

10. ES 10: Service life (worker at industrial site); Service life of cobalt containing alloys, steels and tools in industrial settings

10.1. Title section

Article category: Vehicles (AC 1), Machinery, mechanical appliances, electrical/electronic articles (AC 2), Metal articles (AC 7)

Environment	
1: Service life of cobalt containing alloys, steels and tools in industrial settings	ERC 12a
Worker	
2: Handling and mechanical treatment of metal or hard coated tools, metals and/or alloys – low kinetic energy	PROC 21
3: Use and mechanical treatment of metal or hard coated tools, metals and/or alloys – high kinetic energy	PROC 24
4: Use of cobalt alloy in laser surface treatment	PROC 25
Exposure scenario of the uses leading to the inclusion of the substance into the article	
ES 7: Use at industrial sites; Various products; Various sectors; Production and industrial use of cobalt containing alloys, steels and tools	
ES 9: Use at industrial sites; Base metals and alloys; Manufacture of basic metals, including alloys; Industrial use of cobalt metal in additive manufacturing (3D-printing)	

10.2. Conditions of use affecting exposure

10.2.1. Control of environmental exposure: Service life of cobalt containing alloys, steels and tools in industrial settings (ERC 12a)

Amount used, frequency and duration of use (or from service life)
Daily amount per site <= 50 tonnes/day
Annual amount per site <= 5E3 tonnes/year
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.

10.2.2. Control of worker exposure: Handling and mechanical treatment of metal or hard coated tools, metals and/or alloys – low kinetic energy (PROC 21)

Product (article) characteristics
Maximum emission potential covered in this ES: Low (abrasion based).
Concentration of the substance in mixture is not restricted.
Physical form covered in this ES: Massive object.
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.

10.2.3. Control of worker exposure: Use and mechanical treatment of metal or hard coated tools, metals and/or alloys – high kinetic energy (PROC 24)

Product (article) characteristics
Maximum emission potential covered in this ES: High (abrasion based).
Concentration of the substance in mixture is not restricted.
Physical form covered in this ES: Massive object.
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.
APF of RPE = 10 (90% respiratory protection).

10.2.4. Control of worker exposure: Use of cobalt alloy in laser surface treatment (PROC 25)

Product (article) characteristics
Physical form covered in this ES: Massive object.
Technical and organisational conditions and measures
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.
APF of RPE = 10 (90% respiratory protection).

10.3. Exposure estimation and reference to its source

10.3.1. Environmental release and exposure: Service life of cobalt containing alloys, steels and tools in industrial settings (ERC 12a)

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

10.3.2. Worker exposure: Handling and mechanical treatment of metal or hard coated tools, metals and/or alloys – low kinetic energy (PROC 21)

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

10.3.3. Worker exposure: Use and mechanical treatment of metal or hard coated tools, metals and/or alloys – high kinetic energy (PROC 24)

Route of exposure and type of effects	Exposure estimate	RCR
Inhalation, local, long term	11 µg/m ³ (Measured data)	0.275

10.3.4. Worker exposure: Use of cobalt alloy in laser surface treatment (PROC 25)

Route of exposure and type of effects	Exposure estimate	RCR
Inhalation, local, long term	1 µg/m ³ (MEASE)	0.025

10.4. 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”.