

38. ES 38: Use at industrial sites; Use of cobalt as an intermediate in the manufacture of catalysts

38.1. 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 as an intermediate in the manufacture of catalysts ES1 STP Discharge	ERC 6a
2: Use of cobalt as an intermediate in the manufacture of catalysts ES2 Direct Discharge	ERC 6a
3: Use of cobalt as an intermediate in the manufacture of catalysts ES3 Marine Discharge	ERC 6a
Worker	
4: Use of cobalt as an intermediate in the manufacture of catalysts in closed conditions	PROC 1, PROC 2
5: Use of cobalt as an intermediate in the manufacture of catalysts in semi-closed conditions	PROC 3, PROC 9, PROC 4, PROC 8b
6: Cleaning and maintenance	PROC 28

38.2. Conditions of use affecting exposure

38.2.1. Control of environmental exposure: Use of cobalt as an intermediate in the manufacture of catalysts ES1 STP Discharge (ERC 6a)

Amount used, frequency and duration of use (or from service life)
Daily amount per site <= 0.272 tonnes/day
Annual amount per site <= 98 tonnes/year
Emission days >= 360 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 >= 2E3 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 100

38.2.2. Control of environmental exposure: Use of cobalt as an intermediate in the manufacture of catalysts ES2 Direct

Discharge (ERC 6a)

Amount used, frequency and duration of use (or from service life)
Daily amount per site <= 0.272 tonnes/day
Annual amount per site <= 98 tonnes/year
Emission days >= 360 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
Assumed effluent discharge flow from site >= 245 m3/day
No discharge to marine water assumed
Local freshwater dilution factor 500

38.2.3. Control of environmental exposure: Use of cobalt as an intermediate in the manufacture of catalysts ES3 Marine Discharge (ERC 6a)

Amount used, frequency and duration of use (or from service life)
Daily amount per site <= 0.272 tonnes/day
Annual amount per site <= 98 tonnes/year
Emission days >= 360 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
Assumed effluent discharge flow from site >= 245 m3/day
No discharge to freshwater assumed
Local marine water dilution factor 100

38.2.4. Control of worker exposure: Use of cobalt as an intermediate in the manufacture of catalysts in closed conditions (PROC 1, PROC 2)

Product (article) characteristics
Maximum emission potential covered in this ES: High.
Physical form covered in this ES: Solid, powder / dust, shaped catalysts.
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
Limit the process temperature to 600 °C.
Ensure full containment of the process.
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 = 20 (95% respiratory protection).
Wear protective suit conforming to EN 13982 in cases where direct contact with the substance cannot be avoided.

38.2.5. Control of worker exposure: Use of cobalt as an intermediate in the manufacture of catalysts in semi-closed conditions (PROC 3, PROC 9, PROC 4, PROC 8b)

Product (article) characteristics
Maximum emission potential covered in this ES: High.
Physical form covered in this ES: Solid, powder / dust, shaped catalysts.
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
Limit the process temperature to 160 °C.
Ensure containment of the process as far as technically feasible.
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 = 20 (95% respiratory protection).
Wear protective suit conforming to EN 13982 in cases where direct contact with the substance cannot be avoided.

38.2.6. Control of worker exposure: Cleaning and maintenance (PROC 28)

Product (article) characteristics
Concentration of the substance in mixture is not restricted.
Maximum emission potential covered in this ES: Low.
Amount used (or contained in articles), frequency and duration of use/exposure
Typical duration per shift = 120 min
Typical number of shifts per year = 48 Shifts/year
Technical and organisational conditions and measures
Process is carried out at ambient temperature.
Process is carried out at ambient pressure.
Conditions and measures related to personal protection, hygiene and health evaluation
APF of RPE = 10 (90% respiratory protection).

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.
Wear protective suit conforming to EN 13982 in cases where direct contact with the substance cannot be avoided.

38.3. Exposure estimation and reference to its source

38.3.1. Environmental release and exposure: Use of cobalt as an intermediate in the manufacture of catalysts ES1 STP Discharge (ERC 6a)

Release route	Release rate	Release estimation method
Water	0.02 kg/day	Estimated release factor
Air	5.98E-3 kg/day	Estimated release factor
Soil	0 kg/day	Estimated release factor

Protection target	Exposure estimate	RCR
Fresh water	1.38E-4 mg/L (EUSES 2.1.2)	0.223
Sediment (freshwater)	5.73 mg/kg dw (PEC sediment calculation method for metals)	0.107
Sewage Treatment Plant	6.04E-3 mg/L (EUSES 2.1.2)	0.016
Agricultural soil	0.409 mg/kg dw (EUSES 2.1.2)	0.037
Man via environment - Inhalation	1.64E-6 mg/m ³ (EUSES 2.1.2)	< 0.01

38.3.2. Environmental release and exposure: Use of cobalt as an intermediate in the manufacture of catalysts ES2 Direct Discharge (ERC 6a)

Release route	Release rate	Release estimation method
Water	0.02 kg/day	Estimated release factor
Air	5.98E-3 kg/day	Estimated release factor
Soil	0 kg/day	Estimated release factor

Protection target	Exposure estimate	RCR
Fresh water	2.04E-4 mg/L (EUSES 2.1.2)	0.329
Sediment (freshwater)	8.26 mg/kg dw (PEC sediment calculation method for metals)	0.154
Agricultural soil	0.239 mg/kg dw (EUSES 2.1.2)	0.022
Man via environment - Inhalation	1.64E-6 mg/m ³ (EUSES 2.1.2)	< 0.01

38.3.3. Environmental release and exposure: Use of cobalt as an intermediate in the manufacture of catalysts ES3 Marine Discharge (ERC 6a)

Release route	Release rate	Release estimation method
Water	0.02 kg/day	Estimated release factor
Air	5.98E-3 kg/day	Estimated release factor
Soil	0 kg/day	Estimated release factor

Protection target	Exposure estimate	RCR
Marine water	0.372 µg/L (Clocal calculation with Kp susp. matter marine)	0.158
Sediment (marine water)	45.46 mg/kg dw (PEC sediment calculation method for metals)	0.651
Agricultural soil	0.239 mg/kg dw (EUSES 2.1.2)	0.022
Man via environment - Inhalation	1.64E-6 mg/m ³ (EUSES 2.1.2)	< 0.01

38.3.4. Worker exposure: Use of cobalt as an intermediate in the manufacture of catalysts in closed conditions (PROC 1, PROC 2)

Route of exposure and type of effects	Exposure estimate	RCR
Inhalation, local, long term	19.2 µg/m ³ (Measured data)	0.48

38.3.5. Worker exposure: Use of cobalt as an intermediate in the manufacture of catalysts in semi-closed conditions (PROC 3, PROC 9, PROC 4, PROC 8b)

Route of exposure and type of effects	Exposure estimate	RCR
Inhalation, local, long term	19.2 µg/m ³ (Measured data)	0.48

38.3.6. Worker exposure: Cleaning and maintenance (PROC 28)

Route of exposure and type of effects	Exposure estimate	RCR
Inhalation, local, long term	2.4 µg/m ³ (Measured data)	0.06

38.4. 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".