 13982 in cases where direct contact with the substance cannot be avoided.

5.2.5. Control of worker exposure: Filling of liquids (PROC 9, PROC 8b)

Product (article) characteristics
Maximum emission potential covered in this ES: Very low.
Concentration of the substance in mixture is not restricted.
Physical form covered in this ES: Aqueous solution.
Amount used (or contained in articles), frequency and duration of use/exposure
Duration of exposure: Not restricted.
Technical and organisational conditions and measures
Process is carried out at ambient temperature.
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.
Wear respiratory protection providing a minimum assigned protection factor of 10 (a minimum efficiency of 90%) unless inhalation exposure to the substance can be excluded. For further specification, refer to section 8 of the SDS.

5.2.6. Control of worker exposure: Packaging of low and/or medium dusty materials (PROC 26, PROC 8b)

Product (article) characteristics
Maximum emission potential covered in this ES: Medium.
Physical form covered in this ES: Solid, pellet / pastille.
Concentration of the substance in mixture is not restricted.
Amount used (or contained in articles), frequency and duration of use/exposure
Duration of exposure: Not restricted.
Technical and organisational conditions and measures
Level of automation should be semi-automated.
Use of an integrated local exhaust ventilation with an efficiency of at least 90% is required.
Process is carried out at ambient temperature.
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.
APF of RPE = 10 (90% respiratory protection).

5.2.7. Control of worker exposure: Cleaning & Maintenance (PROC 28)

Product (article) characteristics
Maximum emission potential covered in this ES: High.
Physical form covered in this ES: Solid, powder / dust.
Amount used (or contained in articles), frequency and duration of use/exposure
Duration of exposure: Not restricted.
Technical and organisational conditions and measures
Process is carried out at ambient temperature.
Process is carried out at ambient pressure.
Maintenance and repair work only at facilities which are not in operation. Minor cleaning tasks may be conducted under operation.
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.
APF of RPE = 40 (97.5% respiratory protection).
Wear protective suit conforming to EN 13982 in cases where direct contact with the substance cannot be avoided.

5.3. Exposure estimation and reference to its source

5.3.1. Environmental release and exposure: Use of cobalt in the manufacture of cobalt carboxylates and resinates (intermediate use) (ERC 6a)

Release route	Release rate	Release estimation method
Water	0.101 kg/day	Estimated release factor
Air	1.8E-3 kg/day	Estimated release factor
Soil	0 kg/day	Estimated release factor

Protection target	Exposure estimate	RCR
Fresh water	1.95E-4 mg/L (EUSES 2.1.2)	0.315
Sediment (freshwater)	7.99 mg/kg dw (PEC sediment calculation method for metals)	0.149
Sewage Treatment Plant	1.51E-3 mg/L (EUSES 2.1.2)	< 0.01
Agricultural soil	0.281 mg/kg dw (EUSES 2.1.2)	0.026
Man via environment - Inhalation	1.9E-7 mg/m ³ (EUSES 2.1.2)	< 0.01

5.3.2. Worker exposure: Raw material handling (PROC 26, PROC 8b)

Route of exposure and type of effects	Exposure estimate	RCR
Inhalation, local, long term	20.6 µg/m ³ (Measured data)	0.515

5.3.3. Worker exposure: Reaction (PROC 4, PROC 3, PROC 1)

Route of exposure and type of effects	Exposure estimate	RCR
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Route of exposure and type of effects	Exposure estimate	RCR
Inhalation, local, long term	5 µg/m ³ (Measured data)	0.125

5.3.4. Worker exposure: Packaging of powders (PROC 26)

Route of exposure and type of effects	Exposure estimate	RCR
Inhalation, local, long term	11.6 µg/m ³ (Measured data)	0.29

5.3.5. Worker exposure: Filling of liquids (PROC 9, PROC 8b)

Route of exposure and type of effects	Exposure estimate	RCR
Inhalation, local, long term	10 µg/m ³ (MEASE)	0.25

5.3.6. Worker exposure: Packaging of low and/or medium dusty materials (PROC 26, PROC 8b)

Route of exposure and type of effects	Exposure estimate	RCR
Inhalation, local, long term	16.8 µg/m ³ (Measured data)	0.42

5.3.7. Worker exposure: Cleaning & Maintenance (PROC 28)

Route of exposure and type of effects	Exposure estimate	RCR
Inhalation, local, long term	20.2 µg/m ³ (Measured data)	0.505

5.4. 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".